

The opinion in support of the decision being entered today was not written for publication in a law journal and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MINAKO CHINO, KATSUAKI OGAWA
and TAKAHIRO OKAZAKI

Appeal No. 2005-2453
Application No. 10/102,923

ON BRIEF

Before KIMLIN, WALTZ and JEFFREY T. SMITH, Administrative Patent Judges.

KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-3, 6-12 and 14-17. Claims 4 and 13 have been withdrawn from consideration. Claim 1 is illustrative:

1. A piston ring comprising a continuous hard carbon film containing one or more elements selected from the group consisting of Si, W and Ni located on every surface of the piston ring including an outer peripheral surface, an inner peripheral surface, a top surface and a bottom surface thereof.

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The examiner relies upon the following references as evidence of obviousness:

Frame et al. (Frame) ¹	5,713,324	Feb. 3, 1998
Tanaka et al. (Tanaka)	6,060,182	May 9, 2000
Iwashita et al. (Iwashita)	6,325,385	Dec. 4, 2001

Appellants' claimed invention is directed to a piston ring having a continuous hard carbon film containing one or more of silicon, tungsten and nickel. The hard carbon film is situated on the outer peripheral, inner peripheral, top and bottom surfaces.

The Board remanded this application to the examiner to provide a response to appellants' argument based upon Example 1 and Comparative Example 1 of the specification. The examiner responded to the remand in an Answer dated December 30, 2004, and appellants presented a Reply Brief on February 4, 2005.

Appealed claims 1-3, 6-12 and 14-17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Iwashita in view of Tanaka.

Appellants submit that "the claims do not stand or fall together" (page 5 of the original Brief of November 10, 2003).

¹ We note that the examiner has not repeated the rejection of the claims over Iwashita in view of Frame (Answer, dated December 30, 2004; see the first Answer dated January 13, 2004, page 4). Accordingly, we consider this rejection to be withdrawn (see the Reply Brief, dated February 4, 2005, page 1).

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However, appellants provide a reasonably specific argument only for claims 6 and 10. Accordingly, claims 2, 3, 7-9, 11, 12 and 14-17 stand or fall together with claim 1.

We have thoroughly reviewed each of appellants' arguments for patentability, as well as the specification data relied upon in support thereof. However, we are in complete agreement with the examiner that the claimed subject matter would have been obvious to one of ordinary skill in the art within the meaning of § 103 in view of the applied prior art. Accordingly, we will sustain the examiner's rejection for essentially those reasons expressed in the Answer, and we add the following primarily for emphasis.

As we stated in our remand, there is apparently no dispute that Iwashita, like appellants, discloses a piston ring comprising a continuous hard carbon film containing one or more of silicon, tungsten and nickel. While Iwashita fails to teach that the hard carbon film is on every surface of the piston ring, we fully concur with the examiner that Tanaka evidences the obviousness of providing the film on all such surfaces. In particular, Tanaka provides substantial evidence that it was known in the art to coat a hard film on only one outer surface of the piston ring, on three surfaces, or on every surface of the piston ring. Accordingly, we are in agreement with the examiner

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that it would have been obvious for one of ordinary skill in the art to coat all the surfaces of a piston ring with the hard carbon film of Iwashita, taking into account a typical cost/benefit analysis for doing so. While appellants point to the difference in composition between the hard carbon film of Iwashita and the hard film of Tanaka, we are not persuaded by appellants that such a difference undermines the obviousness of coating the entirety of a piston ring with the hard carbon film of Iwashita. Also, we note that the hard film of Tanaka may contain carbon.

Appellants direct our attention to the comparative data at Table 2, page 24 of the present specification "to compare especially the differences between the piston ring and piston ring-piston examples of Example 1 and Comparative Example 1" (page 9 of principal brief, second paragraph). Appellants submit that "[a] comparison of the two above-cited examples shows superior peeling resistance, and ring top, bottom and inner surface wear resistance index in Example 1 over the corresponding values for Comparative Example 1" (id.).

Our review of the specification data leads us to the same conclusion drawn by the examiner, i.e., that the evidence of obviousness represented by the combined teachings of Iwashita and Tanaka outweighs the evidence of nonobviousness in the form of

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the very limited comparative showing. For one, appellants have not established on this record that the comparative results would be considered truly unexpected by one of ordinary skill in the art. In re Merck & Co., 800 F.2d 1091, 1099, 231 USPQ 375, 381 (Fed. Cir. 1986). We subscribe to the examiner's reasoning that it would seem that it would be expected that "having the hard carbon film on all surfaces would provide better wear resistant [sic, resistance] to all surfaces, since the hard carbon film is one continuous film" (page 7 of Answer of December 30, 2004, third paragraph). Appellants have not rebutted the examiner's reasoning that "since there are no exposed edges of the coatings, the surface would be less susceptible to chipping or flaking or scuffing of the coating" (id.).

Furthermore, the limited comparison is hardly commensurate in scope with the degree of protection sought by the appealed claims. In re Grasselli, 713 F.2d 731, 743, 218 USPQ 769, 778 (Fed. Cir. 1983). While claim 1 on appeal encompasses a considerable breadth of films comprising either silicon, tungsten or nickel, alone, or a myriad of two- or three-component compositions of the three recited components in any non-specified range of amounts, Example 1 of the specification is a very specific film containing only silicon in an amount of 69.4 wt.%. Although appellants state that "[t]he examples were not presented

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to show patentability of any particular hard carbon film material" (page 2 of Reply Brief of February 4, 2005, second paragraph), appellants have not demonstrated that the results obtained in Example 1 could be reasonably extrapolated to the large number of compositions within the scope of claim 1. Also, Example 1 has four different thicknesses of the hard carbon film on four different surfaces, whereas appealed claim 1 fails to recite any difference in thicknesses on the four surfaces. In addition, Comparative Example 1 has a hard carbon film of uniform thickness.

As for the broad ratio of thicknesses of the four surfaces recited in claim 6, we agree with the examiner that it would have been a matter of obviousness for one of ordinary skill in the art to arrive at the optimum thickness of the film for each of the surfaces. It is well settled that where patentability is predicated upon a change in a condition of a prior art composition, such as a change in concentration or the like, the burden is on the applicant to establish with objective evidence that the change is critical, i.e., it leads to a new, unexpected result. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990); In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). As pointed out by the examiner,

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appellants' specification attaches no criticality to the ratio of thicknesses recited in claim 6, and appellants have failed to proffer objective evidence which establishes the criticality.

In conclusion, based on the foregoing and the reasons well-stated by the examiner, the examiner's decision rejecting the appealed claims is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv) (effective Sep. 13, 2004; 69 Fed. Reg. 49960 (Aug. 12, 2004); 1286 Off. Gaz. Pat. Office 21 (Sep. 7, 2004)).

AFFIRMED

EDWARD C. KIMLIN)	
Administrative Patent Judge)	
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THOMAS A. WALTZ)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
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