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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte CHARLES BEUNING, NATHAN ROY EBERSOLE, JOHN W. GALLMAN, NATHANIEL DAVID DIEDRICH, and VERNON WENG-YEW CHANG

Appeal 2018-002494
Application 14/219,424
Technology Center 2800

Before CATHERINE Q. TIMM, JENNIFER R. GUPTA, and LILAN REN, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 1–16 and 19–22. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

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[1] Appellant is the applicant, Textron Innovations, Inc., which, according to the Brief, is the real party in interest. Appeal Br. 2.

The claims are directed to a system for an aircraft (*see, e.g.*, claim 1), an integrated auxiliary power unit (APU), starter-generator-motor (SGM) apparatus, and a vapor cycle cooling system (VCCS) for an aircraft (*see, e.g.*, claim 11), and a method of operating an energy-conversion device, such as an SGM, in a starter mode, in a motor mode, and in a generator mode (*see, e.g.*, claim 19). Claim 1 is illustrative:

> 1. A system for an aircraft, comprising:
>
> a refrigerant compressor for a vapor cycle cooling system (VCCS) for providing air conditioning using a phase-changing fluid;
>
> *an auxiliary power unit (APU)* for mechanically driving the compressor; and
>
> an energy-conversion device operable in any of a starter mode, a generator mode and a motor mode, the energy-conversion device comprising: (i) a first coupling element for selectively coupling and uncoupling the energy-conversion device to the APU such that, in the starter mode, the energy-conversion device is used in driving the APU, (ii) a second coupling element for coupling and uncoupling the energy-conversion device to the compressor such that, in the motor mode, the energy-conversion device mechanically drives the compressor, and (iii) electrical power terminals output element at which, in the generator mode, the energy-conversion device provides electrical output power for powering an aircraft electrical system and, in the starter mode or motor mode, the energy-conversion device receives electrical input power from an external electrical power source.

Appeal Br. 20 (claims appendix) (emphasis added).

The Examiner rejects all the claims under 35 U.S.C. § 103(a). All the rejections rely on Williams[2] as the primary reference. Our Decision will focus on the Examiner's error in applying Williams.

OPINION

Claims 1 and 11 require an auxiliary power unit (APU). These claims also require an energy-conversion device (starter-generator-motor (SGM) in claim 11) with a first coupling element for selectively coupling and uncoupling the energy-conversion device to the APU such that, in a starter mode, the energy-conversion device is used in driving the APU. The method of claim 19 requires operating the energy-conversion device in a starter mode to start the APU.

The Examiner finds that William's air turbine 42 (Fig. 1) is an auxiliary power unit (APU) as required by claims 1 and 11. Final 3. But a preponderance of the evidence indicates that, as argued by Appellant (Appeal Br. 10–11; Reply Br. 3–4), air turbine 42 is not an APU as that term was used in the aircraft art.

Williams provides evidence that APUs were engines such as gas turbine engines. *See* Williams, col. 1, ll. 13–16 ("Currently, *gas turbine* auxiliary power units (APU) are being used to start the thrust engines, and to power the air conditioning and environmental control systems while the aircraft is on the ground." (Emphasis added)).

Williams differentiates the air turbine of their inventive apparatus from an APU. *See* Williams, col. 1, ll. 29–35 (describing Williams'

[2] Williams, US 5,899,085, issued May 4, 1999.

invention as using an air turbine); col. 2, ll. 45–48 (describing the inventive system as *not having an auxiliary power unit*).

The evidence supports Appellant's argument that an APU is a power-generating unit like a piston engine or gas turbine engine that generates power using an internal combustion engine. Such engines must be started, such as by using battery power to generate a spark to begin combustion in the engine. The air turbine of Williams is not a gas turbine engine and does not need to be started in the same manner as an engine. The air turbine converts the energy in the bleed air from the gas turbine engine of the aircraft (the main engine) to rotational energy that turns shaft 116. It does not itself generate power using an engine such as a gas turbine engine. It is, therefore, not an auxiliary *power* unit (APU).

Nor does Williams teach starting an APU using an energy-conversion device. To support a finding that Williams teaches operating an energy-conversion device in a starter mode to start an auxiliary power unit, the Examiner cites to column 8, lines 1–4 of Williams. Final 14. But this portion of Williams describes using pneumatic ground power to drive the air turbine. The energy-conversion device (motor/generator 104) does not start the air turbine 42.

The Examiner applies various further prior art references to meet further limitations in the claims, but the Examiner's use of those references does not cure the deficiencies discussed above.

CONCLUSION

We do not sustain any of the Examiner's rejections.

DECISION

The Examiner's decision is reversed.

REVERSED