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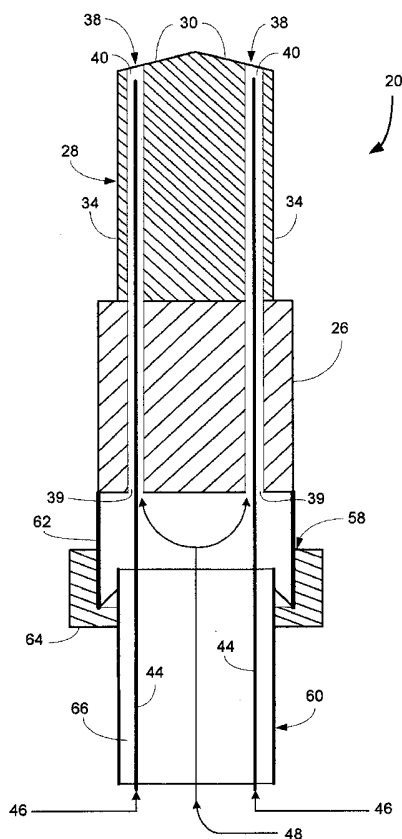
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Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

[Continued on next page]

(54) Title: DEVICE FOR APPLYING CRYOGENIC COMPOSITION AND METHOD OF USING SAME



(57) Abstract: A device of the present invention for applying a cryogenic composition includes a machining tool (20) or tool holder having a channel (38) positioned therethrough and a capillary tube (44) positioned within the channel (38). A dense cryogenic fluid is passed through the capillary tube (44) while a diluent or propellant fluid is passed through the channel. The diluent or propellant fluid flows within the channel (38) and about the capillary tube (44). Upon exiting the capillary tube, the dense fluid admixes with the diluent or propellant fluid to form a cryogenic composite fluid or spray (24). The cryogenic composite fluid or spray is selectively directed onto a substrate (22) for cooling, cleaning or lubrication purposes, or onto the machining tool (20) for cooling purposes.



— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/45122

A. CLASSIFICATION OF SUBJECT MATTER

IPC: **B23Q 11/10**(2006.01);**B23C 5/28**(2006.01)

USPC: 82/1.11;407/11;408/56,57,59

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)

U.S. : 82/1.11;407/11;408/56,57,59

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 practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,056,486 A (Colvin) 02 May 2000 (02.05.2000), Col. 4, lines 59-62; Col. 1, lines 59-64; Col. 6, lines 58-60	1-3, 6-8, 10-12
X	US 3,364,800 A (Benjamin et al) 23 January 1968 (23.01.1968), entire document	1-3, 10-12
Y	US 3,077,802 A (Philip) 19 February 1963 (19.02.1963), Col. 1, lines 10-27; Col. 4, lines 11-20	4, 9, 13
X	US 3,561,299 A (Brisk et al) 09 February 1971 (09.02.1971), entire document	1, 10
A	US 3,889,520 A (Stoferle et al.) 17 June 1975 (17.06.1975), entire document	1-4, 6-13
A	US 5,901,623 A (Hong) 11 May 1999 (11.05.1999), entire document	1-4, 6-13



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:		"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier application or patent published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search
05 June 2006 (05.06.2006)

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/45122

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 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 No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation 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 additional fees, this Authority did not invite payment of any additional fees.
 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 and, where applicable, the payment of a protest fee. |
| ☐ | The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation. |
| ☐ | No protest accompanied the payment of additional search fees. |

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US05/45122

BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claims 1-9 are drawn to A Method of Applying a composite fluid during a machining Process, classified in Class 82/1.11.

Group II, claims 10-13 are drawn to A Machine Tool for Providing Cryogenic composite fluid, classified in Class 408/56.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I does not require a bit to do the machining (for example it could be laser machining).