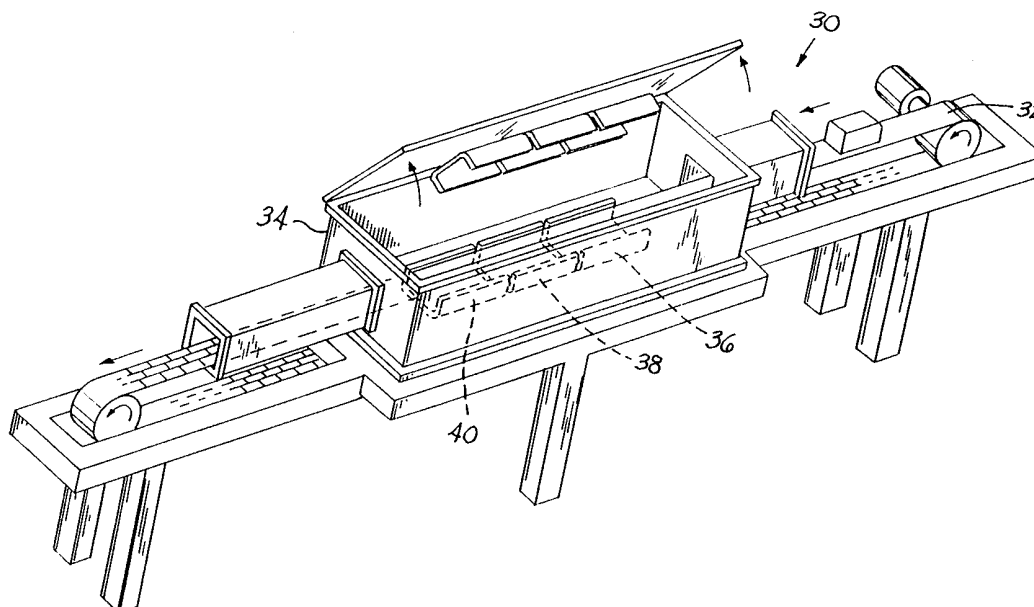




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : C04B 35/58, F27B 9/24, F27D 3/12	A3	(11) International Publication Number: WO 00/02829 (43) International Publication Date: 20 January 2000 (20.01.00)
(21) International Application Number: PCT/US99/14231 (22) International Filing Date: 23 June 1999 (23.06.99) (30) Priority Data: 09/112,639 9 July 1998 (09.07.98) US (71) Applicant: KENNAMETAL INC. [US/US]; P.O. Box 231, Latrobe, PA 15650-0231 (US). (72) Inventor: YECKLEY, Russell, L.; 110 Branwell Drive, Latrobe, PA 15650 (US). (74) Agents: PRIZZI, John, J. et al.; Kennametal Inc., P.O. Box 231, Latrobe, PA 15650-0231 (US).		(81) Designated States: BR, CA, IL, JP, KR, MX, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> (88) Date of publication of the international search report: 17 August 2000 (17.08.00)

(54) Title: CERAMIC AND PROCESS FOR THE CONTINUOUS SINTERING THEREOF

**(57) Abstract**

A continuous process for the manufacture of a ceramic sintered compact wherein the process comprises the steps of: forming a green compact from a powder mixture comprising a first component comprising compounds which contain elements of silicon, aluminum, oxygen and nitrogen; and the powder mixture further comprising a second component comprising a compound of at least one element selected from the group consisting of yttrium, scandium, cerium, lanthanum and the metals of the lanthanide series, and the second component comprising between 0.1 and 10 weight percent of the powder mixture; heat treating the green compact wherein the heat treatment comprises continuously passing the green compact through at least one heating zone so as to produce a sintered compact.

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/14231

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C04B35/58 F27B9/24 F27D3/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C04B F27B F27D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 648 042 A (MILLER JR CHARLES W) 15 July 1997 (1997-07-15) column 5, line 3 - line 46; figure 1 abstract	1-49
Y	US 5 370 716 A (MEHROTRA PANKAJ K ET AL) 6 December 1994 (1994-12-06) column 1, line 26 - line 39 column 1, line 53 - column 2, line 15 column 3, line 19 - column 4, line 43 column 9, line 33 - line 36; figure 1 abstract	1-49
A	EP 0 796 828 A (SANDVIK AB) 24 September 1997 (1997-09-24) the whole document	1-49
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

8 May 2000

Date of mailing of the international search report

09.06.00

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INTERNATIONAL SEARCH REPORT

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PCT/US 99/14231

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	US 5 227 346 A (HWANG CHINMAU J ET AL) 13 July 1993 (1993-07-13) abstract -----	1-49

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 99/14231

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-27

relates to a continuous process for the manufacture of a ceramic sintered compact. The invention is characterised by the steps of forming a green compact from a powder mixture.

2. Claims: 28-35

relates to a continuous process for the manufacture of a ceramic sintered compact. The invention is characterised by the phases of the ceramic.

3. Claims: 36-39

relates to a ceramic cutting insert. The invention is characterised by the shape of its faces where at least one face does not have a surface reaction layer.

4. Claims: 40-43

relates to a ceramic cutting insert. The invention is characterised by its microstructure.

5. Claims: 44-49

relates to a sintered ceramic body. The invention is characterised by its composition and surface region.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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