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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ROBERT STEINGART and DAVID T. CHEN

Appeal 2019-000206
Application 13/208,992
Technology Center 2100

Before JOHN A. JEFFERY, BETH Z. SHAW, and JOHN D. HAMANN, *Administrative Patent Judges*.

JEFFERY, *Administrative Patent Judge*.

DECISION ON APPEAL

This application returns to us after another panel of this Board affirmed the Examiner's rejection of then-pending claims 1–4, 6–11, and 15–26. *Ex parte Steingart*, Appeal No. 2016-008027 (PTAB Mar. 16, 2017). Prosecution reopened after that decision, and Appellant[1] now appeals under 35 U.S.C. § 134(a) from the Examiner's subsequent rejection of claims 1–4, 6–11, and 15–26. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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[1] We use the word Appellant to refer to "applicant" as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as 3D Systems, Inc. Appeal Br. 2.

STATEMENT OF THE CASE

Appellant's invention manufactures non-homogeneous articles using three-dimensional (3D) voxel-based models to enable building article prototypes, such as artificial teeth, with varying colors, shades, textures, etc. Spec. ¶¶ 2, 14–16. To this end, a property that varies throughout the article, such as color, is represented by assigning each voxel a value corresponding to that property in a virtual model. *Id.* ¶ 15. Material is then deposited on a voxel-by-voxel basis such that the deposited material in each voxel has the property value (e.g., color) assigned to that voxel. *Id.* Claim 1 is illustrative:

> 1. A method for manufacturing a non-homogeneous object, the method comprising the steps of:
>
> (a) creating, via a voxel-based modeling system, a 3D voxel representation of the nonhomogeneous object, wherein
>
> the 3D voxel representation comprises a multi-dimensional array of voxel elements, wherein
>
> each voxel element of the multi-dimensional array of voxel elements is assigned one or more respective values representing one or more prescribed physical properties M, wherein a first value of the one or more respective values is assigned one of the following prescribed physical properties: color, translucency, and hardness;
>
> (b) modifying, via the voxel-based modeling system, in accordance with feedback from a user interface associated with the voxel-based modeling system, a geometric shape of the 3D voxel representation of the non-homogeneous object;
>
> (c) using the modified 3D voxel representation to:
>
> define, by a processor of a computing device, a set of 3D dots, each 3D dot comprising a three-dimensional grid of voxels, wherein each voxel

constitutes a voxel element of the 3D dot, to produce a shape of each of a plurality of successive Z-layers of the non-homogenous object, and

define, by the processor, for each 3D dot of each set of 3D dots of each Z-layer of the plurality of successive Z-layers, one or more respective prescribed physical properties from the one or more assigned physical properties M of a plurality of the respective voxel elements corresponding to the 3D dot;

(d) defining, by the processor, for each 3D dot of the set of 3D dots of each Z-layer of the plurality of successive Z-layers, a respective transfer function T(M) that identifies at least one of a pigment, an ink, and a resin to produce a material having the one or more respective prescribed physical properties; and

(e) providing instructions to a 3D printer to produce the non-homogenous object, wherein producing the non-homogenous object comprises depositing, for each dot of the set of 3D dots of each layer of the plurality of successive Z-layers of the non-homogenous object, the at least one of the pigment the ink, and the resin identified by the respective transfer function.

THE REJECTIONS

The Examiner rejected claims 1–4, 6–11, and 15–26 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Final Act. 2–4.[2]

[2] Throughout this opinion, we refer to (1) the Final Office Action mailed December 12, 2017 ("Final Act."); (2) the Appeal Brief filed April 4, 2018 ("Appeal Br."); (3) the Examiner's Answer mailed August 22, 2018 ("Ans."); and (4) the Reply Brief filed October 5, 2018 ("Reply Br.").

The Examiner rejected claims 1–4, 6–11, and 15–26 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. Final Act. 4.

The Examiner rejected claims 1, 4, 6–8, 11, 16–18, 20–22, 25, and 26 under 35 U.S.C. § 103 as unpatentable over Campbell (US 2003/0175410 A1; published Sept. 18, 2003), Steingart (US 2008/0261165 A1; published Oct. 23, 2008), and Gubkin (US 2005/0151734 A1; published July 14, 2005). Final Act. 5–16.

The Examiner rejected claims 2 and 3 under 35 U.S.C. § 103 as unpatentable over Campbell, Gubkin, Steingart, and Xiao J. Wu et al., *Heterogeneous Object Slicing with Geometric Contour Constraint*, 6 COMPUTER-AIDED DESIGN & APPL'NS 137–45 (2009) ("Wang").[3] Final Act. 16–17.

The Examiner rejected claims 8, 17, and 18 under 35 U.S.C. § 103 as unpatentable over Campbell, Steingart, Gubkin, and Tochimoto (US 2002/0167101 A1; published Nov. 14, 2002). Final Act. 17–19.

The Examiner rejected claim 9 under 35 U.S.C. § 103 as unpatentable over Campbell, Steingart, Gubkin, Tochimoto, and Brodkin (US 2010/0323328 A1; published Dec. 23, 2010). Final Act. 19–20.

The Examiner rejected claim 10 under 35 U.S.C. § 103 as unpatentable over Campbell, Steingart, Gubkin, and Silverbrook (US 2007/0150088 A1; published June 28, 2007). Final Act. 20–21.

[3] Although Xiao Wu is the first listed co-author of this document, the Examiner nonetheless refers to the second listed co-author, Michael Wang, when citing this reference. We refer to this reference as "Wang" for clarity and consistency.

The Examiner rejected claim 15 under 35 U.S.C. § 103 as unpatentable over Campbell, Steingart, Gubkin, and Nikolskiy (US 6,633,789 B1; issued Oct. 14, 2003). Final Act. 21.

The Examiner rejected claims 23 and 24 under 35 U.S.C. § 103 as unpatentable over Campbell, Steingart, Gubkin, and Shih (US 6,421,048 B1; issued July 16, 2002). Final Act. 22.

The Examiner rejected claims 1, 4, 6–8, 11, 16–18, 20–22, 25, and 26 under 35 U.S.C. § 103 as unpatentable over Campbell, Steingart, Gubkin, and Appellant's admitted prior art (APA). Final Act. 22–35.

The Examiner rejected claims 2 and 3 under 35 U.S.C. § 103 as unpatentable over Campbell, Steingart, Gubkin, APA, and Wang. Final Act. 35–36.

The Examiner rejected claims 8, 17, and 18 under 35 U.S.C. § 103 as unpatentable over Campbell, Steingart, Gubkin, APA, and Tochimoto. Final Act. 36–37.

The Examiner rejected claim 9 under 35 U.S.C. § 103 as unpatentable over Campbell, Steingart, Gubkin, APA, and Brodkin. Final Act. 37–38.

The Examiner rejected claim 10 under 35 U.S.C. § 103 as unpatentable over Campbell, Steingart, Gubkin, APA, and Silverbrook. Final Act. 38–39.

The Examiner rejected claim 15 under 35 U.S.C. § 103 as unpatentable over Campbell, Steingart, Gubkin, APA, and Nikolskiy. Final Act. 39–40.

The Examiner rejected claims 23 and 24 under 35 U.S.C. § 103 as unpatentable over Campbell, Steingart, Gubkin, APA, and Shih. Final Act. 40–41.

RELATED APPEAL

Despite Appellant's stated unawareness of any related appeals (*see* Appeal Br. 3),[4] this appeal is nonetheless related to an earlier appeal in this application where another panel of this Board affirmed the Examiner's rejection of then-pending claims 1–4, 6–11, and 15–26. *Ex parte Steingart*, Appeal No. 2016-008027 (PTAB Mar. 16, 2017) ("Bd. Dec."). *Accord* Ans. 3 (noting this decision).

THE WRITTEN DESCRIPTION REJECTION

Regarding independent claim 1, the Examiner finds that the limitation, "each 3D dot comprising a three-dimensional grid of voxels, wherein each voxel constitutes a voxel element of the 3D dot," lacks sufficient support in Appellant's original disclosure and, therefore, fails to comply with the written description requirement. Final Act. 2–4; Ans. 3–5.

Appellant argues that the claimed invention complies with the written description requirements because, among other things, the Specification describes a 3D dot as voxels that are, for example, in the form of "parcels" that can be a 3D object or assembly of components under the term's plain meaning. Appeal Br. 12–13; Reply Br. 5. Given this understanding, Appellant contends that ordinarily skilled artisans would consider a 3D dot as a 3D object made of voxels. Appeal Br. 12; Reply Br. 5. Appellant adds that because a 3D dot can be any structure, it can be a 3D grid of voxels as claimed. Reply Br. 6.

[4] The Reply Brief is also silent regarding this related appeal despite the Examiner citing that opinion on pages 3, 8, and 9 of the Answer.

ISSUE

Under § 112, first paragraph, has the Examiner erred in rejecting claim 1 by finding that the recited limitation, "each 3D dot comprising a three-dimensional grid of voxels, wherein each voxel constitutes a voxel element of the 3D dot" ("the voxel grid limitation"), fails to comply with the written description requirement? This issue turns on whether Appellant's original disclosure conveys with reasonable clarity to ordinarily skilled artisans that Appellant possessed the claimed invention as of the filing date.

ANALYSIS

We begin by noting that claim 1 at issue in this appeal is identical to claim 1 that was at issue in the earlier appeal except for the voxel grid limitation—a limitation that was added after the earlier Board decision. *Accord* Ans. 3 (noting this point).

On this record, we find that Appellant's original disclosure conveys, with reasonable clarity, possession of the voxel grid limitation when the application was filed. In the "Summary of the Invention" section, the Specification explains that the present invention is used to fabricate non-homogeneous articles using 3D voxel-based models to enable building article prototypes, such as artificial teeth, with varying colors, shades, textures, etc. Spec. ¶¶ 14–16. To this end, a property that varies throughout the article, such as color, is represented by assigning each voxel a value corresponding to that property in a virtual model. *Id.* ¶ 15. Material is then deposited on a voxel-by-voxel basis such that the deposited material in each voxel has the property value (e.g., color) assigned to that voxel. *Id.*

Material can also be deposited on a parcel-by-parcel basis if more than one voxel is grouped at a time. *Id.*

As shown in Appellant's Figure 1, which details a method for manufacturing an aesthetically-acceptable non-homogeneous object, a 3D voxel representation is defined in step 102 where voxels making up the object's virtual representation are assigned values representing physical properties, such as color, transparency, and hardness. Spec. ¶ 44. In step 104, the 3D voxel representation is scan converted to define a set of 3D dots, or parcels, that when agglomerated together, produce the shape of each of the object's successive Z-layers, such that all Z-layers produce the complete object's shape when put together. *Id.*

A key aspect of this functionality is that 3D dots are defined by scan converting a 3D voxel representation in step 104. According to the Specification's paragraph 33, a 3D dot can be any 3D structure that corresponds to one or more voxels. Notably, paragraph 15 explains that material can be deposited on either (1) a *voxel-by-voxel* basis, *or* (2) a *parcel-by-parcel* basis if more than one voxel is grouped at a time. And paragraph 44 explains that the 3D voxel representation is scan converted in step 104 to define a set of 3D *dots, or parcels,* that when agglomerated together, produce the shape of each of the object's successive Z-layers.

Appellant reasons that ordinarily skilled artisans would understand from this disclosure that a "parcel" can be a 3D object or assembly of individual elements, such as *voxels*, under the plain meaning of the term "parcel," namely a "wrapped bundle" or "package" as defined in a general purpose dictionary. Appeal Br. 12; Reply Br. 5. Appellant then concludes

that, when the original disclosure is considered in light of this definition, a 3D dot is a 3D object made of voxels. Appeal Br. 12.

To be sure, Appellant relies on a general-purpose dictionary to define the term "parcel" that, notably, has a particular meaning in the art pertaining to *preprocessed* graphical objects that is considerably narrower than Appellant's proffered definition. According to a computer graphics dictionary, a "parcel" is "[a] collection of primitive graphics objects that have been *preprocessed* so that they can be rendered efficiently with any desired viewpoint." COMPUTER GRAPHICS DICTIONARY 328 (Roger T. Stevens ed. 2002) ("Computer Graphics Dictionary") (emphasis added). That same dictionary defines "voxel" as "[o]ne of an array of equal-sized cubes that comprise a discretely-defined three-dimensional space." *Id.* at 445.

Despite Appellant's somewhat inartful articulation of the meaning of the term "parcel" that ignores its narrower definition in the computer graphics art, we nonetheless find that the recited voxel grid limitation is reasonably supported by the original disclosure, particularly when the passages cited by Appellant are read in context of the entire original disclosure as it would have been understood by ordinarily skilled artisans. We reach this conclusion emphasizing that the present application is written for those skilled in the art who come to the application with knowledge of what has come before. *See LizardTech, Inc. v. Earth Resource Mapping, Inc.*, 424 F.3d 1336, 1345 (Fed. Cir. 2005). Therefore, it is unnecessary to spell out every detail of the invention; only enough must be included in the disclosure to ensure the claims are clear, and convince a person of ordinary skill in the art that the inventor possessed the invention, and to enable such a

person to make and use the invention without undue experimentation. *See id.*

That is the case here. On this record, ordinarily skilled artisans would understand that if a 3D dot comprises voxels, namely an array of equal-sized cubes that comprise a discretely-defined three-dimensional space under the Computer Graphics Dictionary definition noted above, then those voxels would be arranged with respect to a 3D grid, namely an array of horizontal and vertical lines used to locate particular objects in a graphics image as the term is understood in the art. *See* Computer Graphics Dictionary at 218.

Although a voxel is a volume element, namely a cube, consistent with its definition and the Examiner's characterization (Ans. 5), we nevertheless see no reason why it could not also be considered a "voxel element," namely a cube-based element, of a discretely-defined 3D space, such as the virtual object representation defined in step 102 of Appellant's Figure 1 and described in paragraph 44. Despite the somewhat inartful articulation in claim 1 that "each voxel constitutes a voxel element of the 3D dot," we nevertheless see no reason why Appellant cannot be its own lexicographer regarding the recited "voxel element." *See Multiform Desiccants Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1477 (Fed. Cir. 1998). To the extent there is a distinction between a "volume element" and a "voxel element" as the Examiner apparently suggests (*see* Ans. 5), it is without a meaningful difference in this context.

Therefore, we are persuaded that the Examiner erred in rejecting (1) independent claim 1; (2) independent claim 21 that recites commensurate limitations; and (3) dependent claims 2–4, 6–11, 15–20, and 22–26 for similar reasons.

THE ENABLEMENT REJECTION

For reasons similar to those noted in connection with the written description rejection, we are also persuaded of error in the Examiner's enablement rejection of claims 1–4, 6–11, and 15–26.

THE OBVIOUSNESS REJECTION OVER CAMPBELL, STEINGART, AND GUBKIN

Regarding independent claim 1, the Examiner finds that Campbell discloses, among other things, (1) defining a set of 3D dots, each dot comprising a 3D grid of voxels, where each voxel constitutes a voxel element of the 3D dot, and (2) depositing, for each dot of each layer of the non-homogeneous object's plural successive Z-layers, at least one of the pigment, ink, and resin identified by the respective transfer function. Final Act. 5–7. Although the Examiner acknowledges that Campbell lacks various other recited features including the recited voxel-based modeling system and its modification, user interface, and the recited first value assignment, the Examiner cites Steingart and Gubkin for teaching these features in concluding that the claim would have been obvious. Final Act. 7–9.

Appellant argues that Campbell, considered alone or in combination, does not teach or suggest defining a 3D dot comprising a 3D grid of voxels, where each voxel constitutes a voxel element of the 3D dot as claimed. Appeal Br. 16–17; Reply Br. 6–8. According to Appellant, Campbell pertains to a 2D—not 3D—system where each layer of voxels has only two variable dimensions (x, y) and a constant unit thickness (z), nor would the

cited references motivate ordinarily skilled artisans to modify Campbell's 2D layer-by-layer printing system with any fundamentally different modeling system, such as that in Gubkin. Appeal Br. 16; Reply Br. 7–8. Appellant adds that the cited prior art also does not teach or suggest (1) defining respective prescribed physical properties from the assigned physical properties of the respective voxel elements, and (2) depositing, for each dot of each layer of the non-homogeneous object's plural successive Z-layers, at least one of the pigment, ink, and resin identified by the respective transfer function. Appeal Br. 17–21.

ISSUES

(1) Under § 103, has the Examiner erred in rejecting claim 1 by finding that Campbell, Steingart, and Gubkin collectively would have taught or suggested (1) defining a set of 3D dots, each dot comprising a 3D grid of voxels, where each voxel constitutes a voxel element of the 3D dot; (2) defining respective prescribed physical properties from the assigned physical properties of the respective voxel elements corresponding to the 3D dot; and (3) depositing, for each dot of each layer of the non-homogeneous object's plural successive Z-layers, at least one of the pigment, ink, and resin identified by the respective transfer function?

(2) Is the Examiner's proposed combination of the cited references supported by articulated reasoning with some rational underpinning to justify the Examiner's obviousness conclusion?

ANALYSIS

As noted previously, claim 1 at issue in this appeal is identical to claim 1 that was at issue in the earlier appeal except for the voxel grid limitation that was added after the earlier Board decision. *Accord* Ans. 3 (noting this point). Notably, the Examiner rejects claim 1 over the same prior art references that were cited to reject claim 1 in the earlier appeal, namely Campbell, Steingart, and Gubkin—an obviousness rejection that was affirmed by another panel of this Board in the earlier appeal. *See* Bd. Dec. 3, 6–10.

That is, the Board affirmed the Examiner's obviousness rejection of claim 1 that is now before us in this appeal except for the voxel grid limitation. The Board's findings and conclusions in the earlier decision, including those regarding Campbell and Gubkin (Bd. Dec. 6–10), are therefore applicable here, and indeed binding in this appeal. *See* Manual of Patent Examining Procedure (MPEP) § 706.07(h)(XI)(A) (9th ed. Rev. 08.2017, Jan. 2018) (noting that the Board's decision becomes the "law of the case" in that it is controlling on the application under appeal and later related applications).

The key question before us, then, is whether the Examiner erred by finding that Campbell also teaches or suggests the newly-added voxel grid limitation. On this record, we see no error in the Examiner's findings and conclusions in this regard.

The Examiner finds, and we agree, that Campbell's multi-pass voxel deposition in paragraphs 154 to 156 at least suggests the voxel grid limitation, particularly when considered in light of the dispensing device's

movement in the X-, Y-, and Z-axes in paragraphs 144 and 156 as the Examiner indicates. Final Act. 5–6; Ans. 7.

As the earlier Board panel noted, Campbell's paragraph 155 teaches plural passes, during each of which voxels with bio-ink(s) or solution(s) are deposited to form part or all of the scaffold's layer. *See* Bd. Dec. 8. Notably, the Board held that Campbell's plural voxels in a pass satisfies the claimed 3D dot because it forms a layer (or part of a layer) of a scaffold and corresponds to two or more voxels. *Id.*

Given this holding, particularly considered in light of the dispensing device's movement in the X-, Y-, and Z-axes in paragraphs 144 and 156 as the Examiner indicates (Ans. 7), Campbell at least suggests placing the voxels in respective passes in a 3D grid, namely an array of horizontal and vertical lines used to locate particular objects in a graphics image, as the term is understood in the art. *See* Computer Graphics Dictionary, at 218. The Examiner's finding, then, that this grid is consistent with the Cartesian coordinate system given Campbell's three-dimensional movement capability (Ans. 7) has at least a rational basis that has not been persuasively rebutted on this record.

Appellant's contention that Campbell's layer of voxels is a 2D object with only two variable dimensions (x, y) and a constant unit thickness and is, therefore, ostensibly only a 2D—not a 3D—grid (Reply Br. 7) is unavailing. Leaving aside the fact that Campbell's dispensing devices can be moved in the Z-direction as noted in paragraphs 144 and 156, the fact that voxels are applied in multiple passes at least suggests their arrangement in a 3D grid, or that such an arrangement would have been at least an obvious variation. In short, Appellant's arguments are not commensurate with the scope of the

claim, for nothing in the claim precludes Campbell's multi-pass voxel deposition functionality in paragraph 155 for at least suggesting the voxel grid limitation.

Nor are we persuaded of error in the Examiner's reliance on Campbell for teaching the other disputed limitations of claim 1, namely (1) defining respective prescribed physical properties from the assigned physical properties of the respective voxel elements corresponding to the 3D dot; and (2) depositing, for each dot of each layer of the non-homogeneous object's plural successive Z-layers, at least one of the pigment, ink, and resin identified by the respective transfer function. *See* Final Act. 6–7. Despite Appellant's arguments to the contrary (Appeal Br. 17–21), we see no error in the Examiner's reliance on Campbell for at least suggesting the recited limitations for the reasons indicated by the Examiner and in light of the earlier Board decision. *See* Ans. 9–11. That Appellant did not squarely address—let alone persuasively rebut—the Examiner's reliance on the Board's earlier decision further undermines Appellant's contentions in this regard.

Lastly, we see no error in the Examiner's articulated basis for combining the references as proposed. *See* Final Act. 8–9. Appellant's contention that there is ostensibly nothing *in the cited references* that would motivate or suggest to an ordinarily skilled artisan to modify Campbell's 2D layer-by-layer printing system with any fundamentally different modeling system, such as that in Gubkin (Appeal Br. 17) is unavailing. It is well settled that "[t]he motivation [to combine references] need not be found in the references sought to be combined, but may be found in any number of sources, including common knowledge, the prior art as a whole, or the

nature of the problem itself." *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1361 (Fed. Cir. 2006) (citation omitted). Therefore, to the extent that Appellant contends that the Examiner's rationale to combine the references must come from the cited references themselves, we disagree. On this record, the Examiner's proposed combination of the cited references is supported by articulated reasoning with some rational underpinning to justify the Examiner's obviousness conclusion

Therefore, we are not persuaded that the Examiner erred in rejecting claim 1, and claims 4, 6–8, 11, 16–18, 20–22, 25, and 26 not argued separately with particularity.[5]

OTHER OBVIOUSNESS REJECTIONS

We also sustain the Examiner's obviousness rejections of claims 2, 3, 8–10, 15, 17, 18, 23, and 24 based on Campbell, Gubkin, Steingart, and further in view of Wang, Tochimoto, Brodkin, Silverbrook, Nikolskiy, and Shih. Final Act. 16–22. Despite nominally arguing these claims separately, Appellant reiterates similar arguments made in connection with claim 1, and alleges that the additional cited references fail to cure those purported deficiencies. *See* Appeal Br. 23–25. We are, therefore, not persuaded by these arguments for the reasons previously discussed.

[5] Although Appellant argues claim 21 separately (Appeal Br. 21–22), Appellant reiterates arguments made for claim 1. We, therefore, group these claims accordingly.

THE OTHER OBVIOUSNESS REJECTIONS BASED ON APA

Because our decision is dispositive regarding patentability of all appealed claims based on the foregoing prior art references, we need not reach the merits of the Examiner's decision to also reject claims 1–4, 6–11, 15–18, and 20–26 based on the same prior art references cited above, but also including APA. Final Act. 22–41. *See Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1423 (Fed. Cir. 1984) (approving ITC's determination based on a single dispositive issue, and not reaching other issues not decided by the lower tribunal).

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s) /Basis	Affirmed	Reversed
1–4, 6–11, 15–26	112, first paragraph	Written Description		1–4, 6–11, 15–26
1–4, 6–11, 15–26	112, first paragraph	Enablement		1–4, 6–11, 15–26
1, 4, 6–8, 11, 16–18, 20–22, 25, 26	103	Campbell, Steingart, Gubkin	1, 4, 6–8, 11, 16–18, 20–22, 25, 26	
2, 3	103	Campbell, Gubkin, Steingart, Wang	2, 3	
8, 17, 18	103	Campbell, Steingart, Gubkin, Tochimoto	8, 17, 18	

9	103	Campbell, Steingart, Gubkin, Tochimoto, Brodkin	9	
10	103	Campbell, Steingart, Gubkin, Silverbrook	10	
15	103	Campbell, Steingart, Gubkin, Nikolskiy	15	
23, 24	103	Campbell, Steingart, Gubkin, Shih	23, 24	
1, 4, 6–8, 11, 16–18, 20–22, 25, 26	103	Campbell, Steingart, Gubkin, APA[6]		
2, 3	103	Campbell, Steingart, Gubkin, APA, Wang		
8, 17, 18	103	Campbell, Steingart, Gubkin, APA, Tochimoto		

[6] As explained above, we do not reach the alternative obviousness rejections of claims 1–4, 6–11, 15–18, and 20–26 that include APA, for they are merely cumulative to the Examiner's obviousness rejections of those claims based on other prior art. *See Beloit*, 742 F.2d at 1423 (approving ITC's determination based on a single dispositive issue, and not reaching other issues not decided by the lower tribunal).

9	103	Campbell, Steingart, Gubkin, APA, Brodkin		
10	103	Campbell, Steingart, Gubkin, APA, Silverbrook		
15	103	Campbell, Steingart, Gubkin, APA, Nikolskiy		
23, 24	103	Campbell, Steingart, Gubkin, APA, Shih		
Overall Outcome			1–4, 6–11, 15–26	

TIME PERIOD FOR RESPONSE

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).

AFFIRMED