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(71) Applicant (for all designated States except US): PCBU
SERVICES, INC. [US/US]; Suite 1269, 300 Delaware Av-
enue, Wilmington, DE 19801 (US).

(72) Inventors: CHIEN, John, Ph.D.; 3318 Humboldt Street,
West Lafayette, IN 47906 (US). ROWLAND, Thomas,
F.; 319 Pleasant Grove Road, El Dorado, AR 71730 (US).
ROBIN, Mark, L., Ph.D.; 5415 Hillside Lane, West
Lafayette, IN 47906 (US). BOGGS, Janet; 6922 N. 900
East, Brownsburg, IN 46112 (US). COHN, Mitchel,
Ph.D.; 3029 Courthouse Drive, Apt. 2B, West Lafayette,
IN 47906 (US). HEDRICK, Vicki; 9262 South 300 E.,
Brookston, IN 97923 (US). BRANDSTADTER, Stephan,
Ph., D.; 3946 N. Washington Boulevard, Indianapolis, IN
46205 (US).

(74) Agent: HYTA, Robert, C.; Wells St. John, P.S., 601 W.
First Avenue, Suite 1300, Spokane, WA 99201 (US).

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CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC,
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Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

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16 September 2004

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Previous Correction:

see PCT Gazette No. 30/2004 of 22 July 2004, Section II

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.

(54) Title: METHODS FOR PREPARING ETHERS, HALOGENATED ETHERS, FLUOROETHERS AS WELL AS USES OF THE LATTER IN FIRE EXTINGUISHING SYSTEMS.

(57) Abstract: Highly fluorinated, saturated, and unsaturated fluoroethers are efficient, economical, non-ozone-depleting fire extinguishing agents used alone or in blends with other fire extinguishing agents in total flooding and portable systems. Methods for producing ethers, halogenated ether intermediates, and fluoroethers are disclosed. Novel fluoroether compositions are disclosed. Fluoroether extinguishing mixtures, methods, and systems are disclosed.

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 03/19693

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07C41/16 C07C43/12 C07C41/22 C07C43/17 A62D1/00

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 C07C A62D

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, WPI Data, PAJ, INSPEC, COMPENDEX, BEILSTEIN Data, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2 975 163 A (LO ELIZABETH S) 14 March 1961 (1961-03-14)	1-4, 7-8, 12, 21-23
Y	column 2, line 11 - line 62 column 3, line 47 - line 56; examples 1-4	17-20
X	A. L. HENNE ET AL.: "Fluorinated ethers" J.AM.CHEM.SOC., vol. 72, 1972, pages 4378-4380, XP002277286 experimental: "addition of alcohols to fluorinated olefins", page 4379 and "perchlorination" on page 4380table II ----- -/--	1, 3-9, 11, 13, 15, 16, 21-25, 33-36

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

° Special categories of cited documents :

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

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)

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

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

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

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.

G document member of the same patent family

Date of the actual completion of the international search

6 July 2004

Date of mailing of the international search report

02.08.2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Seelmann, M

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 03/19693

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: 1-23

preparation of an ether of general formula C(X)(Y)(R3)-O-R4

2. claims: 24-49

preparation of a halogenated ether of general formula
C(X)(Y)(R5)-O-R6

3. claims: 50-109

preparation of fluoroethers in general or the particular
ones of general formula R7-O-R8

4. claims: 110-137

fluoroethers of general formula Z1-O-Z2 and uses thereof as
fire extinguishing agents

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 03/19693

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	V.A. GUBANOV ET AL.: "Reaction of hexafluoropropene with (perfluoroalkyl)methanols" J. GEN. CHEM., vol. 35, 1965, pages 399-400, XP0009029609	1-10, 12-14, 21-23
Y	1st entry in the table on page 400 page 399	17-20
X	----- DATABASE CROSSFIRE BEILSTEIN BEILSTEIN INSTITUT ZUR FÖRDERUNG DER CHEMISCHEN WISSENSCHAFTEN; XP002277291 Database accession no. 5257400	1-9,11, 13,15, 21-23
Y	abstract & V. A. PETROV ET AL.: J. FLUORINE CHEM., vol. 95, no. 1, 1999, pages 5-14, XP009029645 page 12, paragraph 4.2	17-20
A	----- US 2 671 799 A (MILLER WILLIAM T) 9 March 1954 (1954-03-09) example I	1-23
X,P	----- US 6 416 683 B1 (KLUG DIANA LYNN ET AL) 9 July 2002 (2002-07-09) examples 11, 12 and 16 as well as 236caE column 2, line 38 - column 8, line 25; tables column 86, line 41 - line 45	24-29, 33-36, 38, 40-42, 50,51, 53, 63-66, 69,71, 75-77, 79,89, 90,110, 111,122, 123,130, 131
X	----- R.C. TERRELL ET AL.: "General anesthetics. 1. Halogenated methyl ethyl ethers as anesthetic agents." JOURNAL OF MEDICINAL CHEMISTRY, vol. 14, no. 6, 1971, pages 517-519, XP002287171 compounds 42 and 44 table I; method of chlorination according to Park's (references 4 and 5): experimental section on page 519	110
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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 03/19693

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	J.D.PARK ET AL.: "Directed chlorination of fluorinated aliphatic ethers." JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, vol. 74, 1952, pages 2292-2294, XP002287172 experimental section, part (1), page 2293, left-hand column page 2292, right-hand column, paragraph 1; table I	24,25, 27-29, 31, 33-35, 38,40-42
X	R.C.TERRELL ET AL.: "General anesthetics. 3. Fluorinated methyl ethyl ethers as anesthetic agents." JOURNAL OF MEDICINAL CHEMISTRY, vol. 15, no. 6, 1972, pages 604-606, XP002287173 compounds 5 and 8 on table I; compounds 38 and 43 on table II; experimental section on page 605: fluorination with anhydrous HF (method B). page 604, right-hand column, last paragraph	50,51, 53, 63-66, 69,71, 75-77, 79,89, 90,110, 111,122, 123,130, 131
X	GB 1 571 356 A (DU PONT) 16 July 1980 (1980-07-16) page 1, line 8 - line 18	110
X	US 3 943 256 A (REGAN BERNARD M) 9 March 1976 (1976-03-09) compound IIIexample 4	110
X	K. K. JOHRI ET AL.: "Comparison of the reactivity of CF ₃ OX (X = Cl, F) with some simple alkenes." JOURNAL OF ORGANIC CHEMISTRY, vol. 48, 1983, pages 242-250, XP000881790 table IV, entry 5	110
X	V.A. PETROV: "New synthesis of hydrofluoroethers." JOURNAL OF FLUORINE CHEMISTRY, vol. 112, 2001, pages 117-121, XP004322994 compound 6a, page 118	110
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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 03/19693

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	B.B.RANDOLPH ET AL.: "Synthesis of functionalized polyfluoroalkyl hypochlorites and fluoroxy compounds and their reactions with some fluoroalkenes." JOURNAL OF FLUORINE CHEMISTRY, vol. 64, 1993, pages 129-149, XP002287174 products of fluoroxy compound 3c page 146; table 1	110
X	----- DATABASE BEILSTEIN BEILSTEIN INSTITUTE FOR ORGANIC CHEMISTRY, FRANKFURT-MAIN, DE; XP002287175 Database accession no. 8203460 abstract & T.A. BISPEN ET AL.: JOURNAL OF APPLIED CHEMISTRY, vol. 71, no. 6, 1998, pages 1009-1013,	110
X	----- DATABASE BEILSTEIN BEILSTEIN INSTITUTE FOR ORGANIC CHEMISTRY, FRANKFURT-MAIN, DE; XP002287176 Database accession no. 2642703 abstract & V.V.BERENBLIT ET AL.: JOURNAL OF ORGANIC CHEMISTRY USSR, vol. 12, 1976, pages 765-768,	110
X	----- DATABASE BEILSTEIN BEILSTEIN INSTITUTE FOR ORGANIC CHEMISTRY, FRANKFURT-MAIN, DE; XP002287177 Database accession no. 4744596 abstract & S.D. CHEPIK ET AL.: BULL.ACAD.SCI.USSR DIV.CHEM.SCI., vol. 40, no. 8.2, 1991, pages 1712-1714,	110
X	----- DATABASE BEILSTEIN BEILSTEIN INSTITUTE FOR ORGANIC CHEMISTRY, FRANKFURT-MAIN, DE; XP002287178 Database accession no. 5429529 abstract & S.D.CHEPIK ET AL.: BULL.ACAD.SCI.USSR DIV.CHEM.SCI., vol. 40, no. 8.2, 1991, pages 1712-1714,	110
X	----- DATABASE BEILSTEIN BEILSTEIN INSTITUTE FOR ORGANIC CHEMISTRY, FRANKFURT-MAIN, DE; XP002287179 Database accession no. 2454312 abstract	50,75, 93,110
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	& V.S. YUMINOV ET AL.: J.GEN.CHEM.USSR, vol. 37, 1967, pages 350-354, ----- DATABASE BEILSTEIN BEILSTEIN INSTITUTE FOR ORGANIC CHEMISTRY, FRANKFURT-MAIN, DE; XP002287180 Database accession no. 1856325 abstract & V.V.BERENBLIT ET AL.: JOURNAL OF ORGANIC CHEMISTRY USSR, vol. 12, 1976, pages 765-768, -----	110,111
A	US 4 014 799 A (OWENS ROBERT J) 29 March 1977 (1977-03-29) cited in the application the whole document -----	122-137

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Information on patent family members

International Application No

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