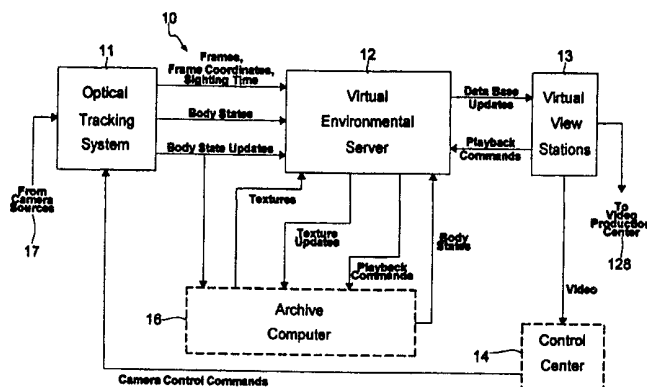




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(21) International Application Number: PCT/US98/27743 (22) International Filing Date: 30 December 1998 (30.12.98) (30) Priority Data: 09/094,524 12 June 1998 (12.06.98) US (71) Applicant: THERMO INFORMATION SOLUTIONS, INC. [US/US]; 6820 Moquin Drive, Huntsville, AL 35806 (US). (72) Inventors: BOYKEN, Jeffery, D.; 104 Shaverlee Court, Meridianville, AL 35759 (US). MITCHELL, Brian, K.; 122 Season Lane, Huntsville, AL 35803 (US). WELLS, Robert, V.; 1000 Kodiak Drive, Huntsville, AL 35803 (US). (74) Agent: GACHE, Russell, Carter; Sirote & Permutt, P.C., 2222 Arlington Avenue South, Birmingham, AL 35205 (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, HR, 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, 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, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> (88) Date of publication of the international search report: 6 April 2000 (06.04.00)	

(54) Title: METHOD AND APPARATUS FOR GENERATING VIRTUAL VIEWS OF SPORTING EVENTS

**(57) Abstract**

A virtual view system (10) uses raw imagery from cameras (17) placed around a sporting arena to generate virtual views of the sporting event from any contemplated view point. The system (10) consists of an optical tracking system (11), a virtual environment server (12), and one or more virtual view stations (13). The optical tracking system (11) receives raw, 2-dimensional video data from a pre-selected number of cameras (17) strategically placed around a sporting arena. The body state data is then passed to a virtual environment server (12) which generates body position information and visual models for transfer to a selected number of virtual view stations (13). Each virtual view station (13) includes viewing software for rendering and viewing a virtual sports scene as desired. The view stations (13) also control the viewing point of view of a virtual camera and output video data to a video production center (128) so that video data may be transmitted and combined with other video input as needed. Optional subsystems such as a control center (14) and an archive computer (16) may be integrated into the system to alter camera positioning, tether, focus, and zoom, and to store processed data for the sporting event and replay the data on demand.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/27743

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :H04N 5/78
US CL :345/418, 427

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. : 345/418, 427, 419, 425, 428, 429, 430, 433, 435

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.
A	US 5,363,297 A (LARSON et al) 08 November 1994	1-20
X	US 5,499,146 A (DONAHUE et al) 12 March 1996, col.3, line 3 through col.12, line 47.	1-20
A	US 4,754,342 A (DUFFY) 28 June 1988	1-20
A	US 5,513,854 A (DAVER) 07 May 1996	1-20

Further documents are listed in the continuation of Box C. See patent family annex.

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Date of the actual completion of the international search 17 JULY 1999	Date of mailing of the international search report 04 FEB 2000
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