

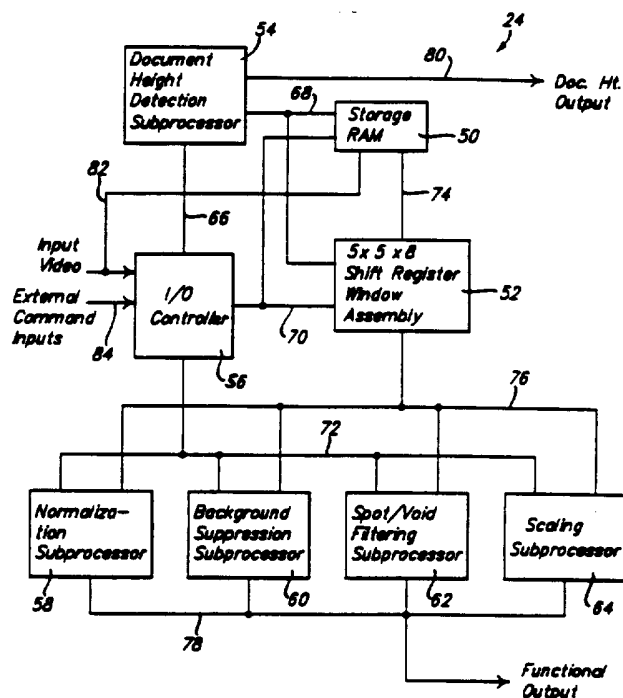


INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification⁵ : G06F 15/70, 15/66, 15/68, 15/62	A3	(11) International Publication Number: WO 91/06065 (43) International Publication Date: 2 May 1991 (02.05.91)
(21) International Application Number: PCT/US90/05676 (22) International Filing Date: 4 October 1990 (04.10.90) (30) Priority data: 419,270 10 October 1989 (10.10.89) US 419,530 10 October 1989 (10.10.89) US 419,594 10 October 1989 (10.10.89) US 419,595 10 October 1989 (10.10.89) US 420,779 10 October 1989 (10.10.89) US (71) Applicant: UNISYS CORPORATION [US/US]; Township Line and Union Meeting Roads, P.O. Box 500, Blue Bell, PA 19424 (US). (72) Inventors: KLEIN, Robert ; 33090 Walnut Lane, Farmington, MI 48018 (US). D'AOUST, Robert ; 8354 Ward, Detroit, MI 48228 (US). GROSSE, Debora, Y. ; 4760 Washtenaw, Apt. B1, Ann Arbor, MI 48108 (US). REASONER, George, E., Jr. ; 732 Waskin Drive, Tecumseh, MI 49286 (US). WILLIAMS, David, C. ; 2775 Winwood, Apt. 187, Ann Arbor, MI 48015 (US). ROPPO, Antonette, M. ; 7064 Green Farm Road, West Bloomfield, MI 48322 (US). BRENNAN, Audrey, A. ; 21175 Woodland Glen Drive, Apt. 204, Northville, MI 48167 (US). JENNINGS, Kevin ; 33645 Longwood, Farmington Hills, MI 48024 (US).	(74) Agent: STARR, Mark, T.; Unisys Corporation, Township Line and Union Meeting Roads, P.O. Box 500, Blue Bell, PA 19424 (US). (81) Designated States: AT (European patent), BE (European patent), CA, CH (European patent), DE (European patent), DK (European patent), ES (European patent), FR (European patent), GB (European patent), IT (European patent), JP, KR, LU (European patent), NL (European patent), SE (European patent). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> (88) Date of publication of the international search report: 9 January 1992 (09.01.92)	

(54) Title: IMAGE DATA PROCESSOR SYSTEM**(57) Abstract**

An image data processor system includes a plurality of subprocessors arranged in a pipeline for carrying out functions of pixel normalization, background suppression, spot and void removal, image scaling, and size detection. Processed image data contain useful image formation data and background data feature a background suppression scheme used to convert each pixel value to preselected values in a smaller range in order to facilitate data processing such as compression and scaling. The initially presented image data in the form of an array of multi-bit pixels having plural scale values are filtered. The scale value pixels are converted to an array of binary pixels in which each pixel is associated with either background or image formation data. Patterns of pixels are used to transform a center pixel in a manner to remove isolated spots or voids from the image. Processed imaged pixel data are analyzed to indicate the size of the document being scanned. Processed image pixel data permit a scaling processor to change the size of the image for further processing.



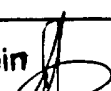
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INTERNATIONAL SEARCH REPORT

International Application No PCT/US 90/05676

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC ⁵ : G 06 F 15/70, 15/66, 15/68, 15/62		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
IPC ⁵	G 06 F	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
Y	EP, A, 0033623 (NCR CANADA LTD - NCR CANADA LTEE) 12 August 1981 see figure 1; page 6, line 24 - page 7, line 2; page 8, lines 10-26	1, 2, 3, 5, 6, 8
A	--	32
Y	Patent Abstracts of Japan, vol. 12, no. 207 (E-621), 14 June 1988, & JP, A, 63005659 (FUJI XEROX CO., LTD) 11 January 1988 see abstract	1-3, 5, 6, 8
A	--	1-8
	FR, A, 2633747 (SAT, SOCIETE ANONYME DE TELECOMMUNICATIONS) 5 January 1990 see abstract; figure 3, page 31, line 30 - page 32	./.
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<p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"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</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"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.</p> <p>"Δ" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
16th October 1991	09. 12. 91	
International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE	Alfredo Prein 	

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category *	Citation of Document, " with indication, where appropriate, of the relevant passages	Relevant to Claim No.
P,Y	EP, A, 0343927 (MITSUBISHI KABUSHIKI KAISHA) 29 November 1989 see abstract; figure 1; column 5, lines 45-49; column 5, line 60 - column 6, line 25 * --	9,10,19,20
A	EP, A, 0055834 (IBM CORP.) 14 July 1982 see page 2, lines 4-9; page 2, lines 17-20 --	9,10,12,19,20
A	GB, A, 2166921 (CANON KABUSHIKI KAISHA) 14 May 1986 see the whole document --	9,12,18,19,20
Y,P	EP, A, 0336430 (DAINIPPON SCREEN Mfg. Co., LTD) 11 October 1989 see page 3, lines 25-44	9,10,19,20
A	--	13,14,17
E	EP, A, 0398501 (CANON KABUSHIKI KAISHA) 22 November 1990 see column 20, lines 10-35 --	21
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A	IBM Technical Disclosure Bulletin, vol. 31, no. 9, February 1989, (Armonk, NY, US), "Image system quality and data compression enhancement by excision of isolated single pels and quad pel groups", pages 235-236 see the whole article --	23,27,28
A	EP, A, 0156344 (HITACHI LTD) 2 October 1985 see abstract; claim 8 * --	22
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III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category *	Citation of Document, ** with indication, where appropriate, of the relevant passages	Relevant to Claim No.
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X	US, A, 4541116 (R.M. LOUGHEED) 10 September 1985 see abstract; column 1 - column 2, line 30; column 8, lines 19-33	25
A	--	24,26
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A	EP, A, 0105707 (IBM CORP.) 18 April 1984 see abstract --	29-34
Y	Patent Abstracts of Japan, vol. 92, no. 10 (P-383), 28 August 1985 & JP, A, 60072078 (TOSHIBA K.K.) 24 April 1985 see the abstract --	35,41,42
Y	GB, A, 2090818 (FUJI XEROX CO., LTD) 21 July 1982 see abstract; page 5, lines 4-8 --	35,41,42
A	EP, A, 051227 (TOKYO SHIBAURA DENKI KABU- SHIKI) 12 May 1982 see abstract; page 1 of claims -----	35,41

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

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V. OBSERVATION WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE ¹

This International search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claim numbers _____ because they relate to subject matter not required to be searched by this Authority, namely: _____

2. Claim numbers _____ because they relate to parts of the International application that do not comply with the prescribed requirements to such an extent that no meaningful International search can be carried out, specifically: _____

3. Claim numbers _____ because they are dependent claims and are not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING ²

This International Searching Authority found multiple inventions in this International application as follows:

1. claims 1-8,32: Pipelined image processor.
 2. claims 9-20 : Image background suppression processor and method.
 3. claims 21-28 : Image filtering processor.
- For further information see form PCT/ISA/206 (continued form).

1. As all required additional search fees were timely paid by the applicant, this International search report covers all searchable claims of the International application
2. As only some of the required additional search fees were timely paid by the applicant, this International search report covers only those claims of the International application for which fees were paid, specifically claims: _____
3. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers: _____
4. As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

- The additional search fees were accompanied by applicant's protest.
- No protest accompanied the payment of additional search fees.

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

US 9005676
SA 41612

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 15/11/91. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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EPO FORM P0079

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

US 9005676
SA 41612

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