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## United States Court of Appeals for the Federal Circuit

01-1364

JOSEPH A. GENTILUOMO,

Plaintiff-Appellant,

v.

BRUNSWICK BOWLING AND BILLIARDS CORPORATION  
(individually and doing business as Brunswick Technology Ventures and as Quantum),

and

COLUMBIA 300, INC. (individually and doing business as Track, Inc.),

and

PIN BREAKER, INC.,

Defendants-Appellees,

and

ROTO-GRIP, INC.,

Defendant.

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DECIDED: June 5, 2002

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Before LOURIE, Circuit Judge, PLAGER, Senior Circuit Judge, and DYK, Circuit Judge.

LOURIE, Circuit Judge.

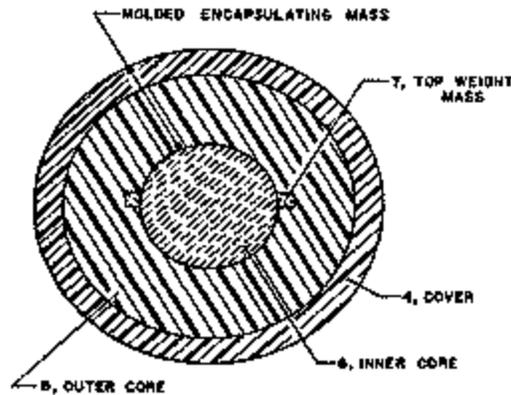
Joseph A. Gentiluomo appeals from the decision of the United States District Court for the Northern District of New York granting summary judgment of invalidity of

Gentiluomo's U.S. Reissue Patent 34,614. Gentiluomo v. Brunswick Bowling & Billiards

Corp., No. 96-cv-544 (N.D.N.Y. Nov. 1, 1999). For the reasons set forth below, we affirm-in-part and reverse-in-part.

## **BACKGROUND**

Mr. Gentiluomo is the sole inventor and owner of the '614 patent, which is directed to a bowling ball having an increased total kinetic energy output. According to the written description of the patent, the invention achieves that objective by concentrating more of the ball's mass toward the center of the ball, i.e., by decreasing the ball's moment of inertia, and thereby achieving a more favorable tradeoff of rotational kinetic energy for translational kinetic energy. '614 patent, col. 1, l. 55 to col. 2, l. 11. An embodiment of the bowling ball has an inner core surrounded by an encapsulating mass with an optional top weight mass adjacent to the inner core, as illustrated in Figure 2 of the patent, reproduced below:



Of the three independent claims in the original patent, two of them defined the inventive balls as having an inner core and an encapsulating mass with specific gravities (having units of weight per volume) in certain ranges. For example, original independent claims 1 and 12 recited, *inter alia*, that the inner core had a “minimum specific gravity of 0.1063 per pound of ball weight,” ’614 patent, col. 7, ll. 40-41, col. 8, ll. 24-25, and that the specific gravity of the molded encapsulating mass “range[d] downward to a minimum value of 0.38,” *id.* at col. 7, ll. 44-45; col. 8, ll. 28-29. The third independent claim in the original patent, claim 17, did not specify a specific gravity of the encapsulating mass, but, unlike claims 1 and 12, did require an “annular shaped (top) weight mass located closely around said inner core,” *id.* at col. 8, ll. 57-58, as depicted by top weight mass 7 in Figure 2.

Shortly after the original patent issued, however, Gentiluomo became aware of prior art bowling balls having specific gravities of their inner cores and encapsulating masses within the ranges he had claimed. In particular, Gentiluomo measured the specific gravities of the encapsulating masses in a Randolph Classic Technica Silver Bullet II (“Randolph Classic”) and a Faball I (“Fab I”) bowling ball to be 1.219 and 1.213, respectively. In his Reissue Application Declaration, Gentiluomo explained the relevance of those prior art balls as follows:

Based on the newly discovered prior art, it now appears that Applicant inadvertently claimed more than he was entitled to. . . . Since the inventive concept of my invention was to relocate weight from the outer portion of prior art balls to within the center portion of the ball, in order to

lower ball moment of inertia . . . the ball's encapsulating mass specific gravity must be made less than that of both the "Technica II Silver Bullet" and the Fab I balls in order to distinguish thereover.

Finding support in the original application for a specific gravity of the encapsulating mass up to 2.30, Gentiluomo chose to file new claims reciting an upper limit of 1.195, slightly below the values measured in the Randolph Classic and Fab I balls. The '614 patent then issued with new claims replacing all of the original claims. Two of the new independent claims, claims 24 and 32, require that the specific gravity of material in the encapsulating mass be in the range "from 1.195 to 0.38 for a specific fixed weight ball." *Id.* at col. 9, ll. 21, 58. A third new independent claim, claim 45, rather than reciting a range for the encapsulating mass specific gravity, requires "an annular shape weight mass located closely around said inner core," *id.* at col. 10, ll. 47-48, similar to original claim 17.

Gentiluomo sued the defendants (collectively "Brunswick") in the district court, alleging infringement of claims 24, 32, 40, and 45, which read as follows:

24. A bowling ball, comprising:

- a) an inner core having a minimum specific gravity of 0.1625 per pound of ball weight, for balls ranging in weight from 8 to 16 pounds;
  
- b) a molded encapsulating mass surrounding said inner core, wherein material adjacent to said inner core is further characterized as having a specific gravity ranging from 1.195 to 0.38 for a specific fixed weight ball within said ball weight range, to effectuate a decrease in ball moment of inertia;
  
- c) said ball having a maximum circumference of 27.002 inches, a minimum circumference of 26.704 inches, and a minimum ball surface Durometer hardness of 72 Shore D;

- d) said ball moment of inertia, of said fixed weight ball, decreases with an increase in inner core density, to effectuate an increase in the total kinetic energy output of said fixed weight ball.

32. A bowling ball, comprising:

- a) an inner core having a minimum specific gravity of 0.1063 per pound of ball weight, for balls ranging in weight from 8 to 16 pounds;
- b) a molded encapsulating mass surrounding said inner core, wherein material adjacent to said inner core is further characterized as having a specific gravity ranging from 1.195 to 0.38 for a specific fixed weight ball within said ball weight range, to effectuate a decrease in ball moment of inertia;
- c) the specific gravity of said inner core being greater than that of said material adjacent to said inner core;
- d) said ball having a maximum circumference of 27.002 inches, a minimum circumference of 26.704 inches, and a minimum ball surface Durometer hardness of 72 Shore D;
- e) said specific gravity values of said inner core, and said encapsulating mass, being selected to effectuate an increase in total kinetic energy output of said fixed weight ball.

40. The bowling ball defined in claim 32, wherein said inner core minimum specific gravity per pound of ball weight, is further characterized as being increased by the amount of 0.0187, to a value of 0.1250.

45. A bowling ball having weight mass positioned to effectuate a decrease in ball moment of inertia, comprising:

- a) an inner core having a minimum specific gravity of 0.1063 per pound of ball weight, for balls ranging in weight from 8 to 16 pounds;
- b) an annular shaped weight mass located closely around said inner core;
- c) and a molded encapsulating mass surrounding said inner core and said annular shaped weight mass.

'614 patent, col. 9, ll. 14-30; col. 9, l. 51 to col. 10, l. 2; col. 10, ll. 22-25; col. 10, ll. 42-50 (emphases added).

Both Brunswick and Gentiluomo filed motions for summary judgment on the issue of validity. Gentiluomo, slip op. at 1. Brunswick argued that the asserted claims would have been obvious over the prior art and thus are invalid under 35 U.S.C. § 103. Gentiluomo argued that the claims would not have been obvious. The court agreed with Brunswick and granted its motion. Id. at 13. According to the court, “[t]he prior art clearly shows that others had described balls with inner cores having a higher density than the outer cores,” id. at 9, and “in order to base a claim of patentability on the precise specific gravities of the ball’s component materials, Plaintiff must demonstrate that the claimed range of specific gravity values (0.38 to 1.195) of the encapsulating material is critical and thus produces some unexpected result which differs from that outside the range,” id. at 10 (citing In re Geisler, 116 F.3d 1465, 1470, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997) and In re Huang, 100 F.3d 135, 136, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996)); see also id. at 11 (citing In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990)). Because Gentiluomo did not demonstrate criticality for the claimed range, id. at 10, 11, the court held that the asserted patent claims were invalid for obviousness and dismissed the complaint, id. at 13.

Because the court’s opinion only mentioned claims 24 and 32 once in passing and did not discuss any of the asserted claims in detail, the parties sought a clarification of the scope

of the judgment. The court responded that all four asserted claims were invalid. Gentiluomo v. Brunswick Bowling & Billiards Corp., No. 96-cv-544 (N.D.N.Y. Dec. 7, 2000).

Gentiluomo, pro se, appeals from the decision of the district court. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).

## DISCUSSION

We review a district court's grant of summary judgment de novo, reapplying the same standard used by the district court. Ethicon Endo-Surgery, Inc. v. United States Surgical Corp., 149 F.3d 1309, 1315, 47 USPQ2d 1272, 1275 (Fed. Cir. 1998). Summary judgment is appropriate "if the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that the moving party is entitled to a judgment as a matter of law." Fed. R. Civ. P. 56(c). When both parties move for summary judgment, the court must evaluate each motion on its own merits, resolving all reasonable inferences against the party whose motion is under consideration. McKay v. United States, 199 F.3d 1376, 1380 (Fed. Cir. 1999).

A determination that a patent is invalid typically involves a two-step process. First, the court determines the scope and meaning of the patent claims at issue. Smiths Indus. Med. Sys., Inc. v. Vital Signs, Inc., 183 F.3d 1347, 1353, 51 USPQ2d 1415, 1418-19 (Fed. Cir. 1999). That step, claim construction, is an issue of law, Markman v. Westview Instruments, Inc., 52 F.3d 967, 970-71, 34 USPQ2d 1321, 1322 (Fed. Cir. 1995) (en banc), aff'd, 517 U.S. 370 (1996), that we review de novo, Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1454, 46 USPQ2d 1169, 1172 (Fed. Cir. 1998) (en banc) (citations omitted). When an asserted ground of invalidity is anticipation under 35 U.S.C. § 102 or obviousness under 35 U.S.C. § 103, the second step involves a comparison of the asserted claims with the prior art. Whether a claim would have been obvious at the time of the invention is a question of law based on underlying findings of fact. Smiths, 183 F.3d at 1354, 51 USPQ2d at 1419-20 (citing Graham v. John Deere Co., 383 U.S. 1, 17-18 (1966)). We review a district court's underlying findings of fact

for clear error, while we rule de novo on the ultimate issue of obviousness. Id. at 1355. Because an issued patent is presumed to be valid, 35 U.S.C. § 282 (1994), the evidentiary burden to show facts supporting a conclusion of invalidity is clear and convincing evidence, WMS Gaming Inc. v. Int'l Game Techs., 184 F.3d 1339, 1355, 51 USPQ2d 1385, 1396-97 (Fed. Cir. 1999).

On appeal, Gentiluomo principally argues that he should not have been required to demonstrate any criticality for the claimed range of specific gravity because it does not overlap that in the prior art. On that basis, Gentiluomo argues that this case is distinguishable from Geisler, Huang, and Woodruff, which were cited by the district court. Gentiluomo further asserts that Brunswick did not meet its burden of establishing that it is entitled to summary judgment of invalidity, but that he did establish that he was entitled to summary judgment that the patent is not invalid when the invention is viewed as a whole. More specifically, Gentiluomo contends that the prior art fails to teach or suggest certain limitations in the claims. Gentiluomo also asserts that his invention would not have been obvious over the prior art because it reallocates the weight of a fixed weight ball from the encapsulating mass to the inner core, whereas the prior art teaches that the inner core's specific gravity or weight is varied in order to obtain balls of different weight (because the specific gravity of the encapsulating mass is fixed). Gentiluomo further asserts that certain prior art taught away from his invention by teaching bowling balls with light cores and heavy shells, and thereby increased moments of inertia.

Brunswick responds that the district court properly considered the question of the criticality of the specific gravity range, and that the claims would have been obvious under that analysis because the claimed range is not critical. Brunswick also challenges Gentiluomo's assertion that the prior art would not have rendered obvious the claimed invention as a whole, including all of the limitations Gentiluomo alleges to have been lacking from the prior art. Finally, Brunswick contends that the district court correctly decided that claim 45 would have been obvious over the prior art because Randolph's U.S. Patent 4,264,071 discloses a

relatively denser inner core shaped so as to provide a top weight mass that serves the same function as the recited “annular shaped weight mass.”

We agree with Brunswick that there were no genuine issues of material fact precluding the court from determining that claims 24, 32, and 40 would have been obvious to one of ordinary skill in the art at the time of the invention, and that those claims are thus invalid under § 103 as a matter of law. However, the existence of genuine issues of material fact precludes summary judgment as to claim 45.

We first address Gentiluomo’s arguments that his invention would not have been obvious because it reallocates the weight of a fixed weight ball from the encapsulating mass to the inner core, and that certain prior art taught away from that concept by teaching bowling balls with light cores and heavy shells. First, we disagree with Gentiluomo’s weight-reallocation argument. That argument is premised on supposed limitations that do not appear in the relevant claims. Gentiluomo contends that the claim phrase “fixed weight ball” as well as limitation (d) of claim 24 and limitation (e) of claim 32 support the notion of weight relocation. We do not agree. The phrase “fixed weight ball” denotes that the weight of the ball does not change over time; it thus does not carry with it the significance attributed to it by Gentiluomo. Moreover, limitation (d) of claim 24 and limitation (e) of claim 32 convey merely an intended result, rather than structural limitations with respect to a given bowling ball. In any event, the claims do not require a bowling ball whose weight allocation changes over time, and the prior art bowling balls of record clearly are “fixed weight balls” as the claims contemplate. Secondly, we disagree with Gentiluomo’s argument that the prior art teaches away from the invention. Gentiluomo selectively cites prior art that might be considered to teach away from his invention, but the most pertinent prior art, that of record, does not do so. The Randolph Classic and Fab I balls, unlike the art cited by Gentiluomo to support his argument, are bowling balls having relatively heavier inner cores and therefore decreased moments of inertia. Moreover, balls with light cores and heavier shells do not necessarily teach away from the claimed balls.

Turning next to the criticality issue, we agree with Brunswick that the district court properly considered the criticality of the specific gravity range. We have affirmed determinations of invalidity or unpatentability under § 103 in cases in which the claimed invention differs from the prior art only in that the claims recite a range of values for a variable different from the range disclosed in the prior art. In such cases, it was held that the invention would have been prima facie obvious because an ordinarily skilled artisan would have sought the optimum values for the variable, Geisler, 116 F.3d at 1468, 43 USPQ2d at 1363, but that a prima facie case of obviousness could have been overcome by showing that the claimed range of the variable produced unexpected results. Id. See also Woodruff, 919 F.2d at 1578, 16 USPQ2d at 1936 (“The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. These cases have consistently held that in such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.”). In many of those cases, the claimed range and the prior art range overlapped, but in others they did not.

Despite Gentiluomo’s contrary characterization of Huang, that case did not involve overlapping ranges.<sup>[1]</sup> The invention in that case was a shock-absorbing grip for tennis racquets or the like. Huang, 100 F.3d at 137, 40 USPQ2d at 1686. The claim required that the grip comprise a textile layer and a polyurethane layer, and that the ratio of their thicknesses (textile to polyurethane) be “larger than approximately 0.18.” Id. at 137, 40 USPQ2d at 1687. The prior art disclosed the same two layers in thickness ratios ranging from 0.111 to 0.142. Id. at 136, 40 USPQ2d at 1686-87. We affirmed the Board’s obviousness rejection because “one of ordinary skill would have experimented with various thicknesses to obtain an optimum range” and “Huang does not contend that he has achieved unexpected results by increasing the thickness of the polyurethane layer.” Id. at 139, 40 USPQ2d at 1689. Previous decisions had held similarly. See In re Aller, 220 F.2d 454, 105 USPQ 233 (CCPA 1955) (affirming an obviousness rejection of a claim to a chemical process reciting use of 25-

70% sulfuric acid at 40-80 degrees when the prior art disclosed the same reaction with 10% sulfuric acid at 100 degrees); In re Hill, 284 F.2d 955, 128 USPQ 197 (CCPA 1960) (affirming an obviousness rejection of a claim to a chemical process conducted at 150-250 degrees when the prior art disclosed the same reaction at 300 degrees); see also Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 227 USPQ2d 773 (Fed. Cir. 1985) (holding invalid as obvious a claim to a titanium alloy reciting 0.8% nickel (Ni) and 0.3% molybdenum (Mo) when the prior art disclosed similar alloys having 0.75% Ni and 0.25% Mo, as well as 0.94% Ni and 31% Mo).

In this case, Brunswick has established obviousness by clear and convincing evidence. In particular, Brunswick has established that the prior art bowling balls were constructed with an inner core and an encapsulating mass having different specific gravities, that the relationship between the specific gravities of a ball's component materials and its total kinetic energy were well known and predictable, and thus selection of a particular value for the encapsulating mass or inner core specific gravity was within the skill of the ordinary artisan, in the absence of any unexpected effects resulting from that selection. Because Gentiluomo failed to proffer any evidence of unexpected results attributable to the claimed range of specific gravity, Brunswick was entitled to summary judgment of invalidity of claims 24, 32, and 40, all of which differ from the prior art only in the range of specific gravity.

Claim 45, however, is in a different posture. The limitations of that claim are different from those of the other litigated claims, and the district court did not separately analyze that claim in light of the prior art. Claim 45 contains no recitation concerning the specific gravity of the encapsulating mass. Instead, it states that "an annular shaped weight mass [is] located closely around said inner core." '614 patent, col. 10, ll. 47-48. To support its assertion that claim 45 would have been obvious, Brunswick relied on an affidavit from Thomas A. Kircher in which he opined as follows:

It is well known in the trade that bowling balls must be provided with appropriately located interior weighting to compensate for the loss of material that occurs when finger holes are drilled into the ball. This '614 patent provides

the extra weight in the form of top weight mass 7 which is close to or part of the inner core 6, thus causing the weight center of core 6 to be offset from the ball geometric center. Randolph patents [4,131,]277 and '071 (Exhs D, J) show constructions having cores 5 and 10, respectively, in which the core is shaped to perform the same function as the core 6 and ring 7. I am of the opinion that the use of a weight like the ring 7 of the '614 would be a completely obvious construction in view of the 277 and '017 patent.

Viewing that statement in the light most favorable to Gentiluomo for the purposes of Brunswick's motion for summary judgment, it falls short of establishing the absence of a triable issue of fact. On its face, Mr. Kircher's conclusion does not follow from the remainder of the passage. Kircher correctly characterizes the Randolph patents as disclosing a core having an irregular shape or off-center position. Notably, however, Randolph's patents do not disclose an annular mass, a separate element from the inner core and the encapsulating mass. That Randolph uses a different element — the core, whether irregularly shaped or positioned off-center — to create the same effect as Gentiluomo's "annular shaped . . . mass" would not have suggested to one skilled in the art to add such a separate "annular shaped . . . mass." Indeed, a fact-finder might reach the conclusion that Randolph teaches a different solution to the same problem, steering one skilled in the art, if anywhere, away from Gentiluomo's solution recited in claim 45. We therefore reverse the court's grant of Brunswick's motion as it concerns claim 45. Because there exist genuine issues as to the teachings of Randolph in relation to claim 45, we affirm the court's denial of Gentiluomo's motion for summary judgment.

In sum, because claims 24, 32, and 40 of Gentiluomo's '614 patent are invalid under 35 U.S.C. § 103, the district court correctly granted summary judgment in favor of Brunswick as to claims 24, 32, and 40. However, the court erred when it granted Brunswick's motion for summary judgment of invalidity of claim 45, though it correctly denied Gentiluomo's motion for summary judgment of validity of the same claim. Accordingly, we affirm-in-part and reverse-in-part.

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[1] Gentiluomo algebraically manipulates the polyurethane to textile ratios (P/T) claimed by Huang and disclosed in the prior art, assuming for both that  $T = 0.032$  inches, to argue that the value of P corresponding to the ratio claimed by Huang overlaps the value of P corresponding to the range disclosed by the prior art. We disagree. According to our calculations, the result is that the prior art range corresponds to  $0.00355 \leq P \leq 0.00454$ , and the claimed value corresponds to  $P \leq 0.00576$ . Those ranges clearly do not overlap.

