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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/620,744	01/08/2007	David H. Levy	93218DAN	9841
1333	7590	01/31/2019	EXAMINER	
EASTMAN KODAK COMPANY PATENT LEGAL STAFF 343 STATE STREET ROCHESTER, NY 14650-2201			LUND, JEFFRIE ROBERT	
			ART UNIT	PAPER NUMBER
			1716	
			MAIL DATE	DELIVERY MODE
			01/31/2019	PAPER

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* DAVID H. LEVY

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Appeal 2018-000606  
Application 11/620,744  
Technology Center 1700

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Before CATHERINE Q. TIMM, MONTÉ T. SQUIRE,  
and MICHAEL G. McMANUS, *Administrative Patent Judges*.

McMANUS, *Administrative Patent Judge*.

DECISION ON APPEAL

The Examiner finally rejected claims 1–12, 14, 16, 17, 21–23, 28–30, 35, 36, 38, 40, 41, 65 – 69, 72, 73, and 75 – 78 of Application 11/620,744 under 35 U.S.C. §§ 102 and 103. Final Act. (July 22, 2016) 2–23.

Appellants<sup>1</sup> seek reversal of these rejections pursuant to 35 U.S.C. § 134(a).

We have jurisdiction under 35 U.S.C. § 6(b).

For the reasons set forth below, we AFFIRM-IN-PART.

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<sup>1</sup> The real party in interest is identified as Eastman Kodak Company.  
Appeal Br. 1.

## BACKGROUND

The present application generally relates to a process and apparatus for the deposition of a thin film layer on a substrate “using a distribution head directing simultaneous gas flows onto a substrate.” Spec. 1, l. 18. The Specification teaches to use a series of gas flows comprising “at least a first reactive gaseous material, an inert purge gas, and a second reactive gaseous material.” *Id.* at 11, ll. 22–23. The Specification further teaches that “[o]ne or more of the gas flows provides a pressure that at least contributes to the separation of the surface of the substrate from the face of the delivery head.” *Id.* at 11, ll. 25–27.

Claim 1 is illustrative of the subject matter on appeal and is reproduced below:

1. A deposition system for thin film deposition of a solid material onto a substrate comprising:
  - a) a plurality of sources for, respectively, a plurality of gaseous materials comprising at least a first, a second, and a third source for a first reactant gaseous material, a second reactant gaseous material, and a third inert gaseous material, respectively;
  - b) a delivery head for delivering the gaseous materials to a substrate receiving thin film deposition and comprising:
    - i) a plurality of inlet ports comprising at least a first, a second, and a third inlet port for receiving the first reactant gaseous material, the second reactant gaseous material, and the third inert gaseous material, respectively; and
    - ii) an output face comprising a plurality of output openings and exhaust openings that face the substrate, wherein the first reactant gaseous material, the second reactant gaseous material, and the third inert gaseous materials are simultaneously

supplied from the output openings in the output face and exhausted from exhaust openings in the output face with a gas flow of the first reactant gaseous material and a gas flow of the second reactant gaseous material being separated by a gas flow of the third inert gaseous material, and wherein pressure generated due to the gas flow of one or more of the first reactant gaseous material, the second reactant gaseous material, and the third inert gaseous materials simultaneously supplied to the substrate surface by the output openings and exhausted from the substrate surface by the exhaust openings forms a gas fluid bearing between the output face of the delivery head and the substrate surface that maintains separation of the gas flow of the first reactant gaseous material and the gas flow of the second reactant gaseous material such that little or no intermixing occurs between the first reactant gaseous material and the second reactant gaseous material during thin film deposition on the substrate surface and maintains a substantially uniform distance between the output face of the delivery head and the substrate surface during thin film deposition on the substrate surface.

Appeal Br. 18–19 (Claims App.) (reformatted for clarity).

#### REJECTIONS

The Examiner maintains the following rejections:

1. Claims 1, 2, 5–8, 14, 16, 17, 21–23, 28–30, 36, 38, 41, 72, 73, and 75 are rejected under 35 U.S.C. § 102(e) (pre-AIA) as anticipated by Devitt al.<sup>2</sup> Final Act. 2–6.

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<sup>2</sup> US 2007/0034228 A1, published Feb. 15, 2007) (“Devitt”).

2. Claims 4, 40, and 76–78<sup>3</sup> are rejected under 35 U.S.C. § 103(a) (pre-AIA) as obvious over Devitt. *Id.* at 6–8.
3. Claims 9, 11, 12, 35, 65, and 66 are rejected under 35 U.S.C. § 103(a) (pre-AIA) as obvious over Devitt in view of Yudovsky.<sup>4</sup> *Id.* at 9–10.
4. Claim 10 is rejected under 35 U.S.C. § 103(a) (pre-AIA) as obvious over Devitt in view of Yudovsky and further in view of Kamikawa et al.<sup>5</sup> *Id.* at 10–11.
5. Claims 67–69 are rejected under 35 U.S.C. § 103(a) (pre-AIA) as obvious over Devitt in view of Drage.<sup>6</sup> *Id.* at 11–13.
6. Claims 1, 2, 4–9, 11, 12, 14, 16, 17, 21–23, 28–30, 35, 38, 66, 72, and 75–78 are rejected under 35 U.S.C. § 103(a) (pre-AIA) as obvious over Yudovsky in view of Devitt. *Id.* at 13–19.
7. Claims 3 and 10 are rejected under 35 U.S.C. § 103(a) (pre-AIA) as obvious over Yudovsky in view of Devitt and further in view of Kamikawa. *Id.* at 19.
8. Claims 36 and 73 are rejected under 35 U.S.C. § 103(a) (pre-AIA) as obvious over Yudovsky in view of Devitt and further in view of Bok.<sup>7</sup> *Id.* at 20.

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<sup>3</sup> Claim 3 was originally included in this rejection but was withdrawn in the Answer. *See* Answer 22.

<sup>4</sup> US 2004/0067641 A1, published Apr. 8, 2004 (“Yudovsky”).

<sup>5</sup> JP403019318A, published Jan. 28, 1991 (“Kamikawa”).

<sup>6</sup> US 4,590,042 issued May 20, 1986 (“Drage”).

<sup>7</sup> US 4,575,408, issued Mar. 11, 1986 (“Bok”).

9. Claims 67–69 are rejected under 35 U.S.C. § 103(a) (pre-AIA) as obvious over Yudovsky in view of Devitt and further in view of Drage. *Id.* at 20–23.

### DISCUSSION

**Rejection 1.** The Examiner rejected claims 1, 2, 5–8, 14, 16, 17, 21–23, 28–30, 36, 38, 41, 72, 73, and 75 as anticipated by Devitt.

Devitt teaches a method and apparatus for cleaning, drying, coating, baking, etching, and depositing surfaces onto a glass substrate as it transitions through and between small gaps between hydrostatic porous media bearings. Devitt, Abstract. Figure 2 of Devitt is reproduced below.

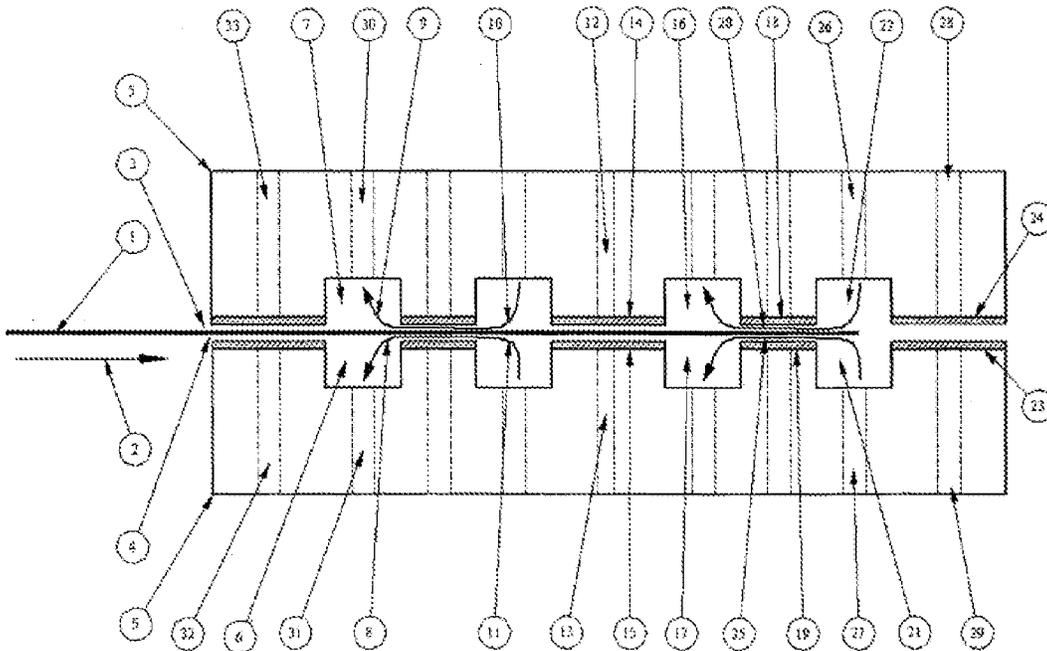


Figure 2 of Devitt “is a schematic view of a multiple . . . cleaning/drying/ etching operation for a solid substrate showing the vertically opposed

hydrostatic bearings, in an immediately sequential embodiment.” Devitt ¶ 46. Figure 2 depicts substrate 1, gaps 3, 4, hydrostatic bearings 14, 15, which are supplied by channels 12, 13, and cleaning agent 10, 11. *Id.* ¶ 55.

Appellant argues that Devitt does not anticipate because it does not teach supplying “reactive gases to a substrate for thin-film deposition on the substrate.” Appeal Br. 5. In this regard, the Examiner determines that the term “for thin-film deposition” is merely a statement of intended use. The Examiner further determines both that a) “the specific type of gas is an intended us[e] of the apparatus and Devitt teaches that any gas can be supplied to the apparatus including a coating gas,” (Final Act. 3) and b) that Devitt teaches a delivery head with an output face that “supplies reactive gases 10, 11, 21, 22 to a substrate 3. (Figure 2).” Answer 26. We consider the proper construction of the claim terms “thin film deposition” and “reactive gases” below.

*Construction of “Thin Film Deposition”*

The Examiner determines that the term “deposition system for thin film deposition of a solid material onto a substrate” as used in the preamble should not be accorded patentable weight as it merely “recites the purpose of a process . . . where the body of the claim does not depend on the preamble for completeness.” Answer 23. The Examiner determines that the limitation “for thin-film deposition on the substrate” is merely an intended use of the apparatus. *Id.* at 26. The Examiner cites to case law which provides that “[a]pparatus claims cover what a device is, not what a device does.” *Id.* (citing *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1468 (Fed. Cir. 1990)).

In his Reply, Appellant points out that the term “thin film deposition” is found both in the preamble and in the body of the claim. Accordingly, Appellant argues, the “thin film deposition” language “provides more than just context for the claimed invention and should be given patentable weight.” Reply Br. 2.

During examination, claim terms must be given their broadest reasonable construction consistent with the Specification. *In re ICON Health and Fitness, Inc.*, 496 F.3d 1374, 1379 (Fed. Cir. 2007). “Construing claims broadly during prosecution is not unfair to the applicant . . . because the applicant has the opportunity to amend the claims to obtain more precise claim coverage.” *See In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004).

The patentability of an apparatus claim “depends on the claimed structure, not on the use or purpose of that structure.” *Catalina Mktg. Int'l v. Coolsavings.com, Inc.*, 289 F.3d 801, 809 (Fed. Cir. 2002). “A patent applicant is free to recite features of an apparatus either structurally or functionally.” *In re Schreiber*, 128 F.3d 1473, 1478 (Fed. Cir. 1997); *In re Swinehart*, 439 F.2d 210, 212 (CCPA 1971) (“there is nothing intrinsically wrong with the use of [functional language] in drafting patent claims”). In order to be accorded patentable weight, however, functional language in an apparatus claim must limit the claim in terms of structure rather than function. *In re Schreiber*, 128 F.3d at 1477–1478; *see also* MPEP § 2114 (Rev. 08.2017, January 2018). In cases in which functional language adds a structural limitation to an apparatus claim, it does so because the language describes something about the structure of the apparatus rather than merely listing its intended or preferred uses. *See, e.g., K-2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1363 (Fed. Cir. 1999) (“[T]he functional language tells us

something about the structural requirements of the attachment between the bootie and the base [of an inline skate] . . .”).

Further, a claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (BPAI 1987), 1987 WL 123826 \*1.

Here, the phrase “thin film deposition” appears several times in claim 1 as follows:

A deposition system for **thin film deposition** of a solid material onto a substrate comprising: . . .

(b) a delivery head for delivering the gaseous materials to a substrate receiving **thin film deposition** and comprising . . .

(ii) an output face comprising a plurality of output openings and exhaust openings that face the substrate . . . wherein pressure generated due to the gas flow . . . forms a gas fluid bearing between the output face of the delivery head and the substrate surface that maintains separation of the gas flow . . . such that little or no intermixing occurs between the first reactant gaseous material and the second reactant gaseous material during **thin film deposition** on the substrate surface and maintains a substantially uniform distance between the output face of the delivery head and the substrate surface during **thin film deposition** on the substrate surface.

Appeal Br. 18 (Claims App.) (claim 1) (emphasis added).

The first use of “thin film deposition” occurs in the preamble and describes the intended use of the deposition system. The second use of “thin film deposition” describes the intended use of the delivery head. The third

use of the term concerns the claim's requirement that the gas flows form a gas fluid bearing such that there is limited intermixing "during thin film deposition." Similarly, the fourth use of the term concerns maintaining a uniform distance between the output face and the substrate "during thin film deposition."

The third and fourth uses of "thin film deposition" both concern effects of the gas flows (limited intermixing and maintaining uniform distance) that occur "during" the intended use of the apparatus.

It has long been held that "apparatus claims cover what a device *is*, not what a device *does*." *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1468 (Fed. Cir. 1990). An inventor of a structure (machine or article of manufacture) is entitled to benefit from all of its uses, even those not described, *Roberts v. Ryer*, 91 U.S. 150, 157 (1875), and conversely, patentability of the structure cannot turn on the use or function of the structure. *In re Michlin*, 256 F.2d 317, 320 (C.C.P.A. 1958) ("It is well settled that patentability of apparatus claims must depend upon structural limitations and not upon statements of function."). Therefore, the courts have devised a test: Structures such as machines and articles of manufacture must be distinguished from the prior art on the basis of structure, and where there is reason to believe that the structure of the prior art is inherently capable of performing the claimed function, the burden shifts to the applicant to show that the claimed function patentably distinguishes the claimed structure from the prior art structure. *See In re Schreiber*, 128 F.3d 1473, 1478 (Fed. Cir. 1997); *In re Hallman*, 655 F.2d 212, 215 (CCPA 1981).

In view of all of the foregoing, we construe the claim to require a device *capable of* limiting the intermixing of gases and maintaining a

uniform distance between delivery head and substrate during operation, we do not construe performance of thin film deposition to be required by the apparatus claim at issue.

*Construction of “Reactant Gaseous Material” Limitations*

Claim 1 includes several limitations that include the term “reactant gaseous material.” In each case, the claim recites a structural element (a source, an inlet port, output openings) for use with a reactant gas and the intended result of supplying the reactant gas (e.g., limited intermixing and maintenance of uniform distance between delivery head and substrate). The system claim includes certain active verbs such as “forms” and “maintains” that describe the effect of supplying the reactant gases.

In construing “reactant gaseous material” we apply the same principles of law discussed above. In addition, we note that in *MasterMine Software v Microsoft Corp.*, the Federal Circuit construed a system claim including active verbs. There, the court held that “[t]hough claim 8 includes active verbs—presents, receives, and generates—these verbs represent permissible functional language used to describe capabilities of the ‘reporting module’ . . . . the claims at issue here merely claim that the system ‘possess[es] the recited structure [that is] capable of performing the recited functions.’” 874 F.3d 1307, 1315–1316 (Fed. Cir. 2017) (citing *Microprocessor Enhancement Corp. v. Tex. Instruments Inc.*, 520 F.3d 1367, 1375 (Fed. Cir. 2008)).

Considering the foregoing, we determine that the “reactant gaseous material” limitations are not structural in nature. Rather, they describe the material the system is intended to work on. The recitation of a material intended to be worked upon by a claimed apparatus does not differentiate the

claimed apparatus structure from the structure of a prior art apparatus. *In re Rishoi*, 197 F.2d 342, 345 (CCPA 1952). The claim does, however, require structure sufficient to “form[ ] a gas fluid bearing” to limit intermixing of other gases and to “maintain[ ]” a uniform distance between the delivery head and a substrate during use.

*Devitt’s Teachings Regarding Reactant Gases*

We further address the Examiner’s finding that Devitt “teaches the claimed structure and is capable of functioning in the claimed manner.” Answer 26–27.

The Examiner finds that “Devitt clearly teaches a delivery head 5 with an output face (bottom of head facing substrate) that specifically supplies reactive gases 10, 11, 21, 22 to a substrate 3. (Figure 2).” *Id.* at 26. The Examiner further finds that “Devitt teaches in paragraph 55 that the gas 21, 22 can be coating material or in paragraph 55 that the reactive gases can be for CVD or PVD.” *Id.*

Devitt teaches (in regard to Figure 2) that “[h]ydrostatic bearings 14, 15 supplied by channels 13, 12 generate sufficient pressure to prevent cleaning agent 10, 11 from migrating in direction 2 of substrate travel into chambers 16, 17.” Devitt ¶ 55. That is, gas supplied through bearings 14, 15 isolates the processes on either side. In the same paragraph, Devitt provides “[t]he substrate 1 is then conveyed via hydrostatic bearing lands 18, 19 into axially displaced vertically disposed relative to one another, chambers 22, 21 which supply the etchant, forced hot air, coating material[,] etc.[.] via channels 26, 27.” *Id.* Devitt additionally teaches that etchant may be substituted for the cleaning solution taught in connection with Figure 1. *Id.* ¶ 59.

Devitt generally teaches that hydrostatic bearings may employ fluid or gas. *See, e.g.*, Devitt ¶ 53 (“hydrostatic bearings **8**, **9**, which can be fluid or gas in application”). Additionally, in the context of Figure 1, Devitt teaches that bearing **5** (on left of figure) may be “hydrostatic or aerostatic.” Devitt ¶ 53. The embodiment of Devitt depicted in Figure 1 may receive high pressure gas through channels **10** and **11** (left part of figure), gas of any pressure through channels **14** and **15** to bearings **8** and **9** (center of figure), and high pressure gas through channels **18** and **19** (right portion of figure). *Id.* ¶ 57. The embodiment of Devitt depicted in Figure 2 is similar to Figure 1 but depicts a larger apparatus capable of “multiple stage” operations that may be performed simultaneously. Devitt ¶ 55. It includes additional gas input channels and lower pressure exit channels.

In view of the foregoing, we determine that Devitt would have taught a person of skill in the art a device capable of the simultaneous use of two reactive gases (in two different “chambers”) separated by an inert gas (supplied through, e.g., bearings **14**, **15**).

Appellant presents a number of secondary arguments in support of their broader argument that Devitt does not anticipate as it does not teach thin film deposition. Appeal Br. 5–7. Appellant argues that Devitt does not teach a simultaneous supply of reactive gases, *id.* at 5, and does not teach coating with a gas, *id.* at 6. The Examiner has determined that “the specific type of gas is an intended us[e] of the apparatus and Devitt teaches that any gas can be supplied to the apparatus including a coating gas.” Final Act. 3. Additionally, Devitt teaches that the operations of Figure 2 may be performed “simultaneously.” Devitt ¶ 55. Accordingly, the Examiner has determined that Devitt teaches a system capable of performing both of the

foregoing. *See also* Answer 27–28. Appellant has not shown error in regard to the foregoing.

Appellant additionally argues that Devitt does not teach the limitations required by claim 21. Claim 21 depends from claim 1 and further requires that the “pressure that separates the surface of the substrate from the face of the delivery head is provided substantially equally by all of gas flows from the face of the delivery head.”

As previously discussed, it is well settled that the recitation of a new intended use for an old product does not make a claim to that old product patentable. *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997). Here, the provision of the pressure by various gas flows is a **use** of the claimed device, not a structure.

In regard to claim 21, the Examiner found that Devitt teaches that “the pressure that separates the surface of the substrate from the face of the delivery head is provided substantially equally by all of gas flows from the face of the delivery head.” Final Act. 5 (citing Devitt ¶ 57). The Examiner further found that “[i]n order for the substrate to remain flat the substrate must be supported by all of the gases equally. If they are not the substrate will buckle and bend at the nonuniform pressure.” Answer 32.

Appellant asserts error arguing that “[n]ot all flows in the reference to Devitt contribute equally to the separation of the surface of the substrate from the face of the delivery head. The spacing in Devitt is primarily set by the flow through the porous media bearing.” Appeal Br. 7–8. This assertion is not supported by citation to declaratory or other evidence. Accordingly, even if claim 21 were to be construed as a structural limitation, Appellant’s assertion is mere attorney argument and is insufficient to rebut the Examiner’s findings.

Appellant additionally argues that Devitt does not teach the limitations required by claim 41. *Id.* at 8. Claim 41 depends from claim 1 and further requires that “a substrate holder is in contact with the substrate during deposition and/or a means for conveying the substrate is in contact with the substrate during deposition.” *Id.* at 23 (Claims App.). The Examiner finds that “[t]he substrate of Devitt moves, therefore . . . a means for conveying the substrate is in contact with the substrate during deposition.” Answer 32. The term “means for conveying the substrate” is a means plus function limitation. 35 U.S.C. § 112 ¶ 6 (pre-AIA).

Construing a means-plus-function claim term is a two-step process. First, one must identify the claimed function. *Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1311 (Fed. Cir. 2012). Second, one must determine what structure, if any, disclosed in the specification corresponds to the claimed function. *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1351 (Fed. Cir. 2015). Here, the claimed function is “conveying the substrate.” The corresponding structure in the Specification is described as follows: “It is noted that, in the present deposition system, a substrate support or holder can be in contact with the substrate during deposition, which substrate support can be a means for conveying the substrate, **for example a roller.**” Spec. 27 (emphasis added). Similarly, the Specification refers to “substrate support 74” as shown in Figure 15, reproduced below.

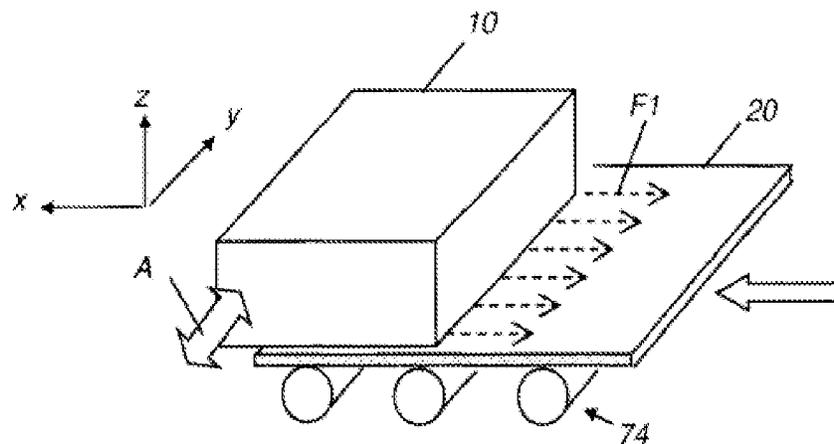


Figure 15 “is a perspective view showing a distribution head used with a substrate transport system.” Spec. 14. The Specification teaches that “motion in either the x or y direction, as shown in Figure 15, can be effected either by movement of delivery head 10, or by movement of substrate 20 provided with a **substrate support 74** that provides movement.” *Id.* at 29. The substrate support depicted in Figure 15 is a roller. Accordingly, the structure corresponding to the claimed function (conveying the substrate) is a roller.

The Examiner does not cite to any portion of Devitt teaching a roller as a substrate support. Nor does the Examiner make any findings that Devitt’s conveying means is an equivalent, as that term is used in 35 U.S.C. § 112 ¶ 6, to a roller. Accordingly, we determine that claim 41 is not anticipated by Devitt.

**Rejection 2.** The Examiner rejected claims 4, 40, and 76–78 as obvious over Devitt.<sup>8</sup> Final Act. 6–8.

Appellant offers only summary argument that “[t]he remaining claims 4, 40, and 76–78 set forth further features of the claimed thin film deposition system that when taken together with the features of claim 1 and any intervening claims are also not believed to be shown or suggested in Devitt.” *Id.* at 9.

Patent Office rules require that an appeal brief include the “arguments of appellant with respect to each ground of rejection, and the basis therefor, with citations of the statutes, regulations, authorities, and parts of the Record relied on. The arguments shall explain why the examiner erred as to each ground of rejection contested by appellant.” 37 CFR § 41.37(c)(1)(iv). Appellant’s summary assertions regarding claims 4, 40, and 76–78 do not comply with such requirement and are inadequate to present an argument for consideration on appeal.

**Rejection 3.** The Examiner rejected claims 9, 11, 12, 35, 65, and 66 as obvious over Devitt in view of Yudovsky. Final Act. 9–10. Appellant substantially relies upon their arguments presented in regard to Devitt, and further argue that Yudovsky does not “correct the deficiencies of Devitt with regard to the claimed invention.” Appeal Br. 9. As we have not found such previously presented arguments to be persuasive, we determine that Appellant has not shown error in this regard.

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<sup>8</sup> The Examiner originally rejected claim 3 as obvious over Devitt. Final Act. 6–7. This rejection was subsequently withdrawn. Answer 22.

Appellant also briefly argues that a person of ordinary skill in the art would not have been motivated to combine Devitt and Yudovsky as posited by the Examiner. *Id.* Appellant, however, does not articulate any specific error in the Examiner's stated reason to combine. As above, this is inadequate to present an issue for appeal.

**Rejection 4.** The Examiner rejected claim 10 as obvious over Devitt in view of Yudovsky and further in view of Kamikawa. Final Act. 10–11. Appellant relies upon their previously presented arguments in support of their appeal of the rejection of claim 10. Appeal Br. at 10. As we have not found such arguments to be persuasive, we determine that Appellant has not shown error in regard to the rejection of claim 10.

**Rejection 5.** The Examiner rejected claims 67–69 as obvious over Devitt in view of Drage. Final Act. 11–13.

Claim 67 requires that a portion of the system of claim 1 includes a “plurality of aperture plates, superposed to define a network of interconnecting supply chambers and directing channels for routing each of the first reactant gaseous material, the second reactant gaseous material, and the third inert gaseous material.” Claims 68 and 69 depend from claim 67 and, thus, include the same limitations.

In support of the rejection, the Examiner determined as follows:

Drage teaches a delivery device that includes at least a portion of the delivery device is formed as a plurality of apertured plates 12, 13, 14, superposed to define a network of interconnecting supply chambers 21, 22, and directing channels 34, 35 for indirectly routing a gaseous materials from its corresponding inlet port to its corresponding elongated emissive channel 45; a diffuser 38; each plate additionally has an

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aperture 23, 24, 31, 32, 41,42, and 37 for exhaust gas; the apertured plates are separable and independently fabricated (by machining) prior to superposition when assembling (by mechanical fasteners) the delivery device.

Final Act. 11.

First, Appellant argues that “[t]here is no disclosure or suggestion in Drage of a delivery device that includes aperture plates to supply multiple gases for thin film deposition.” Appeal Br. 10. This is not directly responsive to the Examiner’s rejection. The Examiner relies upon Devitt as teaching these limitations (regarding multiple gases). Accordingly, Appellant has not shown error in this regard.

Appellant additionally argues that “Drage does not show or suggest a plurality of apertured plates that are perpendicularly disposed with respect to the output face as required by claim 68.” *Id.* The Examiner concedes that Drage does not include an explicit teaching in this regard, but finds that “[t]he specific orientation of the apertured plates i.e. vertical or horizontal is an obvious design choice as to which side (top for horizontal or side for vertical) the gas is supplied to.” Final Act. 12. The Examiner determines that “[t]he motivation for providing the plates in a vertical manner is to provide an alternate orientation or shape of the plates.” *Id.* Appellant does not address the foregoing in their brief. Accordingly, Appellant has not shown error in this regard.

**Rejection 6.** The Examiner rejected claims 1, 2, 4–9, 11, 12, 14, 16, 17, 21–23, 28–30, 35, 38, 66, 72, and 75–78 as obvious over Yudovsky in view of Devitt.

Yudovsky teaches “methods and apparatus for depositing materials on a substrate surface.” Yudovsky ¶ 3. The apparatus of Yudovsky includes a “shuttle 60 for carrying substrate 110. The shuttle 60 is movable in both directions (as indicated by arrow 199).” *Id.* ¶ 26. An excerpt of Figure 1 of Yudovsky is reproduced below.

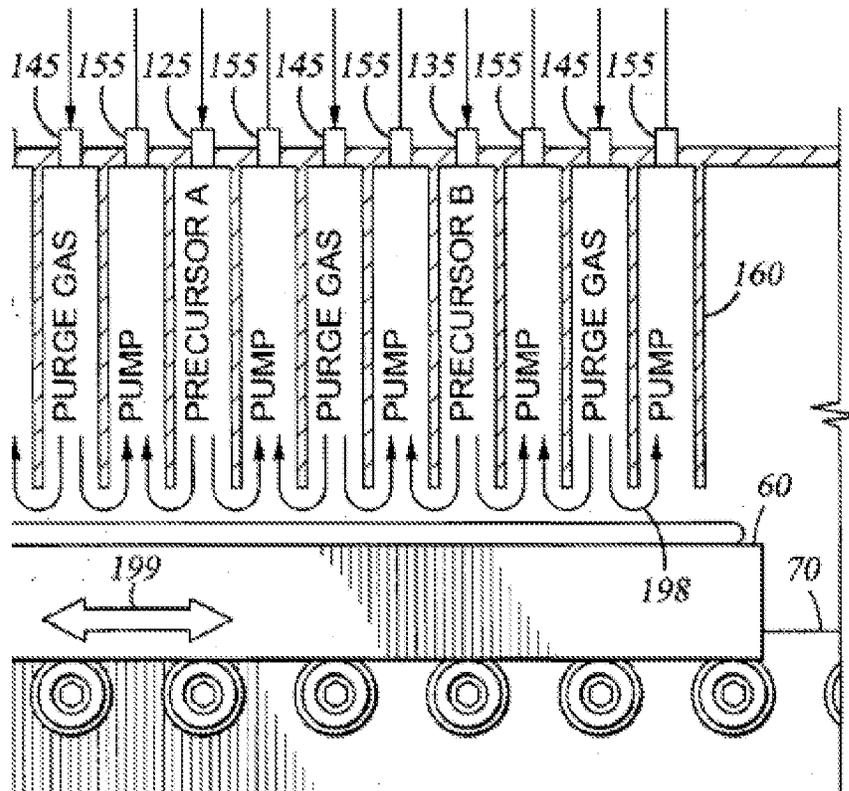


Figure 1 is a schematic side view of the cyclical layer deposition system of Yudovsky. Yudovsky ¶ 13. The excerpt of Figure 1 shown above depicts shuttle 60, which is capable of moving side to side (as shown by arrow 199).

The Examiner determined that one of skill in the art would have had reason to replace the shuttle 60 of Yudovsky with a fluid bearing as taught by Devitt. Final Act. 15. The Examiner found that “[t]he motivation for replacing the shuttle for carrying the substrates or supporting the head of Yudovsky with the gas fluid bearing taught by Devitt is to improve

temperature uniformity, reduce particle generation, prevent stress or physical damage to the substrate, and other advantages known in the art.” *Id.*

Appellant makes several arguments as to why one of skill in the art would not have combined the teachings of Yudovsky and Devitt. First, Appellant argues that Devitt does not contemplate thin film deposition, accordingly, “one of ordinary skill in the art, after reading Yudovsky and Devitt, and considering these references collectively, would not modify the mechanically fixed and constrained deposition system of Yudovsky in order to replace its inert non-floating process gas with the non-process gas hydrostatic bearings taught by Devitt.” Appeal Br. 12. In furtherance of this argument, Appellant asserts as follows:

More particularly, one of ordinary skill in the art would not provide a floating bearing in a sealed vacuumed enclosure as it would defeat the purpose of having a floating bearing. . . . one of ordinary skill in the art would readily understand that Yudovsky would not operate properly . . . if its inert non-floating process gas, used to maintain separation of two reactive gasses, was modified as taught by Devitt to be a non-process gas hydrostatic bearing.

*Id.*

In response, the Examiner finds “there is no need to replace the inert non-floating process gas with the non-process gas hydrostatic bearing gas because these gases are the same gas (nitrogen), and they do the same job of isolating the two reactive gases.” Answer 35. This is supported by the record. *See* Yudovsky ¶ 35; Devitt ¶ 55.

Appellant additionally argues that “one of ordinary skill in the art would not provide a floating bearing in a sealed vacuumed enclosure as it would defeat the purpose of having a floating bearing.” Appeal Br. 12. In response, the Examiner finds that “First, Applicant has not provided any

evidence or argument why placing a floating bearing in a vacuum chamber would defeat the purpose of the floating bearing. Second, floating bearing are commonly used in vacuums.” Answer 35. Indeed, it appears that both Devitt and Yudovsky teach to evacuate used gases by vacuum or low-pressure channels. *Compare* Devitt ¶ 53 (“These two grooves are at a substantially lower pressure . . . possibly even near vacuum”), *with* Yudovsky ¶ 20 (“The vacuum ports are connected to a pumping system configured to evacuate the gas streams out of the processing chamber.”). We adopt the Examiner’s reasoning and stated rationale in this regard.

Appellant presents a third argument against the rejection over Yudovsky in view of Devitt. Appellant argues that Yudovsky requires that the distance between the deposition head and the substrate be 500  $\mu\text{m}$  or more while Devitt teaches that such distance “is on a micron level.” Appeal Br. 13. Although Appellant does not cite to any particular portion of Devitt as supporting such assertion, Appellant seems to allude to Devitt’s teaching that use of a vacuum force “enables the substrate to be introduced to the slit coater with **micron level precision** in the distance to the slit coater.” Devitt ¶ 37 (emphasis added).

The Examiner determines that this statement concerns the **precision** of the distance between the deposition head and the substrate, not the distance itself. Answer 36–37. We adopt the Examiner’s reasoning and stated rationale in this regard. Appellant seeks to present new argument and evidence on this point in the Reply Brief. Reply Br. 7. Appellant, however, has not provided any explanation as to why such evidence was omitted from the Appeal Brief. Accordingly, it will not be considered. *See* 37 CFR §§ 41.33(d) (providing that new evidence will not be admitted except in limited circumstances) and 41.41(b)(2) (providing that new argument will not be

considered by the Board absent a showing of good cause). Moreover, Appellant has not set forth any reason that one of ordinary skill in the art would not have made adjustments in the distance from head to substrate as appropriate for the hypothetical combination. Accordingly, Appellant has not shown that a person of ordinary skill in the art would have been unable to combine the teachings of Devitt and Yudovsky.

Appellant similarly argues that because of the putative discrepancy in the teachings of Yudovsky and Devitt regarding distance to the substrate, “the disclosures of Yudovsky and Devitt teach away from their combination.” Appeal Br. 13. This argument is predicated upon an interpretation of Devitt that we do not adopt. Accordingly, Appellant’s teaching away argument fails for the same reason as Appellant’s previous argument. Nor has Appellant set forth adequate evidence of teaching away.

Appellant relies upon previously presented arguments with regard to it’s the appeal of the rejection of claims 2, 4–9, 11, 12, 14, 16, 17, 21–23, 28–30, 35, 38, 66, 72, and 75–78. *Id.* at 14. As we have not found such arguments to be persuasive, we determine that Appellant has not shown error in regard to the rejection of these claims.

Appellant further argues that the rejection of claim 21 is in error as Devitt does not teach that the pressure that separates the surface of the substrate from the face of the delivery head is provided substantially equally by all of the gas flows from the face of the delivery head. *Id.* at 14. Appellant’s argument is not supported by citation to declaratory or other evidence. Accordingly, it is mere attorney argument and is insufficient to rebut the Examiner’s findings regarding claim 21.

**Rejection 7.** The Examiner rejected claims 3 and 10 as obvious over Yudovsky in view of Devitt and further in view of Kamikawa. Appellant relies upon previously presented arguments in support of the appeal of this rejection. Appeal Br. 14. As we have not found such arguments to be persuasive, we determine that Appellant has not shown error in regard to the rejection of claims 3 and 10.

**Rejection 8.** The Examiner rejected claims 36 and 73 as obvious over Yudovsky in view of Devitt and further in view of Bok. Claims 36 and 73 each require that gas pressure be applied against both a first surface of the substrate and a second surface of the substrate. Appeal Br. 23, 25 (Claims App.). The Examiner determines that “Bok teaches a second gas fluid bearing that applies gas pressure against a second surface of the substrate that lies opposite a first surface of the substrate that faces the delivery head.” Final Act. 20.

Appellant argues that this rejection is in error as follows:

there is no disclosure, teaching, or suggestion in Bok that would lead one of ordinary skill in the art to conclude that a gas fluid bearing could be established between the output face of a delivery head and a substrate surface using one or more of the first reactant, the second reactant, or the third inert gaseous materials (process gasses) that maintains separation of the gas flow of the first reactant gaseous material and the gas flow of the second reactant gaseous material such that little or no intermixing occurs between the first reactant gaseous material and the second reactant gaseous material during thin film deposition on the substrate surface.

Appeal Br. 15–16.

This is not responsive to the rejection. The Examiner does not rely upon Bok as teaching the use of inert and reactive gases such that there is

limited intermixing. Rather, the Examiner relies upon Devitt and Yudovsky as teaching such claim elements. Answer 37. Accordingly, Appellant has not shown error in regard to the rejection of claims 36 and 73.

**Rejection 9.** The Examiner rejected claims 67–69 as obvious over Yudovsky in view of Devitt and further in view of Drage. Final Act. 20–23. Claim 67 requires that a portion of the system of claim 1 includes a “plurality of aperture plates, superposed to define a network of interconnecting supply chambers and directing channels for routing each of the first reactant gaseous material, the second reactant gaseous material, and the third inert gaseous material.” Claims 68 and 69 depend from claim 67 and, thus, include the same limitations.

In support of the rejection, the Examiner determined as follows:

Drage teaches a delivery device that includes at least a portion of the delivery device is formed as a plurality of apertured plates 12, 13, 14, superposed to define a network of interconnecting supply chambers 21, 22, and directing channels 34, 35 for indirectly routing a gaseous materials from its corresponding inlet port to its corresponding elongated emissive channel 45; a diffuser 38; each plate additionally has an aperture 23, 24, 31, 32, 41, 42, and 37 for exhaust gas; the apertured plates are separable and independently fabricated (by machining) prior to superposition when assembling (by mechanical fasteners) the delivery device.

Final Act. 21.

First, Appellant argues that “[t]here is no disclosure or suggestion in Drage of a delivery device that includes aperture plates to supply multiple gases for thin film deposition.” Appeal Br. 16. This is not directly responsive to the Examiner’s rejection. The Examiner relies upon Devitt

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and Yudovsky as teaching the limitations regarding the supply of multiple gases. Accordingly, Appellant has not shown error in this regard.

Appellant additionally argues that “Drage does not show or suggest a plurality of apertured plates that are perpendicularly disposed with respect to the output face as required by claim 68.” *Id.* The Examiner concedes that Drage does not include an explicit teaching to this effect, but finds that “[t]he specific orientation of the apertured plates i.e. vertical or horizontal is an obvious design choice as to which side (top for horizontal or side for vertical) the gas is supplied to.” Final Act. 21. The Examiner determines that “[t]he motivation for providing the plates in a vertical manner is to provide an alternate orientation or shape of the plates.” *Id.* at 21–22. Appellant does not address the foregoing in the brief. Accordingly, Appellant has not shown error in this regard.

In addition to the foregoing, we adopt the findings and analysis of the Examiner as set forth in the Final Office Action and the Examiner’s Answer. Any argument made by Appellants but not addressed in the foregoing is deemed not to comply with 37 CFR § 41.37(c)(1)(iv).

#### CONCLUSION

The rejections of claims 1–12, 14, 16, 17, 21–23, 28–30, 35, 36, 38, 40, 65 – 69, 72, 73, and 75 – 78 are affirmed.

The rejection of claim 41 is reversed.

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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-IN-PART