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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ALESSANDRO RICCARDO BRITANNICO GIAZOTTO

Appeal 2014-005895
Application 10/592,354[1]
Technology Center 3600

Before STEFAN STAICOVICI, FREDERICK C. LANEY, and ARTHUR M. PESLAK, *Administrative Patent Judges*.

LANEY, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Alessandro Riccardo Britannico Giazotto (Appellant) appeals under 35 U.S.C. § 134(a) from the Examiner's final decision rejecting claims 52, 53, 57–61, 65–68, 70–73, 77–81, and 100 under 35 U.S.C. § 103(a) as unpatentable over Corio (US 6,402,259 B2, iss. June 11, 2002), Branson (US 3,702,714, iss. Nov. 14, 1972), and Radó (Zoltán Radó and James C. Wambold, Aircraft Braking Friction Prediction From Flight Data Recorder

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[1] According to Appellant, the real party in interest is Airbus UK Limited. Appeal Br. 2 (filed December 16, 2013).

Data, pub. May 2001).[2] We have jurisdiction over this appeal under 35 U.S.C. § 6(b).

We AFFIRM-IN-PART.

INVENTION

Appellant's invention relates "to the braking of an aircraft on the ground." Spec. 1, ll. 3–4.

The sole independent claim 71 is representative of the claimed invention and reads as follows:

> 1. An aircraft braking controller, for use on an aircraft comprising sensors for providing information relating to a wheel of the aircraft to the controller, the controller comprising:
>
> i) sensor inputs for receiving information relating to the wheel of the aircraft from the sensors,
>
> ii) an input for receiving a command for braking, and
>
> iii) a control output for controlling braking provided by a brake of the wheel,
>
> wherein the controller is configured to monitor and record data from the sensor inputs for the wheel of the aircraft, including:
>
> a) the reacted torque provided to the wheel by the brake,
>
> b) the frictional torque on the wheel provided by interaction of the wheel with the ground, and
>
> c) a level of actuation applied to the brake,
>
> wherein the controller is configured to convert the command for braking into a command for a level of actuation to be applied to the brake of the wheel on the basis of the monitored and recorded data, and wherein the controller is configured to determine, using data from the sensor inputs and a threshold value of frictional torque provided by the ground wheel

[2] The rejection of claims 52, 53, 57–61, 65–68, 70–73, 77–81, and 100 under 35 U.S.C. § 112, second paragraph, has been withdrawn by the Examiner. Ans. 2.

> interaction, whether the wheel is in a brake torque limited region or in a region of braking limited by the friction between the wheel and the ground, and to control the braking in accordance with the determination, wherein the controller is configured to make the said determination on the basis of the monitored and recorded data listed i) to iii).

ANALYSIS

Claim 71

The Examiner concludes a combination of the teachings of Corio, Branson, and Rado renders claim 71 unpatentable. Final Act. 3–5. Appellant asserts the combination, as explained by the Examiner, does not establish a prima facie case of obviousness. Appeal Br. 10–16. Specifically, Appellant argues the combination fails to disclose a controller that provides braking controls based on a real time determination, using data from the sensor inputs and a threshold value of frictional torque provided by the ground wheel interaction, whether the wheel is in a brake torque limited region or in a region of braking limited by the friction between the wheel and the ground, as required by claim 71. *Id.* at 10–13. Appellant asserts further,

> [w]hile the Examiner has presented his opinion as to where the limitations of independent claim 71 are to be found in the prior art, the Examiner has provided no reasoning or analysis that represents a genuine consideration of whether one of ordinary skill in the art would have combined the references in a way to achieve the presently claimed invention even if the references did disclose or suggest all of the limitations of the claimed invention.

Reply Br. 4.

The Examiner relies on the combination of Corio and Branson to disclose a configurable controller with the claimed structural elements (i.e,

sensor inputs, braking command input, and braking control output), which monitors data for the recited sensor inputs (i.e., reacted torque, frictional torque, and level of actuation) and is configured, based on the monitored data, to convert the command for braking into a command for a level of actuation to be applied to the brake of the wheel. Final Act. 3–4. Appellant notably does not dispute the Examiner's factual findings regarding what Corio and Branson teach, nor does Appellant challenge the Examiner's reasoning for why skilled artisans would have known to combine the teachings of Corio and Branson.

The Examiner does not rely on Corio or Branson, however, to disclose configuring a controller to record the data monitored or convert the command for braking into a command for a level of actuation to be applied to the brake of the wheel in accordance with a determination of whether the wheel is in a brake torque limited region or in a region of braking limited by the friction between the wheel and the ground, using data from the sensor inputs and a threshold value of frictional torque provided by the ground wheel interaction. *Id.* at 4. The Examiner relies on Rado to show a skilled artisan knew to record the monitored data and determine, using data from the sensor inputs and a threshold value of frictional torque provided by the ground wheel interaction, whether the wheel is in a brake torque limited region or in a region of braking limited by the friction between the wheel and the ground. *Id.* at 5 (citing Rado pp. 11–12). The Examiner concludes it would have been obvious to modify the controller taught by the combined teachings of Corio and Branson to include the teachings of Rado because the combination would have predictably resulted in a controller with more information about "how the wheel is limited with regard to interacting

forces" and, therefore, "a more versatile and robust brake system, in which greater control can be executed upon making such a determination." *Id.*

Appellant argues that the Examiner's reliance on Rado is misplaced because "[t]here is no disclosure in Rado of real time gathering *and* application of data to aircraft braking when the aircraft is on landing roll nor is there any disclosure . . . by Rado of a controller that is programmed to perform these functions." Appeal Br. 11. According to Appellant, Rado is directed to a process for modeling aircraft braking friction using previously recorded flight data, which can be used to approximate a pre-programmed threshold to predict unsafe conditions. *Id.*at 10–11.

In response, the Examiner correctly points out "Corio already discloses a controller (40, 44) that generally performs real time gathering and application of data to aircraft braking (see column 4, lines 1–7 and column 5, line 66–column 6, line 6 of Corio)." Ans. 2. "[T]he Examiner primarily relies on Rado merely as a general teaching of making a determination as to whether a wheel is in a brake torque limited region or in a friction limited region (see pages 11–14 of Rado)." *Id.* "The Examiner maintains that it would have been obvious to one of ordinary skill in the art to modify the controller of Corio to include said determination and subsequently control braking in accordance with said determination." *Id.* at 2–3.

Appellant has not persuasively shown an error with the Examiner's obviousness determination. Appellant asserts the Examiner first identifies Corio in the Answer as disclosing a controller that performs real time gathering and application of data to control aircraft braking. Reply Br. 6–7. Furthermore, according to Appellant, Corio "has no relation to collecting

data from the brakes or wheels to inform the application of braking function as does the presently claimed invention." *Id.* at 7.

In the Final Office Action, however, the Examiner finds Corio discloses a controller "configured to convert the command for braking into a command for a level of actuation to be applied to the brake of the wheel on the basis of the monitored data." Final Act. 3 (citing Corio col. 4, ll. 1–7 and col. 5, l. 66–col. 6, l. 6). The Examiner further explains, in the Response to Argument, that Rado generally teaches "the capability of determining whether a wheel is in a brake torque limited region or in a friction limited region" and that, "[w]hen such a determination is incorporated into the controller of Corio, . . . the controller of Corio would be capable of controlling the braking in accordance with the determination." *Id.* at 6.

At column 4, lines 1–7, Corio teaches "each brake **34** has an associated torque sensor and wheel speed sensor" that provide outputs "to the respective EMACs[3] **44** via cables," which, in turn, are provided to the BSCUs[4] "as feedback signals *to carry out the brake control and antiskid processing functions*." (emphasis added). At column 5, line 66, to column 6, line 6, Corio similarly teaches "[t]he EMACs **44** are configured to condition the signals and provide the measured wheel speed and torque to the BSCUs **40**," which "in turn *use such information* in a conventional manner *for carrying out brake control and antiskid processing*." (emphasis

[3] "EMACs" refers to a "electromechanical actuator controller," which "which convert brake clamp force commands from the BSCUs **40** to servo motor control signals . . . [to] provide actuator braking forces." Corio col. 3, ll. 49–56.

[4] "BSCU" refers to a "digital brake system control unit," which "carry out the brake control and antiskid processing functions." Corio col. 3, ll. 42–48.

added). Additionally, we note Corio also describes the BSCUs as receiving braking command inputs from transducers 46 and as "process[ing] the signals based on the . . . brake control and antiskid algorithms to produce a brake command signal which is provided to the EMACs." Corio col. 5, ll. 10–18. We, therefore, disagree with Appellant's characterization of both the Examiner's rejection and the teachings of Corio.

We furthermore disagree with the conclusion Appellant draws from the fact that Rado uses historical flight recorder data. Appeal Br. 10. Contrary to Appellant's assertion that Rado is unrelated to performing real time evaluations of wheel friction conditions (*id.*), Rado states,

> The study has shown that data of the flight data recorder *can be used for the real time calculation of the aircraft wheel braking friction*. The researched and developed model can be regarded as the proof of concept for the calculation of the braking friction coefficient *for aircraft during landing*.

Rado 14 (emphasis added). In addition, Rado states, "[t]he friction and torque limited cases can be monitored and *in real-time* separated by the developed model and procedures." *Id.* (emphasis added). Thus, although the Examiner properly relies on Corio to teach that a skilled artisan knew to use a controller to perform real time gathering and application of data to aircraft breaking control, Rado certainly provides evidence that a skilled artisan knew the detection of friction and torque limited conditions was adaptable to providing real-time information relevant to the control and operation of the aircraft.

Appellant also asserts that "the cited prior art structure must be capable of performing the function *without further programing*." Appeal Br. 13 (citing *Ex parte Wheat*, Appeal 2010–008139). Appellant mistakenly relies on our previous *Wheat* decision to support this position. The *Wheat*

decision involved an issue of whether the disclosed controller, *without modification*, was inherently capable of performing the recited function. *Ex parte Wheat*, 2012 WL 2356578, at *2 (PTAB 2012). The Board properly concluded that the "capable of" test in the context of inherency requires the prior art structure, as disclosed and without modification, to be able to perform the function recited in the claim. *Id.* The Board concluded the Examiner acted improperly because the prior art controller would require further programming, which would amount to changing the prior art controller structure to something different than what was disclosed and, as such, the prior art failed to support an anticipation rejection based on inherency. *Id.* at 3.

The Examiner in this case is not relying on inherency. Instead, the Examiner makes an obviousness rejection and, as such, relies on *modifying* the Corio controller in view of the teachings of Branson and Rado to disclose the controller claim 71 recites. The Examiner finds, "a certain level of further programming or reprogramming [of the Corio controller, as modified by Branson and Rado] would be necessitated [to perform the recited functions] and would be within the level of ordinary skill in the art." Final Act. 7. Appellant provides no evidence or persuasive technical reasoning rebutting this finding or demonstrating it was made in error. We note further neither the prior art of record, nor Appellant's Specification, disclose any particular programming for configuring a controller to perform the described functions, which supports the Examiner's position regarding the level of skill of the ordinarily skilled artisan in this case.

Finally, we disagree with Appellant's conclusory allegations that the Examiner wholly fails to provide a reason a skilled artisan would have

combined Rado with Corio and Branson. The Examiner expressly sets forth the rationale as follows:

> [a]t the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the aircraft braking controller as taught by the combined teachings of Corio and Branson to record the data monitored and determine, using the data and a threshold value of frictional torque provided by the ground wheel interaction, whether the wheel is in a brake torque limited region or in a region of braking limited by the friction between the wheel and the ground as taught by Rado. *The rationale for doing so* would have been to provide the predictable result of a more versatile and robust brake system, in which greater control can be executed upon making such a determination. The Examiner also submits that doing so would provide the predictable result of knowing how the wheel is limited with regard to interacting forces.

Final Act. 5 (emphasis added). Appellant has not persuasively demonstrated any flaws with the above reasoning, or its rational underpinning, nor do we find any. Therefore, we sustain the Examiner's rejection of claim 71 as unpatentable over Corio, Branson, and Rado.

Claim 52, 53, 57–61, 65–68, 70, 72, 73, 77–81, and 100

For dependent claims 52, 53, 57–61, 65–68, 70, 72, 73, 77–81, and 100, the Examiner summarily states, "[r]egarding the dependent claims, the Examiner submits that the combination of Corio, Branson, and Rado would result in structure at least capable of meeting the limitations of the claims, as broadly recited." Final Act. 5–6. Appellant asserts this is insufficient to establish a prima facie case of obviousness for the dependent claims.

"The examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability." *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). That burden is satisfied by

"adequately explaining the shortcomings [the Examiner] perceives so that the applicant is properly notified and able to respond." *In re Jung*, 637 F.3d 1356, 1362 (Fed. Cir. 2011). We agree with Appellant that the Examiner's short treatment of the dependent claims fails to establish a prima facie case because it effectively deprives Appellant of notice regarding how the Examiner is reading the prior art to disclose the recited claim elements, at least with any reasonable degree of certainty. As a result, the rejection likewise deprives Appellant from being able to provide a meaningful response. Therefore, we agree a prima facie case of obviousness has not been established for the dependent claims and, as such, we do not sustain the rejection of claims 52, 53, 57–61, 65–68, 70, 72, 73, 77–81, and 100.

DECISION

The Examiner's decision to reject claim 71 is affirmed.

The Examiner's decision to reject claims 52, 53, 57–61, 65–68, 70, 72, 73, 77–81, and 100 is reversed.

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