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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte T. TODD GRIFFITH, DAVID T. YAMAMOTO, ERIK L. GODO, and TU-LUC H. NGUYEN

Appeal 2015-000620
Application 11/462,510
Technology Center 3600

Before JENNIFER D. BAHR, WILLIAM A. CAPP, and SEAN P. O'HANLON, *Administrative Patent Judges*.

O'HANLON, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

T. Todd Griffith et al. (Appellants)[1] appeal under 35 U.S.C. § 134 from the Examiner's final decision, issued September 19, 2013 ("Final Act."), rejecting claims 1–21. We have jurisdiction over this appeal under 35 U.S.C. § 6(b).

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[1] According to Appellants, the real party in interest is The Boeing Company. App. Br. 1.

SUMMARY OF DECISION

We REVERSE.

SUMMARY OF INVENTION

Appellants' claimed invention "relate[s] generally to aircraft control systems, and more particularly to aircraft electrical brake control systems." Spec. ¶ 1. Claim 1, reproduced below from page 24 (Claims Appendix) of the Appeal Brief, is illustrative of the claimed subject matter:

> 1. An electric brake system for an aircraft having at least one left landing gear wheel and at least one right landing gear wheel, the system comprising:
>
> a right brake system control unit configured to generate brake control signals for the at least one right landing gear wheel in response to pilot input; said right brake system control unit independently operates only said right electric brake
>
> a left brake system control unit configured to generate brake control signals for the at least one left landing gear wheel in response to pilot input, said left brake system control unit independently operates only said left electric brake
>
> at least one right electric brake actuator control coupled to and controlled by the right brake system control unit, the at least one right electric brake actuator control unit comprising a microcontroller including processing logic and software configured to generate electronic brake mechanism control signals, including anti-skid signals, only for the at least one right landing gear wheel; and
>
> at least one left electric brake actuator control coupled to and controlled by the left brake system control unit, the at least one left electric brake actuator control unit comprising a microcontroller including processing logic and software configured to generate electronic brake mechanism control signals, including anti-skid signals, only for the at least one left landing gear wheel.

REJECTIONS

Claims 1, 2, 3, 6–9, 11, 12, 16, 18, 20, and 21 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Corio (US 6,402,259 B2, iss. June 11, 2002) and Mondal (US 2005/0012553 A1, pub. Jan. 20, 2005).

Claims 4, 5, 13–15, and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Corio, Mondal, and Nichols (US 2,957,658, iss. Oct. 25, 1960).

Claims 10 and 17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Corio, Mondal, and Dresselhaus (US 2006/0144438 A1, pub. July 6, 2006).

ANALYSIS

Obviousness Rejection Based on Corio and Mondal

The Examiner finds that Corio discloses the invention substantially as claimed in independent claims 1, 12, and 18, including a right brake system control unit ("BSCU") (certain components of electromechanical actuator controller ("EMAC") Right 2), a left BSCU (certain components of EMAC Left 2), a right electric brake actuator control ("EBAC") (servo amplifier of EMAC Right 2), and a left EBAC (servo amplifier of EMAC Left 2), relying on Corio's emergency mode of braking operations. Final Act. 2–3. The Examiner finds that Mondal discloses a variable gain control amplifier (feedback circuit 16 of amplifier 10) that includes a microcontroller including processing logic and software, and reasons that it would have been obvious to a skilled artisan to substitute Mondal's variable gain control amplifier in place of Corio's EMAC servo amplifier "in order to provide a means of automatically and actively controlling the gain of an amplifier to adjust the amplification of the signal depending on the particular system needs." *Id.* at 4. Regarding the anti-skid limitations, the Examiner finds:

> that the electric brake actuator or amplifier (portion of element 44) of [Corio], as modified, is configured to generate anti-skid signals because in col. 3 lines 44-45 the reference describes that BSCU 40 carries out anti-skid processing functions. Then in col. 4 lines 5-7 the reference explains that EMACs 44 (of which the abovementioned amplifier forms a part) conditions the signals and provides them as feedback signals to carry out anti-skid processing functions. Therefore, Examiner maintains that [Corio], as modified, satisfies the added limitations to the independent claims.

Id. at 4–5.

Appellants traverse, arguing, *inter alia*, that Corio's servo amplifiers do not include processing logic and software configured to generate brake mechanism control signals, including anti-skid signals (App. Br. 9–10) and that Corio's brake control system does not generate anti-skid brake control signals in the mode of operation relied upon by the Examiner (*id.* at 10–13).

We are persuaded by Appellants' arguments. The Examiner relies on Corio's emergency brake operating mode (Final Act. 3), presumably because in this mode the redundant (i.e., *not* independent) BSCUs are not available (*see* Corio, 8:31–34). As correctly noted by Appellants, Corio explicitly states that "in the emergency mode, both BSCUs **40** are disabled, and hence *antiskid protection is not available*." *Id.* at 8:61–63 (emphasis added). Nonetheless, the Examiner attempts to modify Corio's EMACs to provide such anti-skid brake signals, reasoning that because the EMACs condition signals provided as feedback to the BSCUs, the EMAC servo amplifiers are configured to generate anti-skid brake signals. Final Act. 4–5 (citing Corio, 4:5–7). The Examiner's logic is flawed because Corio consistently discloses that it is the BSCUs that generate anti-skid brake signals. *See, e.g.*, Corio, 3:44–45 ("the BSCUs **40** carry out the brake control and antiskid processing functions"), 5:5–18 (explaining that "BSCU1 and BSCU2 each contain circuitry for performing top level brake control and antiskid algorithm processing functions" and "produce a brake command signal which is provided to the EMACs **44**."). Corio's EMACs merely convert the signals received from the BSCUs into servo motor signals. *Id.* at 3:49–53. Corio's EMACs somehow "condition" the signals provided by the brake torque and wheel speed sensors, but the EMACs merely "provide [these conditioned signals] to the BSCUs" rather than generating any anti-skid signals. *Id.* at 4:1–7.

To the extent that the Examiner relies on Corio's BSCUs to generate anti-skid braking commands or as providing a suggestion to modify Corio's EMACs to generate anti-skid braking commands in the emergency braking mode, such reliance is misplaced because the BSCUs are disabled in the emergency braking mode (*see* Corio, 8:28–63) and are thus *not* configured to produce any brake control signals, let alone anti-skid signals. On the other hand, when operational, such that they are configured to produce anti-skid signals, Corio's BSCUs are redundant (rather than operating independently on only the right brake and left brake, respectively). *See, e.g.*, Corio 5:2–4.

The Examiner's reliance on Mondal does not remedy the deficiencies of Corio, as the Examiner merely proposes to make Corio's servo amplifier a variable gain amplifier in order to control the amplifier's gain, but has not set forth how such variable gain processing logic and software would be configured to generate electronic brake mechanism control signals, including anti-skid signals. *See* Final Act. 4.

The Examiner has failed to set forth how any of Corio's brake system components are configured to generate anti-skid signals in the emergency braking mode, in which Corio discloses independent brake operation. Accordingly, we reverse the Examiner's rejection of independent claims 1, 12, and 18, as well as of their dependent claims 2, 3, 6–9, 11, 16, 20, and 21, as being unpatentable over Corio and Mondal.

Obviousness Rejection Based on Corio, Mondal, and Nichols

Claims 4 and 5 depend from independent claim 1, claims 13–15 depend from independent claim 12, and claim 19 depends from independent claim 18. App. Br. (Claims Appendix). Nichols is not relied upon by the Examiner in any manner that would remedy the deficiencies noted above with respect to the proposed combination of Corio and Mondal in rendering obvious the subject matter of the independent claims. The rejection of claims 4, 5, 13–15 and 19 is therefore reversed.

Obviousness Rejection Based on Corio, Mondal, and Dresselhaus

Claim 10 depends from independent claim 1, and claim 17 depends from independent claim 12. App. Br. (Claims Appendix). Dresselhaus is not relied upon by the Examiner in any manner that would remedy the deficiencies noted above with respect to the proposed combination of Corio and Mondal in rendering obvious the subject matter of the independent claims. The rejection of claims 10 and 17 is therefore reversed.

DECISION

The Examiner's decision to reject claims 1–21 is reversed.

REVERSED