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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/197,692	08/04/2005	Yueping Guo	04-0217	6349
74576	7590	01/18/2013	EXAMINER	
HUGH P. GORTLER 23 Arrivo Drive Mission Viejo, CA 92692			KIM, TAE JUN	
			ART UNIT	PAPER NUMBER
			3741	
			NOTIFICATION DATE	DELIVERY MODE
			01/18/2013	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte YUEPING GUO

Appeal 2010-011611
Application 11/197,692
Technology Center 3700

Before KEN B. BARRETT, REMY J. VANOPHEM, and
WILLIAM A. CAPP, *Administrative Patent Judges*.

CAPP, *Administrative Patent Judge*.

Opinion Dissenting filed by VANOPHEM, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant seeks our review under 35 U.S.C. § 134 of the final rejection of claims 1-9, 11-14, 18 and 19. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

THE INVENTION

Appellant's invention pertains to a pulse jet engine. Spec. 1. Claim 1, reproduced below, is illustrative of the subject matter on appeal.

1. An engine comprising:

a plurality of pulse ducts, each pulse duct transporting high-pressure fluid from an upstream end to a downstream end, wherein the high-pressure fluid is expelled from said downstream ends of the pulse ducts during operation of the engine; and

an ejector in fluid communication with the plurality of pulse ducts, the ejector including a plurality of segregated compartments for preventing high-pressure fluid expelled from adjacent pulse ducts from interacting, each pulse duct extending into a corresponding compartment with its downstream end located within its corresponding compartment.

THE REJECTIONS

The Examiner relies upon the following as evidence in support of the rejections:

Goddard	US 2,515,644	Jul. 18, 1950
Paris	US 2,834,181	May 13, 1958
Smith	US 3,103,783	Sep. 17, 1963
Heise	US 3,678,692	Jul. 25, 1972
Kraft	US 7,007,455 B2	Mar. 7, 2006

The following rejections are before us for review:¹

1. Claims 1-9 and 13 are rejected under 35 U.S.C. § 102(b) as being anticipated by Paris.
2. Claims 1-5, 7-9 and 13 are rejected under 35 U.S.C. § 102(b) as being anticipated by Goddard.
3. Claims 1, 4, 5, 8, 9 and 12 are rejected under 35 U.S.C. § 102(b) as being anticipated by Smith.
4. Claims 1-9, 11-14 and 18-19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kraft and Paris and optionally in view of Heise.
5. Claims 1-9, 11-14 and 18-19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Paris and Kraft and optionally in view of Heise.

ANALYSIS

Anticipation of Claims 1-9 and 13 by Paris

Appellant argues claims 1-9 and 13 as a group. App. Br. 7-8. We select claim 1 as representative of the group. Claims 2-8 and 13 stand or fall with claim 1. See 37 C.F.R. § 41.37(c)(1)(vii) (2011).

The Examiner finds that Paris teaches an engine comprising a plurality of pulse ducts as claimed. Ans. 5. The Examiner also finds that Paris teaches an ejector with a plurality of segregated compartments as claimed. *Id.*

Appellant argues that Paris does not anticipate the claimed invention because Paris discloses ejector tubes that are separate and spaced apart. App. Br. 7. Appellant argues that “Paris does not describe an ejector

¹The rejection of claims 1-9, 12 and 13 under 35 U.S.C. § 103(a) as being unpatentable over Paris, Goddard or Smith in view of Heise has been withdrawn by the Examiner. Ans. 4.

(singular) having segregated compartments.” App. Br. 8. Appellant also argues that Paris does not describe the ejector’s structural relationship with a plurality of pulse ducts. *Id.*

We first address Appellant’s argument that the term “an ejector” is limited to a singular structure. The indefinite article ‘a’ or ‘an,’ as a general rule, carries the meaning of ‘one or more’ in open ended claims containing the transitional phrase ‘comprising’ absent clear intent to limit the article. *Baldwin Graphic Systems, Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342 (Fed. Cir. 2008). In the instant case, the record does not reflect that Appellant departed from the general rule concerning the article ‘an.’ To the contrary, Appellant’s Specification states: “the articles ‘a’, ‘an’, ‘the’, and ‘said’ are intended to mean that there are one or more of the elements.” Spec. 8.

Paris discloses a ram jet engine that incorporates a plurality of pulse jet units where each, individual pulse duct is associated with an individual ejector tube. Paris, Fig. 1. No two pulse ducts share the same ejector tube (compartment), therefore, each ejector tube is “segregated” from each other ejector tube. The plain and ordinary meaning of “segregated” does not preclude the ejector compartments from being spaced apart. Although Appellant discloses an ejector with adjacent compartments segregated by a commonly shared partition, the claims are not so limited. *See Arlington Indus., Inc. v. Bridgeport Fittings, Inc.*, 345 F.3d 1318, 1327 (Fed. Cir. 2003) (it is improper to read a limitation from the specification into the claims). We agree with the Examiner that Paris’ plurality of ejector tubes collectively comprise an ejector with a plurality of segregated compartments. Ans. 12.

We sustain the Examiner's rejection of claims 1-9 and 13 as anticipated by Paris.

*Unpatentability of Claims 1-9, 11-14 and 18-19
over Paris and Kraft and optionally Heise*

The Examiner finds that Paris teaches various aspects of the invention including the pulse ducts and ejector, but does not teach a processor controlled regulator for controlling the fluid flow to reduce noise. Ans. 11. The Examiner finds that Kraft teaches an engine comprising a plurality of pulse ducts as claimed and also discloses a processor controlled regulator for controlling fluid flow through the ducts such that out-of-phase pressure waves are caused to travel through at least one of the ducts to reduce engine noise. Ans. 11-12. The Examiner further finds that Heise provides evidence that out of phase ducts/waves reduces engine noise. Ans. 12. The Examiner concludes that it would have been obvious to a person of ordinary skill in the art to use a processor controlled regulator, as taught by Kraft, for controlling the fluid flow in the pulse ducts of Paris, out of phase, in order to directly facilitate noise reduction. *Id.*; *see also id.* at 19.

Claims 1-9 and 11-13

Appellant argues all of the rejected claims under a single heading, but then argues claims 1-9 and 11-13 as a sub-group. App. Br. 15 (Argument section VI). We select claim 1 as representative of the sub-group. Claims 2-8 and 11-13 stand or fall with claim 1. See 37 C.F.R. § 41.37(c)(1)(vii) (2011).

With respect to the Examiner's obviousness rejection over Paris as the primary reference, Appellant repeats the same contentions previously argued in connection with the Examiner's Section 102 rejection over Paris,

discussed *supra*. App. Br. 15 (incorporating by reference App. Br. 13-14). We reject those arguments here for essentially the same reason that we found them unpersuasive in connection with the anticipation rejection over Paris. Appellant also argues that the Examiner's rejection is conclusory under *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007), because it lacks articulation as to why a person of ordinary skill in the art would find it obvious to use the out-of phase operation in combination with an ejector having compartments and a plurality of pulse ducts that extend into their corresponding compartments. App. Br. 15.

In the instant case, Paris teaches using pulse jets in phase opposition. Col. 4, ll. 45-47. Heise shows that it was known to use phase shift to reduce engine noise.² The Examiner merely uses Kraft to show that a processor controlled regulator could be used to control phase opposition. Under the circumstances presented by this case, the Examiner's statement that a person of ordinary skill in the art would combine Paris and Kraft in order to facilitate noise reduction constitutes sufficient articulated reasoning with rational underpinning to pass muster under *KSR*.

Accordingly, we sustain the Examiner's unpatentability rejection of Claims 1-9 and 11-13 over a combination Paris and Kraft and optionally Heise.

² "Such double flame tube or cowl arrangements are known and have the general advantage that both tubes operate automatically with a phase shift of 180°, as a result of which the flow from the nozzle becomes almost continuous, and so that accordingly also the exhaust noise is reduced considerably." Heise, Col. 3, ll. 12-17.

Claims 14, 18 and 19

Appellant offers arguments pertaining to claims 1-9, 11-14 and 18-19 under Argument section “V.” App. Br. 13-14. However, as we have already dealt with claims 1-9 and 11-13 in the preceding section, we will only deal with independent claims 14 and claims 18 and 19 that depend therefrom in this section. Appellant does not present separate arguments for patentability of dependent claims 18 and 19 and, accordingly, claims 18 and 19 stand or fall with independent claim 14. See 37 C.F.R. § 41.37(c)(1)(vii) (2011).

Appellant argues that Kraft does not address the reduction of thrust in a pulse duct engine. App. Br. 15 (incorporating by reference App. Br. 13-14). Appellant also argues that Kraft does not disclose an ejector as claimed. *Id.* Appellant repeats the previous arguments that Paris and Heise do not disclose the claimed ejector and its structural relationship with a plurality of pulse ducts. *Id.* Once again, Appellant contends that the Examiner’s obviousness rejection is conclusory. *Id.*

With respect to the thrust reduction argument, the Examiner cited Paris, not Kraft, as disclosing the use of ejectors to increase thrust. Ans. 19. Otherwise, claim 14 does not claim that the invention affects thrust and, therefore, Appellant’s argument is not commensurate with the scope of the claim. With respect to the argument that Kraft does not disclose an ejector as claimed, that element is also supplied by Paris. With respect to the argument that Paris does not disclose an ejector in the claimed structural relationship with a plurality of pulse ducts, we have already considered and rejected that argument in our discussion of the anticipation rejection over Paris, *supra*.

Finally, we reject Appellant's argument that the Examiner's reasoning is "conclusory" for the same reasons that we rejected Appellant's similar argument with respect to the obviousness rejection of claim 1 over Paris, Kraft and Heise *supra*. Accordingly, we sustain the Examiner's unpatentability rejection of Claims 14, 18 and 19 over a combination of Paris and Kraft and optionally Heise.

Other Grounds of Rejection

With respect to the Examiner's other three grounds of rejection, namely:

- Anticipation of Claims 1-5, 7-9 and 13 by Goddard;
- Anticipation of Claims 1, 4, 5, 8, 9 and 12 by Smith; and
- Unpatentability of Claims 1-9, 11-14 and 18-19 over Kraft and Paris and optionally Heise;

inasmuch as we have sustained the Examiner's rejection that all of the pending claims are anticipated and/or unpatentable under one or both of the grounds of rejection discussed *supra*, we do not reach the remainder of the Examiner's rejections.

Otherwise, we have considered the remainder of Appellant's arguments and find them not persuasive.

DECISION

The decision of the Examiner to reject claims 1-9, 11-14 and 18-19 is affirmed.

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

mp

DISSENTING OPINION

VANOPHEM, *Administrative Patent Judge, dissenting*

Claims 1-9 and 13 as anticipated by Paris

I disagree with my colleagues because anticipation requires "...the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim." *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d. 1452, 1458 (Fed. Cir. 1984). The Examiner failed to identify, in the Paris reference, all of the claimed elements arranged as in independent claim 1. Appellant contends that Paris does not disclose an ejector having segregated compartments and a plurality of pulse ducts that extend into their corresponding compartments. App.Br. 8. Further, Appellant points out that Paris discloses at column 3. ll. 41-45, that "The outlet orifice 10 for the gases and the dilution air is a little to the rear of the outlet opening 3 of the ram jet duct, so that the final exhaust of the pulse jet units takes place directly to atmosphere." App.Br. 5. Therefore, Paris clearly discloses that the downstream outlet for the gases and the dilution air of each pulse duct extends to the rear of the outlet opening 3 and therefore does not anticipate independent claim 1, since the claim requires "...each pulse duct extending into a corresponding compartment with its downstream end located within its corresponding compartment." App.Br. 7. (underlining added).

For the above reasons, I would reverse the rejection of claims 1-9 and 13 under 35 U.S.C. § 102(b) as being anticipated by Paris.

Claims 1-9, 11-14, and 18-19 as obvious over Kraft in view of Paris and optionally in view of Heise

The Examiner finds that Kraft teaches a pulse detonation system for a gas turbine engine wherein the high-pressure fluid is expelled from said downstream ends of the pulse ducts during operation of the engine. Ans. 9. The Examiner also finds that Kraft further teaches a processor controlled regulator 82 (See col. 4, ll. 31-59) for controlling firing of each tube such that low, positive pressure regions of pressure pulses are substantially aligned with high, positive pressure regions of adjacent pressure pulses in such a manner to facilitate reducing pressure variations. Specifically, the Examiner finds that as pressure pulses propagate through exhaust chamber 73 higher amplitude dynamic pressure variations are substantially smoothed out, causing the exhaust of combustion gasses exiting exhaust chamber 73 and engine exhaust 30 to be at a substantially uniform and high pressure such that a reduction of dynamic pressure loads is reduced within system 50, and the number and intensity of acoustic pressure waves emitted by the system 50 are facilitated to be reduced, resulting in reducing the structural failures associated with system 50 and the level of noise emitted by the system 50. Ans. 9.

The Examiner finds that Kraft does not teach an ejector with a plurality of segregated compartments for preventing high-pressure fluid expelled from adjacent pulse ducts each pulse duct from interacting, and the ejector geometry. Ans. 9. For Kraft's shortcomings the Examiner relies on the teachings of Paris. Ans. 10-11. Since independent claim 14 contains the exact same language with respect to the extension of the outlet orifice 10 of

each pulse duct or its downstream end being located “within” its corresponding compartment, Paris fails to disclose or teach this feature as was clarified in the rejection of claims 1-9 under 35 U.S.C. § 102(b) above. Therefore the Examiner’s position suffers from each of the same deficiencies as are present in the rejection of claims 1-9. Accordingly, the Examiner has failed to provide articulated reasoning with rational underpinning as to why a person skilled in the art at the time of the invention, would employ the ejector geometry of Paris with the pulse detonation system for a gas turbine engine as taught by Kraft in attempting to obviate the invention. The rejection of claims 1-9, 11-14 and 18-19 under 35 U.S.C. § 103(a) will therefore not be sustained.

Claims 1-9, 11-14, 18 and 19 over Paris, Kraft and optionally applied Heise

Heise offers no teachings that attempt to cure the shortcomings of Paris or Kraft. Therefore, the rejection of claims 1-9, 11-14, 18 and 19 under 35 U.S.C. § 103(a) over Paris, Kraft and in view of the teachings of optionally applied Heise cannot be sustained.

For the above reasons, I would reverse the rejection of claims 1-9 and 13 as anticipated by Paris and the further rejection of claims 1-9, 11-14, 18 and 19 under 35 U.S.C. § 103(a) as obvious over the teachings of Paris in view of the teachings of Kraft and optionally in view of the teachings of Heise.

Since my colleagues do not address the separate rejections, namely of
Anticipation of claims 1-5, 7-9 and 13 by Goddard;
Anticipation of claims 1, 4, 5, 8, 9 and 12 by Smith; and

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Obviousness of claims 1-9, 11-14, 18 and 19 over Paris, Kraft and Heise, I will not do so either.