The opinion in support of the decision being entered today was not written
for publication and is not binding precedent of the Board.

Paper No. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte KORYO MIURA, TAKESHI NARUO,
KOJI SAKAI, and YOSHIHIRO FUJIKAWA

Appeal No. 2002-1488
Application No. 09/463,695

ON BRIEF

Before ABRAMS, STAAB and BAHR, Administrative Patent Judges.

STAAB, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the examiner's final rejection of claims 11-20, all the claims currently pending in the application.

Appellants' invention pertains to an oversized golf club head having a hollow portion and constructed mainly of metal, wherein a so-called PCCP structure is employed for the outer surface of the golf club head. The term "PCCP" stands for a "Pseudo-Cylindrical Concave Polyhedral" shell structure. More particularly:

> . . . the PCCP structure has a shape close to a cylindrical shape macroscopically, but it is actually an arrangement of . . . pair[s] of triangles with their bases adjoined with each other to form a diamond shape (as shown in Fig. 5) or an arrangement of each pair of trapezoids with their lower sides adjoined with each other to form a hexagon . . . . [Specification, page 4.]

An advantage of this form of construction is explained by appellants as follows:

> The cylindrical shape formed of such a PCCP structure has higher rigidity and higher bending strength in the direction toward the central axis of the cylindrical shape that a cylindrical shape formed of a smooth curved surface having the same thickness. Therefore, the golf club head having the hollow portion can be designed to have a reduced thickness without loss in the strength toward the central direction. [Specification, page 5.]

Claim 11, the only independent claim on appeal, is representative of the subject matter at issue and reads as follows:

> 11. A golf club head having a hollow portion comprising a PCCP structure, said PCCP structure defining a central axis oriented to intersect a plane defined by a face portion of said golf club head.

The references of record relied upon by the examiner in the final rejection as evidence of obviousness are:

Knapp	4,058,945	Nov. 22, 1977
Nagai et al. (Nagai)	5,190,289	Mar. 2, 1993
Allen	5,397,126	Mar. 14, 1995
Nelms	5,700,208	Dec. 23, 1997

Claims 11 and 17-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Allen in view of Knapp.

Claims 12-16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Allen in view of Knapp and further in view of Nagai and Nelms.

Reference is made to appellants' brief (Paper No. 12, filed January 28, 2002) and reply brief (Paper No. 14, filed May 8, 2002) and to the examiner's answer (Paper No. 13, mailed March 8, 2002) for the respective positions of appellants and the examiner regarding the merits of these rejections.

Discussion

At the outset, appellants assert (brief, pages 4-8) that Knapp is nonanalogous art. In an obviousness determination under 35 U.S.C. § 103(a), the question of whether an applied reference constitutes analogous art is normally considered to be a threshold issue. However, in the view we take in this appeal, even if we assume that Knapp is analogous art, the standing rejections under 35 U.S.C. § 103(a) are not well founded.

Allen, the examiner's primary reference in each of the rejections, pertains to a metal wood golf club head 10 having a crowned top wall 20 extending rearwardly from a ball striking face wall 15, a toe wall 28 and a heel wall 25 also projecting rearwardly from the face wall, but without a sole plate. The rear of the face wall 15 has an

integrally reinforced and stiffening honeycomb network 42 projecting rearwardly therefrom. As explained at column 8, lines 9-15:

> In addition to reinforcing and stiffening the face wall, the honeycomb cellular network 42 permits face wall 15 to be constructed thinner and hence lighter than normal and the weight thus saved is redistributed according to the present invention to the heel weight wall 26 and the toe weight wall 30.

Allen further explains at column 8, lines 33-48, that the thickness of the striking face wall 15 may be minimized by increasing the depth of the honeycomb network, and that the honeycomb network may be replaced with a cellular network of straight intersecting reinforcing bars.

Knapp is directed to a shell structure for resisting pressure, such as external and internal hydrostatic pressure loading (abstract), although the inherent structural rigidity of Knapp's shell design "can extend its usefulness to many other kinds of loading such as . . . gravity and wind loading, and concentrated forces" (column 1, lines 8-11). Knapp's structure comprises a plurality of flat polyhedral plates sealed together along their edges to provide an undulating cylindrical shell. As is made clear upon review of Knapp's specification and drawing figures, Knapp's shell structure comprises a polyhedral geometry that corresponds to appellants' PCCP structure. Knapp's cylindrical shell structure utilizing polyhedral plates "exhibits a larger circumferential bending rigidity (and thus a greater resistance to buckling failure) than

a perfect cylinder of equivalent overall dimensions" (column 2, lines 6-9); however, "it is much less rigid in the axial direction. Thus, a means for providing additional axial stiffness, such as an inner cylinder, is provided" (column 2, lines 16-18). Knapp envisions "many practical applications for the instant invention" (column 2, lines 28-29), including shells for undersea petroleum storage with undersea petroleum extraction facilities, habitable environments for personnel operating such facilities, undersea observatories, submarine petroleum tankers, orbiting space stations, land-based liquid storage vessels, and undersea nuclear reactor housings (column 2, lines 30-41). A stated objective of Knapp is to provide a pressure resisting cylindrical shell structure "which can be manufactured with *large* span dimensions, such as the external diameter and length" (column 2, lines 54-56; emphasis added).

In rejecting claims 11 and 17-20 under 35 U.S.C. § 103(a), the examiner concedes that Allen does not utilize a PCCP structure in making the golf club head thereof. To account for this deficiency, the examiner turns to Knapp, contending that the Knapp patent shows "that it is old in the art to take advantage of an undulating polyhedral geometry for the exterior wall of a hollow cylindrical object, specifically an object that has customarily been provided with a perfect cylinder shape" (answer, page 4). The examiner considers that Knapp is similar to Allen in that Knapp

> highlights the problems recognized with prior art forgings and castings of geometrically shaped shell structures and briefly highlights the desirability to alter the configuration of known . . . [shell structures] in order to increase the

> diameter, span, and length of these shelled objects without additional cost or complicated manufacturing processes. [Answer, page 4.]

Based on these determinations, the examiner concludes that "the teachings of Knapp are . . . analogous to the teachings of Allen" (answer, page 4) and that it would have been obvious to modify Allen by substituting a PCCP structure for the honeycomb design of Allen, "the motivation being to simply take advantage of another commonly used method for overcoming size limitations associated with routinely used forging and casting techniques in an effort to increase the dimensions of a shell structure while maintaining structural integrity" (answer, pages 4-5).

After having reviewed both Allen and Knapp, we must agree with the arguments presented by appellants on pages 8-15 of their brief that there is no teaching, suggestion or incentive in either reference which would have led one of ordinary skill in the art at the time of appellants' invention to modify the golf club head of Allen in the manner proposed by the examiner to arrive at the subject matter of claim 11. In this regard, we are in accord with appellants that the examiner has failed to identify a basis why one having ordinary skill in the art would have been *realistically* motivated to substitute the PCCP structure of Knapp for the honeycomb design of Allen, especially when considering that Knapp's objective is to facilitate the construction of *large* scale structures such as petroleum storage facilities, orbiting space stations and undersea nuclear reactor housings. Given the disparate natures of the devices disclosed by

Allen and Knapp, it is apparent that the examiner has engaged in an impermissible hindsight reconstruction of the appellants' invention by using claim 11 as a template to selectively pick and choose from among isolated disclosures in the prior art.

Moreover, even if the references were combined in the manner proposed by the examiner, it is not apparent that the resulting golf club head would meet the limitation of claim 11 requiring that the PCCP structure defines "a central axis oriented to intersect a plane defined by a face portion of said golf club head." In the present case, appellants orient the central axis of the PCCP structure to intersect the plane defined by the plane of the face portion in order to *lower* the rigidity of the club head in the hitting direction (specification, page 7, lines 17-24). However, consistent with Allen's objective of reinforcing and stiffening the striking face of the club head and Knapp's disclosure at column 2, lines 6-18, that PCCP geometry results in a cylindrical shell that is more rigid in its circumferential direction and much less rigid in its axial direction than a conventional cylindrical shell, it reasonably appears to us that if the ordinarily skilled artisan were to employ Knapp's PCCP shell design in Allen as a substitute for the reinforcing and stiffening honeycomb network thereof, said artisan would orient the PCCP structure such that its central axis does *not* intersect the plane defined by the striking face of the club head in order to take full advantage of the larger circumferential bending rigidity that Knapp's PCCP design provides.

In light of the foregoing, we will not sustain the examiner's rejection of claims 11 and 17-20 as being unpatentable over Allen in view of Knapp.

Concerning the rejection of claims 12-16, we have reviewed the Nagai and Nelms references additionally relied upon by the examiner in rejecting these claims but find nothing therein that makes up for the deficiencies of Allen and Knapp discussed above. Therefore, we also will not sustain the examiner's rejection of these claims.

The decision of the examiner is reversed.

REVERSED

NEAL E. ABRAMS Administrative Patent Judge	)	
LAWRENCE J. STAAB Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
JENNIFER D. BAHR Administrative Patent Judge	)	

LJS/jlb

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