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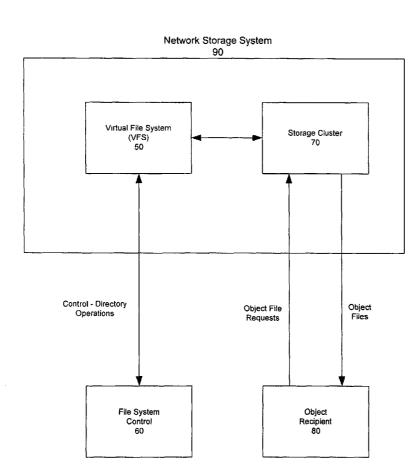
60/186,693	3 March 2000 (03.03.2000)	US
60/186,774	3 March 2000 (03.03.2000)	US
09/695,499	23 October 2000 (23.10.2000)	US
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(54) Title: A NETWORK STORAGE SYSTEM



(57) Abstract: A network storage system includes a virtual file system ("VFS"), to manage the files of the network storage system, and a storage center that stores the files. The VFS and the storage center are separated, such that a client accesses the VFS to conduct file system operations and the client accesses the storage center to upload/download files. The client accesses the network storage system through one or more storage ports. The storage center includes a plurality of distributed object storage managers (DOSMs) and a storage cluster that includes a plurality of intelligent storage nodes. The network storage system includes additional storage centers at geographically disparate locations. The network storage system uses a multi-cast protocol to maintain file information at the DOSMs regarding files stored in the intelligent storage nodes, including files stored in disparate storage centers.

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B. FIELDS SEARCHED

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

EPO-Internal, WPI Data, PAJ, INSPEC, IBM-TDB

C. DOCUM	ENTS CONSIDERED TO BE RELEVANT	
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99 45491 A (NUVOMEDIA INC) 10 September 1999 (1999-09-10)	1-5, 10-16, 21,22
Α	page 3, line 5-31 page 6, line 17-30 page 11, line 30 -page 12, line 28 figure 3	6-9, 17-20,23
A	US 5 923 846 A (GAGE BRUCE ET AL) 13 July 1999 (1999-07-13) column 2, line 26-67 column 5, line 64 -column 6, line 17 column 8, line 3-22 column 15, line 56 -column 17, line 27 -/	1-23

Y Further documents are listed in the continuation of box C.	χ 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
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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 Lázaro, M.L.

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	ion) DOCUMENTS CONSIDERED TO BE RELEVANT	
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
1	US 5 796 952 A (JAIN VIDYUT ET AL) 18 August 1998 (1998-08-18) column 4, line 1 -column 5, line 56 claims 1,2,6	1-23

INTERNATIONAL SEARCH REPORT

Information on patent family members

Internal plication No
PCT/US 01/06707

	atent document I in search report		Publication date		Patent family member(s)	Publication date
WO	9945491	A	10-09-1999	US US EP EP WO WO US	2001011238 A1 2003110084 A1 1070298 A1 1121779 A1 9945491 A1 0021239 A1 2001012000 A1 2002007454 A1	02-08-2001 12-06-2003 24-01-2001 08-08-2001 10-09-1999 13-04-2000 09-08-2001 17-01-2002
US	5923846	Α	13-07-1999	NONE		
US	5796952	Α	18-08-1998	AU AU BR CA CN EP JP NZ US US US	727170 B2 6573198 A 9808033 A 2284530 C 1251669 T 1010116 A2 2000514942 T 337756 A 2002040395 A1 9843380 A2 6138155 A 2002099812 A1 2003065770 A1	07-12-2000 20-10-1998 05-09-2000 06-08-2002 26-04-2000 21-06-2000 07-11-2000 27-04-2001 04-04-2002 01-10-1998 24-10-2000 25-07-2002 03-04-2003