

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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

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

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Ex parte ALEXANDER JAN CAREL DE VRIES, ARMIN HERBERT EMIL AUGUST  
OLSCHEWSKI, JOHN HOWARD TRIPP and PIETER MARTIN LUGT

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Appeal No. 2005-0355  
Application No. 10/080,714

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HEARD: FEBRUARY 8, 2005

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Before MCQUADE, NASE and BAHR, Administrative Patent Judges.  
BAHR, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1, 2 and 4-6, which are all of the claims pending in this application. The proposed amendment filed with the reply brief (Paper No. 18) has not been entered (see Paper No. 19).

We REVERSE.

### BACKGROUND

The appellants' invention relates to a method of manufacturing rolling elements, the rolling surface of which are in contact with a raceway, at least one of the surfaces of the raceway and the rolling elements being provided with a topography comprising recesses which are generally isolated from each other by lands and which may contain a lubricant. A copy of the claims under appeal is set forth in the appendix to the appellants' brief.

The examiner relied upon the following prior art references in rejecting the appealed claims:

Miyasaka	5,592,840	Jan. 14, 1997
Mayumi (Japanese published unexamined patent publication)	H4-321816	Nov. 11, 1992 <sup>1</sup>

The following is the only rejection before us for review.

Claims 1, 2 and 4-6 stand rejected under 35 U.S.C. § 103 as being unpatentable over Mayumi in view of Miyasaka.

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<sup>1</sup> The examiner has referred to this document as "Toru." Additionally, on page 2 of the answer (Paper No. 16), the examiner has listed "Japanese Pat. 04-321816" as the prior art of record relied upon, while the statement of the rejection on page 3 of the answer refers to only the "Patent Abstract" of that publication. Thus, it is not clear whether the abstract only, or the entire patent publication, is relied upon in the rejection. We also note that the "Patent Abstract" document is not in the application file. The USPTO has, however, obtained a translation of the entire patent publication and a copy is appended hereto. In the interest of completeness, we have considered both the patent abstract portion of the translation and the translation of the entire document in our review of this rejection.

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellants regarding the above-noted rejection, we make reference to the answer (Paper No. 16) for the examiner's complete reasoning in support of the rejection and to the brief and reply brief (Paper Nos. 15 and 17) for the appellants' arguments thereagainst.

### OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellants' specification and claims, to the applied prior art references, and to the respective positions articulated by the appellants and the examiner. As a consequence of our review, we make the determinations which follow.

At the outset, we note that the final paragraph of claim 1 is confusing and requires correction. Specifically, this paragraph fails to indicate the other structure, between the recess wall and which the angle  $\alpha$  is defined. In view of the statement on page 3 of appellants' specification that "the average angle  $\alpha$  defined by the intersection of the wall of the recess 13 and the adjacent land 14 is  $2^\circ$ " and the illustration of angle  $\alpha$  in Figure 3, one of ordinary skill in the art would interpret the angle defined in claim 1 to be the angle  $\alpha$  illustrated in Figure 3, that is, the angle between the tangent to the wall at the intersection of the wall and the adjacent land and the adjacent land. Accordingly, we have so interpreted claim 1 for purposes of this appeal.

Mayumi discloses a bearing, used in a helicopter gearbox, having a large number of small recesses provided on the surface of the rolling element of the bearing or at least one of the rolling surfaces of inner and outer bearing rings “to control the roughness of this slightly rough surface” (translation, page 1). According to Mayumi,

[b]y these means, it becomes advantageous to form an oil film between the bearing rings and the rolling element using these recesses, thereby eliminating abrasion and peeling damage and thus extending the usable life [translation, page 1].

We find no disclosure in Mayumi, either in the abstract or in the remainder of the document, of forming the recesses by shot-peening or an average angle  $\alpha$  of less than 5 degrees, as called for in claim 1. The examiner concedes on page 3 of the answer that these features are lacking in Mayumi.

Miyasaka discloses a method of forming recesses (concave portions 52) in the surface of the sliding portion of a metal product, such as a machine part, using a shot-peening process to provide sumps for oil to improve abrasion resistance at the sliding portion (column 1, lines 6-14). Miyasaka teaches in the abstract that, by shot-peening,

the surface retains high hardness and toughness, even if sliding is performed for long time periods, and the concave portions are not deformed so that a stable oil film can be maintained.

The examiner has determined that it would have been obvious to use shot-peening to form the recesses in Mayumi’s bearing so lubricating oil can be retained in

the recesses more efficiently (answer, page 3). As for the recited angle  $\alpha$ , the examiner contends that it would have been obvious to one of ordinary skill in the art at the time of appellants' invention to have set the average angle within the range claimed,

since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art and it would appear that the average angle such as one in Miyasaka would perform equally as well [answer, page 3].

Discovery of an optimum value of a result effective variable is ordinarily within the skill of the art. See In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980) and In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). However, the examiner has not pointed to any indication in either Mayumi or Miyasaka that the angle  $\alpha$  recited in appellants' claim 1 was recognized within the art at the time of appellants' invention to be a result-effective variable. See In re Antonie, 559 F.2d 618, 620, 195 USPQ 6, 8-9 (CCPA 1977).

Relying on Miyasaka's teaching of the use of shots having a diameter size of 20 to 200 micrometers, which includes the diameter of about 200 micrometers disclosed by appellants on page 2 of their specification, and a concave portion depth of 1.2 micrometer or smaller (col. 9, lines 5-10), 0.6 micrometer or smaller (col. 10, lines 8-11), 3.0 micrometer or smaller (col. 11, lines 16-20) or 0.8 micrometers or smaller (col. 13, lines 4-7), which includes the preferred depths of less than 0.5 micrometer and about 0.2 micrometer disclosed by appellants on page 1 of their specification, the examiner further determines that Miyasaka's concave portions or recesses will have an angle  $\alpha$  of

less than 5 degrees (answer, page 4). Appellants (reply brief, page 3), on the other hand, point out that the shot size and recess depth alone cannot be relied upon as an indication of the angle  $\alpha$ , as evidenced by the express teaching in Miyasaka of a concave portion or recess diameter of 0.1 to 5 micrometer, as compared with appellants' disclosed minimum recess diameter of 14 micrometers and maximum recess diameter of 100 micrometers.

In light of the above, even assuming that the teachings with respect to the particulars of the shot-peening process taught by Miyasaka for a sliding part are applicable to the rolling element bearing of Mayumi, it is apparent that it would be necessary to select particular values of the shot diameter, recess depth, recess diameter, etc. within the broad ranges disclosed by Miyasaka in order to arrive at the particular angle range recited by appellants. Where prior art references require a selective combination to render obvious a claimed invention, there must be some reason for the combination other than hindsight gleaned from the invention disclosure. Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1143, 227 USPQ 543, 551 (Fed. Cir. 1985). In this case, especially given the absence of any disclosure in either Mayumi or Miyasaka of any recognition of the criticality of the angle  $\alpha$ , we find no suggestion in the applied prior art for such a combination. It follows that we cannot sustain the examiner's rejection of claim 1 or of claims 2 and 4-6 depending therefrom.

CONCLUSION

To summarize, the decision of the examiner to reject claims 1, 2 and 4-6 under 35 U.S.C. § 103 is reversed.

REVERSED

JOHN P. MCQUADE	)	
Administrative Patent Judge	)	
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	)	
	)	BOARD OF PATENT
JEFFREY V. NASE	)	APPEALS
Administrative Patent Judge	)	AND
	)	INTERFERENCES
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JENNIFER D. BAHR	)	
Administrative Patent Judge	)	

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