(19) World Intellectual Property Organization International Bureau





(43) International Publication Date 13 March 2003 (13.03.2003)

PCT

(10) International Publication Number WO 03/021936 A3

(51) International Patent Classification⁷: H04N 7/12

(21) International Application Number: PCT/US02/28157

(22) International Filing Date:

5 September 2002 (05.09.2002)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/316,963

5 September 2001 (05.09.2001) US

- (71) Applicant: EMBLAZE SYSTEMS LTD. [IL/IL]; 22 Zahrin St., 43662 Raanana (IL).
- (71) Applicant (for TJ only): FRIEDMAN, Mark, M. [US/IL]; 1 Alharizi St., 43406 Raanana (IL).
- (72) Inventors: FRISHMAN, Eyal; 20 Arlozorov St., 44453 Kfar Sava (IL). SAGI, Tamir; 41 Shoham St., 34679 Haifa (IL). OREN, Noam; 5 Liberman St., Herzeliya 46333 (IL).

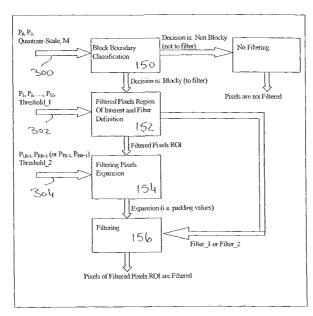
- (74) Common Representative: FRIEDMAN, Mark, M.; c/o Discovery Dispatch, 9003 Florin Way, Upper Marlboro, MD 20772 (US).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): 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, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

with international search report

[Continued on next page]

(54) Title: METHOD FOR REDUCING BLOCKING ARTIFACTS



(57) **Abstract:** A method for removing blocking artifacts from moving and still pictures, comprising classifying horizontal and vertical boundaries in each picture as blocky or non-blocky (150); for each blocky boundary, defining an adaptive, picture content-dependent, one-dimensional filtered pixels region of interest (ROI) that crosses the boundary and is bound at each of its ends by a bounding pixel (152); defining a finite filter having a length correlated with the length of the ROI; defining a filtering pixels expansion that uniquely determines the padding values of the finite length filtered pixels ROI for the finite length filtering; and filtering the ROI pixels using the finite filter and the filtering expansion (154).



O 03/021936 A3

WO 03/021936 A3



 before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments 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.

(88) Date of publication of the international search report:

22 May 2003

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/28157

A. CLASSIFICATION OF SUBJECT MATTER IPC(7) : H04N 7/12 US CL : 375/240.08 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.: 375/240.08, 240.02, 382/232, 236, 238, 239, 268; 348/404.1, 424.2.			
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched None			
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) None			
C. DOCUMENTS CONSIDERED TO BE RELEVANT			
Category *	Citation of document, with indication, where ap	opropriate, of the relevant passages	Relevant to claim No.
A	US 5,787,207 A (GOLIN) 28 July 1998, column 6, line 54 - column 7, line 27.		1
A	US 5,500,685 A (KOKARAM) 19 March 1996, column 12, lines 10-34.		1
Α	US 5,654,759 A (AUGENBRAUN et al) 05 August 1997, column 9, lines 29-67 and fig. 1-2.		1
Further	documents are listed in the continuation of Box C.	See patent family annex.	
Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance		"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	
,	plication or patent published on or after the international filing date	"X" document of particular relevance; the considered novel or cannot be consider when the document is taken alone	
	t which may throw doubts on priority claim(s) or which is cited to the publication date of another citation or other special reason (as	"Y" document of particular relevance; the considered to involve an inventive step combined with one or more other such	when the document is
"O" document referring to an oral disclosure, use, exhibition or other means		being obvious to a person skilled in the	e art
"P" document published prior to the international filing date but later than the priority date claimed		"&" document member of the same patent family	
Date of the actual completion of the international search Date of mailing of the international search report			
10 January 2003 (10.01.2003)		10 31 MAR 2003	
	ailing address of the ISA/US	Authorized officer	÷ .
Commissioner of Patents and Trademarks Box PCT		Mhon T Diep	
Washington, D.C. 20231 Facsimile No. (703)305-3230		Telephone No. 703 305-2600	