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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/590,337	01/06/2015	Sesinando P. Macaraeg	14-1182-US-NP (800-0063)	2278

107112 7590 09/23/2020

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ART UNIT	PAPER NUMBER
1789	

NOTIFICATION DATE	DELIVERY MODE
09/23/2020	ELECTRONIC

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SESINANDO P. MACARAEG and FREDERICK T. CALKINS

Appeal 2019-006544
Application 14/590,337
Technology Center 1700

Before BEVERLY A. FRANKLIN, JEFFREY B. ROBERTSON, and MICHAEL G. McMANUS, *Administrative Patent Judges*.

McMANUS, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant[1] seeks review of the Examiner's decision to reject claims 1, 3–15, and 18–20. 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 Boeing Company. Appeal Brief dated June 17, 2019 ("Appeal Br.") 4.

CLAIMED SUBJECT MATTER

The present application generally relates to "an environmental aspect control assembly." Specification filed January 6, 2015 ("Spec.") ¶ 1. The Specification teaches embodiments of "an environmental aspect control assembly configured to control one or more environmental aspects, such as moisture, sound, and/or temperature." *Id.* ¶ 10.

Claim 1 is illustrative of the subject matter on appeal and is reproduced below with certain limitations bolded for emphasis:

> 1. An environmental aspect control assembly configured to control one or more environmental aspects, the environmental aspect control assembly comprising:
>
> at least one aspect-controlling portion formed of one or more environmental aspect-controlling materials; and
>
> at least one shape-changing actuator operatively connected to the at least one aspect-controlling portion, wherein the at least one shape-changing actuator automatically adapts to changing environmental conditions by having a first actuator shape at a first ambient temperature and a second actuator shape at a second ambient temperature that differs from the first ambient temperature, **wherein the at least one shape-changing actuator changes shape in response to changes between the first ambient temperature and the second ambient temperature**, wherein the first actuator shape causes the at least one aspect-controlling portion to form a first structural shape, wherein the second actuator shape causes the at least one aspect-controlling portion to form a second structural shape that differs from the first structural shape, wherein the first structural shape is one of an expanded or compressed structural shape, wherein the second structural shape is the other of the expanded or compressed structural shape, wherein the at least one shape-changing actuator **is formed of a single piece of wire** having a plurality of windings

that wrap around or within the at least one aspect-controlling portion, and wherein the plurality of windings squeeze and constrict the at least one aspect-controlling portion in the compressed structural shape.

Appeal Br. 23 (Claims App.).

REFERENCES

The Examiner relies upon the following prior art:

Name	Reference	Date
Jacobs et al. ("Jacobs")	US 5,700,337	Dec. 23, 1997
Yambe et al. ("Yambe")	US 2005/0016637A1	Jan. 27, 2005
Kim	US 2010/0138983Al	June 10, 2010
Lewis et al. ("Lewis")	US 2014/0220277 Al	Aug. 7, 2014
Barton	EP0475677 A1	March 18, 1992
M. Ashby, K. Johnson, *Materials and Design, The Art and Science of Material Selection in Product Design*, 2d ed. (2010) ("Ashby")		
P. Tortora, B. Collier, *Understanding Textiles*, 5th ed. (1997) ("Tortora")[2]		

REJECTIONS

The Examiner maintains the following rejections:

1. Claims 1, 7, 8, and 10 are rejected under 35 U.S.C. § 102(a)(1) as anticipated by Yambe. Final Action dated March 21, 2019 ("Final Act.") 2–4.
2. Claims 3, 5, 6, and 12 are rejected under 35 U.S.C. § 103 as being unpatentable over Yambe in view of Lewis and as evidenced by Ashby. *Id.* at 4–5.
3. Claims 4 and 9 are rejected under 35 U.S.C. § 103 as being

[2] Although the Examiner refers to this reference as "Aramid," we follow our normal practice of referring to cited art according to its author's surname.

unpatentable over Yambe in view of Lewis and Kim as evidenced by Tortora and Ashby. *Id.* at 5–8.

4. Claim 11 is rejected under 35 U.S.C. § 103 as being unpatentable over Yambe in view of Jacobs. *Id.* at 8–9.
5. Claims 13 and 18–20 are rejected under 35 U.S.C. § 103 as being unpatentable over Yambe in view of Lewis as evidenced by Ashby. *Id.* at 9–11.
6. Claim 14 is rejected under 35 U.S.C. § 103 as being unpatentable over Yambe in view of Lewis as evidenced by Ashby and further in view of Barton. *Id.* at 12.
7. Claim 15 is rejected under 35 U.S.C. § 103 as being unpatentable over Yambe in view of Lewis and Kim as evidenced by Tortora and Ashby. *Id.* at 12–13.

DISCUSSION

Rejection 1. The Examiner rejects claims 1, 7, 8, and 10 as anticipated by Yambe. *Id.* at 2–4. Yambe is titled "Conveying Device with Peristaltic Movement." Yambe, code (54). Yambe teaches "[a] conveying device with peristaltic movement [that] includes a flexible transport tube and a two-way shape memory alloy." *Id.*, Abstract.

In support of the rejection, the Examiner finds that Yambe teaches a two-way shape memory alloy arranged in a helical or ring form on the surface or inside of a transport tube. Final Act. 3. Figure 2A of Yambe is reproduced below.

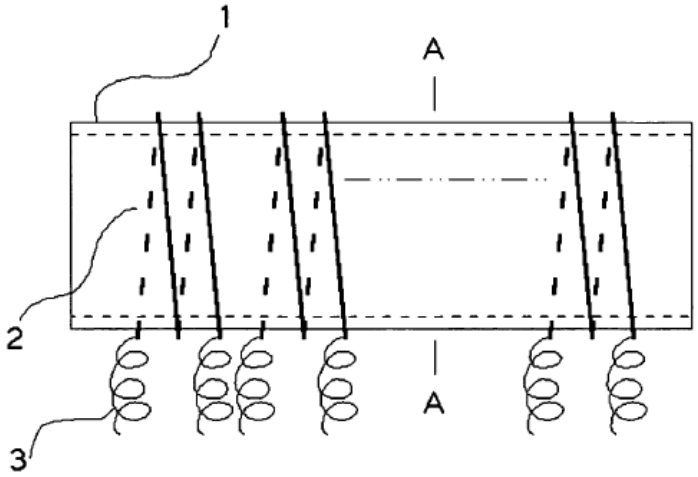

Figure 2A "is a side view of a conveying device with peristaltic movement." *Id.* ¶ 39. The figure depicts transport tube 1, two-way shape memory alloys 2, and wirings 3. *Id.*

The Examiner finds that transport tube 1 satisfies the "aspect-controlling portion" limitation and that memory alloys 2 satisfy the "shape-changing actuator" limitation. Final Act. 3.

Appellant seeks reversal on several bases. Appeal Br. 12–18. First, Appellant argues that Yambe does not teach an assembly "wherein the at least one shape-changing actuator automatically adapts to changing environmental conditions by having a first actuator shape at a first ambient temperature and a second actuator shape at a second ambient temperature that differs from the first ambient temperature, wherein the at least one shape-changing actuator changes shape in response to changes between the first ambient temperature and the second ambient temperature" as required by claim 1. *Id.* at 13–15.

Appellant argues that the foregoing provision requires that the actuator have a first shape at a first ambient temperature, and a second shape

at a second ambient temperature rather than being connected to a source of electrical power that is used to change the shape. *Id.* at 13. Appellant argues that Yambe does not teach such feature because, in Yambe, the alloy "changes shape in response to being electrically conducted and heated." *Id.* at 14. Appellant further argues that the Examiner did not adequately address the subject limitation in the Final Office Action. *Id.* at 15.

In the Answer, the Examiner determines that "Yambe teaches a shape memory alloy that responds to a change in temperature from an external heat source, therefore ***it is inherent to the material*** that in response to a change in temperature a change in shape will occur, regardless of how the change in temperature is applied." Answer 17 (emphasis added).

In its Reply Brief, Appellant argues that the Examiner has not accorded all words of the limitation patentable weight. Reply Brief dated Sept. 3, 2019 ("Reply Br."). Appellant argues that "the Office Action acknowledges that these limitations were '**not evaluated**.'" Reply Br. 2. The portion of the Final Office Action quoted by Appellant is not, however, reflective of the Examiner's determination. The full sentence provides that "[t]his is a functional limitation, and therefore was not evaluated on its own, but in conjunction with the remainder of claim 1." Final Act. 3. In any case, we consider the scope of the limitation at issue as follows.

The claims are to an "assembly." Appeal Br. 23–27 (Claims App'x.). Thus, the claims are apparatus claims.[3] *See* 35 U.S.C. § 101. It has long been held that "apparatus claims cover what a device is, not what a device

[3] Claims 13–15, and 18 are to a "system." Accordingly, they are also apparatus claims.

does." *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1468 (Fed. Cir. 1990). Here, the Applicant uses functional language ("adapts," "changes shape") to define the claim. In order to be accorded patentable weight, functional language in an apparatus claim must limit the claim in terms of structure rather than function. *In re Schreiber*, 128 F.3d at 1477-78; MPEP § 2114. Thus, the limitation at issue is construed to require that the assembly or system of the claims "possess[es] the recited structure [which is] capable of performing the recited functions." *See MasterMine Software v Microsoft Corp.*, 874 F.3d 1307, 1315–16 (Fed. Cir. 2017).

The Examiner makes a specific finding that "it is inherent to the material [of Yambe] that in response to a change in temperature a change in shape will occur, regardless of how the change in temperature is applied." Ans. 17. That is, the Examiner finds that Yambe teaches structure *capable of* changing shape in response to a change in ambient temperature.

As persons of scientific competence in the fields in which they work, examiners are responsible for making findings, informed by their scientific knowledge, as to the meaning of prior art references to persons of ordinary skill in the art. Absent legal error or contrary factual evidence, those findings can establish a prima facie case of obviousness. *In re Berg*, 320 F.3d 1310, 1315 (Fed. Cir. 2003).

The Examiner's finding that Yambe's memory alloy is capable of changing shape in response to a change in ambient temperature is not specifically rebutted and is sufficient to support a prima facie case of obviousness. Accordingly, Appellant has not shown error in this regard.

Second, Appellant argues that Yambe fails to teach an assembly "wherein the at least one shape-changing actuator is formed of a single piece

of wire having a plurality of windings that wrap around or within the at least one aspect-controlling portion." Appeal Br. 15–16. Appellant argues that Yambe's disclosure of a "plurality of two-way shape memory alloys" teaches a device with multiple alloys rather than "a single piece of wire" as claimed. *Id.* at 16.

In the Answer, the Examiner interprets the limitation "as the environmental aspect control assembly comprising at least one shape-changing actuator (i.e. either a single actuator or a plurality of actuators), wherein each individual actuator is formed of a single wire with a plurality of windings." Ans. 18. The Examiner further construes the claim to "limit[] each individual shape-changing actuator to being formed of a single piece of wire." *Id.* The Examiner maintains the findings that these limitations are satisfied by Yambe's two-way shape memory alloys wound around a transport tube. *Id.* at 19.

We find the Examiner's determinations to be supported by the record. Figure 2A of Yambe, *supra*, shows several memory alloys 2 (actuators). The claim's "*at least one* shape-changing actuator" language explicitly permits multiple actuators. Further, the Examiner's finding that the memory alloy may be a wire arranged in a helical or ring form (*id.* at 19) is supported. *See* Yambe ¶ 14 ("The two-way shape memory alloy may be of a fine wire shape or a coil form."); *see also* Yambe Fig. 2A. Thus, we adopt the Examiner's finding that "Yambe discloses at least one two-way shape memory alloy (*shape changing actuator*) which individually comprise a single wire and a plurality of windings." Ans. 20.

Accordingly, Appellant has not shown error in this regard.

Third, Appellant argues that the Examiner has adopted certain inconsistent positions during the course of prosecution. Appeal Br. 16–18. Appellant argues that "the evolving positions within the Office Actions cast doubt on the sufficiency of support for the current positions and arguments within the Office Action." *Id.* at 18. Appellant further argues that inconsistency "seemingly impeach[es] any deference that the Board may deem it owes to the Examiner." *Id.* This is not persuasive of error.

The Board has a statutory duty to "review adverse decisions of examiners upon applications for patents." 35 U.S.C. § 6(b)(1). Prior actions by the Examiner are not "adverse decisions" presently under review and are outside the scope of the present appeal. Further, the Federal Circuit has held that prior decisions during prosecution are not binding on the Examiner. *See BlackLight Power v. Rogan*, 295 F.3d 1269, 1273–1274 (Fed. Cir. 2002) (quoting *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994) (en banc) ("the Commissioner has an obligation to refuse to grant a patent if he believes that doing so would be contrary to law.")); *see also id.* at 1273 ("The complexity of the examination process, and the potential for error in any human activity, weigh on the side of according the PTO latitude.").

Accordingly, Appellant has failed to show error in the rejection on this basis.

Rejections 2–7. The Examiner rejects claims 3–6, 9, 11–15, and 18–20 as obvious over Yambe and various additional references. Final Act. 4–13. In support of its appeal of these claims, Appellant relies on the arguments described above. Appeal Br. 19–22. As we have not found such

arguments to be persuasive, we find that Appellant has not shown error with respect to the rejection of claims 3–6, 9, 11–15, and 18–20.

CONCLUSION

The Examiner's rejections are affirmed.

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 7, 8, 10	102(a)(1)	Yambe	1, 7, 8, 10	
3, 5, 6, 12	103	Yambe, Lewis, Ashby	3, 5, 6, 12	
4, 9	103	Yambe, Lewis, Kim, Tortora, Ashby	4, 9	
11	103	Yambe, Jacobs	11	
13, 18–20	103	Yambe, Lewis, Ashby	13, 18–20	
14	103	Yambe, Lewis, Ashby, Barton	14	
15	103	Yambe, Lewis, Kim, Tortora, Ashby	15	
Overall Outcome			1, 3–15, 18–20	

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