

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 25

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PAUL ODOM

Appeal No. 2005-0028
Application 09/489,602

ON BRIEF

Before FRANKFORT, PATE, and McQUADE, Administrative Patent Judges.

FRANKFORT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1, 4 through 18, 21 and 22, which are all of the claims remaining in the application. Claims 2, 3, 19, 20, 23 and 24 have been canceled.

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Appellant's invention relates to a bicycle crank structure providing both strength enhancement and weight reduction benefits. More particularly, it is indicated on page 3 of the specification that

This invention replaces the double ended crank arm design currently used on bicycles, with a triangulated crank structure. Triangulation is accomplished by replacing a straight bar type structure that connects the spindle to the pedal shaft end of a crank arm, with a split structure that has two separate tube segments, spaced away from a line between the spindle end and the corresponding pedal shaft attachment location, that line being the neutral axis of the structure. During the rider's power stroke, one such tube segment would be mostly under tension while the other would be mostly under compression. This largely eliminates high bending stresses associated with the straight crank design. It does so by moving structural material much further away from the neutral axis of the crank than is possible with a straight crank design.

Independent claims 1, 10, 17 and 22 are representative of the subject matter on appeal, and a copy of those claims may be found in Appendix A of appellant's brief.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Bezin	4,811,626	Mar. 14, 1989
Schmidt	5,946,982	Sep. 7, 1999

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Claims 1, 4 through 18, 21 and 22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Schmidt in view of Bezin. This rejection is collectively set forth on pages 2-7 of the final rejection (Paper No. 14, mailed August 13, 2002).

Rather than reiterate the conflicting viewpoints advanced by appellant and the examiner regarding the above-noted rejection, we refer to the final rejection, the examiner's answer (Paper No. 21, mailed May 20, 2003) and appellant's brief (Paper No. 20, filed April 10, 2003) for a full exposition thereof.

OPINION

Having carefully reviewed the obviousness issues raised in this appeal in light of the record before us, we have made the determinations which follow.

Like the examiner, we find that Schmidt discloses a bicycle crank arm structure (1) projecting from a spindle shaft end and comprising a first arm (2) having a first crank end connected with respect to the spindle shaft end and a first distal end terminating at a pedal attachment area (4); and a second arm (3)

having a second crank end connected with respect to the spindle shaft end and a second distal end terminating at the pedal attachment area (4); and wherein the second distal end is connected with respect to the first distal end to form an angle between the second arm and the first arm. Although Schmidt does not expressly so state, it appears that the crank arm structure (1) is cast and forged to obtain the configuration seen in Figures 1 and 2 of the patent.

When compared with the bicycle crank structure defined in the claims before us on appeal, the examiner notes (e.g., final rejection, page 3) that Schmidt "fails to show each arm having a hollow cross-section and the first and second arms comprising a multi-piece assembly wherein the pieces are bonded together." To account for these differences, the examiner turns to Bezin, urging that this patent teaches, in Figures 11-16, a bicycle crank structure projecting from a spindle shaft end and comprising an arm (1g) having a hollow cross-section (Fig. 13), and wherein the crank structure comprises a multi-piece assembly (1g-3g) that is bonded together.

From the foregoing teachings in Schmidt and Bezin, the examiner concludes that it would have been obvious to a person of ordinary skill in the art at the time of appellant's invention to 1) "modify the solid crank arms of Schmidt with the hollow cross-sectioned crank arm of Bezin in order to reduce the cost of material and the weight of the arm so that the overall cost can be lowered and the [sic, make] operating the vehicle easier," and 2) "modify the one piece molded crank arm of Schmidt with the multi-piece assembly crank arm having pieces bonded together as taught by Bezin in order to minimize the complexity in molding a single piece apparatus having a complex shape and form so that producing a crank arm is easier" (final rejection, pages 3-4).

For the reasons aptly set forth by appellant in the brief, we will not sustain the examiner's rejection of claims 1, 4 through 18, 21 and 22 under 35 U.S.C. § 103(a) based on Schmidt in view of Bezin. Like appellant, we are of the view that, absent hindsight derived from appellant's own disclosure and claims, there is no teaching or suggestion in the prior art relied upon which would have made it obvious to one of ordinary skill in the art at the time of appellant's invention to modify the particular bicycle crank arm structure seen in Schmidt in the

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manner urged by the examiner so as to result in appellant's claimed bicycle crank structure. As our court of review indicated in In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992), it is impermissible to use the claimed invention as an instruction manual or "template" in attempting to piece together isolated disclosures and teachings of the prior art so that the claimed invention is rendered obvious.

Although it has been long recognized in the bicycle arts that it is desirable to reduce the overall weight of a bicycle, e.g., by using tubular elements in the construction of various bicycle components, such as the bicycle frame or, as in Bezin, for constructing a straight pedal crank arm, we note that in pursuing the objective of providing "a weight-optimized crank arm which can be manufactured at low cost" (col. 1, lines 36-38), Schmidt opted to go in a different direction. In particular, Schmidt devised a weight-saving crank arm design having two spaced-apart solid cross-section connecting members or arms (2, 3) extending between the pedal eye (4) and the hub (13) for receiving the spindle shaft end, wherein the connecting members (2, 3) are arranged at a relatively large angle (21) with respect to each other so that one connecting member will carry mostly

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tensile forces and the other connecting member will carry mostly compressive forces during use. In column 1, lines 50-58, Schmidt indicates that

[d]ue to this separation of load-carrying functions, structural properties such as, for example, stiffness and strength of the connecting members can be advantageously optimized. For example, each of the connecting members can be precisely and selectively dimensioned such that the tension-carrying member may have a thicker cross section than that of the compression-carrying member since the compressive strength of a material far exceeds the tensile strength of the same material.

Thus, notwithstanding the teaching in Bezin of a hollow fiber reinforced resin tubular crank arm structure having a lower weight than a conventional straight double ended crank arm, given the disclosure in Schmidt of providing solid cross-section connecting members (2, 3) arranged in a generally triangulated pattern and the recognition of significant advantages to be derived therefrom, we are of the view that it would not have been obvious to one of ordinary skill in the art at the time of appellant's invention to modify the connecting members of Schmidt's triangular type crank arm structure to have a hollow cross-section, or to be formed as a multi-piece assembly, as urged by the examiner.

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In light of the foregoing, we will not sustain the examiner's rejection of independent claims 1, 10, 17 and 22 under 35 U.S.C. § 103(a) as being unpatentable over Schmidt in view of Bezin, or the rejection of dependent claims 4 through 9, 11 through 16, 18 and 21 under 35 U.S.C. § 103(a) based on those same references. Thus, the decision of the examiner is reversed.

REVERSED

CHARLES E. FRANKFORT)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
WILLIAM F. PATE III)	APPEALS AND
Administrative Patent Judge)	INTERFERENCES
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Administrative Patent Judge)	

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