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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MASA AKI NAGASE,
ATSUSHI HIDAKA, KAORU HIRATA, RYOUSUKE DOHI,
KOUJI NISHINO, and NOBUKAZU IKEDA

Appeal 2018-008570
Application 14/170,953
Technology Center 1700

Before GEORGE C. BEST, JEFFREY R. SNAY, and
MERRELL C. CASHION, JR., *Administrative Patent Judges*.

BEST, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the
Examiner's decision to reject claims 1, 2, and 4–9² of Application

¹ We use the word “Appellant” to refer to “Applicant” as defined in 37
C.F.R. § 1.42. Appellant identifies Fujikin, Inc., as the real party in interest.
Appeal Br. 1.

² Appellant has canceled claim 3 by amendment after entry of the Final
Action. Amendment (E) After Final (September 18, 2017) (entered
September 25, 2017).

14/170,953. Final Act. (June 20, 2017). We have jurisdiction under 35 U.S.C. § 6.

An oral hearing was held in this appeal on October 31, 2019.³

For the reasons set forth below, we *affirm*.

I. BACKGROUND

The '953 Application describes a raw material vaporizing and supplying apparatus useful in semiconductor manufacturing equipment that carries out the metallic organic chemical vapor deposition process. Spec. ¶ 1.⁴ The raw material vaporizing and supplying apparatus is said to be capable of supplying raw material gas while controlling the flow rate of even a liquid or solid raw material at a low gas pressure with a high degree of accuracy. *Id.*

Claim 1 is representative of the '953 Application's claims and is reproduced below from the Claims Appendix of the Appeal Brief.

1. A raw material vaporizing and supplying apparatus arranged to employ a baking method, the apparatus comprising:
a source tank operably connected for storing and vaporizing raw material;
a raw material gas supply channel operably connected to supply raw material gas from an internal space portion of the source tank to a process chamber;

³ A transcript of the hearing will be added to the record of the '953 Application when it becomes available.

⁴ In the Appeal Brief, Appellant cites both the originally-filed Specification and the pre-grant publication of the '953 Application. *Compare* Appeal Br. 2–4 *with* Appeal Br. 6. We shall follow our practice of citing only the originally-filed Specification.

a pressure type flow rate control system installed along the way of the supply channel, the pressure type flow rate control system controlling a flow rate of raw material gas supplied to the process chamber;

a constant temperature heating unit that heats the source tank, the raw material gas supply channel, and the pressure type flow rate control system to a set temperature;

wherein raw material gas is generated in the internal space portion of the source tank by heating the source tank, and thereafter is supplied to the process chamber while the pressure type flow rate control system performs flow rate control,

wherein the pressure type flow rate control system is configured to control a flow rate of raw material gas from the source tank that is pure raw material gas without containing a dilution gas and comprises a control valve (CV), a temperature detector (T) and a pressure detector (P) provided on a downstream side of the control valve (CV), an orifice provided on a downstream side of the pressure detector (P), an arithmetic and control unit operably connected to perform a temperature correction of a flow rate of the raw material gas computed by use of a detection value from the pressure detector (P), on the basis of a detection value from the temperature detector (T), and comparing a predetermined flow rate of the raw material gas and a computed flow rate, so as to output a control signal (Pd) for controlling opening or closing of the control valve (CV) in a direction whereby a difference between the both flow rates is reduced, and

wherein a branched purge gas supply channel is connected to a primary side of the pressure type flow rate control system, and

a branched dilution gas supply channel is connected to a secondary side of the pressure type flow rate control system.

Appeal Br. 10–11.

II. REJECTIONS

On appeal, the Examiner maintains⁵ the following rejections:

1. Claims 1, 2, and 4–7 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Hirata,⁶ Lowery,⁷ and Sarigiannis.⁸ Final Act. 14–17.
2. Claims 1, 2, and 4–8 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Hirata, Lowery, Sarigiannis, and Kim.⁹ Final Act. 17–18.
3. Claim 9 is rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Hirata, Lowery, and McMEnamin.¹⁰ Final Act. 18–20.

⁵ We have restated the grounds of rejection at issue to reflect Appellant’s Amendment After Final. In this Amendment, Appellant incorporated the limitations of dependent claim 3 in the independent claim 1 and canceled claim 3. Amendment (E) After Final (September 18, 2017) (entered September 25, 2017). In an Advisory Action, the Examiner maintained the rejection of claim 1 on the basis used to reject claim 3. Advisory Action (September 25, 2017).

⁶ US 2010/0012026 A1, published January 21, 2010.

⁷ US 2002/0174898 A1, published November 28, 2002.

⁸ US 2009/0214779 A1, published August 27, 2009.

⁹ US 6,656,282 B2, issued December 2, 2003.

¹⁰ US 4,393,013, issued July 12, 1983.

III. DISCUSSION

After entry of the Final Action, Appellant sought to amend the claims in the '953 Application. Amendment (E) After Final (September 18, 2017). The proposed amendments to the claims were entered on September 25, 2017. Advisory Action 5. In these amendments, Appellant, *inter alia*, amended claim 1 to incorporate the limitations recited in dependent claim 3 and canceled claim 3. *Id.* at 2.

Appellant argues for reversal of all of the rejections at issue based upon the limitations in amended claim 1. *See* Appeal Br. 5–9. We, therefore, select amended claim 1 as representative of the claims subject to this ground of rejection and limit our discussion to this claim. 37 C.F.R. § 41.37(c)(1)(iv).

A. *Rejection of claims 1, 2, and 4–7 as unpatentable over the combination of Hirata, Lowery, and Sarigiannis.*

According to Appellant, the combination of Hirata, Lowery, and Sarigiannis does not describe or suggest the following elements of claim 1: (1) “a pressure type flow rate control system installed along the way of the supply channel, the pressure type flow rate control system controlling a flow rate of a raw material gas supplied to the process chamber” and (2) “a branched purge gas supply channel . . . connected to a primary side of the pressure type flow rate control system, and a branched dilution gas supply channel . . . connected to a secondary side of the pressure type flow rate control system.” Appeal Br. 7.

First, Appellant argues that neither Hirata nor Lowery describes or suggests the claimed pressure type flow rate control system installed along the way of the supply channel. Appeal Br. 6; Reply Br. 2–3.

In the Final Action, the Examiner found that Hirata describes the claimed pressure type flow rate control system. Final Act. 5 (citing Hirata ¶¶ 51, 97; Fig. 1). In particular, the Examiner found that Hirata describes an “[a]utomatic pressure regulating device for source tank 15 ([0051]), while being supplied to the process chamber 11, the flow rate of mixed gas G_0 is controlled with high accuracy through valve V_0 at a constant mixture ratio and a predetermined flow rate value ([0097], last sentence[]).” *Id.* (discussing Hirata Fig. 1).

Appellant argues that the arrangement shown in Hirata would not allow the pressure type flow rate control system to accurately control the mixture ratio of the gas. Appeal Br. 6 (citing Spec. ¶¶ 33–34). Appellant, however, does not provide any evidence or explanation of why Hirata’s flow rate control system would be unable to control the mixture ratio of the gas. *Id.* Appellant’s unsupported assertion is not persuasive of the existence of reversible error.¹¹

¹¹ We note that the Appeal Brief contains the following passage: “Applicants maintain all of their previous arguments of record and incorporate them herein.” Appeal Br. 6. In pertinent part, our rules provide that the argument section of the brief *shall* contain

[t]he arguments of appellant with respect to each ground of rejection, and the basis therefor, with citations of statutes, regulations, authorities, and parts of the Record relied on. . . . Except as provided for in §§41.41, 41.47 and 41.52, *any arguments or authorities not included in the appeal brief will be refused consideration* by the Board for the purposes of the present appeal.

37 C.F.R. § 41.37(c)(1)(iv) (emphasis added). Incorporation by reference, therefore, is not sufficient to present an argument for reversal. *See DeSilva v. DiLeonardi*, 181 F.3d 865, 867 (7th Cir. 1999) (“A brief must make all

Appellant, therefore, has not persuaded us that the Examiner reversibly erred in finding that Hirata describes the claimed pressure type flow rate control system.

Moreover, the Examiner also found, in the alternative, that Lowery describes the claimed pressure type flow rate control system. Final Act. 9–10 (citing Lowery ¶¶ 20, 27). In particular, the Examiner found that Lowery’s

meter system 20 comprises a mechanical system 22 and an electrical system 24. The mechanical system 22 comprises a flow restrictor 30 defining a restriction chamber 32 and a pressure balancing system 34. The electrical system 24 comprises a pressure sensor 40, a temperature sensor 42, and a meter circuit 44 ([0020], 2nd and 3rd sentences, the claimed “a pressure type flow rate control system installed along the way of the supply channel”)[.] The meter circuit 44 stores or otherwise has access to calibration data relating mass flow rate to pressure and temperature for a given fluid ([0027], the pressure sensor 40 of the electrical system 24, together, is the claimed “the pressure type flow rate control system controlling a flow rate of raw material gas supplied to the process chamber” . . .)[.]

Final Act. 9–10 (discussing Lowery Fig. 1).

The Appeal Brief does not address this finding in any way. *See* Appeal Br. 5–9. Appellant, therefore, has waived the ability to challenge the correctness of the finding that Lowery describes or suggests the claimed pressure type flow rate control system.¹²

arguments accessible to the judges, rather than asked them to play archaeologists with the record.”).

¹² The Reply Brief contains an unsupported assertion that Lowery’s pressure type flow rate control system cannot accurately control the flow rate of the high-speed flow gas. Reply Br. 3. We will not consider this untimely argument because Appellant has not explained why it could not have been

In view of the foregoing, we are not persuaded that Appellant has demonstrated that the Examiner reversibly erred in finding that the combination of Hirata, Lowery, and Sarigiannis describes or suggests the claimed “pressure type flow rate control system installed along the way of the supply channel, the pressure type flow rate control system controlling a flow rate of a raw material gas supplied to the process chamber.”

Second, the Examiner found that Sarigiannis describes the claimed branched purge gas supply channel and branched dilution gas supply channel. Final Act. 14–15 (citing Sarigiannis Fig. 16).

According to Appellant, Sarigiannis does not describe or suggest the claimed pressure type flow rate control system and, therefore, cannot describe or suggest the claimed locations for connection of the branched purge gas supply channel and branched dilution gas supply channel. Appeal Br. 6–7.¹³

The Examiner responds that “[a] person of ordinary skill in the art would have known to add the purge gas and the dilution gas at the two sides of the control valve.” Answer 13. The Examiner further responds that the

raised in the Appeal Brief. *See* 37 C.F.R. § 41.37(c)(1)(iv); *Ex parte Nakashima*, 93 USPQ2d 1834 (BPAI 2010) (informative) (explaining that arguments and evidence not timely presented in the Principal Brief will not be considered when filed in a Reply Brief, absent a showing of good cause explaining why the argument could not have been presented in the Principal Brief).

¹³ We note that Appellant’s Reply Brief presents an argument regarding Sarigiannis that is not set forth in the Appeal Brief. *See* Reply Br. 3 (arguing that there is no motivation to combine Sarigiannis with Hirata). For the reasons set forth in footnote 12, above, we will not consider this untimely argument.

location to add the dilution gas must be downstream of the flow rate control system. *Id.* According to the Examiner, if the dilution gas is attached between the components of the pressure type flow rate control system, the pressure type flow rate control system would not function properly. *Id.* Moreover, locating the dilution gas channel attachment point upstream from the pressure type flow rate control system would be redundant because the purge gas supply already provides an inert gas supply to the region of the apparatus upstream of the pressure type flow rate control system. *Id.*

We determine that the Examiner has provided adequate reasoning to rebut Appellant's unsupported assertion. We, therefore, are not persuaded that Appellant has established the existence of reversible error regarding the Examiner's finding that Sarigiannis describes or suggests the claimed branched purge gas supply channel and branched dilution gas supply channel.

In view of the foregoing, we determine that the Examiner did not reversibly err in rejecting claim 1, as amended, as unpatentable over the combination of Hirata, Lowery, and Sarigiannis. Accordingly, we also affirm the rejection of claims 2 and 4–7, which depend from claim 1.

B. Rejection of claims 1, 2, and 4–8 as unpatentable over the combination of Hirata, Lowery, Sarigiannis, and Kim.

Appellant argues that the rejection of claims 1, 2, and 4–8 as unpatentable over the combination of Hirata, Lowery, Sarigiannis, and Kim should be reversed for the reasons set forth in arguing for reversal of the rejection over the combination of Hirata, Lowery, and Sarigiannis. *See* Appeal Br. 9 (“[T]he Examiner has not established a *prima facie* case of § 103 obviousness against claims 1–2 and 4–9 because the combination of Hirata, Lowery, and Sarigiannis, with or without Kim or McMEnamin, does

not teach each and every limitation is recited in sole independent claim 1, as amended.”).

For the reasons set forth above, we have affirmed the rejection of independent claim 1 as unpatentable over the combination of Hirata, Lowery, and Sarigiannis. We, therefore, also affirm the rejection of claims 1, 2, and 4–8 as unpatentable over the combination of Hirata, Lowery, Sarigiannis, and Kim.

C. Rejection of claim 9 as unpatentable over the accommodation of Hirata, Lowery, and McMenamin.

Appellant argues that the rejection of claim 9 is unpatentable over the combination of Hirata, Lowery, and McMenamin should be reversed because the Examiner has not established a prima facie case of obviousness with respect independent claim 1. Appeal Br. 9. As discussed above, we have affirmed the rejection of claim 1. We, therefore, also affirm the rejection of claim 9.

IV. CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 2, 4–7	103(a)	Hirata, Lowery, Sarigiannis	1, 2, 4–7	
1, 2, 4–8	103(a)	Hirata, Lowery, Sarigiannis, Kim	1, 2, 4–8	
9	103(a)	Hirata, Lowery, McMenamin	9	
Overall Outcome			1, 2, 4–9	

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED