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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte DEREJE AGONAFER and HUY N. PHAN

Appeal 2019-004912
Application 13/400,704
Technology Center 3700

Before JOHN C. KERINS, MICHAEL L. WOODS, and
ERIC C. JESCHKE, *Administrative Patent Judges*.

WOODS, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1–4, 6, 8–15, and 21–27. Appeal Br. 1. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ We use the word Appellant to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as the Board of Regents, The University of Texas System. Appeal Br. 1.

CLAIMED SUBJECT MATTER

The Specification describes a heat transfer system for cooling electronic components. Spec. 1 (Background). Claims 1, 11, and 23 are independent. Appeal Br. 34–38 (Claims App.). We reproduce claim 1, below:

1. A system for cooling a plurality of microchips in a stack, the stack having one side engaged with a substrate and a plurality of unengaged sides, the system comprising:
 - a cold core in thermal communication with all of the unengaged sides of the stack, said cold core having a three-dimensional shape and comprising a base, a generally opposing top, and at least one side surface;
 - a plurality of solid state cooling devices each in thermal communication and in contact with said cold core;
 - a plurality of heat sinks each in thermal communication with one of said plurality of solid state cooling devices; and
 - an air mover positioned to produce a flow of air adjacent one or more of said plurality of heat sinks, wherein each microchip in the plurality of microchips is cooled to a sub-ambient temperature.

Appeal Br. 34 (Claims App.).

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Kelada	US 6,370,884 B1	Apr. 16, 2002
Farrar	US 2003/0042153 A1	Mar. 6, 2003
Grisham	US 2005/0011199 A1	Jan. 20 2005
Su	US 2005/0252228 A1	Nov. 17, 2005
Childress	US 7,059,137 B2	June 13, 2006
Pan	US 2007/0204627 A1	Sept. 6, 2007
Momose	US 2007/0291234 A1	Dec. 20, 2007
Carter	US 8,358,503 B2	Jan. 22, 2013

REJECTIONS²

The following rejections are before us on appeal:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis
1–3, 6, 22, 23, 25–27	103	Grisham, Farrar, Pan
4, 21, 24	103	Grisham, Farrar, Pan, Childress
8, 9	103	Grisham, Farrar, Pan, Kelada, Carter
10	103	Grisham, Farrar, Pan, Carter
11, 12, 15	103	Grisham, Farrar, Pan, Su, Kelada, Carter
13	103	Grisham, Farrar, Pan, Su, Kelada, Carter, Momose
14	103	Grisham, Farrar, Pan, Su, Carter, Childress

Final Act. 2–18.

OPINION

I. Claims 1–3, 6, 22, 23, 25–27 – Grisham, Farrar, Pan

Appellant argues claims 1, 2, 22, 23, and 25–27 as a group. *See* Appeal Br. 9–20.³ We select claim 1 as the representative claim, with claims 2, 22, 23, and 25–27 standing or falling with claim 1. 37 C.F.R. § 41.37(c)(1)(iv) (2018).

Appellant also presents separate arguments for claims 3 and 6. *See* Appeal Br. 19–20. We address these arguments separately.

a. Rejection of Claims 1, 2, 22, 23, 25–27

In rejecting claim 1, the Examiner finds that Grisham discloses several features of the claimed invention. *See* Final Act. 2–3 (citing in part Grisham, Figs. 2, 3). We reproduce Grisham’s Figure 2, below:

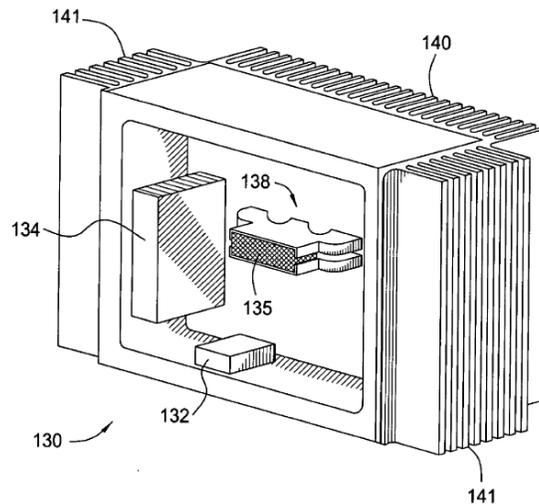


Figure 2 depicts enclosure 130 with a cut-away section exposing internal enclosure 138. Grisham ¶ 28. Enclosure 130 may be hermetically sealed to protect main controller 134, temperature controller 132, and optical signal

² The Examiner objected to a proposed amendment under 35 U.S.C. § 132(a) for containing new matter. Final Act. 2; 35 U.S.C. § 132(a) (“No amendment shall introduce new matter into the disclosure of the invention”). Appellant requests that we reverse the objection. Appeal Br. 9. Review of that objection, however, is accomplished via petition to the Director under 37 C.F.R. § 1.181, not by appeal to the Board, because the objection is “unrelated to any rejection before the Board.” *See Ex parte Frye*, 94 USPQ2d 1072, 1078 (BPAI 2010) (precedential).

³ Although Appellant presents arguments for claim 2 separately from independent claim 1, Appellant simply repeats the same arguments made in connection with claim 1. *Compare* Appeal Br. 18–19, *with id.* at 9–18.

processing component 135 from the elements. *See id.* ¶¶ 26, 28. Sealing of these components, however, may exacerbate the problem of temperature control. *See id.* ¶ 28. To address this problem, inner enclosure 138 may be thermally coupled to heat sinks 140, 141, located on the exterior of enclosure 130. *See id.*

We also reproduce Grisham’s Figure 3, below:

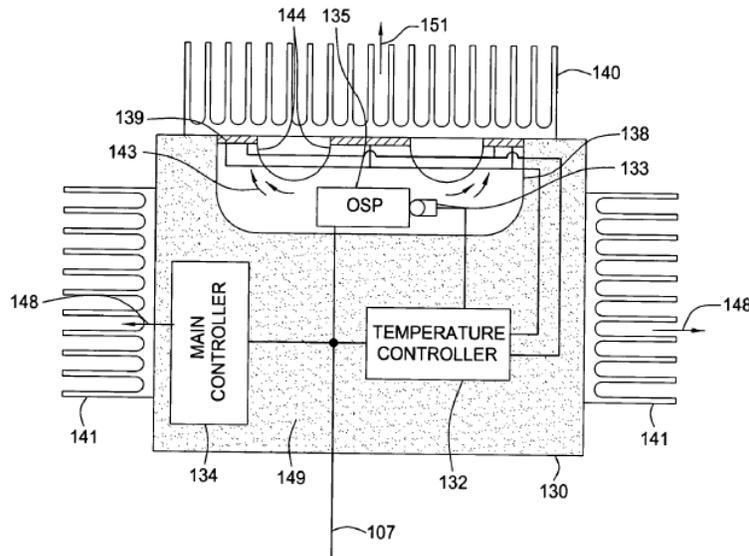


FIG. 3

Figure 3 depicts enclosure 130 in which heat generated by optical signal processing components 135 may be conducted to finned heat sink 140 via inner enclosure 138 and active temperature regulating components 139, as shown by arrow 151. Grisham ¶ 30.

The Examiner relies on Grisham for disclosing the claimed “cold core” (enclosure 130) in thermal communication with “electronic components” (132, 134, 135), a “plurality of solid state cooling devices” (temperature regulating components 139) in thermal communication and in contact with the cold core, and a “plurality of heat sinks” (140, 141) in

thermal communication with “solid state cooling devices” 139. Final Act. 2–3 (citations omitted).

The Examiner acknowledges that Grisham does not teach using the system for cooling “microchips in a stack engaged with a substrate,” and relies on Farrar for teaching “a system for cooling a plurality of microchips in a stack.” Final Act. 3 (citing in part Farrar Fig. 4). We reproduce Farrar’s Figure 4, below:

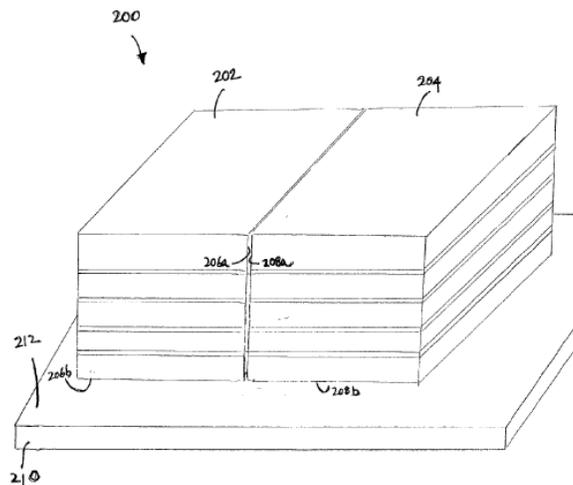


FIG. 4

Figure 4 depicts electronic module 200 with “a plurality of chip stacks joined together to form a single, compact structure.” Farrar ¶ 39. Module 200 comprises two chip stacks 202, 204. *Id.* Lower surface 206b, 208b of chip stacks 202, 204 are mounted to upper surface 212 of bonding substrate 210. *Id.* ¶ 40.

In combining Grisham with Farrar, the Examiner reasons that a skilled artisan would have modified Grisham “by providing the substrate stacked with plurality of microchips as taught by Farrar inside the enclosure of” Grisham’s cold core “in order to efficiently and effectively cool the stack of microchips within the cold core to within a specific temperature range that allows most efficient operation of the microchips.” Final Act. 3.

The Examiner further acknowledges that Grisham fails to teach “an air mover positioned to produce a flow of air adjacent one or more of the heat sinks.” *Id.* at 4. The Examiner relies on Pan for teaching an “air mover” (fan 112) positioned parallel to heat sinks (114, 118) to produce air flow (arrows 120, 180) adjacent one or more plurality of heat sinks. *Id.* (citing in part Pan’s Figure 1). We reproduce Pan’s Figure 1, below:

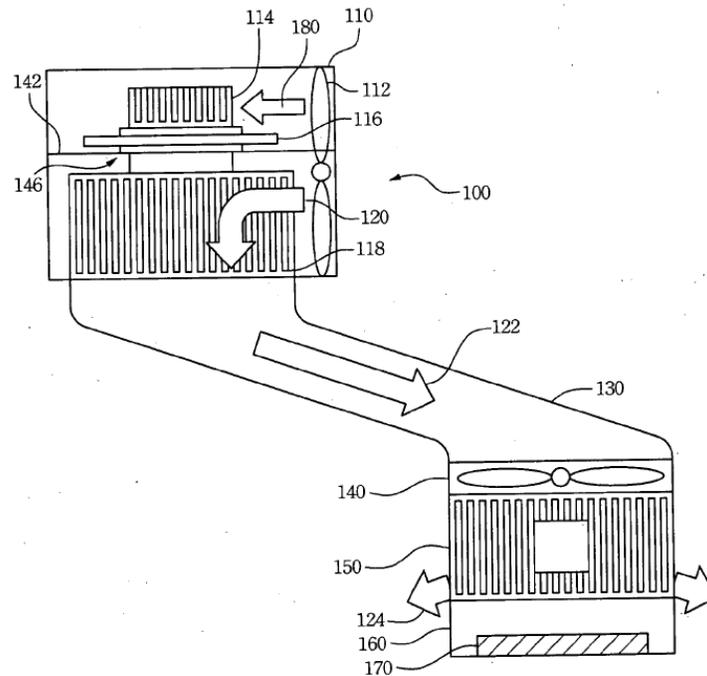


Fig. 1

Figure 1 depicts cooling apparatus 100 including fan 112, heat-dissipating fins 114, thermoelectric chip-cooling module 115, cooling fins 118, and wind guide 130. Pan ¶ 17. Fan 112 drives air 180 from outside heat-dissipating barrel 110 to heat-dissipating fins 114 while also driving air 120 through cooling fins 118 so as to form cooling air 122. *Id.*

In further combining Pan with Grisham, the Examiner reasons that a skilled artisan would have provided an “air mover,” such as Pan’s fan, to

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Grisham’s heat sinks “in order to increase the coefficient of convective heat transfer and the speed of heat dissipation.” Final Act. 4.

b. Analysis of Claims 1, 22, 23, 25–27

Appellant presents numerous arguments, several of which are nested with one another, in contesting the rejection of claim 1. *See* Appeal Br. 9–18. We address each of these arguments separately, below.

First, Appellant contends that “Graham does not relate to systems for cooling a plurality of *microchips in a stack* as recited in claims 1 and 23, but instead relates to an outdoor cooling system for cooling electronic equipment.” Appeal Br. 12 (emphasis added). Appellant argues that “Grisham’s enclosure 130 does not appear to be in thermal communication with electronic components or ‘**in thermal communication with all of the unengaged sides of the stack.**’” *Id.* at 12–13.

Appellant’s first argument is not persuasive as one cannot show nonobviousness by attacking a reference individually where the rejection is based on a combination of references. *See In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986); *In re Keller*, 642 F.2d 413, 425–26 (CCPA 1981). In the present case, the Examiner acknowledges that Grisham does not teach using the system for cooling microchips in a stack engaged with a substrate, and relies on Farrar for teaching this structure. *See* Final Act. 3. The Examiner proposes to modify Grisham, based on Farrar’s teachings, to meet the claimed limitation. *See id.*

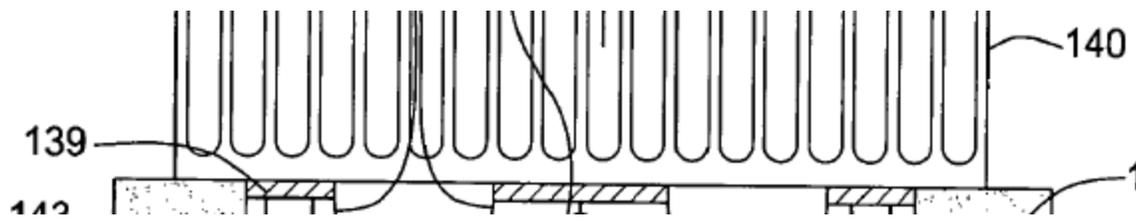
Second, Appellant argues that “one of ordinary skill in the art would not consider enclosure 130 as being a ‘**cold core.**’” Appeal Br. 13.

Appellant’s second argument is not persuasive. As explained correctly by the Examiner, Appellant’s own Specification describes that the

cold core can be a “solid, liquid or a combination of the two.” *See* Ans. 3–4 (citing Spec. 5). Indeed, the Specification describes that the cold core “may be any combination of sizes, shapes, and materials that is best suited for a particular system” and “may be solid or liquid, or a combination of the two.” Spec. 5. Based on Appellant’s own broad definition of “cold core,” we agree with the Examiner’s finding that Grisham’s solid enclosure 130 reasonably satisfies the claimed “cold core.” *See* Ans. 3–4.

Third, Appellant argues that “Grisham explicitly teaches heat sinks 140/141 are on the exterior of enclosure 130 and thus not in thermal communication with solid state cooling devices . . . [t]hus, Grisham explicitly teaches away from the presently claimed invention.” Appeal Br. 13.

Appellant’s third argument is not persuasive for at least the following three reasons. First, the argument appears to presume that “in thermal communication” requires that the heat sinks *directly contact* the solid state cooling devices. We find nothing in the record to support such a narrow construction of “in thermal communication.” Second, and notwithstanding Appellant’s overly narrow claim construction, Grisham’s Figure 3 depicts “heat sink” 140 in direct contact with “solid state cooling device” 139. We reproduce a portion of Grisham’s Figure 3, below, to depict this structure:



As can be seen from the partially-reproduced Figure 3, above, “heat sink” 140 is in direct contact with “solid state cooling device” 139. *See also* Final Act. 2–3 (citing Grisham’s Figure 3). Third, and as to Appellant’s *teaching*

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away argument, a reference teaches away from a modification when the reference, taken as a whole, criticizes, discredits, or otherwise discourages the modification. *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004).

Appellant cites to nothing in Grisham that criticizes, discredits, or otherwise discourages the modifications proposed by the Examiner.

Fourth, Appellant argues that “Farrar does not disclose or suggest a ‘cold core’ as defined in claims 1 and 23.” Appeal Br. 15. Appellant argues that “Farrar’s enclosure 500 . . . is not ‘in contact’ with a ‘plurality of solid state cooling devices’ as required by claims 1 and 23.” *Id.*

Appellant’s fourth argument is not persuasive. As explained above, one cannot show nonobviousness by attacking a reference individually where the rejection is based on a combination of references. *See Merck*, 800 F.2d at 1091. In the present case, the Examiner relies on Grisham—not Farrar—for teaching a “cold core” in direct contact with the “solid state cooling devices.” *See* Final Act. 3 (finding that Grisham’s “solid state cooling devices” 139 are in “thermal communication and in contact with” cold core 130 (citing Grisham’s Fig. 3)). Indeed, and as shown above, Grisham’s Figure 3 depicts Grisham’s “cold core” 130 in direct contact with “solid state cooling device” 139.

Fifth, Appellant argues that “Farrar is not analogous to Grisham,” as “Grisham relates to ‘reliable outdoor instrument cooling systems’ . . . while Farrar ‘relates to semiconductor processing technology.’” Appeal Br. 16.

Appellant’s fifth argument is not persuasive. The issue is not whether Farrar is analogous to Grisham, but whether Farrar is analogous to the claimed invention. *In re Klein*, 647 F.3d 1343, 1348 (Fed. Cir. 2011) (“A reference qualifies as prior art for an obviousness determination under § 103 only when it is analogous to the claimed invention.” (internal citations

omitted)). Furthermore, the two-prong test to define the scope of analogous prior art is (1) “whether the art is from the same field of endeavor, regardless of the problem addressed,” and (2) even “if the reference is not within the field of the inventor’s endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved.” *Id.* (internal citation omitted).

Appellant’s argument is also premised on an unreasonably narrow field of endeavor. Appellant’s characterization of the field of endeavor to be Grisham’s “outdoor instrument cooling systems” is unreasonably narrow. We find that the field of endeavor of the claimed invention is *cooling systems*, as each of the claims recite a “system for cooling.” Appeal Br. 34–38. Moreover, both Grisham and Farrar generally relate to cooling systems. *Compare* Grisham ¶ 2 (Field of the Invention), *with* Farrar, code (57).

Sixth, Appellant argues that “Pan does not teach or suggest ‘an air mover positioned to produce a flow of air adjacent to one or more of said plurality of heat sinks, wherein each microchip in the plurality of microchips is cooled to a sub-ambient temperature.’” Appeal Br. 18.

Appellant’s sixth argument is not persuasive. As explained above, one cannot show nonobviousness by attacking a reference individually where the rejection is based on a combination of references. *See Merck*, 800 F.2d at 1091. In the present case, the Examiner relies on Farrar—not Pan—for teaching “cooling a plurality of microchips in a stack.” Final Act. 3. As discussed in detail above, Pan’s Figure 1 depicts fan 112 that moves air flow adjacent heat sinks 114, 118, and Appellant’s argument does not identify error in the Examiner’s findings.

Seventh, Appellant argues that “Pan is not analogous to the teachings of Grisham,” which “relates to ‘reliable outdoor instrument cooling systems’

. . . while Pan relates to a double-effect thermoelectric cooling apparatus for a computer system.” Appeal Br. 18 (citation omitted).

Appellant’s seventh argument is not persuasive, as it focuses on whether Pan is analogous to Grisham, rather than to the claimed invention (*In re Klein*, 647 F.3d at 1348), and is premised on an unreasonably narrow definition of the field of endeavor, specifically, “outdoor instrument” cooling systems (*see* Appeal Br. 18). We do not find that the field of endeavor is limited to outdoor instrument cooling systems, but more broadly to *cooling systems*, which both Grisham and Pan relate to. Grisham ¶ 2 (Field of the Invention); Pan, code (57).

Appellant’s arguments do not persuade us of Examiner error, and we affirm the rejection of claim 1, and each of claims 2, 22, 23, and 25–27, which fall with representative claim 1, as unpatentable over Grisham, Farrar, and Pan.

c. Analysis of Claim 3

Claim 3 depends from claim 1 and further recites, “wherein said base defines a cavity that is sized and shaped to receive the stack of microchips.” Appeal Br. 34 (Claims App.).

To address this limitation, the Examiner finds that this is an intended use limitation and that Grisham’s enclosure is capable of holding a stack of microchips as shown in Farrar. Final Act. 5.

In contesting this rejection, Appellant argues that “Farrar’s ‘enclosure 500’ does not have a base ‘that defines a cavity that is sized and shaped to receive the stack of microchips’” and “[t]hus, Farrar explicitly teaches away from the invention defined by claim 3.” Appeal Br. 19.

Appellant's argument is not persuasive, as one cannot show nonobviousness by attacking a reference individually where the rejection is based on a combination of references. *See Merck*, 800 F.2d at 1091. In the present case, the Examiner finds that Grisham's enclosure 130 is capable of holding a stack of microchips, and Appellant's argument pertaining to Farrar's enclosure 500 does not address the rejection before us.

Appellant's arguments do not persuade us of Examiner error, and we affirm the rejection of claim 3 as unpatentable over Grisham, Farrar, and Pan.

d. Analysis of Claim 6

Claim 6 depends from claim 1 and further comprises "a duct positioned to direct at least a portion of said flow of air adjacent one or more of said plurality of heat sinks." Appeal Br. 34–35 (Claims App.).

To address this limitation, the Examiner relies on Pan and finds that Pan "discloses a duct positioned to direct at least a portion of the flow of air adjacent one or more of the plurality of heat sinks (heat dissipation channel 110 and guide 130 to direct air flow adjacent the heat sinks 114, 118[.]).]" Final Act. 4 (citations omitted).

Appellant argues, "It is unclear what element in Pan is being referred to as a duct adjacent one or more of said plurality of heat sinks." Appeal Br. 20.

Appellant's argument is not persuasive. The Examiner relies on Pan's channel 110 and guide 130 as meeting the claimed "ducts." Final Act. 4.

Because Appellant's arguments do not persuade us of Examiner error, we affirm the rejection of claim 6 as unpatentable over Grisham, Farrar, and Pan.

II. Claims 4, 21, 24 — Grisham, Farrar, Pan, Childress

The Examiner relies on Childress for addressing the limitations of dependent claims 4, 21, and 24. *See* Final Act. 5–6.

Appellant argues that the “heating and cooling system described in Childress is configured for use in the passenger compartments of automobiles” and “Childress does not in any way relate to the teachings of Grisham or the presently claimed invention.” Appeal Br. 21–22; *see also id.* at 22 (presenting similar argument in contesting the rejection of claims 21 and 24).

Appellant’s argument is not persuasive, as it is premised on an incorrect definition of the field of endeavor, specifically, “passenger compartments of vehicles.” *See id.* at 21. We do not find that the field of endeavor is limited in such a way. Rather, the field of endeavor of the claimed invention is *cooling systems*, which both Grisham and Childress generally relate. *Compare* Grisham ¶ 2 (Field of the Invention), *with* Childress, 1:9–11 (“the present invention relates to an electronically powered cooling and heating device”).

Appellant’s arguments do not persuade us of Examiner error, and we affirm the rejection of claims 4, 21, and 24 as unpatentable over Grisham, Farrar, Pan, and Childress.

III. Claims 8, 9 – Grisham, Farrar, Pan, Kelada, Carter

Claims 8 and 9 depend from claim 1. Appeal Br. 35 (Claims App.). To address these limitations, the Examiner relies on the teachings of Kelada and Carter. *See* Final Act. 6–10 (citations omitted).

In contesting the rejection of claims 8 and 9, Appellant argues that neither Kelada nor Carter is analogous to the other cited art. *See* Appeal Br. 23–25. In particular, Appellant contends that Kelada relates to “an apparatus for cooling fluids” (*id.* at 23) while Carter relates to “mechanisms for a stackable module for energy-efficient computer systems” (*id.* at 24).

We disagree. The issue is not whether Kelada and Carter are analogous to the other cited art, but whether they are analogous to the claimed invention. *In re Klein*, 647 F.3d at 1348. Furthermore, we find that Kelada and Carter both relate to the field of endeavor of the claimed invention, namely, *cooling systems*. Kelada discloses “water cooling for thermoelectrically cooling fluids” (Kelada, code (57)) and Carter describes “an alternative to air cooling using a liquid cooling system with coolant/air heat exchangers” (Carter, 3:3–5).

Appellant’s arguments do not persuade us of Examiner error, and we affirm the rejection of claims 8 and 9 as unpatentable over Grisham, Farrar, Pan, Kelada, and Carter.

IV. Claim 10 – Grisham, Farrar, Pan, Carter

Claim 10 depends from claim 1 and further recites, *inter alia*, “wherein one or more of said base, and said at least one side surface of said cold core defines a *plurality of cavities*.” Appeal Br. 36 (Claims App.) (emphasis added).

To address this limitation, the Examiner relies on Carter’s teaching of a plurality of cavities, each for one electronic component. Final Act. 11 (citing in part Carter’s Figure 4D).

Appellant argues, “It is unclear what structure of Carter is being construed as a ‘cold core’ having defined ‘plurality of cavities, each sized and shaped to receive one of said plurality of stacks.’” Appeal Br. 26.

Appellant’s argument is not persuasive, as one cannot show nonobviousness by attacking a reference individually where the rejection is based on a combination of references. *See Merck*, 800 F.2d at 1091. In the present case, the Examiner relies on Grisham for teaching a “cold core,” Farrar for teaching a “plurality of stacks,” and proposes to modify Grisham “by having a plurality of cavities each capable of accommodating plurality of electronic component as taught by Carter.” Final Act. 10–11 (citations omitted). In other words, the Examiner does not rely on Carter for teaching a “cold core” having defined “plurality of cavities, each sized and shaped to receive one of said plurality of stacks.” As such, Appellant’s focus on Carter does not address the rejection before us, which is based on a combination of teachings from Grisham, Farrar, Pan, and Carter.

Appellant’s arguments do not persuade us of Examiner error, and we affirm the rejection of claim 10 as unpatentable over Grisham, Farrar, Pan, and Carter.

V. Claims 11, 12, 15 – Grisham, Farrar, Pan, Su, Kelada, Carter

In rejecting claim 11, the Examiner relies on the same or similar teachings from Grisham, Farrar, Pan, Kelada, and Carter as set forth in the prior rejection of claims 8 and 9. *Compare* Final Act. 11–16 (rejecting claim 11), *with id.* at 6–10 (rejecting claims 8 and 9). The Examiner relies on Su for teaching “an air mover to produce a flow of air adjacent one or more of the plurality of heat sinks” and reasons that a skilled artisan would have further modified Grisham to include this structure. *Id.* at 14.

Appellant argues that “Su relates to a vacuum laser device and system for providing contact temperature” and “Su does not in any way relate to the teachings of” the other art. Appeal Br. 27–28.

Appellant’s argument is not persuasive. We disagree with Appellant’s assertion that Su is non-analogous art. The issue is not whether Su is analogous to the other cited art, but whether Su is analogous to the claimed invention. *In re Klein*, 647 F.3d at 1348. We find that Su is related to the field of endeavor of the claimed invention, namely, a *cooling system* for dissipating heat. *See, e.g.*, Su, code (57) (“A vacuum laser constant temperature device is adopted for a housing that has a heat dissipation module arranged therein.”).

Appellant’s arguments do not persuade us of Examiner error, and we affirm the rejection of claims 11, 12, and 15 as unpatentable over Grisham, Farrar, Pan, Su, Kelada, and Carter.

VI. Claim 13 – Grisham, Farrar, Pan, Su, Kelada, Carter, Momose

Claim 13 depends from claim 11 and further comprises, “a duct positioned to direct at least a portion of said flow of air adjacent one or more of said plurality of primary and secondary heat sinks.” Appeal Br. 37 (Claims App.).

In addressing this limitation, the Examiner finds that Momose teaches duct 713 positioned to direct at least a portion of the flow of air adjacent one or more of the plurality of primary heat sinks. Final Act. 17 (citing Momose, Figs. 15, 16, 19). The Examiner reasons that a skilled artisan would have further modified Grisham “to have provided a duct (713) . . . as taught by Momose around the heat sinks of the cooling device . . . in order to

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direct the air over the entire surface of the fins and to prevent moisture from creeping into the cooling device.” *Id.*

In contesting the rejection, Appellant argues that “Momose does not teach ‘a plurality of heat sinks each in thermal communication with one of said plurality of solid state cooling devices.’” Appeal Br. 30.

Appellant’s argument is not persuasive, as one cannot show nonobviousness by attacking a reference individually where the rejection is based on a combination of references. *See Merck*, 800 F.2d at 1091. In the present case, the Examiner relies on Grisham—not Momose—for teaching “a plurality of heat sinks (140, 141, see fig. 2) each in thermal communication with one of the plurality of solid state cooling devices (heat sinks 140, 141, surround the cold core and the TEC’s 139[)].” *See* Final Act. 12 (addressing independent claim 11, from which claim 13 depends).

Appellant also argues that “Momose is not analogous” because “Momose describes a cooling system for a projector, while Grisham relates to ‘reliable outdoor instrument cooling systems.’” Appeal Br. 30.

Appellant’s non-analogous art argument is also unpersuasive. As similarly discussed above, the issue is not whether Momose is analogous to Grisham, but whether Momose is analogous to the claimed invention. *In re Klein*, 647 F.3d at 1348. Furthermore, we find that Momose also relates to the field of endeavor of the claimed invention, namely, *cooling systems*. *See, e.g.*, Momose, code (54) (“Cooling Device and Projector”).

Appellant’s arguments do not persuade us of Examiner error, and we affirm the rejection of claim 13 as unpatentable over Grisham, Farrar, Pan, Su, Kelada, Carter, and Momose.

VII. Claim 14 – Grisham, Farrar, Pan, Su, Kelada, Carter, Childress

Claim 14 depends from claim 11 and further comprises “at least four solid state cooling devices” and “at least four heat sinks.” Appeal Br. 37 (Claims App.).

To address these limitations, the Examiner relies on Childress’s teaching of at least four solid state cooling devices (thermoelectric units 10) and at least four heat sinks (30). Final Act. 18 (citing in part Childress’s Fig. 5). The Examiner reasons that a skilled artisan would have further modified Grisham to include at least four solid state cooling devices and at least four heat sinks, as taught by Childress. *Id.*

In contesting the rejection, Appellant argues that “Childress does not relate to a system for cooling a plurality of microchips in a stack as claimed” and Childress is not in the same field of endeavor of the claimed invention. *See* Appeal Br. 32 (citation omitted).

Appellant’s argument is not persuasive. First, Appellant is attacking Childress individually; the Examiner does not rely on Childress for teaching “a system for cooling a plurality of microchips in a stack.” *See* Final Act. 18. Second, we find that Childress is analogous to the claimed invention, as Childress relates to the field of *cooling systems*. *See, e.g.*, Childress, 1:9–11 (“the present invention relates to an electronically powered cooling and heating device”).

Appellant’s arguments do not persuade us of Examiner error, and we affirm the rejection of claim 14 as unpatentable over Grisham, Farrar, Pan, Su, Kelada, Carter, Momose, and Childress.

CONCLUSION

The Examiner's rejections of claims 1–4, 6, 8–15, and 21–27 are affirmed.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Reversed	Affirmed
1–3, 6, 22, 23, 25–27	103	Grisham, Farrar, Pan		1–3, 6, 22, 23, 25–27
4, 21, 24	103	Grisham, Farrar, Pan, Childress		4, 21, 24
8, 9	103	Grisham, Farrar, Pan, Kelada, Carter		8, 9
10	103	Grisham, Farrar, Pan, Carter		10
11, 12, 15	103	Grisham, Farrar, Pan, Su, Kelada, Carter		11, 12, 15
13	103	Grisham, Farrar, Pan, Su, Kelada, Carter, Momose		13
14	103	Grisham, Farrar, Pan, Su, Carter, Childress		14
Overall Outcome				1–4, 6, 8–15, 21–27

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). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED