



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : G02F	A2	(11) International Publication Number: WO 98/47039 (43) International Publication Date: 22 October 1998 (22.10.98)
(21) International Application Number: PCT/US98/02515 (22) International Filing Date: 9 February 1998 (09.02.98) (30) Priority Data: 60/038,149 10 February 1997 (10.02.97) US Not furnished 5 February 1998 (05.02.98) US (71) Applicant (for all designated States except US): OPTICAL NETWORKS, INC. [US/US]; 3450 Hillview Avenue, Palo Alto, CA 94304 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): SHARMA, Rohit [IN/US]; 20350 Stevens Creek Boulevard #315, Cupertino, CA 95014 (US). MCADAMS, Larry, R. [US/US]; 1801 Robbin Whipple Way, Belmont, CA 94002 (US). (74) Agents: SLONE, David, N. et al.; Townsend and Townsend and Crew LLP, 8th floor, Two Embarcadero Center, San Francisco, CA 94111-3834 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>Without international search report and to be republished upon receipt of that report.</i>
(54) Title: METHOD AND APPARATUS FOR OPERATION, PROTECTION, AND RESTORATION OF HETEROGENEOUS OPTICAL COMMUNICATION NETWORKS (57) Abstract Techniques for providing normal operation and service restoration capability in the event of failure of terminal equipment or transmission media in a heterogeneous network, such as a hybrid network containing single- and multi-wavelength lightwave communications systems. An optical switching node or OSN (12, 120a-d) is placed at each node in the ring network (110) to provide the required connections between various fibers (55) and terminal equipment (50, 50a-d), but having switch states that allow signals on the protection fibers to bypass the terminal equipment at that node. Ring-switched signals propagate around the ring on protection fibers (55adp', 55dap') without encountering the terminal equipment at the intervening nodes. To the extent that the protection fiber links between any given pair of nodes are incapable of supporting all the relevant communication regimes, such links are modified to provide such support.		

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon	KR	Republic of Korea	PL	Poland		
CN	China	KZ	Kazakstan	PT	Portugal		
CU	Cuba	LC	Saint Lucia	RO	Romania		
CZ	Czech Republic	LI	Liechtenstein	RU	Russian Federation		
DE	Germany	LK	Sri Lanka	SD	Sudan		
DK	Denmark	LR	Liberia	SE	Sweden		
EE	Estonia			SG	Singapore		