UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/437,304	04/02/2012	Frederick M. Schwarz	61457US01; 67097-1803US1	4398

54549 7590 02/23/2018

CARLSON, GASKEY & OLDS/PRATT & WHITNEY
400 West Maple Road
Suite 350
Birmingham, MI 48009

EXAMINER	
GOYAL, ARUN	

ART UNIT	PAPER NUMBER
3741	

NOTIFICATION DATE	DELIVERY MODE
02/23/2018	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ptodocket@cgolaw.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte FREDERICK M. SCHWARZ,
and DANIEL BERNARD KUPRATIS

Appeal 2017-002377
Application 13/437,304
Technology Center 3700

Before: MICHAEL L. HOELTER, LISA M. GUIJT, and JEFFREY A. STEPHENS, *Administrative Patent Judges*.

HOELTER, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE[1]

Appellants appeal under 35 U.S.C. § 134(a) from a Final Rejection of claims 1, 5, 6, and 8–20. Final Act. 1; *see also* Advisory Action, mailed March 2, 2016 ("Advisory Act."). Claims 2–4 and 7 have been canceled.

---

[1] Appellants identify the following cases as being related (abandoned cases are not included herein): (i) Application Serial No. 13/407,795, filed February 29, 2012, Geared Turbofan Engine with Counter-Rotating Shafts, (present status: Examiner's Answer mailed November 2, 2017, no Appeal No. assigned); and (ii) Application Serial No. 13/459,498, filed April 30, 2012, Geared Turbofan with Three Turbines All Co-Rotating (present status: assigned Appeal No. 2017-002075, Decision rendered January 31, 2018).

(*see* Amendment, filed October 15, 2015). We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

THE CLAIMED SUBJECT MATTER

The disclosed subject matter "relates to a gas turbine having three turbine sections, with one of the turbine sections driving a fan through a gear change mechanism." Spec. ¶ 1. Apparatus claims 1 and 17 are independent. Claim 1 is illustrative of the claimed subject matter and is reproduced below:

> 1. A gas turbine engine comprising:
>
> a fan rotor, a first compressor rotor and a second compressor rotor, said second compressor rotor compressing air to a higher pressure than said first compressor rotor;
>
> a first turbine rotor, said first turbine rotor driving said second compressor rotor, and a second turbine rotor, said second turbine rotor driving said first compressor rotor;
>
> a fan drive turbine positioned downstream of said second turbine rotor, said fan drive turbine driving said fan rotor through a gear reduction;
>
> said first compressor rotor and said second turbine rotor rotating as an intermediate speed spool, and said second compressor rotor and said first turbine rotor rotating together as a high speed spool, with said high speed spool, said intermediate speed spool, and said fan drive turbine rotating in the same direction; and
>
> a power density of the engine is greater than or equal to about 1.5 lbf/in^3, and less than or equal to about 5.5 lbf/in^3, said power density being defined as a ratio of thrust produced by said engine expressed in pounds force to a volume of a turbine section incorporating each of said first turbine rotor, said second turbine rotor and said fan drive turbine rotor, expressed in cubic inches[] and said thrust is sea level take-off flat-rated static thrust.

REFERENCES RELIED ON BY THE EXAMINER

Dev	US 7,219,490 B2	May 22, 2007
Orlando et al.	US 2008/0098715 A1	May 1, 2008
Donnerhack	US 2009/0133380 A1	May 28, 2009
Somanath et al.	US 7,632,064 B2	Dec. 15, 2009
Ress, Jr.	US 8,887,485 B2	Nov. 18, 2014
Kupratis et al.	US 8,887,487 B2	Nov. 18, 2014

THE REJECTIONS ON APPEAL[2]

Claims 1, 5, 6, and 8–20 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 6 of Kupratis.

Claims 1, 5, and 6–16 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 3–16 of copending Application No. 13/459,498.

Claims 1, 5, and 6–16 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 3–16 of copending Application No. 13/437,290 in view of Orlando.

Claims 1, 5, 6, 8–10, 13, 14, and 17–20 are rejected under 35 U.S.C. § 103(a) as unpatentable over Donnerhack, Dev, and Somanath. Final Act. 4–7.

Claims 1, 5, 6, and 8–20 are rejected under 35 U.S.C. § 103(a) as unpatentable over Ress, Jr., Dev, and Somanath. Final Act. 7–10.

[2] "[T]he Examiner withdraws the rejection under 35 U.S.C. [§] 112 [second] paragraph." Advisory Act. 2.

ANALYSIS

Double-patenting and provisional double-patenting rejections

Regarding the Examiner's double-patenting rejection in view of Kupratis, Appellants have not submitted a terminal disclaimer but instead state, "[s]hould this application ultimately be allowed, or should any of the co-pending applications be allowed, Appellant[s] will submit a Terminal Disclaimer at the appropriate time." App. Br. 3. Hence, the Examiner's double-patenting rejection remains in effect, and we summarily sustain the rejection of claims 1, 5, 6, and 8–20.

Regarding the Examiner's provisional double-patenting rejections under copending Application No. 13/459,498 and copending Application No. 13/437,290 in view of Orlando, Appellants make the same statement as above. *See* App. Br. 3. Hence, until such time arrives, both of the Examiner's provisional double-patenting rejections remain in effect, and we do not reach them in this appeal.

Prior art rejections

Both independent claims 1 and 17 recite a "power density."[3] In both of the obviousness rejections, the Examiner relies on Dev as recognizing that engine performance "is associated to the ratio of the thrust to the volume of the *engine*, Fig. 22." Final Act. 5, 8 (emphasis added); *see also* Ans. 3, 5. In

[3] Claims 1 and 17 each define the engine's "power density" as a ratio "of thrust . . . to a volume of a *turbine* section" (emphasis added). Both claims further recite the power density being "greater than or equal to about 1.5 lbf/in^3, and less than or equal to about 5.5 lbf/in^3."

both rejections, the Examiner replicates Figure 22 of Dev.[4] Final Act. 6, 9; Ans. 4. Based on the graph depicted, the Examiner states, "the ratio of the thrust to the turbine section volume[] has been recognized in the prior art as a result effective variable," which "can be obviously optimized through routine experimentation." Final Act. 5–6, 9; Ans. 3 (referencing Dev Fig. 22; *In re Antonie*, 559 F.2d 618 (CCPA 1977); MPEP 2144.05(II)(B)). Somanath is relied on for teaching a "mid-turbine-frame." Final Act. 6, 9; Ans. 3, 5. The Examiner concludes that it would have been obvious to modify the respective primary reference (i.e., Donnerhack or Ress, Jr.) to include Somanath's frame "so that the thrust-to-volume ratio (as defined by [Appellants]) would" have the values recited "in view of *In re Antonie* and *In re Aller*."[5] Final Act. 7, 10; *see also* Ans. 3.

Appellants contend, "the claimed power density is only associated with the volume of the turbine section, and not the overall volume of the engine" and "Dev is able to achieve greater thrust at lower volume of the entire *engine*, as opposed to a lower volume of the *turbine*." App. Br. 3–4. Appellants contend "[n]owhere in the prior art is any such ratio discussed" and further, "the Examiner must first show that the parameter to be optimized is recognized as a result-effective variable." App. Br. 5–6 (citing *Antonie*); *see also id.* at 8. In summation, Appellants state that, without support that the "claimed ratio is a known result-effective variable," "there is no *prima facie* case of obviousness." App. Br. 7.

---

[4] Figure 22 of Dev is a graph contrasting "ENGINE CYLINDRICAL VOLUME, cu.ft." (x-axis) to "RATED THRUST, lbf" (y-axis).

[5] *In re Aller*, 220 F.2d 454 (CCPA 1955).

There is merit to Appellants' contentions. The Examiner understands that engine volume is a combination of (a) turbine section volume; (b) compressor section volume; and (c) combustor section volume. Final Act. 5, 6, and 8–9; *see also* Ans. 3–4. The Examiner further recognizes that the graph shown in Figure 22 of Dev "uses total engine volume" and not just turbine volume as recited. Final Act. 6, 9; Ans. 4. The Examiner seeks to resolve this disparity by addressing "Dev's Fig. 1" stating, "the volume of the turbine section appears to be less than 25% of total engine volume" thereby achieving a ratio within the recited range. Final Act. 6, 9; Ans. 4. This is problematic for multiple reasons. First, the Examiner relies on the apparent scale of Figure 1 of Dev to arrive at a percentage of turbine volume (Final Act. 6, 9; Ans. 4) even though Dev describes Figure 1 as being "a schematic" view.[6] Dev 2:35–36. Appellants contend that "measuring drawings which have not been stated to be to scale is improper, and reversible." Reply Br. 2; *see also* App. Br. 5. Further, the Examiner contends "the ratio taught by Dev can easily be converted to teach the claimed ratio." Ans. 4. However, nowhere does the Examiner attempt to explain that any change in Dev's engine volume would be proportional across all three contributing volume sections, nor does the Examiner address the issue where one section's volume might vary (or remain constant) but not another. Instead, based on a schematic figure that is not described as illustrating relative proportions, the Examiner concludes that "the ratio of

[6] *Hockerson-Halberstadt, Inc. v. Avia Group International, Inc.*, 222 F.3d 951, 956 (Fed. Cir. 2000), states that "patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the [S]pecification is completely silent on the issue."

thrust to turbine section volume above [a value] was known in the Art." Final Act. 6, 9; *see also* Ans. 4.

We are instructed by our reviewing court that "[t]he Patent Office has the initial duty of supplying the factual basis for its rejection" and that "[i]t may not, because it may doubt that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in its factual basis." *In re Warner*, 379 F.2d 1011, 1017 (CCPA 1967). We are of the opinion that the Examiner's use of a schematic drawing to calculate relative proportions is a "resort to speculation, unfounded assumptions or hindsight reconstruction." *Id.*; *see also* App. Br. 5. Additionally, the Examiner appears to presume that changes in engine volume will result in proportional volume changes across the turbine, compressor, and combustor sections. However, as indicated above, the Examiner does not explain how a change in engine volume could not also encompass a disproportionate effect on the volume of these three sections. In effect, one skilled in the art, viewing Dev's changing engine volume, would have to guess at what the turbine section volume might be. The Examiner does not state or otherwise indicate that one skilled in the art would be aware of an expected ratio between an engine's volume and the volume of the turbine section of that engine, such that one skilled in the art could employ Dev's Figure 22 to reasonably ascertain a turbine section volume (and from which the recited "power density" could be determined).[7]

[7] In other words, although it may be possible for one skilled in the art to ascertain a turbine section volume from Dev (i.e., fore-armed with knowledge of what a turbine section volume might reasonably be based on a given engine volume), that correlation is not before us for review and we decline to rely upon a stated scaling of Figure 1 of Dev to arrive at a turbine

Accordingly, and based on the record presented, we agree with Appellants that the Examiner has failed to properly express a prima facie case of obviousness. App. Br. 6–7. We reverse the Examiner's rejection of claims 1, 5, 6, 8–10, 13, 14, and 17–20 as unpatentable over Donnerhack, Dev, and Somanath. We likewise reverse the Examiner's rejection of claims 1, 5, 6, and 8–20 as unpatentable over Ress, Jr., Dev, and Somanath.

DECISION

The Examiner's nonstatutory obviousness-type double patenting rejection of claims 1, 5, 6, and 8–20 in view of Kupratis is affirmed.

The Examiner's provisional double-patenting rejections of claims 1, 5, and 6–16 have not been reached.

The Examiner's art rejections of claims 1, 5, 6, and 8–20 under 35 U.S.C. § 103(a) are 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)(1)(iv).

AFFIRMED

---

section volume. *See* App. Br. 5; Reply Br. 2. For example, regarding combustor section volume, Dev teaches "the combustor volume diminishes with the cube of engine scale." Dev. 14:63–64.