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**Datasheet for the decision
of 28 January 2020**

Case Number: T 0765/18 - 3.3.05

Application Number: 13172168.0

Publication Number: 2653580

IPC: C22C29/08

Language of the proceedings: EN

Title of invention:

Cemented carbide-metallic alloy composites

Patent Proprietor:

KENNAMETAL INC.

Opponents:

Ceratizit Luxembourg S.a.r.l.
Sandvik Intellectual Property AB

Headword:

Cemented carbide-metallic alloy composites/KENNAMETAL

Relevant legal provisions:

EPC Art. 56
RPBA 2020 Art. 13(1)
RPBA Art. 13(3)

Keyword:

Inventive step - obvious alternative - main request (no)
Late-filed auxiliary requests - admitted (no)

Decisions cited:

T 1597/16

Catchword:



Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 0765/18 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 28 January 2020

Appellant: Ceratizit Luxembourg S.a.r.l.
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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
21 February 2018 concerning maintenance of the
European Patent No. 2653580 in amended form.**

Composition of the Board:

Chairman E. Bendl
Members: A. Haderlein
 O. Loizou

Summary of Facts and Submissions

I. The appeals were filed by appellant 1 (opponent 1) and appellant 2 (opponent 2) against the interlocutory decision of the opposition division finding that, on the basis of the then auxiliary request 1, the patent in suit met the requirements of the EPC.

II. Independent claims 1 and 16 of this request (now main request) read as follows:

"1. A composite sintered powder metal article, comprising:

a first region comprising a cemented hard particle material, wherein the cemented hard particle material comprises at least 60% by volume of hard particles dispersed in a continuous binder phase; and

a second region comprising:

one of a sintered metal and a sintered metallic alloy selected from nickel, a nickel alloy, titanium, a titanium alloy, molybdenum, a molybdenum alloy, cobalt, a cobalt alloy, tungsten, and a tungsten alloy, wherein the metal or metallic alloy includes 0 up to 20% by volume of hard particles dispersed in the metal or metallic alloy;

and wherein the first region is metallurgically bonded directly to the second region at a sintered interface free of cracks and brittle secondary phases, and the first region and the second region each have a thickness greater than 100 microns."

"16. A method of making a composite sintered powder metal article in accordance with any one of the preceding claims, comprising:

providing a first powder in a first region of a mold, the first powder comprising at least 60 volume percent

of hard particles and a powdered binder;
providing a second powder in a second region of the
mold, wherein the second powder contacts the first
powder and comprises:
at least one of a metal powder and a metallic alloy
powder selected from a nickel powder, a nickel alloy
powder, a molybdenum powder, a molybdenum alloy powder,
a titanium powder, a titanium alloy powder, a cobalt
powder, a cobalt alloy powder, a tungsten powder, and a
tungsten alloy powder; and
0 up to 20% by volume of hard particles;
consolidating the first powder and the second powder in
the mold to provide a green compact; and
sintering the green compact to provide a composite
sintered powder metal article comprising a first region
comprising a cemented hard particle material formed
from the first powder and metallurgically bonded at at
a sintered interface free of cracks and brittle
secondary phases directly to a metallic second region
formed from the second powder."

III. The opposition division held that the subject-matter of
claim 1 involved an inventive step when starting from

D11: DE 2 139 738 A1

as the closest prior art.

In the proceedings before the opposition division, the
following document was also cited:

D12: US 4 198 233 A.

IV. With its grounds of appeal, appellant 2 filed further
evidence.

V. With its reply to the grounds of appeal, the proprietor (respondent) filed the following document:

PP1: Davis, J.R., ASM Textbook - Tool Materials.

VI. The board issued a communication under Article 15(1) RPBA 2007 indicating that the evidence filed with the grounds of appeal appeared to be novelty-destroying with respect to the subject-matter of claim 1 of the respondent's main request.

VII. Under cover of its submissions dated 17 December 2019, the respondent filed auxiliary requests 1 to 4, stating that they were in response to the preliminary opinion of the board.

VIII. Auxiliary requests 1 to 4 differ from the main request, *inter alia*, as follows.

Auxiliary request 1: in claim 16 the expression "sintered interface" is replaced by "liquid phase sintered interface" (emphasis added).

Auxiliary request 2: in claim 1 the minimum thickness of both regions is amended to 0.5 centimetres.

Auxiliary request 3: claim 1 corresponds to claim 16 of the main request.

Auxiliary request 4: claim 1 corresponds to claim 16 of the main request, with the additional amendment concerning the minimum thickness as in claim 1 of auxiliary request 2.

IX. The appellants' arguments, as far as relevant to the present case, may be summarised as follows.

The subject-matter of claims 1 and 16 differed from the disclosure of D11 only in that the metal or metallic alloy was selected from the list recited in these claims. The problem to be solved was to provide an alternative article or an alternative method. The solution was obvious in view of D12.

The auxiliary requests either gave rise *prima facie* to new objections or did not *prima facie* overcome the objection with respect to the lack of inventive step. Therefore, these requests should not be admitted into the proceedings.

- X. The respondent's arguments, as far as relevant to the present case, may be summarised as follows.

The subject-matter of claims 1 and 16 of the main request differed from D11 by the metal or metallic alloy being selected from the list recited in these claims. The problem to be solved was to provide an alternative article or an alternative method. It was not obvious to arrive at the claimed article and the claimed method, because D11 only mentioned steel and was silent about the metal or metallic alloy being selected from the list recited in claim 1. D12 did not teach the claimed solution, because the example in D12 related to a steel matrix and only one region was sintered. Therefore, no sintered interface was obtained in D12.

The auxiliary requests had been filed in order to overcome objections with respect to the other prior art, and should be admitted because, apart from auxiliary request 3, they *prima facie* overcame the lack of inventive step objection and did not raise any new

objections.

XI. Requests

The appellants 1 and 2 requested respectively that the decision under appeal be set aside and that the patent be revoked.

The respondent requested that both appeals be dismissed (main request) or, alternatively, that the patent be maintained in amended form on the basis of one of auxiliary requests 1 to 4 filed with its letter dated 17 December 2019.

Reasons for the Decision

1. Main request - inventive step
 - 1.1 The patent is directed to cemented carbide-metallic alloy articles and methods of making such articles.
 - 1.2 D11 concerns such cemented carbide-metallic alloy articles (see in particular claim 1).
 - 1.2.1 The respondent submitted that D11 should not be considered as the closest prior art, because it dealt with steel as the sintered metallic alloy and not with any of the materials called for in claim 1 with respect to the second region. This argument, however, is not persuasive, because D11 generally addresses the same purpose as the patent, namely problems arising from materials that combine properties such as wear resistance, strength and fracture toughness (paragraph [0003] of the patent; pages 1 and 2 of D11). For this reason, D11 qualifies as the closest prior art when

assessing inventive step.

- 1.2.2 It is common ground that D11, in particular Example 4 on page 7, discloses all the features of independent claims 1 and 16 except for the sintered metal/sintered metallic alloy (claim 1) or metal powder/metallic alloy powder (claim 16). Thus, the subject-matter of claims 1 and 16 differs from the article and method disclosed in D11 by the metal/metallic alloy comprised in the second region which is selected from nickel, a nickel alloy, titanium, a titanium alloy, molybdenum, a molybdenum alloy, cobalt, a cobalt alloy, tungsten and a tungsten alloy.
- 1.3 As to the problem to be solved, the parties agree that it consists in the provision of an alternative article and an alternative method.
- 1.4 Concerning obviousness, the appellants referred to D12.
 - 1.4.1 D12 explicitly refers to D11 (column 1, line 43) and teaches in claim 1 and in column 2, lines 13 to 16, that the two powders for the two regions can be iron, nickel, cobalt or mixtures thereof, i.e. iron, nickel and cobalt are disclosed as equivalent. In view of the problem to be solved, i.e. providing an alternative article/method, the respondent's argument that the skilled person would not replace the steel of D11 with nickel or cobalt, or with a nickel or cobalt alloy, is not persuasive. While D11 teaches that both regions are made from steel, it clearly teaches that both layers or regions should be made from material having similar properties in terms of expansion coefficient and hardenability behaviour. For the skilled person considering the teaching of D11 and being aware of the disclosure of D12, which teaches that both regions

could be prepared from a base metal of nickel or cobalt, at least trying to replace the steel of D11 with nickel (alloy) or cobalt (alloy) would have been obvious. They would thus have arrived at the subject-matter of independent claims 1 and 16 in an obvious way.

- 1.4.2 In view of this clear teaching, it is not decisive that a steel matrix is used in the only example of D12 (column 3, from line 6 onwards), as submitted by the respondent.
- 1.4.3 In its opinion, the skilled person would learn from D12 that it was essential to sinter only one region, followed by hot-pressing the sintered body in order to densify the other region. Thus, when combining the teachings of D11 and D12, the skilled person would not arrive at an article having a sintered interface as required in claims 1 and 16.

This line of argument is not persuasive. Firstly, it is uncontested that in D12 the region having the lowest sintering temperature is completely sintered. This means that even if the other region is not (completely) sintered, the interface would still be a "sintered interface", i.e. it also encompasses an interface between a sintered region and a not (completely) sintered region. Secondly, D12 teaches that after the sintering step and before the hot-pressing step, the region having the higher sintering temperature is "not yet fully sintered" (column 2, line 35). Accordingly, this means that this region is fully sintered after the hot-pressing step. Moreover, as convincingly argued by the appellants at the oral proceedings, sintering also encompasses sintering due to solid-state diffusion phenomena at temperatures below the liquidus

temperature, which phenomena occur during the above hot-pressing step.

The respondent, likewise, contended at the oral proceedings that sintering can also encompass solid-state sintering, although the skilled person would understand that in the patent the term "sintering" referred to liquid-phase sintering. This argument is not persuasive, however, because the patent does not contain a statement that sintering is to be understood restrictively in the sense of liquid-phase sintering and, moreover, claims 1 and 16 of the main request only relate to "sintering" and not to "liquid-phase sintering". Thus, D12 teaches that a sintered interface between the two regions is obtained after the hot-pressing step.

1.4.4 In conclusion, the skilled person would have at least tried to replace the steel matrix in D11 with a cobalt or nickel matrix as taught in D12. Moreover, even if the skilled person also applied the two-step process taught in D12, they would have arrived at the article according to claim 1 of the main request. Likewise, the sintering step called for in the last five lines of claim 16 would be arrived at.

1.5 The subject-matter of claims 1 and 16 does not involve an inventive step within the meaning of Article 56 EPC.

2. Auxiliary requests - admittance

2.1 Auxiliary requests 1 to 4 were filed after the oral proceedings had been arranged. Their admission was therefore at the board's discretion (Article 13(1) RPBA 2020 and Article 13(3) RPBA 2007; see also T 1597/16, Reasons 2). In exercising its discretion to admit

auxiliary requests 1 to 4 into the appeal proceedings, the board has to decide whether the amendments put forward overcome all the objections raised in its communication under Article 15(1) RPBA 2007.

- 2.2 Concerning auxiliary request 1, claim 16 thereof corresponds to claim 16 of the main request, with "sintered interface" reading "liquid phase sintered interface".

It was uncontested that the passages in the application as filed referred to by the respondent (paragraphs [0041], [0042] and [0065]) do not disclose the added feature "liquid phase"; they only disclose specific process conditions, including values for temperature and pressure. Likewise, the passages referred to in PP1, page 41, left-hand column, first full paragraph and middle column, second full paragraph, only relate to cobalt and not to all metal (alloys) recited in claim 1, including tungsten (alloy). Thus, *prima facie*, there is no basis in the application documents as filed for the proposed amendment. Put differently, the proposed amendments would give rise to new objections.

- 2.3 In claim 1 of auxiliary request 2, the minimum thickness of both regions is amended to 0.5 centimetres.

D11 relates to sealing devices in the form of strips or rings which are intended, for example, for sealing the piston of a rotary piston internal combustion engine against the housing therefor (see page 1). Examples are depicted in the figures (see also page 7). From these passages it is apparent that the articles disclosed in D11 have regions whose thicknesses are at least in the order of millimetres. Thus, the proposed amendment does

not clearly further delimit the claimed article from the disclosure of D11 and, therefore, cannot be considered to *prima facie* overcome the lack of inventive step of the subject-matter of claim 1 of the main request. Whether there are any alleged advantages with such an alleged distinguishing feature, as contended by the respondent, is immaterial in this respect.

- 2.4 Concerning auxiliary request 3, claim 1 thereof uncontestedly corresponds to claim 16 of the main request whose subject-matter is found to lack inventive step (see above) and thus fails to overcome this objection.
- 2.5 Concerning auxiliary request 4, claim 1 thereof corresponds to claim 16 of the main request, with the restriction to the minimum thickness of both regions as amended in claim 1 of auxiliary request 2. Therefore, this request does not *prima facie* overcome the objection of lack of inventive step with respect to the subject-matter of claim 16 of the main request for the reasons set out above for auxiliary request 2.
- 2.6 For these reasons, the board, exercising its discretion, did not admit the auxiliary requests into the appeal proceedings.
3. Since the main request is not allowable and the auxiliary requests are not admitted into the proceedings, the patent is to be revoked.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:



C. Vodz

E. Bendl

Decision electronically authenticated