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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* MING-JUN LI, XIAOMING LUO, JOSEPH EDWARD MCCARTHY, GAOZHU PENG, JEFFERY SCOTT STONE, PUSHKAR TANDON, and CHUNFENG ZHOU[1]

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Appeal 2018-002358
Application 14/247,894
Technology Center 1700

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Before BRADLEY R. GARRIS, GEORGIANNA W. BRADEN, and JENNIFER R. GUPTA, *Administrative Patent Judges*.

GARRIS, *Administrative Patent Judge.*

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134 from the Examiner's decision rejecting claims 1–16 and 18–20. We have jurisdiction under 35 U.S.C. § 6.

We AFFIRM.

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[1] Appellant is the Applicant, Corning Incorporated, which is identified as the real party in interest (App. Br. 3).

Appellant claims a method of forming a soot blank, to be used in forming an optical fiber, comprising the steps of forming a soot body, partially consolidating the soot body to form a soot blank with a bulk density of between 0.8 and 1.6 g/cm$^3$, and drilling a plurality of holes into the soot blank (independent claim 13; *see* remaining independent claims 1 and 19). According to Appellant's Specification, the partial consolidation step is a heating operation that creates a soot blank having a bulk density within the claimed range (Spec. ¶¶ 28–29) "to provide sufficient body and mechanical strength for drilling, while being an easier material to drill than fully consolidated glass, allowing the drilling of deeper and more precise holes . . . than would be possible into a fully consolidated glass preform" (*id.* at ¶ 30).

A copy of representative claim 13, taken from the Claims Appendix of the Appeal Brief, appears below.

13. A method for forming a soot blank, comprising the following steps:

forming a soot body, the soot body comprising a silica-based soot material;

partially consolidating the soot body to form a soot blank with a top surface and a bulk density of between 0.8 g/cm$^3$ and 1.6 g/cm$^3$; and

drilling a plurality of holes into the top surface of the soot blank.

Appellant does not present separate arguments specifically directed to the dependent claims under rejection (*see* App. Br. 14–18). Therefore, the dependent claims will stand or fall with their parent independent claims, of which claim 13 is representative.

Under 35 U.S.C. § 103, the Examiner rejects claims 1–16 and 18 as unpatentable over Jakobsen (WO 03/078338 A2, published September 25, 2003) in view of Dawes (US 2001/0132038 A1, published June 9, 2011) and Edagawa (US 5,246,475, issued September 21, 1993) and rejects claims 19 and 20 as unpatentable over these references in combination with Deneka (US 4,767,430, issued August 30, 1988).

We sustain these rejections for the reasons given in the Final Office Action, the Examiner's Answer, and below.

In rejecting claim 13, the Examiner finds that Jakobsen discloses forming a soot body (i.e., a preform) and drilling holes into the soot body but does not disclose the claimed step of partially consolidating to form a soot blank with a bulk density of between 0.8 and 1.6 g/cm$^3$ (Final Action 4–5). The Examiner finds that it was known in the prior art to partially sinter (i.e., partially consolidate) a soot body (1) in order to increase bulk density and strength whereby the partially sintered soot body can be soaked in a rare earth doping solution without disintegrating as taught by Edagawa and (2) in order to increase strength and durability whereby the partially sintered soot body can be handled more easily or machined (e.g., drilled) as taught by Dawes (*id.* at 5 (citing Edagawa col. 3, ll. 51–68 and Dawes ¶¶ 46, 98)). In light of these Edagawa and Dawes teachings, the Examiner concludes that "[i]t would have been obvious to partially sinter (i.e. partially consolidate) the soot body [of Jakobsen] so as to make the preform more durable [i.e., by densifying and strengthening Jakobsen's preform via partial sintering]" (*id.*). Regarding the particular bulk density range of claim 13, the Examiner

concludes that "[i]t would have been obvious to perform routine experimentation to determine the optimal density" (*id.*).

Appellant argues that there is no motivation or reason to modify Jakobsen according to Dawes or Edagawa (App. Br. 15–16). Specifically, Appellant argues that "the vapor-deposited preform of Jakobsen in the absence of partial sintering possesses a mechanical strength similar to the mechanical strength of the soot-pressed preform of Dawes after partial sintering" (*id.* at 15) and accordingly that "one of ordinary skill in the art would lack a rationale to partially sinter the vapor-deposited preform of Jakobsen based on the disclosure of Dawes" (*id.*). Furthermore, Appellant points out that the partial sintering of Edagawa is to achieve a body "having sufficient mechanical strength to withstand soaking in a rare earth solution" (*id.*) and argues that "there is no reason to expect that the partial sintering used by Edagawa would make the preform of Jakobsen more amenable to drilling" (*id.* at 16). Appellant also points out that "the mechanical strength of the vapor-deposited preform of Jakobsen is sufficient for drilling" (*id.*) and argues that "accordingly . . . one of ordinary skill in the art has no rationale to modify Jakobsen to include partial sintering before drilling" (*id.*).

As the Examiner correctly observes, Appellant provides no evidence in support of the above quoted argument that Jakobsen's preform in the absence of partial sintering possesses a mechanical strength similar to the preform of Dawes after partial sintering (Ans. 11–12; *see* Final Action 12). Moreover, contrary to Appellant's contentions, the fact that Edagawa's partial sintering increases strength and density in order to withstand soaking

does not show error in the Examiner's determination that increased strength and density would make Jakobsen's preform more durable and, therefore, more amenable to drilling (i.e., drilling without damaging the preform). Similarly, this determination by the Examiner is not shown to be erroneous because Jakobsen's preform is capable of being drilled in the absence of further strengthening. The issue presented by the Examiner's rejection is whether the drilling operation of Jakobsen would have been facilitated by partially sintering the preform. We find that the combined teachings of Dawes and Edagawa support a conclusion that an artisan would have partially sintered Jakobsen's preform in order to facilitate drilling without damaging the preform by increasing its density, strength, and durability.

Appellant also argues that partially sintering the preform of Jakobsen would be contrary to Jakobsen's purpose because a partially sintered preform would be less porous, more solid and thus less amenable to processing (App. Br. 16–17).

The Examiner's rejection cites Jakobsen's disclosure at lines 12–23 on page 39 (Final Action 4). In this disclosure, Jakobsen teaches "the formation of a porous body, which is later sintered to a solid body forming the finished preform" (Jakobsen 39:13–15), "[t]he porous body is more amenable to processing than the solid" (*id.* at 39:15–16), and "[t]he present inventors have found methods to form structures in the porous body that remain in the final solidified preform" (*id.* at 39:16–18). Jakobsen discloses that such structures are "holes . . . made . . . by traditional drilling" (*id.* at 39:19–20). This disclosure reveals that Jakobsen's purpose is to drill holes in a porous body before it is fully sintered into a solid body because "[t]he

porous body is more amenable to processing than the solid" (*id.* at 39:15–16). We perceive insufficient convincing merit in Appellant's argument that partial sintering is contrary to this purpose. Appellant has not even asserted, much less shown, that a partially sintered body would be less porous and, therefore, less amenable to processing than a fully sintered solid body.

Finally, Appellant challenges the Examiner's conclusion that it would have been obvious to perform routine experimentation to determine optimal density and thereby achieve the claimed density range (App. Br. 17). In particular, Appellant argues that "[s]ince the non-sintered porous body of Jakobsen is readily amenable to drilling, . . . [such] drilling can similarly be readily accomplished at densities outside of Applicant's claimed density range . . . [and therefore] densities determined through routine optimization suggested by the Examiner need not fall within Applicant's claimed range" (*id.*at 17).

Appellant offers insufficient evidence that Jakobsen's drilling step can be accomplished at densities outside the claimed range or that densities optimized for drilling need not fall within the claimed range. On the other hand, bulk densities in the claimed range of 0.8–1.6 g/cm$^3$ are described in the Specification as "provid[ing] sufficient body and mechanical strength for drilling, while being an easier material to drill than fully consolidated glass" (Spec. ¶ 30). This description supports the Examiner's position that densities which have been optimized for drilling (i.e., by providing a partially sintered body with sufficient strength for drilling while being easier to drill than a fully sintered or consolidated body as taught by Jakobsen, Dawes and Edagawa) would fall within the density range of claim 13.

In summary, Appellant's arguments fail to show reversible error in the § 103 rejection of representative independent claim 13 and correspondingly the § 103 rejections of remaining claims 1–12, 14–16, and 18–20.

The decision of the Examiner 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).

**AFFIRMED**