

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. 19

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RANJIT KUMAR SINGH, MICHAEL SCOTT NIXON, and
JEFFERY EDWARD DALY

Appeal No. 1999-2131
Application No. 08/971,504

ON BRIEF

Before FRANKFORT, NASE, and LAZARUS, Administrative Patent
Judges.

LAZARUS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1 through 74, which are all of the claims pending in this application.

We affirm and remand.

THE INVENTION

The appellants' invention relates to a thrust bearing in rolling cutter drill bits (specification, p. 1). A copy of the claims under appeal is set forth in the appendix to the appellants' brief. Claims 1, 44 and 49 are representative and read as follows:

1. A rolling cutter drill bit comprising a body and a plurality of legs, at least one of said legs having a cantilevered bearing spindle, a rolling cutter rotatably mounted on the bearing spindle, lubricant delivering means within the bearing spindle, and a floating thrust bearing element configured to carry onward thrust loads from the rolling cutter onto said bearing spindle, said floating thrust bearing element being formed of a wrought alloy material consisting primarily of chromium carbide and cobalt and having a yield strength of less than 120,000 psi and a ductility of at least 4%, both at room temperature.

44. A drill bit comprising:
a body having a leg, the leg having a cantilevered bearing spindle;

a cutter rotatably mounted on the bearing spindle; and

a bearing element configured to carry loads between the rolling cutter and the bearing spindle, the bearing element formed of a material comprising a cobalt-based superalloy having a yield strength of less than 120,000 psi and a ductility of at least 4% at room temperature.

49. A drill bit comprising:
a body having a leg, the leg having a cantilevered bearing spindle;

a cutter being rotatably disposed on the bearing spindle; and

of U.S. Patent No. 5,725,313 since, in the examiner's view, the claims of this application, if allowed, would improperly extend the "right to exclude" already granted in the patent.

Claims 1 through 74 stand rejected under the judicially-created doctrine of obviousness-type double patenting over claims 1 through 27 of U.S. Patent No. 5,725,313.

Rather than reiterate the conflicting viewpoints regarding the above-noted rejections, we make reference to the final rejection (Paper No. 5, mailed May 22, 1998) and the answer (Paper No. 12, mailed December 29, 1998) for the examiner's complete reasoning in support of the rejections, and to the brief (Paper No. 11, filed October 26, 1998) and reply brief (Paper No. 13, filed March 2, 1999) 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 result of our review, we make the determinations that follow.

--The double patenting rejections--

The examiner's double patenting rejection of claims 1 through 74 is stated as two separate rejections. One rejection is under the judicially-created doctrine of "obviousness-type" double patenting, and the other "under the judicially created doctrine of double patenting over claims 1-27 of U.S. Patent No. 5,725,313, since the claims, if allowed, would improperly extend the 'right to exclude' already granted in the patent" (final rejection, page 3). This latter rejection refers to In re Schneller,² and it is not stated as being under 35 U.S.C. § 101 (i.e., "same invention" type). All types of double patenting other than the "same invention" type have come to be referred to as "obviousness-type" double

² 397 F.2d 350, 158 USPQ 210 (CCPA 1968).

patenting. See In re Van Ornum, 686 F.2d 937, 942-43, 214 USPQ 761, 766 (CCPA 1982) and Ex parte Davis, 56 USPQ2d 1434, 1435 (Bd. Pat. App. & Int. 2000). For this reason we treat both double patenting rejections as being "obviousness-type", i.e., both are considered merged into a single rejection on the same ground. The appellants do not argue the merits of the "obviousness-type" double patenting rejection; rather they offer to submit a terminal disclaimer to overcome it (brief, page 10). Since the appellants have not yet provided an acceptable terminal disclaimer, we summarily sustain the examiner's rejection on this ground. The appellants may still overcome this ground of rejection by submitting an acceptable terminal disclaimer.

--The obviousness rejection as being unpatentable
over Drake in view of Du Mond--

We will not sustain the examiner's rejection of claims 1 through 74 under 35 U.S.C. § 103.

In rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. See In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993). A prima facie case of obviousness is established by presenting evidence that the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the references before him to make the proposed combination or other modification. See In re Lintner, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972). Furthermore, the conclusion that the claimed subject matter is prima facie obvious must be supported by evidence, as shown by some objective teaching in the prior art or by knowledge generally available to one of ordinary skill in the art that would have led that individual to combine the relevant teachings of the references to arrive at the claimed invention. See In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988).

With this as background, we analyze the prior art applied by the examiner in the rejection of the claims on appeal.

Drake discloses a roller cutter type drill bit (column 4, line 60) which, as shown in Fig. 1, has a bit body (11) and legs (12) (column 5, lines 13-14). As shown in Fig. 2, leg (12) has roller cutter (60) rotatably mounted on the main body (spindle) portion (50) of bearing journal (20) and a flat thrust washer (86) is in the space between bearing surface (58) and bearing shoulder (74) with lubricant being supplied to the bearings from reservoir (38) via channels (39 and 40) and passages (42). The thrust washer (86) is disclosed as a floating type bearing element, although, under certain conditions, it may alternatively be press fit or fixed to journal (20) or roller cutter (60) (column 7, lines 8-14). It is stated that "[i]t is an object of this invention to provide aluminide coated superalloy sliding bearing elements for roller cutter drill bits" (column 4, lines 39-41). As explained by Drake,

[m]aterials used in combination with the hardened steel surfaces in bit journal bearings have included precipitation hardened copper-beryllium... and cobalt-based stellite alloys (shown in U.S. Pat. No. 4,323,284). These materials offer suitable ambient temperature yield strengths for use as structural elements or inlays, and acceptable anti-galling properties against hardened steel. However, at elevated PVs they can undergo a transition to

high-friction operation, and except for the stellites, these alloys exhibit a rapid reduction in yield strength at temperatures above about 500⁰ F. Because such surface temperatures are not uncommon in bit thrust bearings, stellites have been the structural inlay material of choice for journal surfaces (column 2, lines 5-22).... The combination of an aluminide coating and a superalloy substrate material to form a sliding bearing element in a roller cutter drill bit provides increased bearing performance and consistency under high-PV operating conditions encountered in rock bit service. The mechanical behavior of this coating/substrate combination extends the range of bit bearing operating temperatures, provides improved bearing recoverability from load and friction spikes, and allows the use of floating element bearing designs in higher-stress, higher-velocity applications. This is achieved through the combination of improved high-temperature mechanical properties of the substrate along with the tribological characteristics of the aluminide coating. Aluminide coatings are particularly adapted for use with nickel-base superalloys such as Inconel 718, which may be formed from strip, powders, or machined or cast to produce thin bushing or washer elements which are subsequently diffusion-coated to a thickness of preferably about 0.005 inch, and thermally treated to a yield strength of more than about 140,000 psi. (column 3, lines 58-68 and column 4, lines 1-11).

Thus, Drake teaches an aluminide coating on a superalloy bearing element that has a yield strength of more than about 140,000 psi.

Du Mond discloses nonferrous alloy wear-resistant materials including Stellite 6B, the most widely-used cobalt-base wear alloy. It is disclosed that the ability of Stellite 6B parts to withstand the abrasive effects of hard, sharp particles makes them especially useful in, for example, rock crushers and rollers. Stellite 6B is also described as resistant to seizing, galling and erosive wear.

After the scope and content of the prior art are determined, the differences between the prior art and the claims at issue are to be ascertained. Graham v. John Deere Co., 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966).

The examiner does not clearly identify the differences between the relied-on prior art and claims 1-24, 26, 27, 41-48, 53, 54, 59-64, 69 and 70. The examiner states that Drake discloses all of the claimed elements "except for those shown by Metals Handbook [Du Mond]" (final rejection, page 2). However, the examiner does not identify the limitation(s) of the appellants' claims which he believes are found in Du Mond but lacking in Drake. The examiner argues that

one having ordinary skill in the art would have found that providing chromium cobalt and carbide alloys as taught by Metals Handbook [Du Mond] in the drill bit assembly of Drake, would have been obvious in view of the teaching of Metals Handbook [Du Mond] of providing certain chromium cobalt and carbide alloys in order to provide certain desirable properties (final rejection, page 2).

We can only speculate as to what the "certain desirable properties" are and why they are desirable since the examiner provides no explanation. The examiner also argues that Du Mond's Stellite 6B is exactly the same Stellite 6B that applicants employ and which therefore necessarily has the same properties (answer, page 4). However, we fail to see how this helps to explain what the difference(s) is between Drake's disclosure and the claims on appeal, or is suggestive of combining Du Mond with Drake.

It is our view that the examiner has failed to provide an adequate explanation of the difference between the appellants' claims 1-24, 26, 27, 41-48, 53, 54, 59-64, 69 and 70 and the prior art. Without a clear understanding of what the examiner considers to be the difference, or differences, between Drake

and the appellants' claims, we are unable to focus our evaluation of the rejection before us on appeal so as to determine if the examiner has provided any sound reasoning for the combination of Drake and Du Mond. The examiner admits that Drake does not provide a teaching or suggestion to combine the references, argues that Du Mond provides it, and refers to page 590 of Du Mond and "Stellite 6B" in Table 1 and the middle and right columns (answer, page 4). However, the examiner does not describe what there is in Du Mond that would have been suggestive of the combination with Drake.³

When the incentive to combine the teachings of the references is not readily apparent, it is the duty of the examiner to explain why the combination of the teachings is proper. Without it, the examiner has failed procedurally to establish a prima facie case of obviousness. Accordingly, it is our opinion that the examiner's rejection does not set forth a prima facie case in that the examiner has not explained the differences between Drake and the claims on

³ The mere fact that the references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. See In re Mills, 916 F.2d 680, 682, 16

appeal, or where in the prior art there is a suggestion for combining Drake and Du Mond so as to arrive at the particular drill bit claimed by the appellants. Since the examiner has not set forth a prima facie case of obviousness, we will not sustain the examiner's rejection of claims 1-24, 26, 27, 41-48, 53, 54, 59-64, 69 and 70 over Drake in view of Du Mond.

Turning now to the examiner's rejection of claims 25-40, 49-58 and 65-74, these claims recite, inter alia, a thrust washer which floats and locks depending on the load condition as recited in claims 49-58 and 65-74, or a thrust washer having an inside diametric clearance greater than the outside diametric clearance as recited in claims 25-40. As disclosed by the appellants on page 9 of their specification, if the inside diametric clearance is larger than the outside diametric clearance the floating thrust washer will lock during extreme load peaks.

The examiner does not describe where in the prior art there is any teaching or suggestion of the floating and locked conditions as expressed in claims 49-58 and 65-74 or the relative outside and inside diametric clearances as expressed in claims 25-40. The appellants argue that claims 25-40, 49-58 and 65-74 recite a drill bit having a thrust washer with certain dimensional characteristics not found in any of the art of record (brief, page 8). In response, the examiner briefly explains that "it would be the natural and expected result of a non-fixed thrust washer as at reference 58 of Drake, to float while unloaded and lock while loaded, because of friction" (answer, page 4). We assume the examiner is referring to Drake's thrust washer (86), not to the flat annular surface (58) on the journal body (50). Even so, without any reasoning as to how "friction" would cause the limitations of appellants' claims to be satisfied by the combination of Drake and Du Mond, we must conclude that the only suggestion would be impermissible hindsight.⁴ Further we

⁴ Obviousness may not be established using hindsight or in view of the teachings or suggestions of the inventor. See Para-Ordnance Mfg. v. SGS Importers Int'l, 73 F.3d 1085, 1087, 37 USPQ 2d 1237, 1239 (Fed. Cir. 1995) (citing W. L. Gore & Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1551, 1553, 220 USPQ 303, 311, 312-13 (Fed. Cir. 1983), cert. denied, 469 U.S. 851

do not understand why the examiner's rejection combines Drake and Du Mond when the examiner's explanation appears to suggest that the claimed subject matter is taught by Drake alone. It is our opinion that the examiner has not explained what there is in Drake or Du Mond that is suggestive of their combination so as to yield the subject matter of claims 25-40, 49-58 and 65-74. Therefore, we will not sustain the examiner's rejection of claims 25-40, 49-58 and 65-74 over Drake in view of Du Mond.

For the above reasons, it is our opinion that the examiner has failed procedurally to establish a prima facie case of obviousness, and we will not sustain the examiner's obviousness rejection of claims 1 through 74 on this ground.

REMAND TO THE EXAMINER

We remand this application, pursuant to 37 CFR § 1.196(e), to the examiner to consider whether any of claims 1 through 74 should be rejected in view of the following considerations.

The appellants' claims 1-74 are directed to a drill bit and, in general, three types of bearing elements or thrust washers:

- 1) a thrust washer having an inside diametric clearance greater than the outside diametric clearance as recited in claims 25-40 or which floats and locks depending on the load condition as recited in claims 49-58 and 65-74,
- 2) a broadly recited bearing element, that is apparently either fixed or floating, made of a material having a yield strength of less than 120,000 psi (claims 44-48 and 59-64), and
- 3) a "floating" bearing element of a material having a yield strength of less than 120,000 psi (claims 1-24 and 41-43).

With respect to group 1), the appellants' claims 25-40, 49-58 and 65-74, the examiner should review Fig. 2 of Drake's disclosure wherein the inside circumferential portion of thrust washer (86) is shown as spaced from main body portion (50) and the exterior circumferential portion of thrust washer

(86) is shown as next to roller cutter (60). The examiner should determine whether Drakes's thrust washer (86), in the floating mode i.e. with some clearance between the washer and both the main body (50) and cutter (60), would have inside and outside diametric clearances as described by the appellants' specification at page 9, lines 9-16, and, if so, whether the limitations of the appellants' claims (e.g., claim 49) are met, or obviated, by Drake.

With respect to group 2), the appellants' claims 44-48 and 59-64, Childers et al. (U.S. Patent No. 4,323,284 cited at column 2, line 12 of Drake) discloses that materials used in rolling cutter drill bit thrust bearings have included stellite alloys, such as stellite 6 (column 2, line 48). The appellants' own disclosure teaches that the room temperature yield strength of stellite materials is less than 120,000 psi (specification, page 5, lines 1-6) and that a ductile stellite material at room temperature may have a minimum yield strength of around 80,000 psi and a ductility of at least 4% (specification, page 7, lines 18-21). The examiner should consider whether the drill bit set forth in the appellants'

broad claims (e.g., claims 44, 59 and 62) would be met, or obviated, by Childers' drill bit which includes a thrust bearing, at least in part, formed of stellite material.⁵ Also, given the disclosure in Childers of a thrust bearing formed of stellite 6 and the appellants' disclosure (page 8) of a preferred embodiment that uses "grade 6B wrought STELLITE", the examiner should consider how one of ordinary skill in the art practicing Childers' use of stellite for a bearing element or thrust washer would have selected among the various stellites available? The examiner should also consider Du Mond's disclosure of stellite 6B as the "most widely used cobalt-base wear alloy".

Turning to group 3), with regard to the examiner's consideration of claim 1, it is our determination that the claim 1 phrase "consisting primarily of" is an open term which permits

⁵ The open term "comprising" as used in the appellants' claim 44 does not exclude other materials.

inclusion of other materials.⁶ We do not find any definition for this phrase in the appellants' specification. The ordinary usage of "primarily" means "mainly" or "principally". Also, the appellants could have used one of the known closed terms (e.g., "consisting of"), but chose not to do so. Hence, it is our view that one of ordinary skill in the art, taking the appellants' written description into account, would have understood the phrase "consisting primarily of" to mean that other materials are not excluded. Specifically, Drake's aluminide coating is not excluded.

The only difference between Drake and claim 1 is the limitation of the thrust bearing element being "formed of a wrought alloy material consisting primarily of chromium carbide and cobalt and having a yield strength of less than 120,000 psi and a ductility of at least 4%, both at room temperature". The examiner should consider whether, based on

⁶ During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow in order to achieve complete exploration of applicant's invention and its relationship to prior art, so that ambiguities can be recognized, scope and breadth of language explored and clarification imposed. See In re Zletz, 893 F. 2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989).

the other art of record, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Drake's thrust bearing element by providing that Drake's superalloy material be a stellite material, such as stellite 6, as taught by Childers or a wear resistant material, such as stellite 6B, as taught by Du Mond.

The examiner should also review the present claims 1-74 to determine if any of the claims recite the same invention as described in claims 1-27 of the appellants' prior U.S. Patent No. 5,725,313. For example, does claim 3 of the present application and claim 19 of the '313 patent recite the same invention?

CONCLUSION

To summarize, the decision of the examiner to reject claims 1 through 74 for obviousness-type double patenting is affirmed; the decision of the examiner to reject claims 1 through 74 under 35 U.S.C. § 103 is reversed; and this application is remanded for consideration of the matters discussed supra.

In addition to affirming the examiner's rejection of one or more claims, this decision contains a remand. 37 CFR § 1.196(e) provides that

Whenever a decision of the Board of Patent Appeals and Interferences includes or allows a remand, that decision shall not be considered a final decision. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

Regarding any affirmed rejection, 37 CFR § 1.197(b) provides:

(b) Appellant may file a single request for rehearing within two months from the date of the original decision....

The effective date of the affirmance is deferred until conclusion of the proceedings before the examiner unless, as a mere incident to the limited proceedings, the affirmed rejection is overcome. If the proceedings before the examiner does not result in allowance of the application, abandonment or a second appeal, this case should be returned to the Board of Patent Appeals and Interferences for final action on the

affirmed rejection, including any timely request for rehearing thereof.

This application, by virtue of its "special" status, requires immediate action, see MPEP § 708.01. (Seventh Edition, Rev. 1, February 2000).

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED and REMANDED

CHARLES E. FRANKFORT)	
Administrative Patent Judge)	
)	
)	
)	
)	BOARD OF PATENT
JEFFREY V. NASE)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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APPLICATION NO. 08/971,504

APJ LAZARUS

APJ FRANKFORT

APJ NASE

DECISION: **ED**

Prepared By: RBL

DRAFT TYPED: 26 Apr 02

FINAL TYPED: