

[54] **REMOVABLE BACKLIGHTING ASSEMBLY FOR FLAT PANEL DISPLAY SUBSYSTEM**

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[73] Assignee: Silicon Graphics, Inc., Mountain View, Calif.

[*] Notice: This patent is subject to a terminal disclaimer.

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[52] U.S. Cl. 345/87; 345/102; 345/905; 353/122

[58] Field of Search 345/102, 87, 905; 353/122; 362/31, 216; 349/59

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,622,584	11/1986	Nagasaki et al.	358/98
4,842,378	6/1989	Flasck et al.	362/31
5,206,673	4/1993	Kawahara et al.	353/98
5,207,493	5/1993	Murase et al.	362/31
5,333,073	7/1994	Suzuki	349/59
5,353,075	10/1994	Conner et al.	353/122
5,381,309	1/1995	Borchardt	362/31
5,394,308	2/1995	Watanabe et al.	362/31
5,404,185	4/1995	Vogeley et al.	353/122
5,477,423	12/1995	Fredriksz et al.	362/31
5,479,328	12/1995	Lee et al.	362/216
5,485,354	1/1996	Ciupke et al.	362/31
5,548,670	8/1996	Koike	385/27
5,550,657	8/1996	Tanaka et al.	359/49

5,568,164	10/1996	Ogawa	345/145
5,593,221	1/1997	Evanicky et al.	353/122
5,654,779	8/1997	Nakayama et al.	345/905
5,661,839	8/1997	Whitehead	385/31
5,688,035	11/1997	Kashima et al.	362/31

FOREIGN PATENT DOCUMENTS

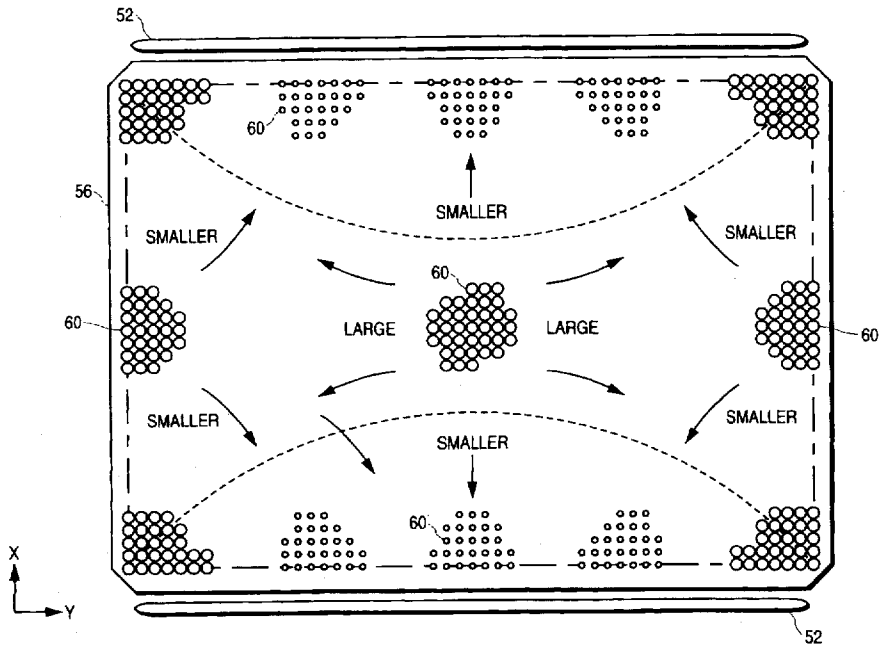
1-316790	12/1989	Japan	G09F 9/00
4-149417	5/1992	Japan	G03B 21/132

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[57] **ABSTRACT**

A light distributing removable door assembly (and elements thereof) for a back-lit flat panel display subsystem wherein the subsystem is for direct viewing as a monitor and having overhead projection capability. The removable door assembly provides for back-lighting via a light pipe for direct viewing when installed in the subassembly. When the door assembly is removed, the active matrix LCD is semi-transparent and can be placed over the imaging screen (viewing side down) of an overhead projector such that the LCD color image can be thus projected. The lamps that provide the back-lighting remain within the display subsystem when the door is removed and a unique optical coupling is provided between the lamps and a light pipe within the door. A specialized bi-directional light extraction pattern is used on a light pipe of the removable door to provide effective and uniform light distribution over the LCD image. A clamping mechanism is also described within the removable door for securing the layers used in the door assembly. The clamping mechanism allows a reduction in a size of a junction formed between the lighting units of the subsystem and the removable door assembly.

13 Claims, 19 Drawing Sheets



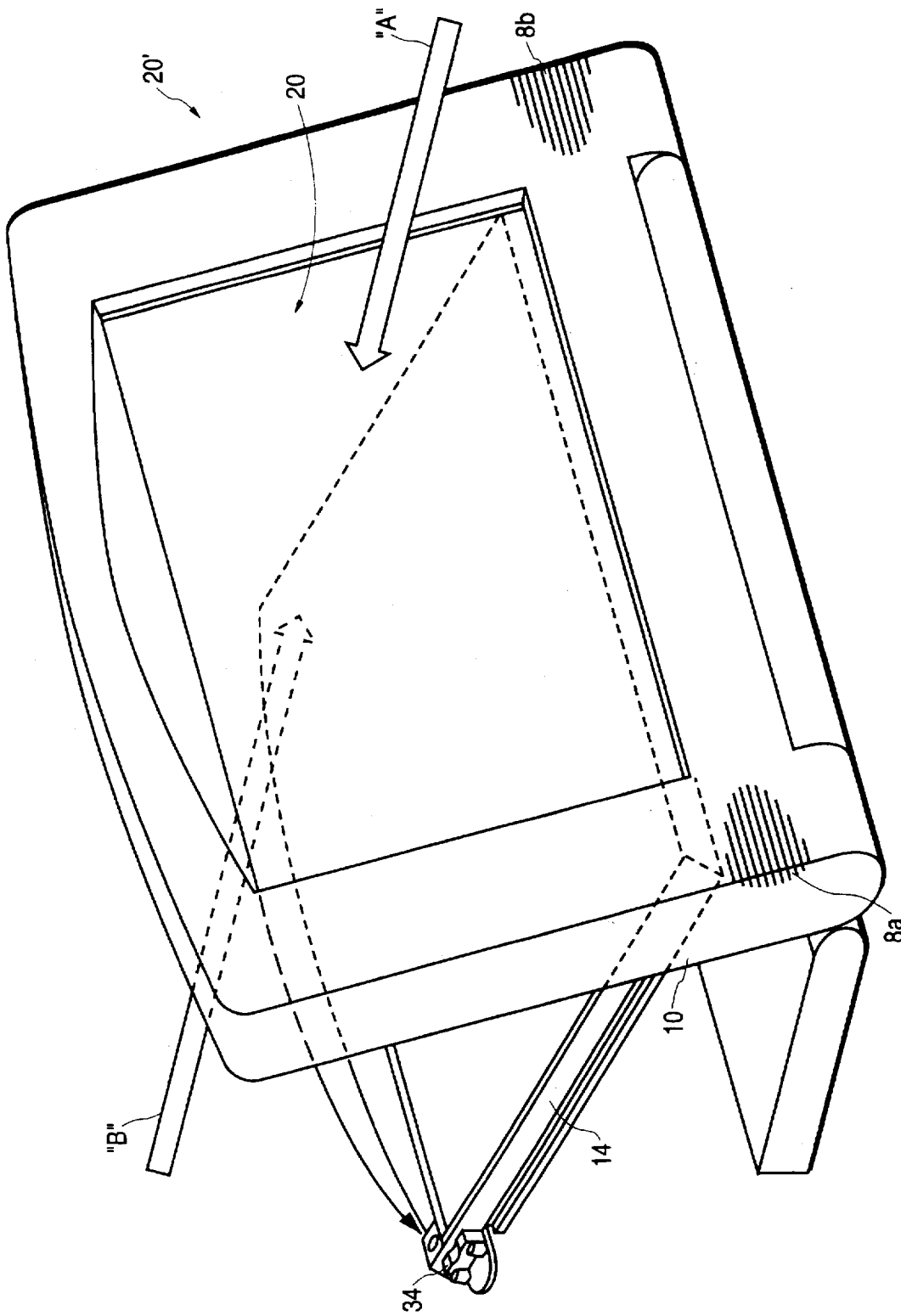


FIG. 1A

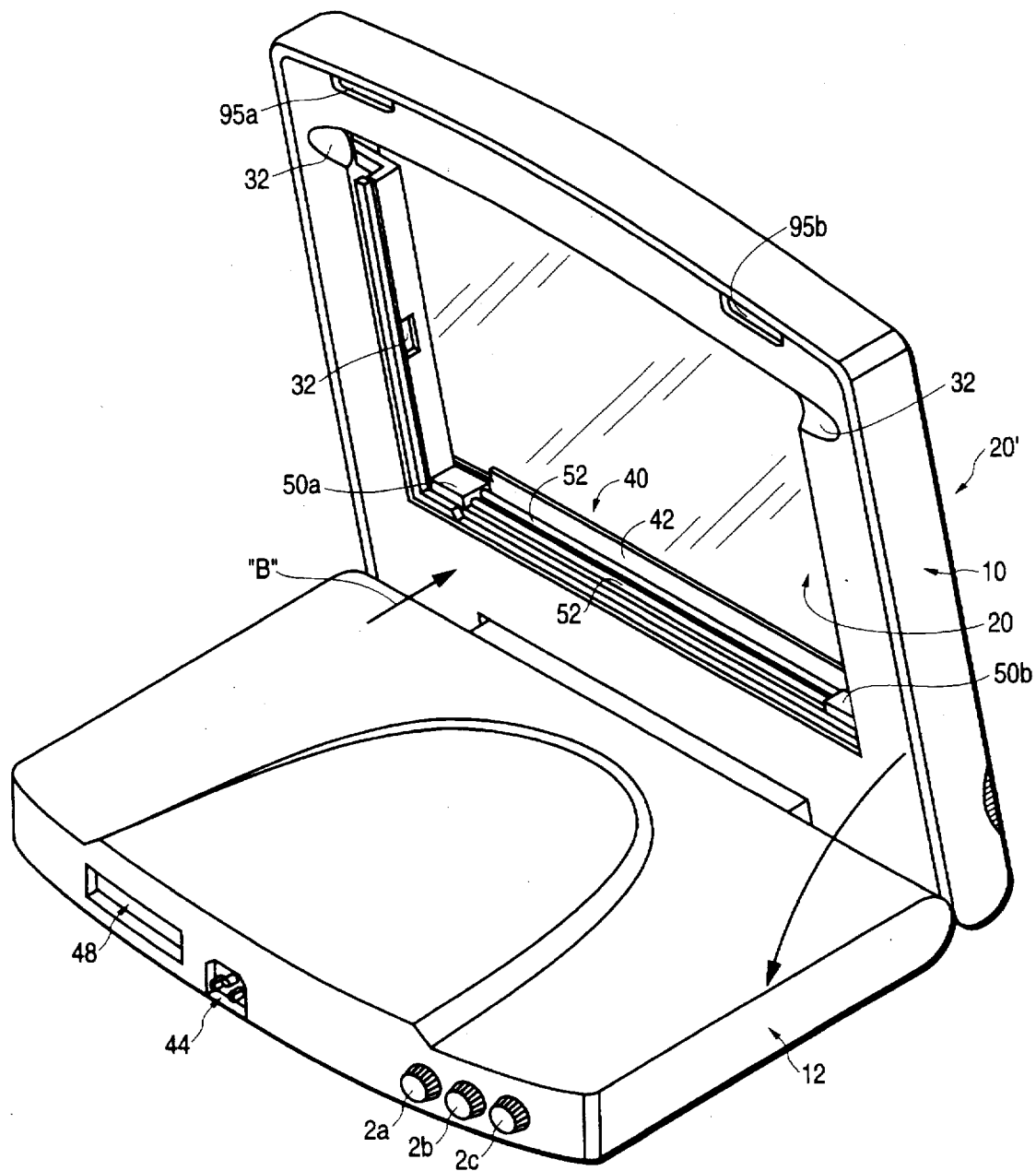


FIG. 1B

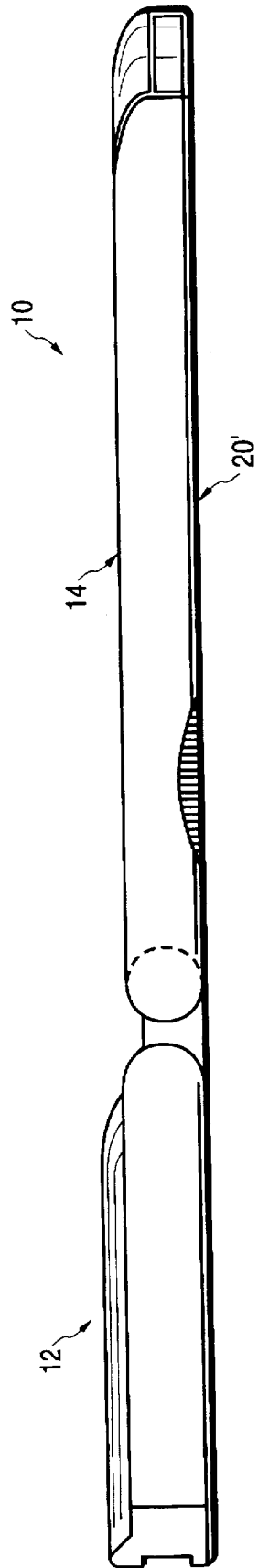


FIG. 1C

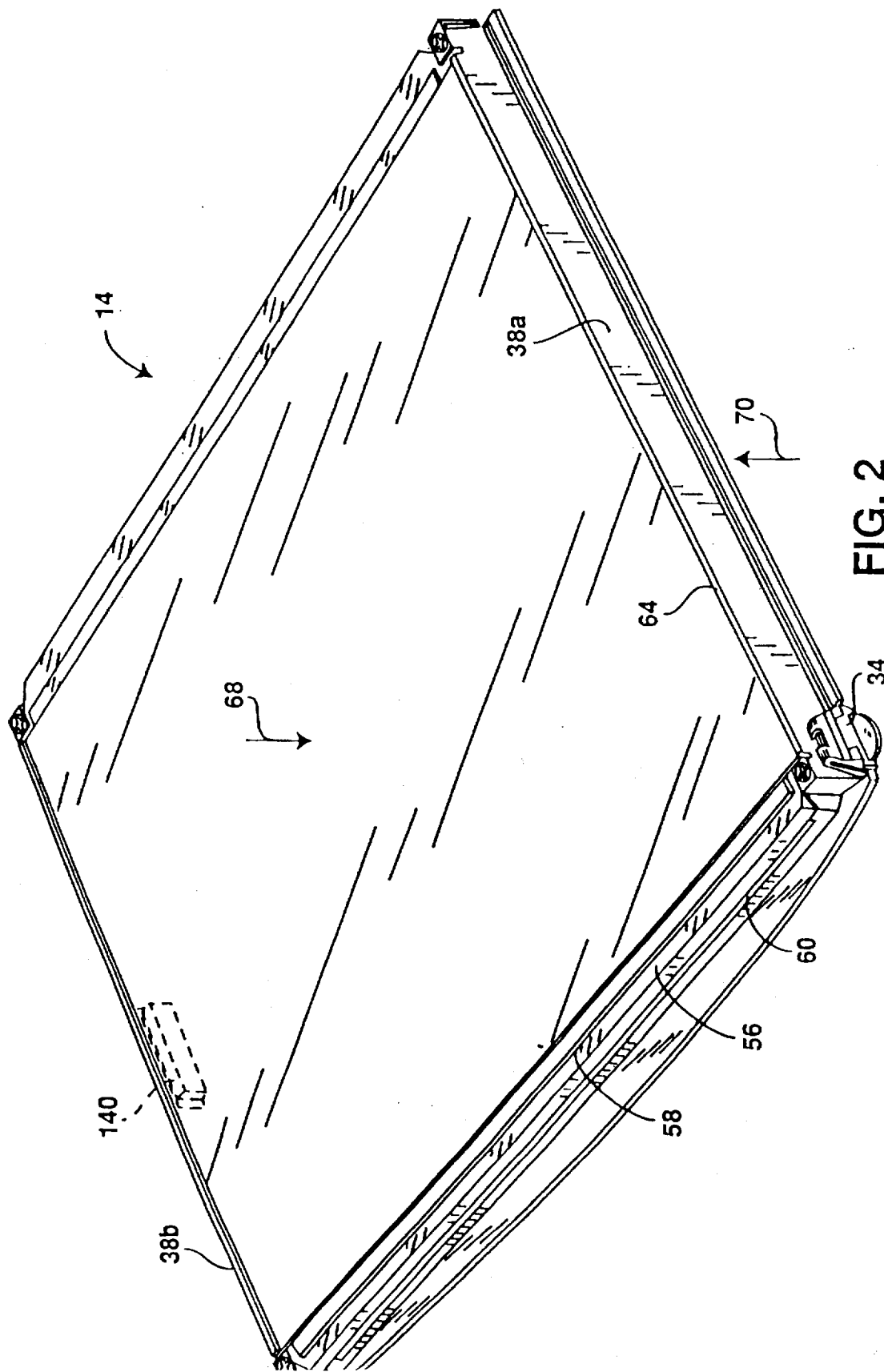


FIG. 2

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