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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JED MARGOLIN

Appeal 2012-003538
Application 11/736,356
Technology Center 3600

Before WILLIAM A. CAPP, NEIL T. POWELL, and
BART A. GERSTENBLITH, *Administrative Patent Judges*.

Opinion for the Board filed by *Administrative Patent Judge*
GERSTENBLITH.

Opinion Dissenting-in-Part filed by *Administrative Patent Judge* CAPP.

GERSTENBLITH, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Jed Margolin (“Appellant”) appeals under 35 U.S.C. § 134 from the Examiner’s decision rejecting claims 1-14. We have jurisdiction under 35 U.S.C. § 6(b).

Claimed Subject Matter

Claims 1, 5, 8, and 12 are the independent claims on appeal. Claim 1 is illustrative of the claimed subject matter and is reproduced below.

1. A system for safely flying an unmanned aerial vehicle in civilian airspace comprising:

(a) a ground station equipped with a synthetic vision system;

(b) an unmanned aerial vehicle capable of supporting said synthetic vision system;

(c) a remote pilot operating said ground station;

(d) a communications link between said unmanned aerial vehicle and said ground station;

(e) a system onboard said unmanned aerial vehicle for detecting the presence and position of nearby aircraft and communicating this information to said remote pilot;

whereas said remote pilot uses said synthetic vision system to control said unmanned aerial vehicle during at least selected phases of the flight of said unmanned aerial vehicle, and during those phases of the flight of said unmanned aerial vehicle when said synthetic vision system is not used to control said unmanned aerial vehicle said unmanned aerial vehicle is flown using an autonomous control system.

App. Br. 55, Claims App’x.

References

The Examiner relies upon the following prior art references:

Margolin	US 5,904,724	May 18, 1999
Duggan	US 2005/0004723 A1	Jan. 6, 2005

Rejection

Appellant seeks review of the following rejection:

Claims 1-14 are rejected under 35 U.S.C. § 103(a) as unpatentable over Margolin and Duggan.

SUMMARY OF DECISION

We AFFIRM-IN-PART.

OPINION

The Examiner concludes that the combination of Margolin and Duggan would have rendered obvious the subject matter of claims 1-14 to one of ordinary skill in the art at the time of invention. Ans. 4-13. The Examiner finds that Margolin discloses the elements of claim 1, except that it does not disclose “that the vehicle is flown using an autonomous control system (e.g., autopilot).” *Id.* at 5 (emphasis omitted). The Examiner finds that Duggan discloses:

a system for safely flying an unmanned aerial vehicle in civilian airspace comprising: a ground station controlling an unmanned aerial vehicle . . . wherein during phases of a flight of an unmanned aerial vehicle . . . when a synthetic vision [system] . . . is not used to control said unmanned aerial vehicle said unmanned aerial vehicle is flown using an autonomous control system.

Id. at 5-6 (emphasis omitted). The Examiner concludes that it would have been obvious to one of ordinary skill in the art to modify the system of Margolin to “incorporat[e] an autopilot to ensure smooth transitions” as taught by Duggan. *Id.* at 6 (emphasis omitted).

Claims 1, 3, 4, 8, 10, and 11¹

Appellant raises several arguments in response to this rejection. We address each.

First, Appellant asserts that neither Margolin nor Duggan teaches whereas said remote pilot uses said synthetic vision system to control said unmanned aerial vehicle during at least selected phases of the flight of said unmanned aerial vehicle, and during those phases of the flight of said unmanned aerial vehicle when said synthetic vision system is not used to control said unmanned aerial vehicle said unmanned aerial vehicle is flown using an autonomous control system.

App. Br. 15-22; *see* Reply Br. 5-6.

The Examiner relies upon a combination of Margolin and Duggan as disclosing these elements of the claim 1. Thus, the failure of any one of the references to disclose these elements is inapposite where a second reference discloses the missing elements. *See In re Keller*, 642 F.2d 413, 426 (CCPA 1981) (“one cannot show non-obviousness by attacking references individually where, as here, the rejections are based on combinations of references”); *see also In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (same); *In re Young*, 927 F.2d 588, 591 (Fed. Cir. 1991) (“The test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art.”).

¹ Appellant does not separately argue claims 1, 3, 4, 10, and 11. *See* App. Br. 14-54. Appellant raises a separate argument with respect to claim 8 (*see* App. Br. 34), but the elements argued are actually recited in claim 9, not claim 8 (*see id.* at 57). Thus, Appellant has not raised a separate argument with respect to the elements of claim 8. Accordingly, we select claim 1 as representative, and claims 3, 4, 8, 10, and 11 stand or fall with claim 1. *See* 37 C.F.R. § 41.37(c)(1)(vii) (2011); *see also In re Lovin*, 652 F.3d 1349, 1351 (Fed. Cir. 2011).

Additionally, Appellant acknowledges that Margolin and Duggan each disclose the use of a synthetic vision system for flying an unmanned aerial vehicle. *See, e.g.*, Reply Br. 4-5 (identifying elements (a)-(e) of claim 1 as disclosed by Margolin), 6 (quoting Duggan, paras. [0356], [0388]). The Examiner relied upon Duggan, not Margolin, as disclosing the use of an autonomous control system to fly an unmanned aerial vehicle. *See id.* at 5-6. And the Examiner provides a specific reason with rational underpinning as to why one of ordinary skill in the art at the time of invention would have been prompted to combine these disclosures, i.e., “for the purpose of incorporating an autopilot to ensure smooth transitions (Duggan abstract, sec 0014, 0085, 0086).” Ans. 6 (emphasis omitted).

Accordingly, Appellant’s argument is not persuasive.

Second, Appellant contends that Margolin does not support the Examiner’s assertion that it “shows ‘whereas said remote pilot uses said synthetic vision system (305, 306, 307, 311 on aircraft) to control said unmanned aerial vehicle 300 during at least selected phases of the flight of said unmanned aerial vehicle.’” App. Br. 16-17. Appellant’s dispute centers on the Examiner’s assertion that “selected phases implies some or all phases during flight.” *Id.* at 22; *see* Ans. 5. Specifically, Appellant asserts that he “intended that the phases be selected.” App. Br. 22. Appellant contends that the Examiner’s interpretation that “at least selected phases of the flight” includes “some or all phases” is broader than the interpretation he intended. *Id.*

Claim 1 (and independent claims 5, 8, and 12) utilizes the open-ended transition term “comprising.” App. Br. 55, Claims App’x. “‘Comprising’ is a term of art used in claim language which means that the named elements

are essential, but other elements may be added and still form a construct within the scope of the claim.” *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501 (Fed. Cir. 1997) (citation omitted). “The word ‘comprising’ transitioning from the preamble to the body signals that the entire claim is presumptively open-ended.” *Gillette Co. v. Energizer Holdings Inc.*, 405 F.3d 1367, 1371 (Fed. Cir. 2005).

Claim 1 (and independent claims 5, 8, and 12) further recites the phrase “during *at least* selected phases of the flight of said unmanned aerial vehicle.” App. Br. 55, Claims App’x (emphasis added). Nothing in the claim restricts “selected phases” to less than any or all phases of the flight. Accordingly, Appellant’s argument that the Examiner erred in finding that “selected phases” is broad enough to include some or all phases during flight is not persuasive.

Third, Appellant asserts that “[a]n autonomous control system is much more than an autopilot. [Appellant] does not equate the two.” App. Br. 22.

Appellant’s argument does not specifically explain what features of an autonomous control system are not disclosed by an autopilot system. Appellant’s contention is thus unsupported by any evidence and does not apprise us of error by the Examiner.

Additionally, we agree with the Examiner that Duggan’s system is described as providing autonomous control. *See, e.g.*, Duggan at para. [0390] (“[A]n operator can maintain a variable level of control over a UAV, from fully manual to fully autonomous, with simple user-friendly inputs.”); *see* Ans. 6.

Fourth, Appellant contends that the Examiner erred by not relying on the ordinary and customary meaning of the phrase “civilian airspace” and by

interpreting the prior art too broadly in finding that it discloses this element of the claims. *See* App. Br. 41-46; Reply Br. 7-8. Appellants' argument focuses on the distinction between "civilian airspace" and "military airspace." App. Br. 43-45.

The Examiner relied upon Margolin's disclosure of remote aircraft flown by a recreational enthusiast as disclosing that the airspace discussed therein is a "civilian airspace." Ans. 4-5, 14-15.

Claim 1 is directed to "[a] system for safely flying an unmanned aerial vehicle in civilian airspace." App. Br. 55, Claims App'x.² The phrase "for safely flying an unmanned aerial vehicle in civilian airspace" does not appear to warrant significant patentable weight because it merely recites a purpose or an intended use of the system. *See, e.g., Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999) (explaining that if "the body of the claim fully and intrinsically sets forth the complete invention, including all of its limitations, and the preamble offers no distinct definition of any of the claimed invention's limitations, but rather merely states, for example, the purpose or intended use of the invention, then the preamble is of no significance to claim construction because it cannot be said to constitute or explain a claim limitation" (citations omitted)).

Even assuming that the phrase limits the claim, the most Appellant has offered by way of an ordinary and customary meaning of the phrase is that it is distinguishable from "military airspace." *See* App. Br. 42-45. In other words, "civilian airspace" is non-military airspace. As found by the Examiner, Margolin discloses an embodiment in which "the Remote Aircraft

² The phrase "civilian airspace" only appears in the preamble of each independent claim. App. Br. 55-58, Claims App'x.

103 is a remote controlled plane or helicopter *used for recreational purposes.*” Margolin, col. 3, ll. 50-51 (emphasis added); *see* Ans. 5. Based on the disclosure of using the aircraft for recreational purposes, the Examiner’s finding that Margolin discloses using the aircraft in civilian airspace is consistent with Appellant’s argument as to civilian airspace’s ordinary and customary meaning—non-military airspace—because it is more likely than not that recreational use is undertaken in non-military airspace. Accordingly, Appellant’s arguments are not persuasive.

Fifth, Appellant contends that the Examiner erred in interpreting the term “safety” and that the Specification defines “the particular level of safety.”³ App. Br. 46-48 (quoting Spec. 4, ll. 24-26); Reply Br. 7-11.

As reflected above, the preamble of claim 1 does not appear to warrant significant patentable weight because it merely recites a purpose or an intended use of the system. *See, e.g., Pitney Bowes, Inc*, 182 F.3d at 1298.

Further, even if we were to consider the term, Appellant’s assertion that the Specification defines the term “safely” focuses entirely on paragraph 10, which states:

It is important when flying a UAV in an airspace shared with other aircraft, both civilian and military, that collisions during all phases of the flight (including taking off and landing) not happen. The current method for accomplishing this is to place restrictions on all other traffic in an air corridor representing the path of the intended flight of the UAV, thereby inconveniencing other traffic and disrupting the National Airspace System.

³ We understand Appellant’s arguments to refer to the claim term “safely.”

We agree with the Examiner that this paragraph does not recite the term “safely,” does not expressly define the term, and does not provide any particular level of safety that would be considered safe. *See* Ans. 16. Further, we agree with the Examiner’s finding that it is more likely than not that flying safely is at least suggested by Margolin’s “simulated remote aircraft used for training remote pilots.” *See, e.g.*, Margolin, col. 9, ll. 33-53; *see also* Ans. 16. Accordingly, Appellant’s arguments directed to the term “safely” in the preamble of claim 1 are not persuasive.

Claims 2, 5, 8, and 12

Appellant contends that the Examiner failed to point to any specific portion of Margolin or Duggan as teaching the following limitations of claim 5:

whereas the selected phases of the flight of said unmanned aerial vehicle comprise:

- (a) when said unmanned aerial vehicle is within a selected range of an airport or other designated location and is below a first specified altitude;
- (b) when said unmanned aerial vehicle is outside said selected range of an airport or other designated location and is below a second specified altitude.

App. Br. 28.

Claim 5, which is similar to claim 1, is directed to “[a] system for safely flying an unmanned aerial vehicle in civilian airspace,” but unlike claim 1, claim 5 specifically recites two of the selected phases of the flight as elements (a) and (b) shown above. App. Br. 56, Claims App’x. Even though claim 5 recites that the “remote pilot uses said synthetic vision system to control said unmanned aerial vehicle during *at least* selected phases of the flight” (*id.* (emphasis added)), and thus permits the use of

synthetic vision for all of the phases of flight, the Examiner must at least identify where the two recited phases are disclosed by or would have been obvious in light of the recited prior art.

Here, the Examiner's rejection and response to Appellant's argument do not identify where Margolin or Duggan discloses these two recited phases. *See* Ans. 7-8, 13-16. Accordingly, because the Examiner did not address each and every element of claim 5, the Examiner did not establish a *prima facie* case of obviousness of claim 5, or claims 6 and 7, which depend therefrom.

Claim 2 depends from claim 1, but, similar to claim 5, recites two specific selected phases of the flight. App. Br. 55, Claims App'x. Claim 9 depends from claim 8, but, also similar to claims 2 and 5, recites two specific selected phases of the flight. *Id.* at 57. Claim 12, from which claims 13 and 14 depend, is directed to “[a] method for safely flying an unmanned aerial vehicle” and, similar to claim 5, recites two specific selected phases of the flight. *Id.* at 58. Accordingly, for the same reasons discussed with respect to claim 5, the Examiner did not establish a *prima facie* case of obviousness with respect to claims 2, 9, and 12-14.

Thus, we do not sustain the rejection of claims 2, 5-7, 9, and 12-14.⁴

⁴ The dissent-in-part spends nearly three pages attempting to explain why one of ordinary skill in the art would understand Margolin to disclose these elements of the claims. Had the Examiner provided such an explanation for the rejection, we would have had something specific to review. Here, however, the Examiner's entire rejection repeats the language of the claims and simply adds a citation to “Margolin (abstract; figs. 1-7; col. 3, lines 8-67; col. 4, lines 1-67; col. 5, lines 1-67)” without more. *See, e.g.*, Ans. 6. Nothing about our reversal requires an *ipsissimis verbis* test as the dissent-in-part alleges; rather, our reversal simply requires some explanation

Secondary Considerations

In his Reply Brief, Appellant raises a potential argument regarding the non-obviousness of the claims, stating that the invention is directed to “safely flying UAVs in civilian airspace because safely flying UAVs in civilian airspace (which includes safely sharing civilian airspace with other aircraft) was a long unmet need at the time [Appellant] made his invention, and it is still an unmet need as of the date of this Reply.” Reply Br. 8. Appellant further contends that the present application “claims priority from a Provisional Application filed April 19, 2006. At the time, [Appellant’s] invention filled a long unmet need. As of FAA Administrator Babbitt’s speech in 2009 the need was still unmet.” *Id.* at 10.

Establishing long-felt need requires objective evidence that an art-recognized problem existed in the art for a long period of time without solution. *Newell Companies, Inc. v. Kenney Mfg. Co.*, 864 F.2d 757, 768 (Fed. Cir. 1988). “[L]ong-felt need is analyzed as of the date of an articulated identified problem and evidence of efforts to solve that problem.” *Texas Instruments, Inc. v. U.S. Int’l Trade Comm’n*, 988 F.2d 1165, 1178 (Fed. Cir. 1993). Establishing long-felt need also requires objective evidence that the invention satisfies the long-felt need. *In re Cavanagh*, 436 F.2d 491, 496 (CCPA 1971). This can be demonstrated, for example,

or indication by the Examiner as to how the reference discloses the elements of the claims such that we may review adequately each issue on appeal before us. Here, the Examiner’s citation to all seven figures of Margolin and nearly three columns worth of text, unaccompanied by *any* explanation or indication as to how the elements of the claims are taught therein, failed to do so. Unlike the approach taken in the dissent-in-part, we are not inclined to substitute our view for what the Examiner *might* have intended absent some indication in the rejection.

by evidence establishing commercial success and that the industry purchased the claimed invention because it satisfied the long-felt need. *See W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1555 (Fed. Cir. 1983).

Here, even assuming that there was a long-felt need, Appellant has not submitted any objective evidence that the invention satisfies the long-felt need. Accordingly, having fully considered and weighed the evidence presented, we conclude that the Examiner's evidence of obviousness outweighs Appellant's evidence of non-obviousness and we thus sustain the rejection of claims 1, 3, 4, 8, 10, and 11.

DECISION

We AFFIRM the Examiner's decision rejecting claims 1, 3, 4, 8, 10, and 11.

We REVERSE the Examiner's decision rejecting claims 2, 5-7, 9, and 12-14.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART

CAPP, *Administrative Patent Judge*, dissenting-in-part.

I agree in the decision to affirm the rejection of claims 1, 3, 4, 8, 10, and 11. However, I respectfully disagree with my colleagues' decision to reverse the Examiner's rejection of claims 2, 5-7, 9, and 12-14, which are the claims related to using a synthetic vision system during altitude operation of the claimed unmanned aerial vehicle ("UAV").

The ostensible reason for the majority's decision to reverse the Examiner is that the Examiner did not adequately specify where Margolin discloses a synthetic vision system for controlling the UAV during low altitude phases of flight. I disagree that the Examiner did not adequately specify that Margolin discloses the limitations at issue. Furthermore, I disagree that the Examiner should have been required to identify where Margolin discloses these limitations with more specificity.

In rejecting claim 1, the Examiner cited to col. 5, ll. 50-60 of Margolin for disclosure of a synthetic vision system to control the aircraft at selected phases of flight. Ans. 5. In rejecting claim 2, the Examiner also cited to the following passages of Margolin: Abstract; Figs. 1-7; col. 3, ll. 8-67; col. 4, ll. 1-67; col. 5, ll. 1-67. Ans. 6.

Figure 7 of Margolin is described as an example of a three dimensional image presented to a remote pilot by a remote pilot station. Margolin, col. 2, ll. 65-66. The three dimensional image of Fig. 7 is later described in considerable detail as a synthetic representation of terrain. *Id.* at col. 9, l. 66 – col. 10, l. 50. Furthermore, Margolin discloses that:

Computer **405** performs the mathematical operations to transform and project the three dimensional data to generate video data representing a synthesized three-dimensional projected view of the terrain (and, if desired, manmade

structures) *in the vicinity of the environment of Remote Aircraft 103*. This video data is transmitted to Graphics System **406**, which displays the synthesized three-dimensional projected view on Video Display **407**.

Margolin, col. 5, ll. 46-55 (emphasis added). Someone of ordinary skill in the art of aviation systems would immediately recognize and understand from the above quoted disclosure that a visual display of the terrain was being provided to the pilot/operator so that the pilot/operator would be able to see and avoid terrain based obstacles or, in other words, so that the pilot/operator would not crash the UAV into the terrain (or terrain based obstacles such as buildings, towers, etc.). As a matter of common sense, someone of ordinary skill in the art of aviation systems intuitively understands that, in contrast to high altitude phases of flight, terrain avoidance is paramount at low altitude, or, to parrot the language of claim 2 - “below a ... specified altitude.”

I cannot agree with my colleagues that the Examiner failed to make out a prima facie case of obviousness because the Examiner failed to cite specific verbiage from Margolin reciting the disputed claim language. We have never held Examiners and their applied references to an *ipsissimis verbis* test and there is no reason to do so in this case. *See In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009) (a reference need not satisfy an *ipsissimis verbis* test). Here, the Examiner cited relevant prior art and made fact findings on the basis of such art. Those fact findings, in my opinion, are correct.

In my opinion, the Examiner made out a prima facie of obviousness under applicable law. *See In re Oetiker*, 977 F.2d 1442, 1445 (Fed. Cir. 1992). Under *Oetiker*, the burden shifted to Appellant to rebut the

Examiner's case with evidence or argument. *Id.* Here, Appellant essentially did nothing to rebut the Examiner's case beyond faulting the Examiner for failing to find *ipsissimis verbis* disclosure of the low altitude limitations of claim 2 in Margolin. To rebut the Examiner's prima facie case, the majority should have required Appellant to demonstrate why the synthetic terrain display in Margolin was intended for a phase of flight that excluded low altitude flight operations. This, Appellant did not do. Thus, in my opinion, the Examiner's rejection of claims 2, 5-7, 9, and 12-14 should have been affirmed.

The bottom line here is that the dependent limitations of claim 2 do not distinguish over Margolin. Anyone of only ordinary skill in aviation would understand that Margolin discloses the use of a synthetic vision system, among other things, to assist in terrain avoidance when flying at low altitude.⁵ In my opinion, Margolin clearly discloses use of a synthetic vision system at low altitude phases of flight and the Examiner adequately articulated such in the Answer.

For the foregoing reasons, I respectfully dissent.

⁵ The two dependent limitations of claim 2, collectively, encompass the entire surface of planet Earth (i.e., within and outside of airport zones). Thus, the limitations cannot distinguish over the prior art based on the scope of geographic limitations.