

(19) World Intellectual Property
Organization
International Bureau



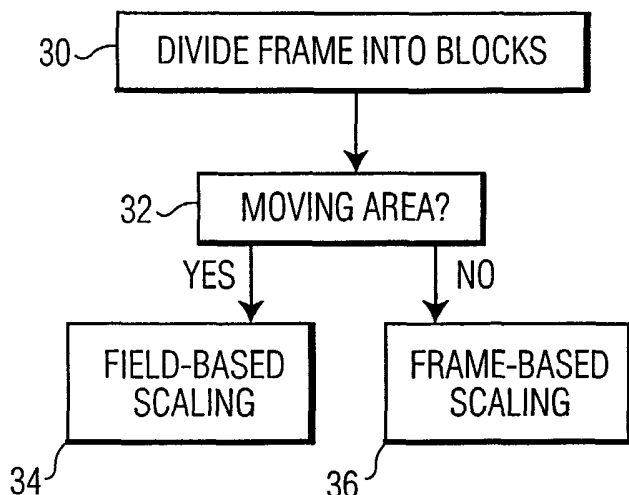
(43) International Publication Date
13 March 2003 (13.03.2003)

PCT

(10) International Publication Number
WO 2003/021968 A3

- (51) International Patent Classification⁷: **H04N 7/26, 7/30**
- (21) International Application Number:
PCT/IB2002/003507
- (22) International Filing Date: 23 August 2002 (23.08.2002)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
09/946,717 5 September 2001 (05.09.2001) US
- (71) Applicant: **KONINKLIJKE PHILIPS ELECTRONICS N.V.** [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (72) Inventors: **ZHONG, Zhun**; Prof. . Holstlaan 6, NL-5656 AA Eindhoven (NL). **CHEN, Yingwei**; Prof. . Holstlaan 6, NL-5656 AA Eindhoven (NL).
- (74) Agent: **LANDOUSY, Christian**; Philips Intellectual Property & Standards, Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).
- (81) Designated States (*national*): CN, JP, KR.
- (84) Designated States (*regional*): 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).
- Published:
— with international search report
- (88) Date of publication of the international search report:
27 May 2004
- 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.*

(54) Title: SIGNAL ADAPTIVE SPATIAL SCALING FOR INTERLACED VIDEO



(57) Abstract: The present invention is directed to a method of scaling interlaced video. According to the present invention, the method includes a step (30) in which an interlaced video frame is divided into blocks, a step (32) for determining if any of the blocks correspond to a moving area in the interlaced video frame, a step (34) in which field-based scaling is performed on blocks corresponding to a moving area, and a step (36) in which frame-based scaling is performed on blocks not corresponding to a moving area.

WO 2003/021968 A3

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IEU2/03507

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 H04N/26 H04N7/30				
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) IPC 7 H04N				
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) EPO-Internal, PAJ				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	WO 99 00985 A (KADONO SHINYA ;MATSUSHITA ELECTRIC IND CO LTD (JP)) 7 January 1999 (1999-01-07) abstract	1-8		
X	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 04, 30 April 1999 (1999-04-30) & JP 11 018092 A (MATSUSHITA ELECTRIC IND CO LTD), 22 January 1999 (1999-01-22) abstract	1-8		
--- -/--				
<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 :				
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> <ul style="list-style-type: none"> *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 </td> <td style="width: 50%; border: none; vertical-align: top;"> <ul style="list-style-type: none"> *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. *Z* document member of the same patent family </td> </tr> </table>			<ul style="list-style-type: none"> *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 	<ul style="list-style-type: none"> *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. *Z* document member of the same patent family
<ul style="list-style-type: none"> *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 	<ul style="list-style-type: none"> *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. *Z* document member of the same patent family 			
Date of the actual completion of the international search <p style="text-align: center;">12 March 2003</p>		Date of mailing of the international search report <p style="text-align: center;">19/03/2003</p>		
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 <p style="text-align: center;">Berbain, F</p>		

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IE, J2/03507

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>YIM C ET AL: "AN EFFICIENT METHOD FOR DCT-DOMAIN IMAGE RESIZING WITH MIXED FIELD/FRAME-MODE MACROBLOCKS" IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS FOR VIDEO TECHNOLOGY, IEEE INC. NEW YORK, US, vol. 9, no. 5, August 1999 (1999-08), pages 696-700, XP000848395 ISSN: 1051-8215 abstract</p>	1-8
Y	<p>EP 0 536 784 A (MATSUSHITA ELECTRIC IND CO LTD) 14 April 1993 (1993-04-14) abstract page 3, line 58 -page 5, line 20</p>	1-8
A	<p>VETRO A ET AL: "FREQUENCY DOMAIN DOWN-CONVERSION OF HDTV USING AN OPTIMAL MOTION COMPENSATION SCHEME" INTERNATIONAL JOURNAL OF IMAGING SYSTEMS AND TECHNOLOGY, WILEY AND SONS, NEW YORK, US, vol. 9, no. 4, 1998, pages 274-282, XP000768998 ISSN: 0899-9457 paragraph '0III!</p>	1-8
A	<p>EP 0 889 651 A (MATSUSHITA ELECTRIC IND CO LTD) 7 January 1999 (1999-01-07) abstract figures 13,16</p>	1-8

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB92/03507

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
WO 9900985	A	07-01-1999	JP 11018092 A WO 9900985 A1	22-01-1999 07-01-1999
JP 11018092	A	22-01-1999	WO 9900985 A1	07-01-1999
EP 0536784	A	14-04-1993	JP 2991833 B2 JP 5103312 A DE 69224129 D1 DE 69224129 T2 EP 0536784 A2 US 5347308 A	20-12-1999 23-04-1993 26-02-1998 23-07-1998 14-04-1993 13-09-1994
EP 0889651	A	07-01-1999	AU 5410298 A EP 0889651 A1 US 6263024 B1 CN 1211372 A WO 9826601 A1 JP 3191753 B2 JP 10229564 A	03-07-1998 07-01-1999 17-07-2001 17-03-1999 18-06-1998 23-07-2001 25-08-1998