US006778177B1

(12) **United States Patent** (10) **Patent No.: US 6,778,177 B1**
Furtner (45) **Date of Patent: Aug. 17, 2004**

(54) **METHOD FOR RASTERIZING A GRAPHICS BASIC COMPONENT**

(75) Inventor: **Wolfgang Furtner**, Fuerstenfeldbruck (DE)

(73) Assignee: **SP3D Chip Design GmbH**, Starnberg (DE)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/958,297**

(22) PCT Filed: **Apr. 10, 2000**

(86) PCT No.: **PCT/EP00/03175**

§ 371 (c)(1),
(2), (4) Date: **Feb. 19, 2002**

(87) PCT Pub. No.: **WO00/63846**

PCT Pub. Date: **Oct. 26, 2000**

(30) **Foreign Application Priority Data**

Apr. 15, 1999 (DE) 199 17 092

(51) Int. Cl.^{7} **G06F 12/02**
(52) U.S. Cl. **345/544**; 345/443; 345/506
(58) Field of Search 345/544, 501, 345/502, 503, 505, 506, 530, 418, 440, 441, 442, 443

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,367,632 A		11/1994	Bowen et al.
5,821,944 A		10/1998	Watkins
5,864,512 A	*	1/1999	Buckelew et al. 365/230.01
5,914,722 A	*	6/1999	Aleksic 345/423
6,184,907 B1	*	2/2001	Min 345/558
6,236,408 B1	*	5/2001	Watkins 345/582

FOREIGN PATENT DOCUMENTS

DE	19600431 A1	9/1996
GB	2297018 A	7/1996

OTHER PUBLICATIONS

J.D. Foley, et al., "Grundlagender Computergraphik", 1. Ed. Addison–Wesley, 1994, ISBN: 3–89319–647–1; pp 75–82 and 101–106.
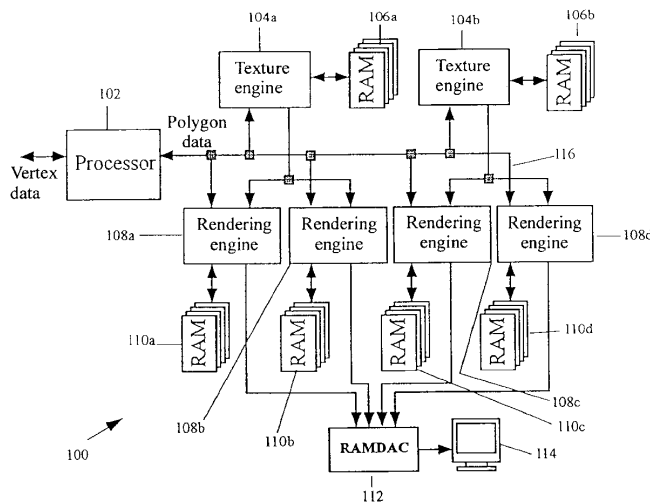
* cited by examiner

Primary Examiner—Kee M. Tung
(74) *Attorney, Agent, or Firm*—Dougherty, Clements, Hofer & Bernard

(57) **ABSTRACT**

A method for rasterizing a graphic primitive (**120**) in a graphics system generates, starting from graphic primitive description data, pixel data for the graphic primitive, the graphics system comprising a memory which is divided up into a plurality of blocks (a, a+1, b, b+1) which are each associated with a predetermined one of a plurality of areas on a mapping screen (**114**). Each block of the plurality of blocks (a, a+1, b, b+1) is associated with a memory page in the memory. The method includes scanning the pixels associated with the graphic primitive (**120**) in one of the plurality of blocks (a) into which the graphic primitive extends, repeating the preceding steps until all of the pixels associated with the graphic primitive have been scanned in each of the plurality of blocks into which the graphic primitive extends, and outputting the pixel data.
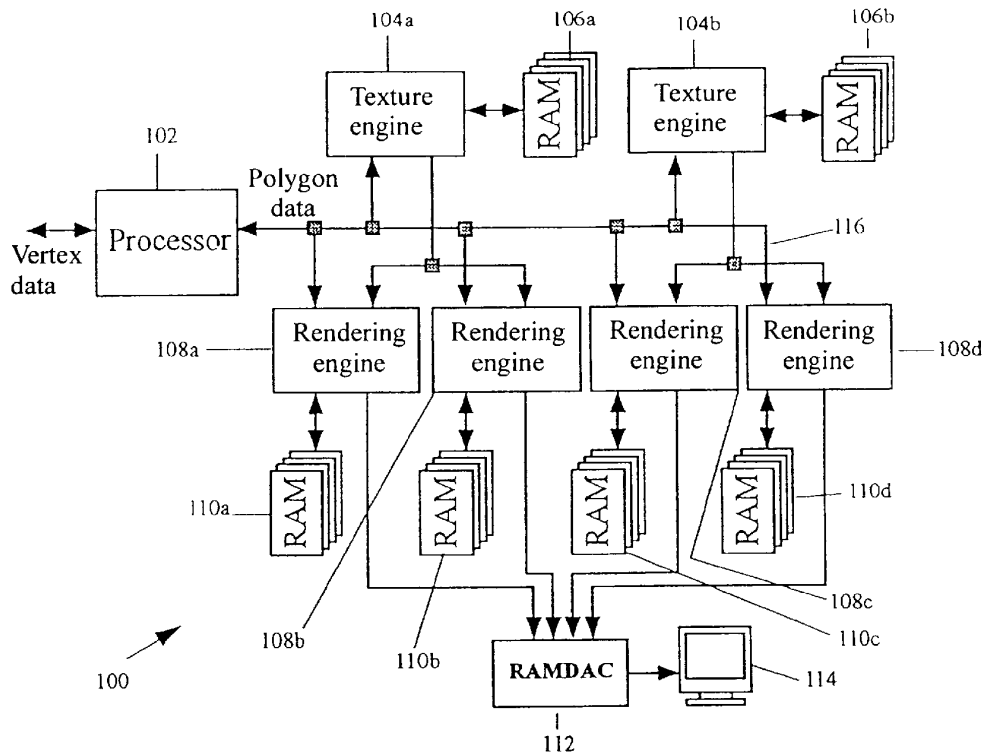
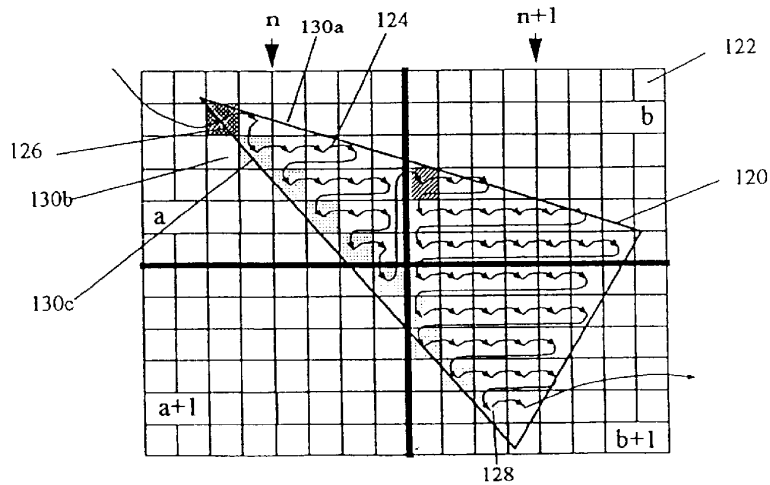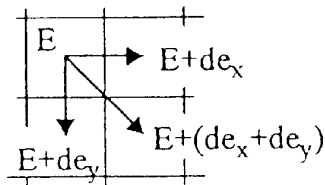**15 Claims, 12 Drawing Sheets**

Fig. 1

Fig. 2

$$E \quad \rightarrow E+de_x$$
$$E+de_y \quad E+(de_x+de_y)$$

Fig. 3

126   120   122   132

132

Cluster:

Non-visible
Visible

128

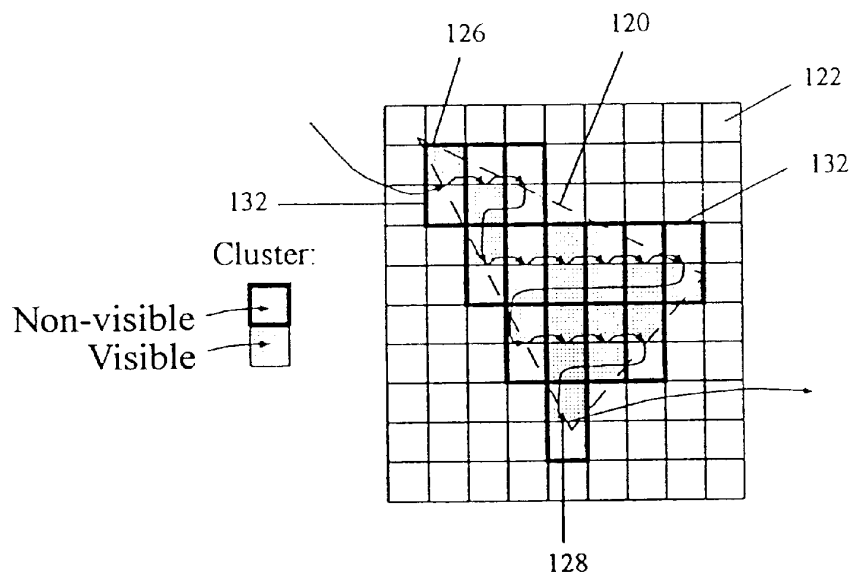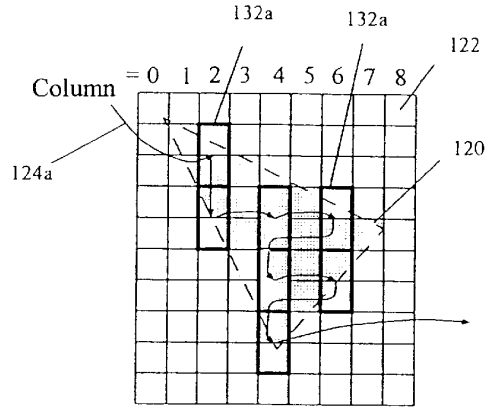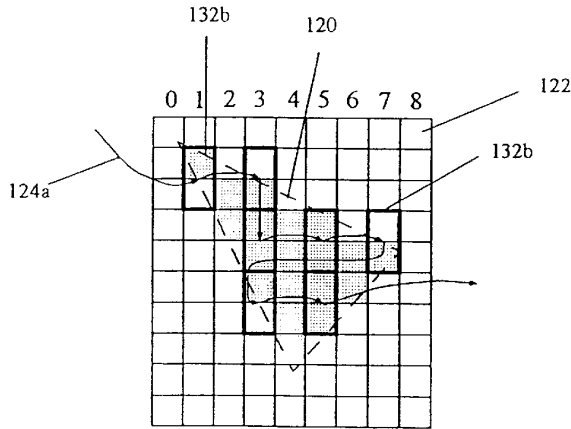Fig. 4

		clx	
		1	2
cly	1		
	2		

Fig. 5

A)

B) Fig. 6

Fig. 7

ilfx = 1, 2, 4, ...
ilfy = 1
cly = 1, 2, 4, ...
clx = 1 Rendering engine
clx = 2 Texture engine

Starting values
Deltas
Scanning direction
Cluster form
Interleave factors
Interleave offset

Starting value correction unit	Edge interpolation unit	Visibility determination unit

Start command
Visibility
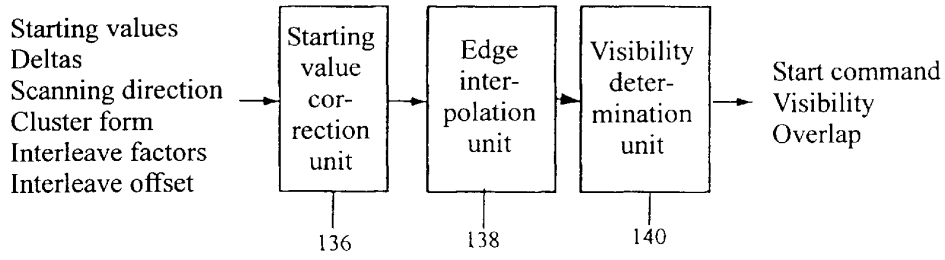Overlap

136   138   140
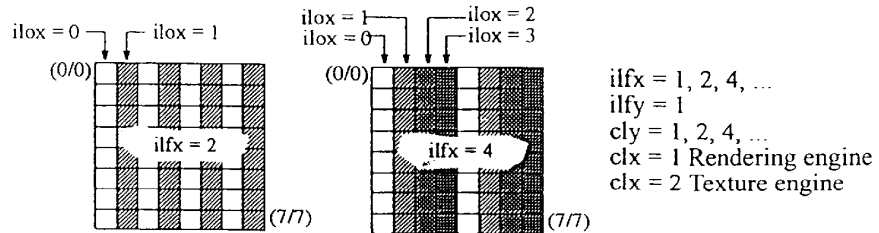
Fig. 8

Fig. 9

Fig. 10

DOCKET ALARM
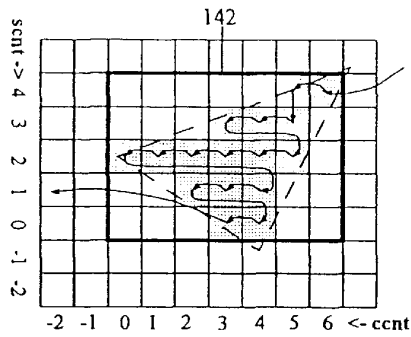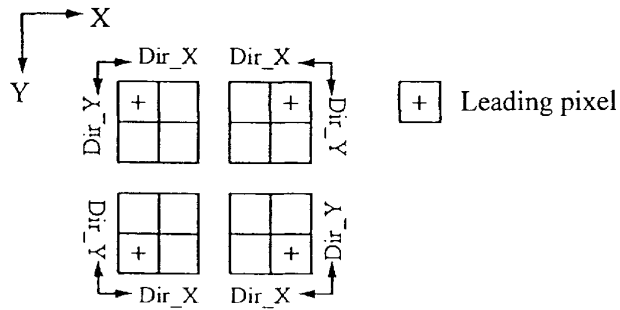
Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS
Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS
Sync your system to PACER to automate legal marketing.