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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte HANS-PETER NÜRNBERG

Appeal 2019-006909
Application 15/366,821
Technology Center 3700

Before JOHN C. KERINS, JILL D. HILL, and GEORGE R. HOSKINS,
Administrative Patent Judges.

HOSKINS, *Administrative Patent Judge.*

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1–3, 5–8, 10–13, and 15–21 in this application.

A telephonic hearing was held on September 10, 2020. *See* Transcript (entered Sept. 21, 2020).

We AFFIRM.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies adidas AG as the real party in interest. Appeal Br. 3.

CLAIMED SUBJECT MATTER

Claim 1 is the sole independent claim on appeal, and it recites:

1. A ball comprising:
 - a bladder having a majority weight component of a material of a first material class;
 - at least one intermediate layer arranged exterior to the bladder and having a majority weight component of the material of the first material class; and
 - at least one exterior layer arranged exterior to the at least one intermediate layer and having a majority weight component of the material of the first material class,wherein the first material class is selected from a group consisting of thermoplastic polyurethane, polyvinyl chloride, polyethylene, polyamide, and polypropylene.

Appeal Br. 15 (Claims App.).

REJECTIONS ON APPEAL

Claims 1–3, 5–8, 10, 11, and 17–21 are rejected under 35 U.S.C. § 103 as unpatentable over Ou '795 (US 6,206,795 B1, iss. Mar. 27, 2001), Ou '018 (US 6,348,018 B1, iss. Feb. 19, 2002), and Lin (US 2010/0144470 A1, pub. June 10, 2010).

Claim 12 is rejected under § 103 as unpatentable over Ou '795, Ou '018, Lin, and Taniguchi (US 2006/0084536 A1, pub. Apr. 20, 2006).

Claim 13 is rejected under § 103 as unpatentable over Ou '795, Ou '018, Lin, and Swiszc (US 2014/0100067 A1, pub. Apr. 10, 2014).

Claim 15 is rejected under § 103 as unpatentable over Ou '795, Ou '018, Lin, and Lo (US 8,622,857 B2, iss. Jan. 7, 2014).

Claim 16 is rejected under § 103 as unpatentable over Ou '795, Ou '018, Lin, and Dobrounig (US 6,306,054 B1, iss. Oct. 23, 2001).

OPINION

*A. Obviousness over Ou '795, Ou '018, and Lin
(Claims 1–3, 5–8, 10, 11, and 17–21)*

Appellant argues claims 1–3, 5–8, 11, and 17–21 as a first group, and argues claim 10 separately as a second group. Appeal Br. 6–12. We select claim 1 to decide the appeal as to the first group, then we address claim 10 separately as the second group. *See* 37 C.F.R. § 41.37(c)(1)(iv) (2018).

1. Claims 1–3, 5–8, 11, and 17–21

The issues presented here revolve around claim 1’s requirement for all three layers of the ball to include the same material class. The Examiner’s rejection focuses on thermoplastic polyurethane as the material class.

Specifically, the Examiner finds Ou ’795 discloses, in Figures 2 and 3, a ball (i.e., basketball 20) comprising a bladder (i.e., spherical bladder carcass 30), an intermediate layer (i.e., cushion layer 42), and an exterior layer (i.e. cover layer 41). *See* Final Act. (mailed Sept. 7, 2018), 2; Non-Final Act. (mailed Mar. 7, 2018), 3; Ans. 3; Ou ’795, 2:66–3:2, 3:14–15, 3:20–22. The Examiner finds Ou ’795 discloses bladder 30 is made from rubber, intermediate layer 42 is made from polyurethane foam, and exterior layer 41 is made from polyurethane. *See* Non-Final Act. 3 (citing Ou ’795, 3:1–2, 3:10–38); Ans. 3. Appellant does not contest these findings, which we determine are supported by a preponderance of the evidence. *See* Ou ’795, 3:1–2 (“spherical bladder carcass 30 . . . is a hollow rubber ball”), 3:14–16 (“cover layer 41 [is] made of leather or synthetic leather such as polyurethane (PU) or polyvinyl chloride (PVC)”), 3:21–39 (“cushion layer 42 [is] made of foam material . . . such as EVA, PU foam, or sponge”).

Appellant argues the Examiner employs improper hindsight in selecting polyurethane as the material for intermediate layer 42 and exterior layer 41. *See* Appeal Br. 6, 7, 9. We disagree. Ou '795 discloses three specific materials for intermediate layer 42, and three specific materials for exterior layer 41. Ou '795, 3:14–16, 3:21–39. A person of ordinary skill in the art would understand Ou '795 thereby discloses any respective combination of the specific materials identified in each list of possibilities, including polyurethane foam for intermediate layer 42 and polyurethane for exterior layer 41. *Id.* This is not a hindsight modification or addition to the disclosure of Ou '795; it is simply a reading of the disclosure by a person of ordinary skill in the art. Thus, we find Ou '795 discloses a basketball in which the bladder is made of rubber, and the intermediate layer and the exterior layer are made of polyurethane.

Next, the Examiner finds “Ou '018 reveals that it is known in the art of inflatable game balls to form the bladder from rubber or polyurethane.” Final Act. 2, 3 (citing Ou '018, 2:61–62); Ans. 3 (citing Ou '018, 2:61–3:14). The Examiner finds the ball of Ou '018 also has a cover made from polyurethane. Final Act. 4 (citing Ou '018, 2:31–35, 2:61–62). Based on these disclosures, the Examiner determines “[i]t would have been obvious . . . to form the bladder of Ou '795 from polyurethane in order to take advantage of that material’s well known physical characteristics.” *Id.* at 2, 3–4 (referring further to “the teaching of Ou ['795] to form his bladder from rubber and Ou ['018] teaching that the use of rubber and polyurethane are equally well known in the art of sports balls”); Ans. 3–4.

Appellant argues the Examiner employs improper hindsight in modifying the bladder of Ou '795 to be made of polyurethane instead of

rubber, based on the “conclusory rationale . . . to take advantage of the material’s ‘well known physical characteristics.’” Appeal Br. 6, 7, 9–10; Reply Br. 5. Appellant faults the Examiner for not identifying the physical characteristics that were well known, or how the characteristics were not already present in Ou ’795 without replacing its rubber bladder with a polyurethane bladder. Appeal Br. 9–10. Further, according to Appellant: “Ou ’018 fails to disclose or suggest that a *polyurethane* inflatable bladder is used with a *polyurethane* ball cover,” because “Ou ’018 only connects a *polyurethane* bladder with a *leather* ball cover.” *Id.* at 7 (citing Ou ’018, 1:17–19, 2:31–35, 2:61–62); Reply Br. 3–4.

We conclude a preponderance of the evidence supports the Examiner’s determination of obviousness, which is based on an articulated, rational underpinning. *See In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006), *cited with approval in KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). “The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR*, 550 U.S. at 416. For example: “[W]hen a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result.” *Id.*

We agree with the Examiner’s application of these principles to this case. We do not find anything unpredictable in substituting polyurethane for rubber as the bladder material in the basketball of Ou ’795, given the disclosure in Ou ’018 that an inflatable game ball bladder may be “generally made of rubber *or* polyurethane.” Ou ’018, 2:55–62 (emphasis added). That disclosure reflects the understanding of a person of ordinary skill in the art

that rubber and polyurethane are known to be predictable, alternative materials for forming an inflatable bladder in a game ball. Appellant provides no persuasive reason why a person of ordinary skill in the art could not have implemented such a substitution, or any persuasive reason why the results of the substitution would have been unpredictable. Thus, we conclude the Examiner's obviousness rejection permissibly relies on a predictable substitution of art-recognized equivalent bladder materials.

We, further, agree with the Examiner's finding that Ou '018 discloses American football 1 having at least two layers, ball cover 10 and inflatable bladder 20, both made of polyurethane. *See* Ans. 8–9, 11; Ou '018, Fig. 1, 2:23–39, 2:55–62, 3:3–6. This is not hindsight; it is simply reading the disclosure of Ou '018. We flatly reject Appellant's contention that the description of a “conventional” ball in the background of Ou '018 being formed by a polyurethane bladder and a leather cover reveals that the entire disclosure of Ou '018, including its inventive ball, is limited to using a polyurethane bladder only with a leather cover. *See id.* at 1:13–19. For example, Ou '018 discloses that even conventional balls could have a polyurethane cover, rather than a leather cover. *See id.* at 1:25–28.

Thus, the combination of Ou '795 and Ou '018 rationally leads, without hindsight, to a ball having a polyurethane bladder, a polyurethane intermediate layer, and a polyurethane exterior layer. Claim 1 specifically requires “*thermoplastic polyurethane*” in all three layers. Appeal Br. 15 (Claims App.) (emphasis added). The Examiner correspondingly finds “Lin reveals that it is known in the art of inflatable game balls to use thermoplastic polyurethane as the material for the game ball.” Final Act. 2, 4 (citing Lin ¶ 11); Ans. 4 (citing Lin ¶¶ 11, 24–25).

The Examiner determines it would have been obvious “to use thermoplastic polyurethane as the material for the game ball of Ou ’795 as modified by Ou ’018 in order to take advantage of that material’s well known physical characteristics.” Final Act. 4–5; Ans. 4. The Examiner finds Lin particularly discloses thermoplastic polyurethane “facilitates recycling and manufacture,” and has good shock-absorbing properties and a high resistance to impact and abrasion, providing a rational basis for obviousness. Final Act. 5 (citing Lin ¶¶ 29, 37); Ans. 4.

Appellant argues the Examiner employs improper hindsight in relying on Lin for the obviousness of using thermoplastic polyurethane in all three layers of the basketball of Ou ’795, based on the “conclusory rationale . . . to take advantage of the material’s ‘well known physical characteristics.’” Appeal Br. 6, 8–10. Appellant asserts Lin’s disclosure is limited to using thermoplastic polyurethane *only* in an exterior layer, so Lin does not disclose or suggest using thermoplastic polyurethane to make the bladder. *Id.* at 6, 8 (citing Lin ¶¶ 25, 35). Thus, according to Appellant, the rejection is deficient because the three cited references do not disclose or suggest using thermoplastic polyurethane to make the bladder. *Id.* at 8–10. Appellant asserts that, even if the Examiner is correct that Lin discloses using thermoplastic polyurethane in an exterior layer to facilitate manufacturing and recycling of a game ball, and advantageously provides a high resistance to impact and abrasion, still there is no reason for forming the bladder from thermoplastic polyurethane. *Id.* at 9–10.

We conclude a preponderance of the evidence supports the Examiner’s determination of obviousness, which is based on an articulated, rational underpinning. “It is well-established that a determination of

obviousness based on teachings from multiple references does not require an actual, physical substitution of elements.” *In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012) (citations omitted). “Rather, the test for obviousness is what the combined teachings of the references would have suggested to those having ordinary skill in the art.” *Id.* at 1333; *see also In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (each prior art reference “must be read, not in isolation, but for what it fairly teaches in combination with the prior art as a whole”).

As discussed above, the combination of Ou ’795 and Ou ’018 leads rationally to a basketball having all three components (bladder, intermediate layer, and exterior layer) made of polyurethane. We agree with the Examiner’s finding that Lin discloses making a ball (i.e., soccer ball 4) using thermoplastic polyurethane to form an intermediate layer (i.e., foamed layer 412) and an exterior layer (i.e., non-foamed layer 411), in combination with air bladder 43 having an unspecified material composition. *See* Lin, Fig. 8, ¶¶ 24–25, 35. We also agree with the Examiner’s finding that Lin discloses thermoplastic polyurethane layers 411, 412 provide at least two advantages: (1) “it is not necessary to separate the two layers when recycling” the ball, and (2) the ball “has good shock-absorbing properties and high resistance to impact and abrasion.” *Id.* ¶¶ 7–8, 29, 37.

A person of ordinary skill in the art would readily appreciate that making *all three* polyurethane layers of the ball, which results from combining Ou ’795 and Ou ’018, out of *thermoplastic* polyurethane as disclosed by Lin for the intermediate and exterior layers, would achieve the same recycling and performance advantages discussed in Lin. *See* Ans. 10–11. Appellant does not provide any reason why this would not

occur, and we perceive none. There is, therefore, a rational basis for the obviousness of claim 1, despite that none of the three references discloses a bladder made of thermoplastic polyurethane.

We acknowledge Appellant's point that Lin does not disclose forming a bladder from thermoplastic polyurethane. Nonetheless: "A person of ordinary skill is also a person of ordinary creativity, not an automaton," and "in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle." *KSR*, 550 U.S. at 420, 421. Here, a person of ordinary skill in the art would appreciate that forming all three polyurethane layers of the ball of Ou '795 and Ou '018 (including the bladder) out of thermoplastic polyurethane would obtain the recycling, biodegradability, and performance characteristic advantages described in Lin. Lin ¶¶ 29, 37. In particular, this would avoid the need to separate the bladder from the other layers when recycling. *Id.* ¶ 29. Further, while the bladder may perhaps play a smaller role than the intermediate and exterior layers in providing shock-absorbing and impact resistance properties to the ball, the bladder still plays a role in providing these properties. *Id.* ¶ 37.

Appellant finally argues Ou '795, Ou '018, and Lin, whether taken individually or collectively, do not disclose or suggest using the same material for all three layers in a ball, as is required in claim 1. Appeal Br. 6–8; Reply Br. 2–3. Here, Appellant asserts the respective balls disclosed in each reference each include layers of *different* materials, and no single reference discloses a ball having three layers of the *same* material. Appeal Br. 6–8; Reply Br. 2–3.

This argument is not persuasive because it attacks the respective disclosures of the three cited prior art references separately, rather than considering the Examiner's proposed combination as a whole. *See* Ans. 8; *Mouffet*, 686 F.3d at 1332–33; *Merck*, 800 F.2d at 1097. For the reasons provided above, we determine the combined disclosures of Ou '795, Ou '018, and Lin lead to the obviousness of claim 1, despite that none of the references individually discloses a ball having three layers made from the same material.

For the foregoing reasons, we sustain the rejection of claims 1–3, 5–8, 11, and 17–21 as unpatentable over Ou '795, Ou '018, and Lin.

2. *Claim 10*

Claim 10 recites: “The ball of claim 1, further comprising at least one protection layer arranged between the bladder and the at least one intermediate layer and made of the material of the first material class.”
Appeal Br. 16 (Claims App.).

The Examiner finds Ou '795, in Figure 4, correspondingly illustrates “additional layers (320) and (43)” that “define protection layers” arranged between bladder 30 and intermediate layer 42. Non-Final Act. 4; Final Act. 2 (incorporating Non-Final Office Action); Adv. Act. (mailed Dec. 26, 2018). The Examiner finds layer 320 is “part of the bladder carcass,” along with bladder 30, but is separated from bladder 30 by reinforcing lining layer 301. Ans. 5, 12 (citing Ou '795, 3:1–5). Therefore, the Examiner determines it would have been obvious to change the material of layer 320 from rubber to thermoplastic polyurethane, along with bladder 30, for the reasons discussed above in connection with claim 1. Adv. Act.; Ans. 5, 12–13.

Appellant contends the Examiner's rejection of claim 10 "is guided by improper hindsight for similar reasons as discussed . . . with respect to claim 1." Appeal Br. 11–12; Reply Br. 6. Appellant specifically objects to the Examiner's reasons for modifying bladder 30 of Ou '795 to be made of thermoplastic polyurethane in light of Ou '018 and Lin. Appeal Br. 11–12. Appellant characterizes the Examiner's position as being that "if a material is disclosed for any part of a ball, it would be obvious to use it for any other part of the ball," and "because Lin discloses the same material for two layers of an outer shell, it would be obvious to make every layer of the entire b[a]ll out of that material." *Id.* Appellant further argues the "Examiner has not shown a known instance of thermoplastic polyurethane as a protective layer." Reply Br. 6.

For substantially the same reasons provided above in connection with claim 1, we do not discern error in the Examiner's rejection of claim 10. In particular, we agree with the Examiner's finding that Ou '795's reinforcing lining layer 301 bifurcates bladder carcass 30 into an inner layer and an outer layer, which are made of the same material. *See* Ou '795, Figs. 3–4, 3:1–3. Appellant does not dispute this finding.

As discussed above, it would have been obvious to use thermoplastic polyurethane as the bladder carcass material, creating a bladder layer (the inner layer of bladder carcass 30) and a protection layer (the outer layer of bladder carcass 30), both made of thermoplastic polyurethane. Thus, we sustain the rejection of claim 10 as unpatentable over Ou '795, Ou '018, and Lin.

B. Obviousness over Ou '795, Ou '018, Lin, and one of Taniguchi, Swiszczy, or Lo (Claims 12, 13, and 15)

The Examiner rejects dependent claims 12, 13, and 15 as unpatentable over Ou '795, Ou '018, Lin, and one of Taniguchi, Swiszczy, or Lo. *See* Final Act. 3. In response, Appellant relies on arguments we have considered above. *See* Appeal Br. 12. For the reasons provided above, we sustain these rejections.

C. Obviousness over Ou '795, Ou '018, Lin, and Dobrounig (Claim 16)

Claim 16 recites: “The ball of claim 1, wherein the first material class is polyvinyl chloride or polyethylene.” Appeal Br. 16 (Claims App.). Here, the Examiner’s focus shifts away from thermoplastic polyurethane which is contemplated in claim 1 but not in claim 16, to the polyvinyl chloride class recited in claim 16.

Specifically, the Examiner relies on the combination of Ou '795 and Ou '018 leading to a ball having a bladder, an intermediate layer, and an exterior layer, all made from polyurethane, as described above. Non-Final Act. 6–7; Final Act. 2, 3 (incorporating Non-Final Office Action); Ans. 7. The Examiner then finds “Dobrounig teaches the equivalence between polyurethane and polyvinyl chloride in a sports ball setting.” Adv. Act. (citing Dobrounig, 4:40–44); Ans. 7, 13–14. In the Examiner’s view, the same is true of Ou '795 and Ou '018, both of which disclose polyurethane and polyvinyl chloride as alternative materials for the cover layer of a game ball. Non-Final Act. 7 (citing Ou '795, 3:13–16); Ans. 7, 13 (citing Ou '018, 3:3–8). The Examiner determines it would have been obvious,

based on these teachings, “to use polyvinyl chloride instead of the polyurethane in order to take advantage of that material’s physical characteristics.” Adv. Act.; Ans. 7, 13–14.

Appellant contends “Dobrounig only references polyvinyl chloride once,” where it states: “The next layer 50 in the sequence of layers involves the syntactic foam layer according to the invention,” and “polyurethane is used as matrix material 52 into which hollow spheres 54 are mixed” but “[p]olyurethane foams or PVC [polyvinyl chloride] can also be used.” Appeal Br. 13 (quoting Dobrounig, 4:40–44). Appellant asserts this disclosure is “that PVC can be used for a specific application in place of polyurethane,” which “does not suggest that it would be appropriate in all situations,” so the Examiner has relied on improper hindsight. *Id.*; Reply Br. 6–7.

We agree with the Examiner’s finding that the disclosures of Ou ’795, Ou ’018, and Dobrounig all reflect the understanding of a person of ordinary skill in the art that polyurethane and polyvinyl chloride are known substitutes for each other as a layer material in a sport ball. *See* Ou ’795, 3:13–16 (“Each of the cover panels 40 comprises a cover layer 41 made of leather or synthetic leather such as polyurethane (PU) or polyvinyl chloride (PVC).”); Ou ’018, 3:3–8 (“The cover skin 23 of each of the cover pieces 11 is made of leather, or synthetic leather such as polyvinyl chloride (PVC) or polyurethane (PU) with or without foaming material for backing”); Dobrounig, 4:40–44 (“The next layer 50 in the sequence of layers involves the syntactic foam layer,” in which “[p]olyurethane foams or PVC can . . . be used.”).

Based on this understanding, it would have been obvious to substitute polyvinyl chloride for polyurethane in the ball of Ou '795 and Ou '018. We do not find anything unpredictable in making this substitution given the cited prior art disclosures, which instead indicate polyurethane and polyvinyl chloride are known to be predictable, alternative materials in this regard. Appellant provides no persuasive reason why a person of ordinary skill in the art could not have implemented such a substitution, or any persuasive reason why the results of the substitution would have been unpredictable. Thus, we conclude the Examiner's obviousness rejection permissibly relies on a predictable substitution of art-recognized equivalent ball layer materials.

For the foregoing reasons, we sustain the rejection of claim 16 as unpatentable over Ou '795, Ou '018, Lin, and Dobrounig.

DECISION SUMMARY

In summary, we affirm the Examiner's decision to reject claims 1-3, 5-8, 10-13, and 15-21, as summarized in this table:

Claim(s) Rejected	35 U.S.C. §	Reference(s) / Basis	Affirmed	Reversed
1-3, 5-8, 10, 11, 17-21	103	Ou '795, Ou '018, Lin	1-3, 5-8, 10, 11, 17-21	
12	103	Ou '795, Ou '018, Lin, Taniguchi	12	
13	103	Ou '795, Ou '018, Lin, Swiszczy	13	
15	103	Ou '795, Ou '018, Lin, Lo	15	
16	103	Ou '795, Ou '018, Lin, Dobrounig	16	
Overall Outcome			1-3, 5-8, 10-13, 15-21	

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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