

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* LANE D. LEMONS, FRANK M. SIMONUTTI, and ROBERT T.  
THURMAN

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Appeal 2008-2141  
Application 11/078,755<sup>1</sup>  
Technology Center 3700

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Decided: June 4, 2008

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Before DONALD E. ADAMS, LORA M. GREEN, and  
RICHARD M. LEBOVITZ, *Administrative Patent Judges*

ADAMS, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal under 35 U.S.C. § 134 involves claims 77-79 and 82-97, the only claims pending in this application. We have jurisdiction under 35 U.S.C. § 6(b).

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<sup>1</sup> This application is the divisional of Application No. 10/752,634, Appeal No. 2008-2808.

## INTRODUCTION

The claims are directed to a golf ball. Claims 77 and 89 are illustrative:

77. A golf ball comprising:

a core comprising a high cis-content polybutadiene rubber, a co-crosslinking agent, and a free radical initiator, the core having a deflection, under an applied static load of 200 lb., of greater than about 0.160 inches;

an inner layer comprising about 60% to about 80% ethylene, from about 8% to about 20% by weight of an  $\alpha$ ,  $\beta$ -unsaturated carboxylic acid and from about 5% to about 25% of an n-alkyl acrylate, about 100% of the carboxylic acid of the inner layer being neutralized with metal ions; and

a cover layer comprising about 80% to about 82% by weight of ethylene and about 18% to 20% of weight of an  $\alpha$ ,  $\beta$ -unsaturated carboxylic acid, and having a shore D hardness within the range of 50 to 75.

89. The golf ball of claim 77, wherein the core, the inner layer, and the cover layer each have a specific gravity within the range of 1.118 to 1.132.

The Examiner relies on the following prior art references to show unpatentability:

Nakahara et al.	US 5,002,281	Mar. 26, 1991
Cavallaro et al. ('842)	US 5,947,842	Sep. 7, 1999
Cavallaro et al. ('669)	US 5,965,669	Oct. 12, 1999
Rajagopalan	US 6,613,842 B2	Sep. 2, 2003
Jordan	US 6,623,380 B2	Sep. 23, 2003

The rejections as presented by the Examiner are as follows:

1. Claims 77-79 and 82-88 stand rejected under 35 U.S.C. § 103 as unpatentable over the combination of '842, '669, Rajagopalan, and Jordan.
2. Claims 89, 90, and 94 stand rejected under 35 U.S.C. § 103 as unpatentable over the combination of '842, '669, Rajagopalan, Jordan, and Nakahara.

We reverse.

## DISCUSSION

### *Claim Interpretation:*

#### *Claim 77:*

Claim 77 is drawn to a golf ball. The claimed golf ball comprises a core, an inner layer, and a cover layer.

The core comprises:

1. a high cis-content polybutadiene rubber,
2. a co-crosslinking agent, and
3. a free radical initiator.

In addition, claim 77 requires the core to have a deflection, under an applied static load of 200 lb., of greater than about 0.160 inches.

The inner layer comprises:

1. about 60% to about 80% ethylene,
2. from about 8% to about 20% by weight of an α, β-unsaturated carboxylic acid, and
3. from about 5% to about 25% of an n-alkyl acrylate.

We interpret the percentages for each ingredient to represent the total amount of each identified ingredient in the inner layer. For example, the total amount of ethylene in the inner layer is about 60% to about 80%. In

addition, claim 77 requires that about 100% of the carboxylic acid of the inner layer is neutralized with metal ions.

The cover layer comprises:

1. about 80% to about 82% by weight of ethylene and
2. about 18% to 20% of weight of an  $\alpha$ ,  $\beta$ -unsaturated carboxylic acid.

We interpret the percentages for each ingredient to represent the total amount of each identified ingredient in the cover layer. For example, the total amount of ethylene in the cover layer is about 80% to about 82%.

Claim 77 requires the cover to have a shore D hardness within the range of 50 to 75.

*Claim 89:*

Claim 89 depends from and further limits the golf ball of claim 77 to require that the core, the inner layer, and the cover layer each have a specific gravity within the range of 1.118 to 1.132.

*Findings of Fact (FF):*

1. ‘842 teaches a multi-layer golf ball comprising “a core, at least one cover layer and at least one mantle layer disposed between the core and cover layer” (‘842 4:63-66).
2. ‘842 teaches golf balls

having a softer feel, while also providing superior distance, low spin, durability and ease of manufacturing. Generally, the prior art has been directed at making golf balls perform like a three piece ball by providing a softer cover. The present invention is directed to improved golf balls that have low driver spin rates and substantial distance more like conventional two piece balls,

but have a soft feel by using a soft core, harder thermoplastic mantle layer, and a harder cover.

(‘842 4: 36-44.)

3. ‘842 teaches that the “composition of the golf ball core comprises a base mixture of polybutadiene, a metal salt diacrylate . . . , preferably, zinc diacrylate . . . , and a free radical initiator, to which at least some calcium oxide (CaO) is added instead of zinc oxide as an activation agent” (‘842 5: 6-12).

4. ‘842 teaches that the “polybutadiene preferably has a cis 1,4 content of above about 90% and more preferably above 96%” (‘842 6: 35-37).

5. Appellants’ Specification teaches that the “co-crosslinking agent is preferably a Zinc salt of an unsaturated acrylate ester. Zinc diacrylate is a preferred metal salt” (Spec. 7: ¶ 0018).

6. ‘842 teaches that “[s]uitable free radical initiators for use in the invention include, but are not limited to peroxide compounds” (‘842 6: 64-66).

7. ‘842 teaches that the “terms ‘compression’ or ‘compression points’ refer to the compression scale based on the ATT Engineering Compression Tester. This scale, which is known to those working in this field, is used in determining the relative compression of a core or ball and is sometimes referred to as the PGA compression” (‘842 6: 12-17).

8. ‘842 teaches that “[m]ost preferably, the core compression is less than about 60 and is low enough to make the ball compression less than or equal to about 80” (‘842 11: 7-9).

9. Appellants’ Specification discloses that a “deflection of greater than about 0.170 inches . . . under an applied static load of 200 lb. . . . correlates

to a PGA compression of between about -20 and 15" (Spec. 5: ¶ 0014). In addition, Appellants' Specification discloses that a "deflection of greater than about 0.160 inches . . . under an applied static load of 200 lb. . . . correlates to a PGA compression of between about -20 and 15" (Spec. 5: ¶ 0017).

10. '842 teaches that the inner layer may be composed of "a blend of a first and a second thermoplastic ('842 12: 15-17).

11. '842 teaches that

the first thermoplastic is a thermoplastic copolyetherester block copolymer, copolyesterester block copolymer, a dynamically vulcanized thermoplastic elastomer, a functionalized styrene-butadiene elastomer, a functionalized hydrogenated styrene-butadiene block copolymer, a thermoplastic polyurethane or a metallocene polymer.

('842 12: 17-24.)

12. '842 teaches that the second thermoplastic of the inner layer "is a material such as . . . a terpolymer of ethylene, acrylic or methacrylic acid and n-alkyl acrylate" ('842 12: 25-30).

13. Appellants' preferred α, β-unsaturated carboxylic acid is acrylic acid (Spec. 5: ¶ 0020).

14. '842 teaches that the cover layer is composed of "ethylene and an alpha, beta-unsaturated carboxylic acid . . . wherein 10% to 90% of the carboxylic acid groups are neutralized by a metal cation" ('842 12: 65 - 13: 5).

15. '842 teaches commercially available materials that may be used in the preparation of an inner (mantle) layer ('842 11:18 - 12: 64). '842 does not,

however, identify the concentration of each ingredient in these commercially available materials.

16. ‘842 teaches that the “cover preferably has a shore D of 65 or greater” (‘842 4: 60-61).

17. ‘842 teaches that cover materials comprise “olefin such as ethylene and an alpha, beta-unsaturated carboxylic acid such as methacrylic acid wherein 10% to 90% of the carboxylic acid groups are neutralized by a metal cation” (‘842 13: 1-7). ‘842 does not, however, identify the concentration of each ingredient in the cover layer.

18. ‘842 teaches that “[p]referably, the specific gravity of the core is less than about 1.2. The mantle layer preferably has a specific gravity greater than about 1.2 and, most preferably, about 1.25. The cover can have a specific gravity of greater than 1” (‘842 14: 22-25).

19. ‘669 teaches a multi-layer golf ball comprising “a core, a cover and one or more mantle layers disposed between the core and cover” (‘669 1:7-10).

20. ‘669 teaches that the

cover layer consists essentially of at least a first and a second ionomer resin. The first resin is a copolymer of 16 to 35% by weight of an alpha, beta-unsaturated carboxylic acid and 84 to 65% by weight of an olefin, wherein about 10 to about 90% of the carboxyl groups of the copolymer are neutralized with a metal ion. The second resin is a terpolymer of 9 to 12% by weight of an alpha, beta-unsaturated carboxylic acid, 1 to 50% by weight n-alkyl acrylate or methacrylate and 38 to 90% by weight of an olefin, wherein about 10 to about 90% of the carboxyl groups of the terpolymer are neutralized with a metal ion.

(‘669 Abstract.)

21. ‘669 teaches that “covers comprising about a 50/50 blend of sodium ionomer having about 19% by weight methacrylic acid . . . and a lithium

ionomer having about 15% by weight methacrylic acid are advantageous for distance or low spin type balls” (‘669 4: 6-11).

22. ‘669 teaches that the olefin may be ethylene (‘669 13: 67 - 14: 1).
23. ‘669 also teaches a cover layer “comprised of a blend of greater than or about 40% by weight of a first cover material, greater than or about 40% by weight of a second cover material and about or less than 15% by weight of a third cover material” (‘669 13: 51-57). This cover layer cover comprises an alpha, beta-unsaturated carboxylic acid in the range of >12.95-14.6% and ethylene in the range of 65.7-85.5%. Specifically, ‘669 teaches that the first cover material comprises

85 to 70 parts by weight of . . . ethylene and greater than 16 wt. % of an alpha, beta-unsaturated carboxylic acid such as methacrylic acid wherein about 10% to about 90% of the carboxylic acid groups are neutralized by a metal ion. . . . The second cover material . . . consist[s] of a copolymer comprising about 95 to about 80 parts by weight of ethylene and about 13 to about 16 parts by weight of an alpha, beta unsaturated carboxylic acid such as acrylic or methacrylic acid . . . wherein about 10% to about 90% of the carboxylic acid groups are neutralized by lithium. . . . [T]he third cover material . . . consist[s] of a terpolymer comprising about 38 to about 90 parts by weight of . . . ethylene and about 9 to about 12 parts by weight of an alpha, beta-unsaturated carboxylic acid such as acrylic or methacrylic acid . . . wherein about 10% to about 90% of the carboxylic acid groups are neutralized by sodium.

(‘669 13: 65 - 15: 8).

24. ‘669 teaches a golf ball core comprising “a base mixture of polybutadiene, a metal salt diacrylate . . . preferably, zinc diacrylate . . . and a free radical initiator” (‘669 6: 62-66).

25. ‘669 teaches that the inner (mantle) layer “comprises thermoplastic copolyesterester block copolymer, dynamically vulcanized thermoplastic

elastomer, styrene-butadiene elastomer with functional groups such as maleic anhydride or sulfonic acid attached, thermoplastic polyurethane or polymers made using a metallocene catalyst or blends thereof” (‘669 17: 42-48).

26. ‘669 provides a listing of suitable commercially available thermoplastic polyetheresters and thermoplastic ionomer resins (‘669 18: 38-48; *see also* ‘669 21-24: Table VII). ‘669 does not, however, identify the concentration of each ingredient of these commercially available materials in the inner (mantle) layer.

27. Rajagopalan teaches “a golf ball comprising a core and a cover” (Rajagopalan 2: 37-38).

28. Rajagopalan teaches that the “golf ball may further include an intermediate layer disposed between the core and the cover and, if so, the intermediate layer may include a tensioned elastomeric material” (Rajagopalan 3: 24-28). Rajagopalan does not however, identify the concentration of the ingredients of the inner (intermediate) layer.

29. Jordan teaches a golf ball core comprising at least about 90% and more preferably at least about 96% cis-1,4-polybutadiene, a co-crosslinking agent, and a free radical initiator (Jordan 5: 22-39).

30. Jordan teaches that “[a]ny conventional material or method may be used in preparing the golf ball cover disposed over the core” (Jordan 10: 65-66).

31. Jordan teaches “a two-piece core” wherein the “inner core comprises polybutadiene, zinc oxide, a metal salt of a material selected from the group consisting of diacrylates, dimethacrylates and monomethacrylates and tungsten” (Jordan 4: 48-53).

32. Nakahara teaches “a three-piece solid golf ball comprising a solid core consisting of an inner core and an outer shell surrounding said inner core, and a cover covering said solid core” (Nakahara Abstract).
33. Nakahara exemplifies an outer layer composition comprising cis-1,4-polybutadiene, zinc acrylate, zinc oxide, an antiaging agent and dicumyl peroxide (Nakahara 5-6: Table 1).

*Obviousness :*

1. Claims 77-79 and 82-88 stand rejected under 35 U.S.C. § 103 as unpatentable over the combination of ‘842, ‘669, Rajagopalan, and Jordan.

Based on the combined teachings of ‘842, ‘669, Rajagopalan, and Jordan the Examiner concludes that “[o]ne having ordinary skill in the art would have concluded that the amounts of each component are an obvious matter of design choice wherein any amount of the components implied by . . . ‘842 would perform equally as well because it provides the golf ball with a softer feel” (Ans. 5). ‘842, however, teaches that a softer feels is accomplished by utilizing a soft core, harder thermoplastic inner (mantle) layer, and a harder cover (FF 2). The Examiner fails to identify a teaching in ‘842 that would suggest that the concentration of ingredients set forth in Appellants’ claimed invention would meets these requirements.

‘842 fails to teach the concentration of each ingredient in the inner (mantle) and cover layers (FF 15 and 17). While the Examiner attempts to make up for this deficiency by directing attention to ‘669 and Rajagopalan, neither of these references teach the concentration of each ingredient in the inner (mantle) layer (FF 25, 26, and 28). For example, ‘669 describes the

amounts in the cover layer (FF 20-23), but not in the inner (mantle) layer (FF 26).

We recognize the Examiner's reliance on Jordan to teach a core with zero compression. However, the Examiner did not identify, and we do not find, a teaching in Jordan of a golf ball that comprises an inner layer that meets the requirements of Appellants' claimed invention.

Simply stated, the Examiner failed to identify a teaching in the prior art of an inner layer that comprises about 60% to about 80% ethylene, from about 8% to about 20% by weight of an  $\alpha$ ,  $\beta$ -unsaturated carboxylic acid and from about 5% to about 25% of an n-alkyl acrylate, about 100% of the carboxylic acid of the inner layer being neutralized with metal ions as is required by Appellants' claimed invention. In addition, the Examiner failed to identify a teaching in the prior art that an inner layer having this composition would represent a harder thermoplastic inner (mantle) layer as required by '842. Accordingly, we find that the Examiner failed to meet his initial burden of presenting the evidence necessary to establish a *prima facie* case of obviousness.

Having found that the Examiner failed to identify a teaching in the prior art that would have lead a person of ordinary skill in this art to an inner layer comprising the concentration of ingredients required by Appellants' claimed invention, we need not address the Examiner's findings with regard composition of the core and cover layer of the prior art golf balls.

For the foregoing reasons we reverse the rejection of claims 77-79 and 82-88 under 35 U.S.C. § 103 as unpatentable over the combination of '842, '669, Rajagopalan, and Jordan.

2. Claims 89, 90, and 94 stand rejected under 35 U.S.C. § 103 as unpatentable over the combination of ‘842, ‘669, Rajagopalan, Jordan, and Nakahara.

The Examiner relies on the combination of ‘842, ‘669, Rajagopalan, and Jordan as discussed above. In addition, the Examiner finds that “Cavallaro et al. discloses that the cover has a specific gravity between 0.96 to 1.2, but does not disclose all of the layers having approximately the same specific gravity” (Ans. 7).

Claims 89 and 90 depend directly or indirectly on claim 77. Claim 94 depends from claim 83, which is drawn to a golf that comprises, *inter alia*, an inner layer comprising about 60% to about 80% ethylene, from about 8% to about 20% by weight of an α, β-unsaturated carboxylic acid and from about 5% to about 25% of an n-alkyl acrylate, about 100% of the carboxylic acid of the inner layer being neutralized with metal ions.

As discussed above, the combination of ‘842, ‘669, Rajagopalan, and Jordan fail to teach a golf ball with an inner layer meeting the requirements of Appellants’ claimed invention. The Examiner did not identify, and we do not find, a teaching in Nakahara that comprises an inner layer that meets the requirements of Appellants’ claimed invention. Accordingly, for the reasons set forth above, we reverse the rejection of claims 89, 90, and 94 under 35 U.S.C. § 103 as unpatentable over the combination of ‘842, ‘669, Rajagopalan, Jordan, and Nakahara.

## CONCLUSION

In summary, we reverse the rejections of record.

Appeal 2008-2141  
Application 11/078,755

REVERSED

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