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(12) **United States Patent**
Pirim

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(54) **METHOD AND DEVICE FOR AUTOMATIC VISUAL PERCEPTION**

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(51) **Int. Cl.**⁷ **G06F 15/18; G01R 23/10; G06K 9/00**

(52) **U.S. Cl.** **706/20; 702/78; 382/133**

(58) **Field of Search** **706/20; 702/78; 382/133**

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,783,828	A	11/1988	Sadjadi	382/170
5,008,946	A	4/1991	Ando	382/104
5,088,488	A	* 2/1992	Markowitz et al.	607/27
5,109,425	A	4/1992	Lawton	382/107
5,163,095	A	* 11/1992	Kosaka	382/133
5,278,921	A	1/1994	Nakamura et al.	382/167
5,359,533	A	* 10/1994	Ricka et al.	702/78
5,384,865	A	1/1995	Loveridge	382/262
5,488,430	A	1/1996	Hong	348/699
5,592,237	A	* 1/1997	Greenway et al.	348/716
5,625,717	A	4/1997	Hashimoto et al.	382/260
5,694,495	A	12/1997	Hara et al.	382/324
5,712,729	A	1/1998	Hashimoto	359/562
5,774,581	A	6/1998	Fassnacht et al.	382/180
5,793,888	A	8/1998	Delanoy	382/219
6,304,187	B1	10/2001	Pirim	340/576
6,486,909	B1	11/2002	Pirim	348/143
6,597,738	B1	7/2003	Park et al.	375/240.16
2002/0101432	A1	* 8/2002	Ohara et al.	345/589

FOREIGN PATENT DOCUMENTS

EP	0 046 110	2/1982
EP	0 380 659 A1	8/1990
EP	0 394 959 A2	10/1990
FR	2 611 063 A1	8/1988
FR	2 751 772	1/1998
JP	06-205780 A	7/1994
WO	WO 98/05002	2/1998
WO	WO 99/36893	7/1999
WO	WO 99/36894	7/1999
WO	WO 00/11610	3/2000

OTHER PUBLICATIONS

Stephanie G. Mallat, "A Theory for Multiresolution Signal Decomposition: The Wavelet Representation", IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. 11, No. 7, Jul. 1989, pp. 674-693.

John G. Daugman, "Complete Discrete 2-D Gabor Transforms by Neural Networks for Image Analysis and Compression", IEEE Transaction on Acoustics, Speech and Signal Processing, vol. 36, No. 7, Jul. 1988, pp. 1169-1179.

Alberto Tomita, Jr., et al., "Hand Shape Extraction from a Sequence of Digitized Gray-Scale Images", IECON '94, 20th International Conference on Industrial Electronics, Control and Instrumentation, vol. 3 of 3, Special Sessions, Signal Processign and Control, pp. 1925-1930.

Giacomo Indiveri et al., "System Implementations of Analog VLSI Velocity Sensors", 1996 IEEE Proceedings of Micro-Neuro '96, pp. 15-22.

(Continued)

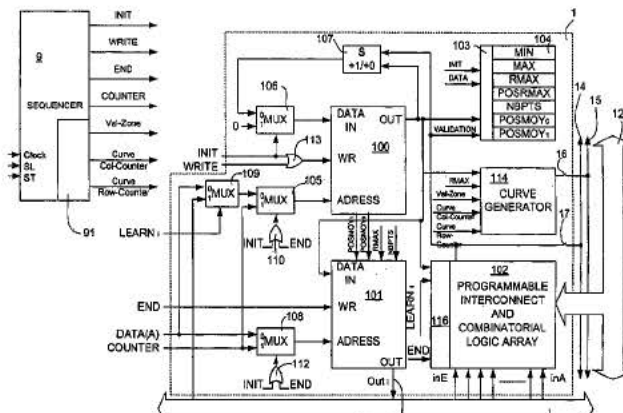
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(57) **ABSTRACT**

A visual perception processor comprises histogram calculation units, which receive the data DATA(A), DATA(B), . . . DATA(E) via a single data bus and supplying classification information to a single time coincidences bus. In a preferred embodiment the histogram calculation units are organized into a matrix.

29 Claims, 31 Drawing Sheets



OTHER PUBLICATIONS

Pierre-Francois Rüedi, "Motion Detection Silicon Retina Based on Event Correlations", 1996 IEEE Proceedings of MicroNeuro '96, pp. 23-29.

Revue Trimestrielle Des <<Techniques de Lingenieur>>, "Instantanés Technique" Techniques De ingénieur, Mars 1997-No 5 (40F), ISSN 0994-0758.

Es Professionnels de Linformatique En Entreprise Magazine, "Objectif Securite Des Reseaux", No 24, Janvier, 1997. Electronique International Hebdo, 5 Decembre 1996-No 245, "Premier . . . oeil", Françoise Gru svelet (with translation).

Nabeel Al Adsani, "For Immediate Release The Generic Visual Perception Processor", Oct. 10, 1997, p. 1.

Colin Johnson, "Vision Chip's Circuitry Has Its Eye Out For You", <http://192.215.107.74/wire/news/1997/09/0913vision.html>, pp. 1-3.

The Japan Times, "British firm has eye on the future", Business & Technology, Tuesday, Nov. 18, 1997, 4th Edition.

Inside the Pentagon's, Inside Missile Defense, an exclusive biweekly report on U.S. missile defense programs, procurement and policymaking, "Missile Technology" vol. 3, No. 16-Aug. 13, 1997, p. 5.

Electronique, "Le Mechanisme de la Vision Humaine Dans Le Silicium", Electronique Le Mensuel Des Ingenieurs De Conception, No. 68, Mars 1997, ISSN 1157-1151 (with translation).

"Elektronik Revue" ER, Eine Elsevier-Thomas-Publikation, Jahrgang 8, Marz 1997, NR.3, ISSN0939-1134.

"Un Processor de Perception Visuelle", LeHAUT pAR-LEUR, 25F Des solutions électroniques pour tous, No 1856, 15 janvier 1997 (with translation).

"Realiser Un Decodeur Pour TV Numberique", Electronique, Le Mensuel Des Ingenieurs De Conception, No. 66, Janvier 1997.

Groupe Revenu Français, Air & Cosmos Aviation International, "Un Calculateur De perception Visuelle", Hebdomadaire, vendredi 6 décembre 1996, 34 Année, No 1590, 22F.

Kenichi Yamada, et al; "Image Understanding Based on Edge Histogram Method for Rear-End Collision Avoidance System", Vehicle Navigation & Information Systems Conference Proceedings; (1994), pp. 445 450 published Aug. 31, 1994; XP 000641348.

* cited by examiner

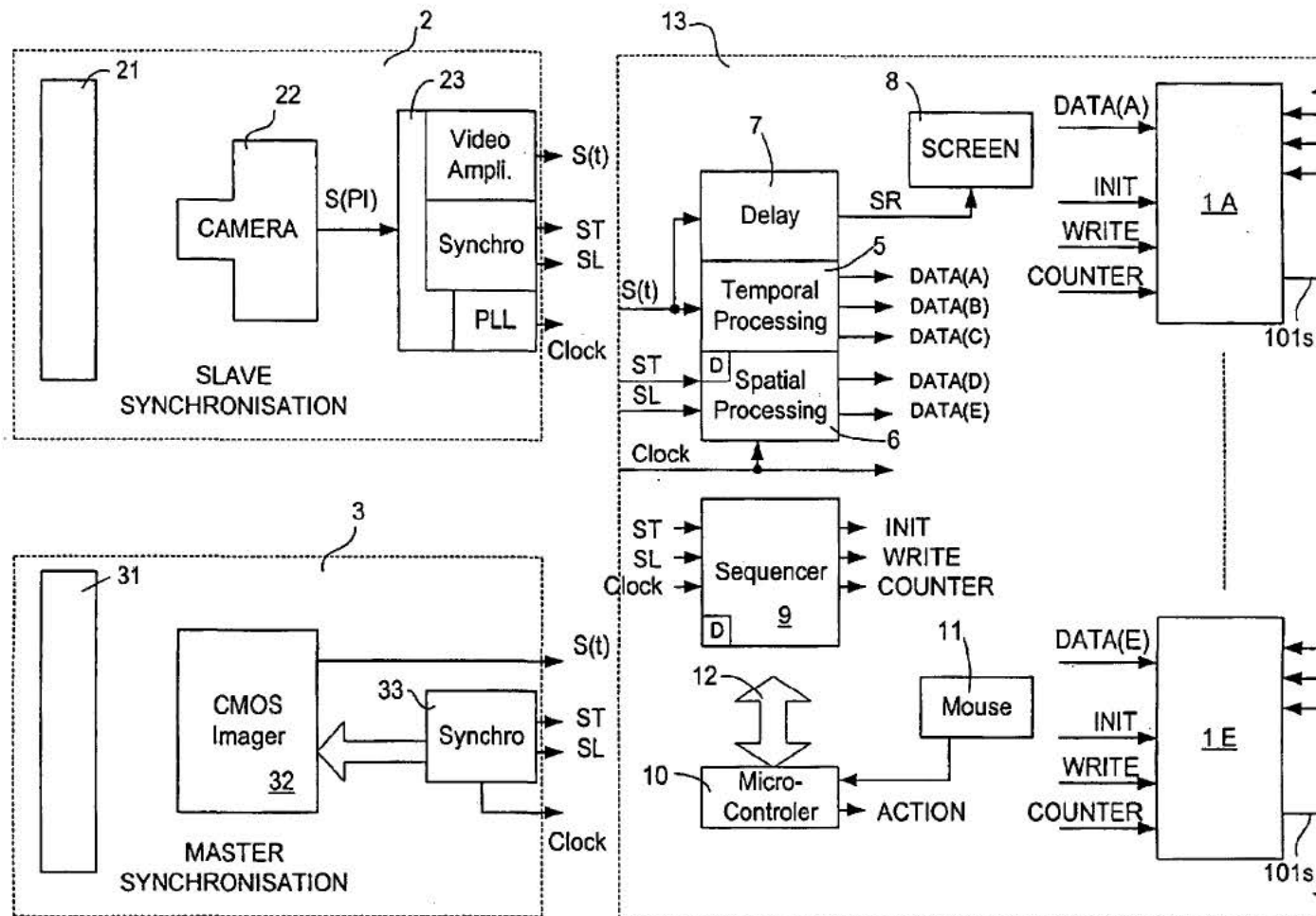


FIG. 1 PRIOR ART

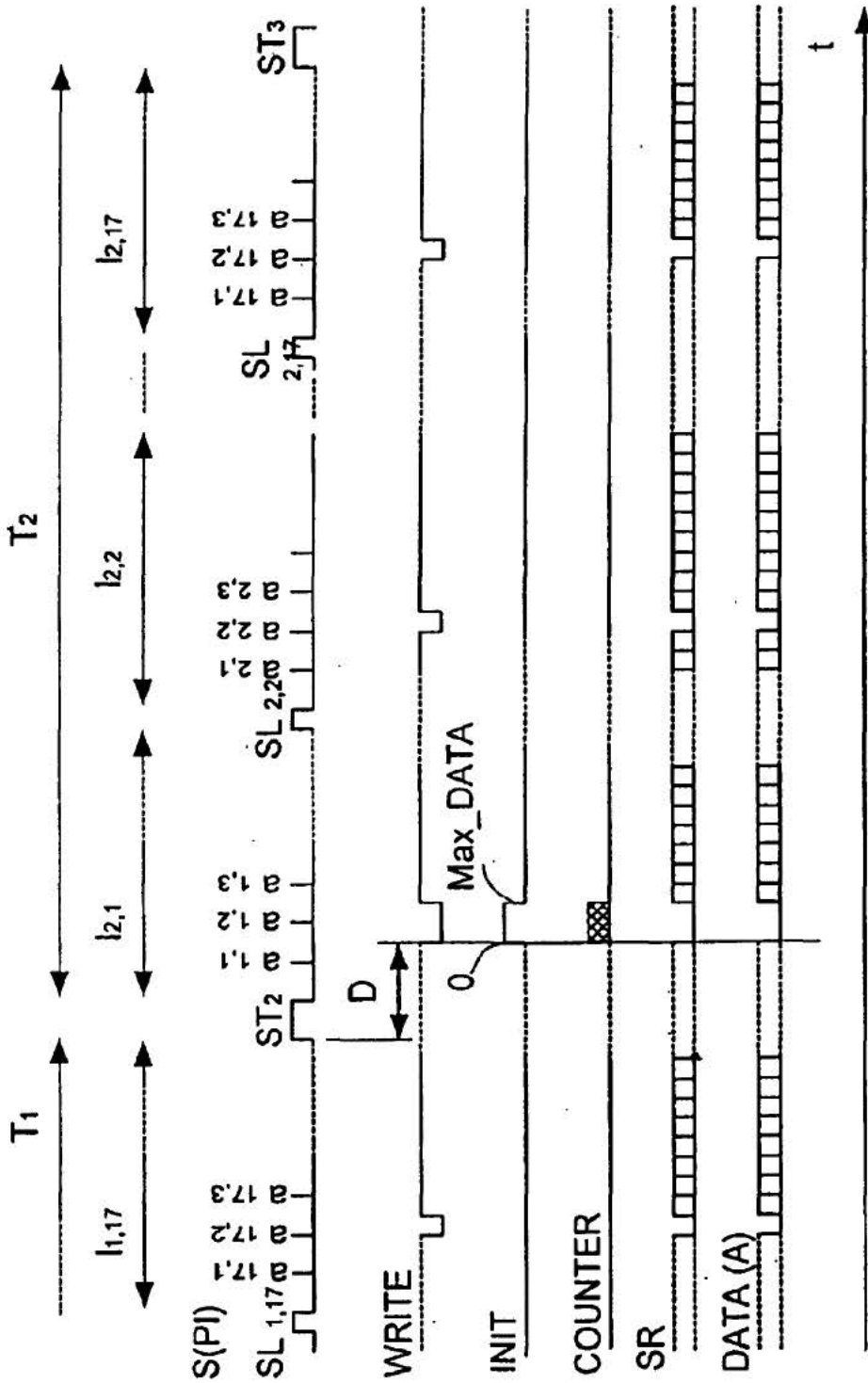


FIG. 2

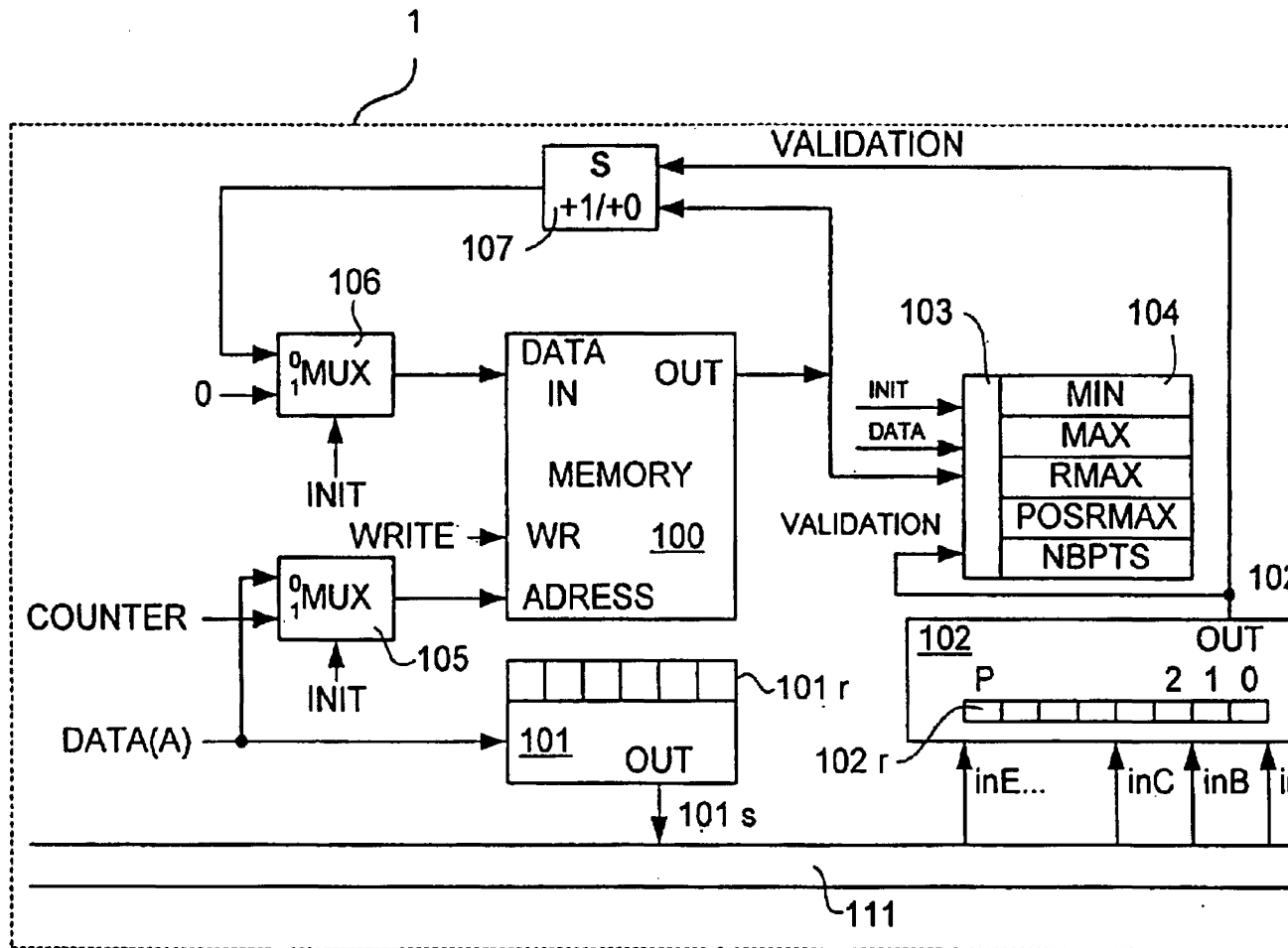


FIG. 3

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