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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ANTHONY LITWINOWICZ, VINEET SAHASRABUDHE,
ALEX FAYNBERG, JOHN KNAG,
and WILLIAM FELL

Appeal 2019-004199
Application 14/259,198
Technology Center 3600

Before: JOHN C. KERINS, PHILLIP J. KAUFFMAN, and
TARA L. HUTCHINGS, *Administrative Patent Judges*.

KAUFFMAN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1–3, 5–10, and 12–18. Final Act. 8–21. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

CLAIMED SUBJECT MATTER

The claims are directed to an apparatus and method for assisting a pilot of a rotorcraft in avoiding a hard landing, particularly under conditions where the aircraft carries a heavy load and the pilot's vision is limited due to factors such as darkness. Spec. ¶¶ 2–3. Claims 1, 8, and 15 are independent. Claim 1 is reproduced below:

1. A method of operating a rotary wing aircraft comprising:

obtaining data from one or more sensors through a processing device including a measured vertical rate of descent of the rotary wing aircraft and a measured distance of the rotary wing aircraft from at least one of an obstacle and the ground;

processing, by the processing device, the data, including a sensed weight of the aircraft, to generate a flight envelope including a predetermined deceleration profile;

generating, through the processing device, a tactile cue corresponding to the flight envelope; and

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Sikorsky Aircraft Corporation. Appeal Br. 1.

applying the tactile cue to an inceptor operatively associated with the rotary wing aircraft to encourage manipulation of the inceptor to a desired position [to]² maintain the predetermined deceleration profile of the rotary wing aircraft.

REJECTIONS³

I. Claims 1–3, 6–10, and 13–18 are rejected under 35 U.S.C. § 103 as unpatentable over Enns, Ishihara, and Ben-Arie.⁴ Non-Final Act. 12–20.

II. Claims 5 and 12 are rejected under 35 U.S.C. § 103 as unpatentable over Enns, Ishihara, Ben-Arie, and Salai. Non-Final Act. 20–21.⁵

² Claims 8 and 15 each recite “to a desired position to maintain” (emphasis added), and for that reason it appears claim 1 inadvertently omitted the word “to.”

³ In the Final Office Action, the Examiner also rejected claims 8, 13–15, and 18 under 35 U.S.C. § 112(a) for lack of written description; and claims 7, 8, 13–15, and 18 under 35 U.S.C. § 112(b) for indefiniteness. Non-Final Act. 8–12. The Examiner withdrew these rejections in the Answer. Ans. 15–16.

⁴ Enns et al. (US 2015/0235560 A1, published Aug. 20, 2015); Ishihara et al. (US 2013/0106623 A1, published May 02, 2013); Ben-Arie et al. (US 2011/0125346 A1, published May 26, 2011).

⁵ Meek et al. (US 3,295,795, issued Jan. 03, 1967) (“Salai”).

ANALYSIS

I. Claims 1–3, 5, 8–12, 15, 16, and 20⁶

a. Claim Construction

We begin by construing the limitation at issue.

Claim 1 recites the step of “applying the tactile cue to an inceptor⁷ operatively associated with the rotary wing aircraft to encourage manipulation of the inceptor to a desired position [to] maintain the predetermined deceleration profile of the rotary wing aircraft.” Independent claims 8 and 15 contain similar limitations.

One claim interpretation advanced by Appellant is that the claimed tactile cue “guides his [the pilot’s] hand to a desired point.” Appeal Br. 10. For the reasons that follow, Appellant’s assertion is not commensurate in scope with the independent claims.

The independent claims do not recite that the tactile cue moves the inceptor; rather, the tactile cue is required to “encourage manipulation” of the inceptor, meaning that the cue encourages the pilot to manipulate the inceptor. *See Arlington Industries, Inc. v. Bridgeport Fittings, Inc.*, 632 F.3d 1246, 1256 (Fed. Cir. 2011) (quoting Giles S. Rich, *The Extent of the Protection and Interpretation of Claims—American Perspectives*, 21 Int’l

⁶ Appellant argues these claims based on the limitations of the independent claims (claims 1, 8, and 15). Appeal Br. 12.

⁷ An inceptor is a flight control such as a collective, cyclic, or anti-torque pedal. *See Spec.* ¶ 32.

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Rev. Indus. Prop. & Copyright L. 497, 499, 501 (1990)) (“the name of the game is the claim”).

Turning to the Specification, claim 3, which depends from independent claim 1, adds that “the tactile cue comprises at least one of a soft stop, a stick shaker, and a detent.” This connotes that a soft stop, stick shaker, and a detent can be tactile cues that encourage manipulation of the inceptor to a desired position to maintain the predetermined deceleration profile of the aircraft.

The claimed system used velocities, positions, and an onboard mathematical model to estimate collective and cyclic stick deflections that adhere to one or more profiles (e.g., a descent or deceleration profile). Spec. ¶¶ 24, 29. Tactile cues such as soft stops, stick shakers, and detents can enforce these flight profiles. *Id.* This language is consistent with the interpretation that the claims require the tactile cue to encourage the pilot to manipulate the inceptor to maintain the predetermined deceleration profile of the aircraft. Indeed, the Specification expressly states that a “tactile cue (6) may be used to *encourage the pilot* to place one or more flight controls (e.g., collective, cyclic, anti-torque pedals, etc.) in a particular position or state, such that the aircraft operates within the profile (4).” Spec. ¶ 32 (emphasis added); *see also* ¶ 33 (describing that the method may provide tactile cues to a pilot for operating an aircraft), Appeal Br. 3 (citing Spec. ¶¶ 32, 33, 39; Fig 3 (block 312)).

In light of the Specification, a person of ordinary skill would interpret that soft stops, stick shakers, and detents are examples of tactile cues that

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may be used to encourage the pilot to manipulate the inceptor (e.g., collective or cyclic) to a desired position to maintain the predetermined deceleration profile of the aircraft. These tactile cues “enforce” the predetermined deceleration profile by encouraging the pilot to manipulate the inceptor. *See* Spec. ¶ 29.

b. *Obviousness*

Appellant argues based on each of the three prior art references.

1. Enns

Appellant’s first argument relates to Enns.

The Examiner found that Enns discloses a method of generating and applying a tactile cue when a rate of descent exceeds a threshold. Non-Final Act. 12–13. The Examiner initially based this finding on an interpretation that the requirement for the tactile cue to encourage manipulation of the inceptor to a desired position to maintain the predetermined deceleration profile was functional language not entitled to patentable eight. *Id.*

Appellant acknowledges that Enns discloses a system that generates and applies a tactile warning when a warning condition arises. Appeal Br. 10. Appellant argues that Enns’s tactile cue is not a tactile cue as claimed because it does not: “encourage manipulation of an inceptor in a particular manner to achieve a soft landing,” reduce pilot workload, or guide the pilot’s hand to a desired point. *Id.*

In the Answer, the Examiner modifies the rejection to assert that Enns discloses a tactile cue indicating that a rate of descent has exceeded a

threshold, and this cue encourages manipulation as claimed by encouraging the pilot to adjust the inceptor to eliminate the condition that is activating the tactile cue (i.e., exceeding the rate of descent). Ans. 17–18.

In the Reply Brief, Appellant does not contest that Enns makes such a disclosure. Rather, Appellant again asserts that Enns’s tactile cue does not correspond to a tactile cue as claimed. Specifically, Appellant responds that the Enns’s tactile cues (a back drive, soft stop, and a vibration) are not tactile cues as claimed because Enns’s tactile cues do not push or pull the inceptor in a desired direction to reduce pilot workload. Reply Br. 2.

The independent claims do not recite that the tactile cue pushes or pulls the inceptor in a desired direction. Nor do the claims recite that pilot workload is reduced or that the pilot’s hand is guided to a certain point. Further, Appellant does not identify, nor do we discern, a disclosure in the Specification that supports such an interpretation. Rather, the independent claims require that the tactile cue encourages the pilot to manipulate the inceptor to maintain the predetermined deceleration profile. *See* Ans. 18 (pointing out that the Specification supports the interpretation that the claims require the tactile cue to encourage manipulation by the pilot rather than the tactile cue itself manipulating the inceptor).

We agree with the Examiner that Enns’s tactile cue warns the pilot that a rate of descent has been exceeded and this warning encourages the pilot to manipulate the inceptor to alleviate that condition. *See* Enns ¶¶ 70, 71. In other words, once warned by the tactile cue, the pilot will move the inceptor to a position that does not exceed the predetermined rate of descent

(i.e. a rate of descent within the predetermined deceleration profile). By this technique, Enns's tactile cue encourages manipulation of the inceptor to maintain the predetermined deceleration profile of the rotary wing aircraft.

For these reasons, Appellant's argument regarding Enns is not persuasive of error by the Examiner.

2. Ishihara

Appellant's second argument relates to Ishihara.

The Examiner found that Enns discloses generating a flight envelope including a predetermined deceleration profile and generates a tactile cue for exceeding a rate of descent, but Enns does not disclose processing by the processing device the data including a measured weight of the aircraft.⁸ The Examiner relies on Ishihara for processing by the processing device, that data, including the weight of the aircraft, to generate a flight envelope including a predetermined deceleration profile. Non-Final Act. 13–14; Enns ¶ 49; Ishihara ¶ 13.

Appellant argues that Ishihara's alert is not associated with the inceptor. Appeal. Br. 10–11; Reply Br. 3. This argument is both nonresponsive and an individual attack on the reference. The Examiner relies on Enns, not Ishihara, for association of the alert with the inceptor, and relies on Ishihara for processing by the processing device. *See* Non-Final Act. 13–14.

⁸ As explained later, the Examiner proposes to modify the combination of Enns and Ishihara to include sensed weight rather than measured weight in view of Ben Arie.

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Appellant argues that Ishihara does not contain any teachings that would lead one of ordinary skill in the art to combine the references as the Examiner proposes. Appeal. Br. 10–11. Although obviousness does not require an explicit teaching in a reference, a reference may still provide a rationale underpinning for a proposed modification. *See generally KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (rejecting the rigid requirement of a teaching, suggestion, or motivation to combine known elements in order to show obviousness). Here, the Examiner reasoned that the proposed modification would facilitate safe operation of an aircraft. *See* Non-Final Act. 13–14; Ans. 20–21 (citing Ishihara ¶¶ 1, 12, 13). This reasoning has a rational underpinning in that Ishihara discloses a system and method for improving sink rate alerting for rotary wing aircraft. Ishihara ¶¶ 1, 12, 13. Appellant’s argument does not cast doubt on this reasoning.

Appellant adds that, “there is no teachings in Enns or Ishihara that the pilot is encouraged to manipulate the inceptor to establish a desired inceptor position to maintain a selected sink rate.” Appeal Br. 11. As detailed in the previous section, Enns discloses encouraging the pilot to manipulate the inceptor to maintain the predetermined deceleration profile.

For these reasons, Appellant’s argument regarding Ishihara is not persuasive of error by the Examiner.

3. Ben-Arie

Appellant’s third argument relates to Ben-Arie.

Appellant argues that Ben-Arie suggests that weight may be a monitored flight parameter, but does not disclose generating a flight

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envelope based on a sensed weight of an aircraft. Appeal Br. 11; Reply Br. 3. We agree with the Examiner that Ben-Arie discloses sensing the weight of the aircraft and generating a flight envelope based on the sensed weight. Ans. 22; Ben-Arie ¶¶ 7, 17 (Table 1, listing weight as a monitored flight parameter), 22.

Appellant argues that none of the cited prior art, disclose that “tactical cues are generated and applied to an inceptor in order to move an aircraft to a selected point in a flight envelope.” Appeal Br. 11. For the reasons that follow, this argument is not commensurate in scope with the claims at issue.

Claim 6 depends from independent claim 1 and recites that the tactile cue “is selected to encourage a pilot to operate the aircraft at a selected point within the flight envelope.” The presence of this limitation in claim 6 suggests independent claim 1 does not contain this limitation. *See Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 910 (Fed. Cir. 2004) (“[W]here the limitation that is sought to be ‘read into’ an independent claim already appears in a dependent claim, the doctrine of claim differentiation is at its strongest.”).

For these reasons, Appellant’s argument regarding Ben-Arie is not persuasive of error by the Examiner.

4. Conclusion

Appellant has not demonstrated error in the rejection of claims 1–3, 5, 8–12, 15, 16, and 20.⁹

II. Claims 6 and 13

Claim 6 depends from independent claim 1 and recites “wherein the tactile cue is selected to encourage a pilot to operate the aircraft at a selected point within the flight envelope.” Claim 13 depends from independent claim 8 and contains a similar limitation.

Claims 6 and 13 require that the tactile cue encourages the pilot to manipulate the inceptor to operate the aircraft at a selected point within the flight envelope. The claims do not specify which point within the flight envelope; rather, the claims require encouraging manipulation to any point within the flight envelope.

In the Non-Final Action, the Examiner determined that the claim language “to encourage a pilot to operate at a selected point with the flight envelope” is functional language entitled to no patentable weight. Non-Final Act. 14–15.

Appellant argues that none of the cited prior art employs a tactile cue to encourage manipulation of an inceptor to a selected point. Appeal Br. 11; Reply Br. 3.

⁹ The Examiner rejected claims 5 and 12 as obvious over Enns, Ishihara, Ben-Arie, and Salai. Appellant’s arguments are unpersuasive for these claims for the same reasons given with regard to the independent claims.

In the Answer, the Examiner modifies the rejection to give patentable weight to the limitation at issue. Ans. 23. Specifically, the Examiner explains that Enns's tactile cue encourages the pilot to adjust the aircraft controls to eliminate the dangerous condition (exceeding the descent rate) and in doing so moves the inceptor to a point that eliminates the condition. *Id.* We agree. Enns tactile cue encourages the pilot to manipulate the inceptor to a point that is not triggering the cue, which is by definition a point within the predetermined deceleration profile.

Appellant has not demonstrated error in the rejection of claims 6 and 13.

III. Claims 7, 14, and 18

Claim 7 depends from claim 6 and recites, "wherein the selected point within the flight envelope is selected to provide a soft landing of the aircraft." Claims 14 and 18 contain similar provisions.

Appellant argues that

providing an alert that a rate of descent may be exceeded is not the same as providing a tactile cue that encourages a specific action to be taken. Simply shaking an inceptor, as is the case in Enns, does not equate to a tactile cue that encourages a pilot to take specific action so as to reduce pilot workload as is the case of the present invention. Further, providing a tactile cue that encourages a pilot to achieve a soft landing alleviates pilot workload and is different than simply providing a warning. The Appellant respectfully submits that providing a warning is not the same as providing a force, - such as a specific tactile cue, encouraging action that would lead to specific behavior.

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Appeal Br. 12.

We discern no meaningful distinction between this argument and the one made against Enns with regard to the independent claims. This argument is unpersuasive for the reasons given above. Consequently, Appellant has not demonstrated error in the rejection of claims 7, 14, and 18.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1-3, 6-10, 13-18	103	Enns, Ishihara, Ben-Arie	1-3, 6-10, 13-18	
5, 12	103	Enns, Ishihara, Ben-Arie, Salai	5, 12	
Overall Outcome			1-3, 5-10, 12-18	

AFFIRMED