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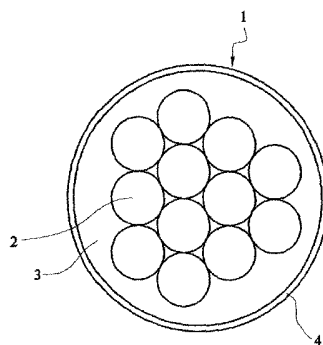
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23 September 2004

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(54) Title: OPTICAL CABLE FOR INSTALLATION BY BLOWING



(57) Abstract: A fibre optic cable (1) includes a core of primary coated optical fibres (2) embedded in an inner layer (3) of acrylate material, having sufficient tensile strength when cured to lock at least the outermost fibres (2) in place and still allow the fibres to be easily broken out of the assembly for termination and splicing purposes. The hardness of the acrylate layer (3) is such that at least the outermost fibres (2) of the bundle are restricted from moving axially relative to the inner layer (3). The inner layer (3) is then surrounded by a loose thin jacket (4) formed from a mixture of high density polyethylene having a Shore hardness greater than or equal to 60 and a generally uniformly distributed slip agent, including a polyether modified poly (dimethylsiloxane) material such as polyether modified hydroxy functional poly (dimethylsiloxane) material. The mixture from which the outer layer (4) is formed is compacted by means of heat and pressure. The outer layer (4) may also contain a mineral filler, such as calcium carbonate and/or titanium dioxide, in order to improve the stability of the dimensions of the outer layer (4) as the temperature changes.

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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/GB 03/02762

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC 7 G02B6/44		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC 7 G02B		
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) PAJ, WPI Data, EPO-Internal, INSPEC		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 035 087 A (BONICEL JEAN-PIERRE ET AL) 7 March 2000 (2000-03-07) abstract; figure 3 column 2, line 6 -column 4, line 67 ---	1-4,9,16
X	US 4 687 294 A (ANGELES PURITA R) 18 August 1987 (1987-08-18) abstract; claims 4,5; figures 1,3 column 5, line 56 -column 6, line 51 ---	1,2,16
X	EP 0 296 836 A (BICC PLC ;CORNING LTD (GB)) 28 December 1988 (1988-12-28) abstract; figure 1; table 1 page 1, line 2 - line 9 ---	1,2
	-/--	
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> 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. *&* document member of the same patent family
Date of the actual completion of the international search  20 April 2004		Date of mailing of the international search report  04.06.2004
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  Faderl, I

## INTERNATIONAL SEARCH REPORT

International Application No

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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	US 5 761 361 A (PFANDL W. ET AL) 2 June 1998 (1998-06-02) abstract; figures 1,4 column 6, line 41 - line 49 column 7, line 33 - line 67 column 8, line 7 - line 23 ---	9
A	US 5 557 703 A (BARKER PHILIP A ET AL) 17 September 1996 (1996-09-17) abstract; figures 3,6A ---	1-27
A	US 6 334 015 B2 (JAMET PATRICK) 25 December 2001 (2001-12-25) abstract; claims 3,6; figure 4 column 3, line 5 - line 16 column 4, line 47 - line 67 ---	1-8
A	EP 0 405 851 A (AMERICAN TELEPHONE & TELEGRAPH) 2 January 1991 (1991-01-02) abstract; figure 1 ---	1-8
A	PATENT ABSTRACTS OF JAPAN vol. 009, no. 186 (P-377), 2 August 1985 (1985-08-02) & JP 60 057304 A (FURUKAWA DENKI KOGYO KK), 3 April 1985 (1985-04-03) abstract ---	1
A	DE 31 44 182 A (SIEMENS AG) 19 May 1983 (1983-05-19) page 6; figure 1 ---	1
A	DE 195 20 978 A (SIEMENS AG) 12 December 1996 (1996-12-12) abstract; claims 1,6-9; figures 1,3-5 column 2, line 64 -column 3, line 11 ---	1-27
A	US 4 952 021 A (AOKI TETSUJI ET AL) 28 August 1990 (1990-08-28) abstract; figures 1A,2 column 1, line 32 -column 4, line 26 ---	1-27
A	US 6 389 204 B1 (HURLEY WILLIAM C) 14 May 2002 (2002-05-14) abstract; figures 4,6 ---	1-27
A	US 4 000 936 A (GLOGE DETLEF CHRISTOPH) 4 January 1977 (1977-01-04) abstract; figures 4,10 -----	1-27

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

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

1. Claims: 1-8

A cable assembly comprising a plurality of flexible signal transmitting members surrounded by a first layer such that axial movement of at least the outermost signal transmitting members relative to said first layer is restricted, and a continuous thermoplastic polymer second layer arranged outwardly of said first layer characterised by the fact that the hardness of the polymer of the second layer is greater than or equal to a Shore D hardness of 60

2. Claims: 9-15

A cable assembly comprising a plurality of flexible signal transmitting members surrounded by a first layer such that axial movement of at least the outermost signal transmitting members relative to said first layer is restricted, and a continuous thermoplastic polymer second layer arranged outwardly of said first layer characterised by the fact that the second layer has a thickness of less than 400 microns around at least 10% of the circumference of the cable assembly

3. Claims: 16-27

A cable assembly comprising a plurality of flexible signal transmitting members surrounded by a first layer such that axial movement of at least the outermost signal transmitting members relative to said first layer is restricted, and a continuous thermoplastic polymer second layer arranged outwardly of said first layer characterised by the fact that the second layer is adapted to be removed from said first layer by sliding over said first layer

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/GB 03/02762

## 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.

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 03/02762

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6035087	A	07-03-2000	FR 2760539 A1	11-09-1998
			FR 2760540 A1	11-09-1998
			BR 9800864 A	04-01-2000
			CA 2229333 A1	10-09-1998
			CN 1193120 A , B	16-09-1998
			EP 0864896 A1	16-09-1998
			JP 10260340 A	29-09-1998
US 4687294	A	18-08-1987	AU 575638 B2	04-08-1988
			AU 4182685 A	28-11-1985
			CA 1251972 A1	04-04-1989
			DE 3518822 A1	28-11-1985
			FR 2564988 A1	29-11-1985
			GB 2159296 A , B	27-11-1985
EP 0296836	A	28-12-1988	AT 113389 T	15-11-1994
			AU 607231 B2	28-02-1991
			AU 1823788 A	05-01-1989
			CA 1321722 C	31-08-1993
			DE 3851915 D1	01-12-1994
			DE 3851915 T2	23-03-1995
			EP 0296836 A1	28-12-1988
			ES 2061651 T3	16-12-1994
			GB 2206220 A , B	29-12-1988
			JP 1088411 A	03-04-1989
			JP 2831357 B2	02-12-1998
			US 4976519 A	11-12-1990
			US 5761361	A
US 5557703	A	17-09-1996	AT 153144 T	15-05-1997
			AU 653623 B2	06-10-1994
			AU 2196192 A	11-02-1993
			BG 61196 B1	28-02-1997
			BG 98330 A	30-06-1994
			CA 2110800 A1	21-01-1993
			CZ 9302923 A3	13-04-1994
			DE 69219680 D1	19-06-1997
			DE 69219680 T2	11-09-1997
			DK 521710 T3	01-12-1997
			EP 0521710 A1	07-01-1993
			EP 0592505 A1	20-04-1994
			ES 2102464 T3	01-08-1997
			FI 935911 A	29-12-1993
			WO 9301512 A1	21-01-1993
			GB 2271649 A , B	20-04-1994
			GR 3023418 T3	29-08-1997
			HK 133696 A	02-08-1996
			HU 66090 A2	28-09-1994
			NO 934907 A	01-03-1994
			NZ 243408 A	22-12-1994
			RO 113909 B1	30-11-1998
			SK 150593 A3	11-05-1994
			US 5555335 A	10-09-1996
			ZA 9204893 A	28-04-1993
			DE 69130531 D1	07-01-1999
			DE 69130531 T2	22-04-1999
			EP 0539432 A1	05-05-1993

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 03/02762

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
US 6334015	B2	08-11-2001	FR 2785994 A1	19-05-2000
			AU 6346599 A	05-06-2000
			BR 9914888 A	17-07-2001
			CA 2349921 A1	25-05-2000
			CN 1326556 T	12-12-2001
			EP 1131661 A1	12-09-2001
			WO 0029892 A1	25-05-2000
			HU 0104462 A2	28-03-2002
			JP 2002530693 T	17-09-2002
			SK 6522001 A3	03-12-2001
			US 2001038739 A1	08-11-2001
			EP 0405851	A
AT 133291 T	15-02-1996			
AU 608480 B1	28-03-1991			
CA 2019920 A1	31-12-1990			
CN 1048457 A , B	09-01-1991			
DE 69024860 D1	29-02-1996			
DE 69024860 T2	30-05-1996			
DK 405851 T3	12-02-1996			
EP 0405851 A1	02-01-1991			
ES 2081934 T3	16-03-1996			
JP 2726737 B2	11-03-1998			
JP 3040311 A	21-02-1991			
KR 192107 B1	15-06-1999			
MX 173838 B	30-03-1994			
JP 60057304	A	03-04-1985		
			JP 1547841 C	09-03-1990
DE 3144182	A	19-05-1983	DE 3144182 A1	19-05-1983
DE 19520978	A	12-12-1996	DE 19520978 A1	12-12-1996
US 4952021	A	28-08-1990	JP 2050111 A	20-02-1990
			JP 2780310 B2	30-07-1998
			JP 2050112 A	20-02-1990
			JP 2780311 B2	30-07-1998
			AU 617173 B2	21-11-1991
			AU 3488189 A	23-11-1989
US 6389204	B1	14-05-2002	EP 1262808 A1	04-12-2002
US 4000936	A	04-01-1977	BE 831759 A1	17-11-1975
			CA 1051238 A1	27-03-1979
			DE 2533144 A1	12-02-1976
			FR 2280909 A1	27-02-1976
			GB 1519521 A	02-08-1978
			IT 1041349 B	10-01-1980
			JP 51037661 A	30-03-1976
			NL 7508912 A	03-02-1976
			SE 408829 B	09-07-1979
			SE 7508186 A	02-02-1976