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(54) **MULTIPLE AND HYBRID GRAPHICS DISPLAY TYPES**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,665,454	A *	5/1972	Stoddard et al.	345/472
4,055,004	A	10/1977	Chase	
4,631,532	A	12/1986	Grothe	
4,635,050	A	1/1987	Grothe et al.	
4,712,047	A	12/1987	Weindorf	
5,138,305	A *	8/1992	Tomiyasu	345/213
5,499,325	A	3/1996	Dugan, Jr.	
5,513,365	A *	4/1996	Cook et al.	710/72
5,606,657	A	2/1997	Dennison	
5,752,032	A	5/1998	Keller et al.	
5,799,204	A	8/1998	Pesto, Jr.	
5,883,642	A	3/1999	Thomas et al.	
5,910,180	A	6/1999	Flory et al.	
5,948,091	A	9/1999	Kerigan et al.	
5,960,213	A	9/1999	Wilson	
6,047,123	A *	4/2000	Brown et al.	717/127
6,137,457	A *	10/2000	Tokuhashi et al.	345/1.1
6,326,935	B1 *	12/2001	Boger	345/3.2

FOREIGN PATENT DOCUMENTS

WO	WO 99/39328	8/1999

OTHER PUBLICATIONS

"Method for Attachment of Multiple Dissimilar Monitors"; Jan. 1995; pp. 129-131; vol. 38, No. 01; IBM Technical Disclosure Bulletin.

* cited by examiner

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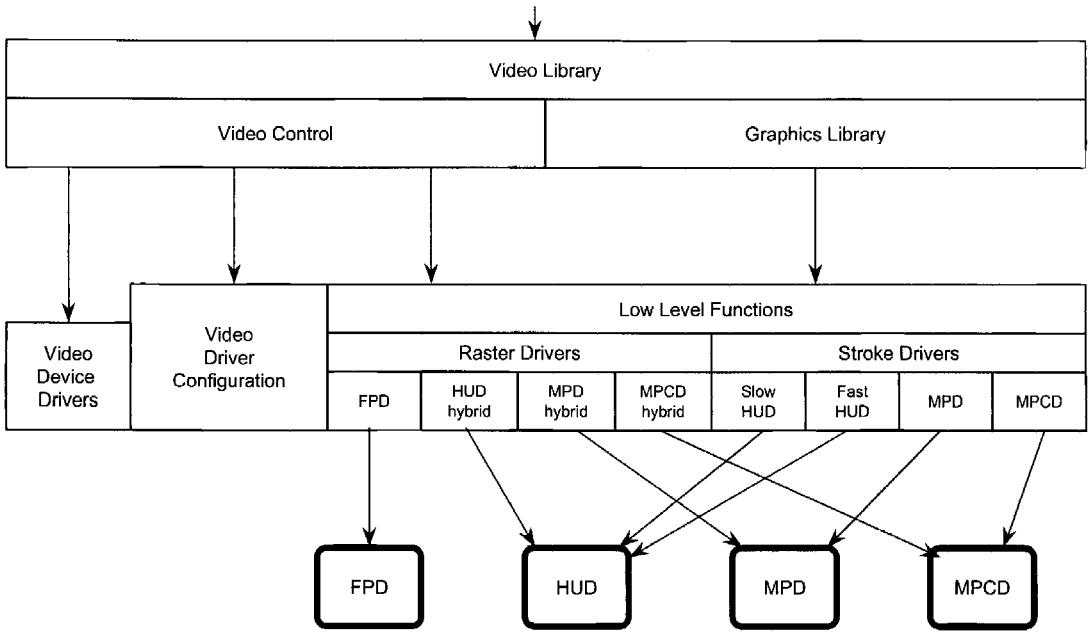
(57) **ABSTRACT**

A display interface device and method for an individual personal computer, workstation, or embedded system comprising one or more display interfaces; a video library; and driving any one of a plurality of video displays of a plurality of types connected to the one or more display interfaces from output of the video library. OpenGL is a preferred API. Driving of hybrid displays as well as stroke displays using formats designed for raster displays (such as VAPS) is also provided for. Real-time switching between displays is also provided for.

18 Claims, 10 Drawing Sheets