



United States Patent [19]

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Nakayama et al.

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[54] **LIQUID CRYSTAL DISPLAY DEVICE HAVING A REMOVABLE HOLDING MEMBER FOR THE LIGHT SOURCE**

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[73] Assignees: **Mitsubishi Denki Kabushiki Kaisha; Asahi Glass Company Ltd.**, both of Tokyo, Japan

4,945,350	7/1990	Kawamura	359/50
5,121,232	6/1992	Miyadera	359/49
5,128,781	7/1992	Ohno et al.	362/26
5,166,815	11/1992	Elderfield	359/49
5,182,660	1/1993	Tanaka	359/50
5,438,484	8/1995	Kanda et al.	385/95
5,453,855	9/1995	Nakamura et al.	359/83
5,473,454	12/1995	Blanchard	359/69
5,542,016	7/1996	Kaschke	385/901
5,555,160	9/1996	Tawara et al.	362/31

FOREIGN PATENT DOCUMENTS

3208-162	10/1982	Germany	362/31
62-35390	3/1987	Japan	
63-150985	10/1988	Japan	
4-102888	4/1992	Japan	
4-186226	7/1992	Japan	359/48

[21] Appl. No.: **365,791**

[22] Filed: **Dec. 29, 1994**

[30] Foreign Application Priority Data

May 18, 1994 [JP] Japan 6-103797

[51] Int. Cl.⁶ **G02F 1/1333; G02F 1/1335; G01D 11/28; F21V 7/04**

[52] U.S. Cl. **349/58; 349/64; 349/65; 345/905; 362/26; 362/27; 362/31; 385/901**

[58] Field of Search 362/26, 27, 31, 362/32; 359/40, 41, 42, 48, 50, 49, 69, 70, 83; 385/146, 901; 345/905; 349/58, 61, 62, 64, 65, 70, 113

[56] References Cited

U.S. PATENT DOCUMENTS

4,043,636	8/1977	Eberhardt et al.	359/42
4,560,264	12/1985	Kitazawa et al.	359/83
4,573,766	3/1986	Bournay, Jr. et al.	359/48

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[57] ABSTRACT

A liquid crystal display device adaptable for various applications is provided which comprises a liquid crystal display panel, lamps, lamp holders respectively holding the lamps, a photoconductive board provided between the lamps, and a frame covering both the lamps and the lamp holders, wherein the photoconductive board comprises an outer photoconductive part fixed to the lamp holders, and an inner photoconductive part held on the rear side thereof by a holding member provided to the frame.

11 Claims, 9 Drawing Sheets

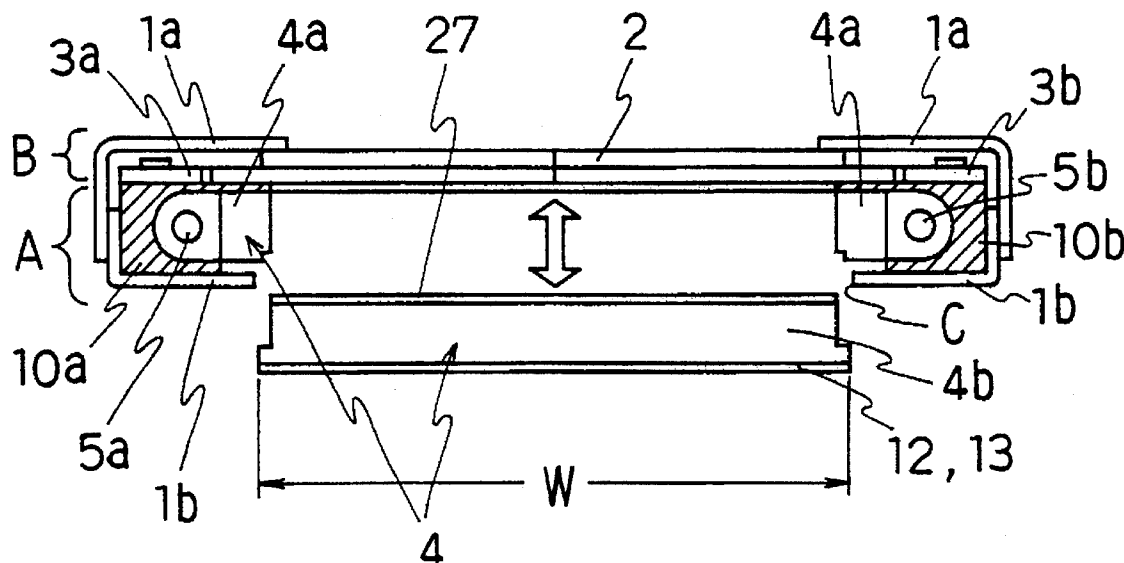


FIG. 1a

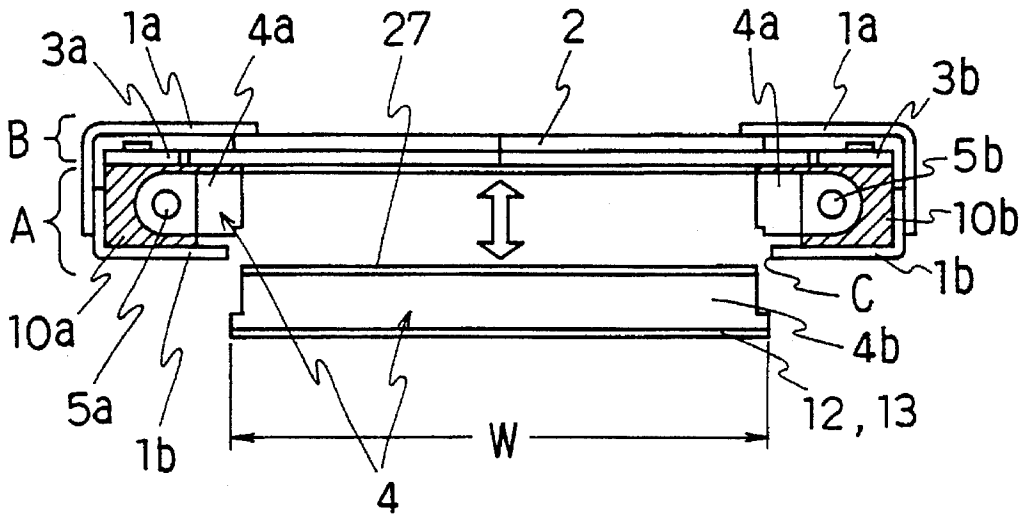


FIG. 1b

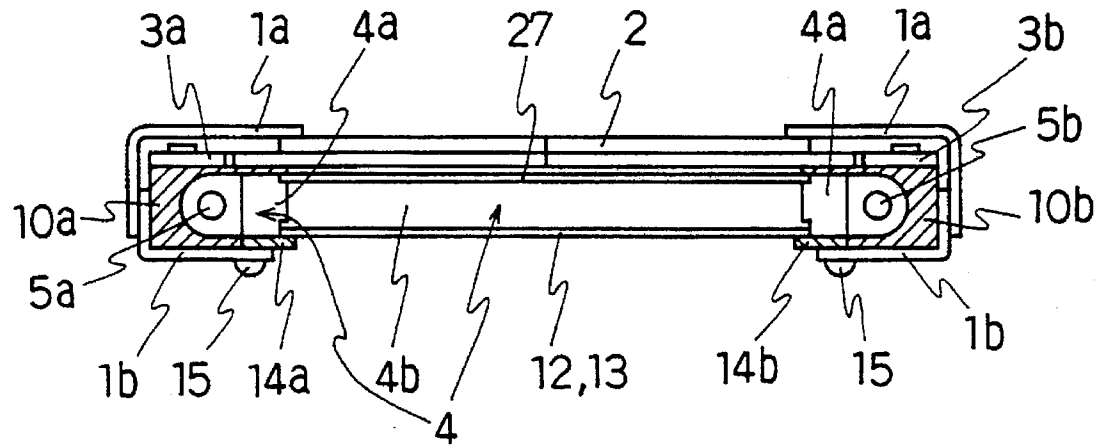


FIG. 2a

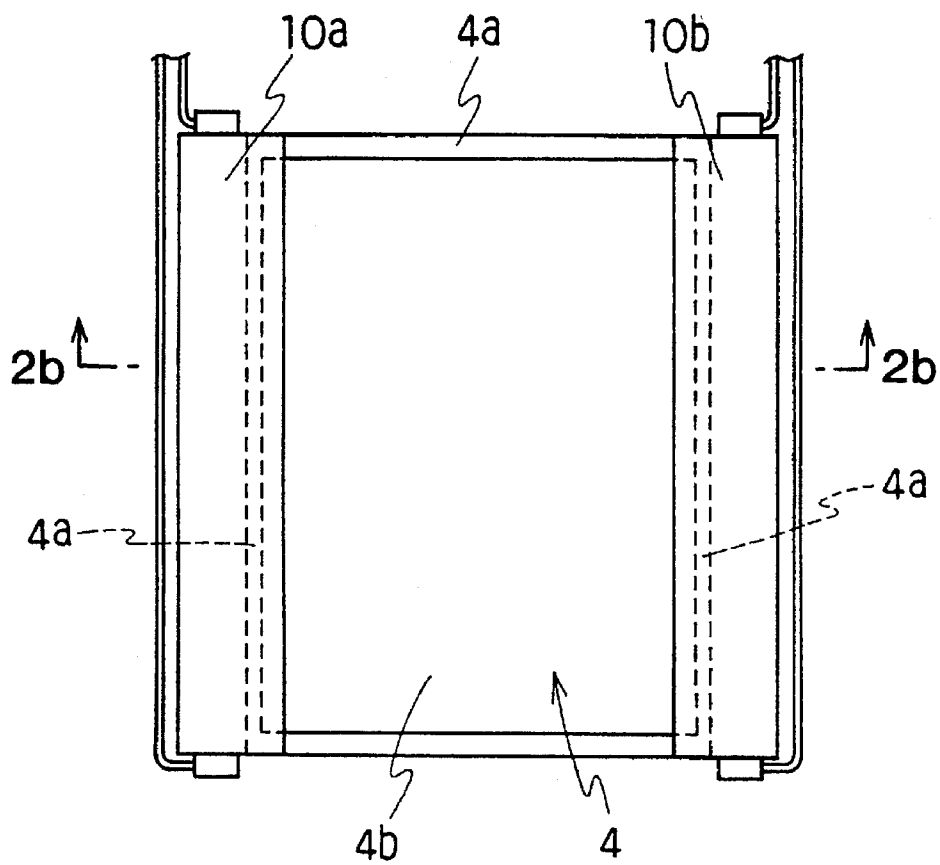


FIG. 2b

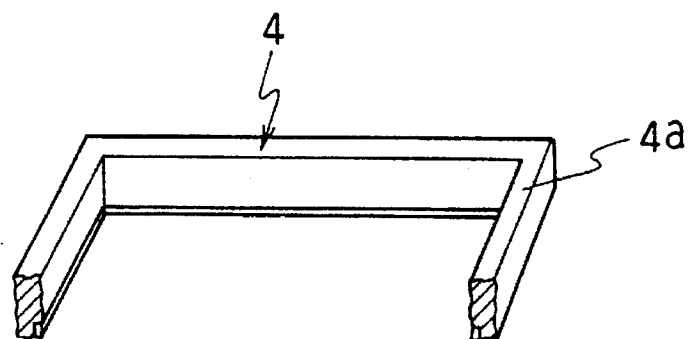


FIG. 3a

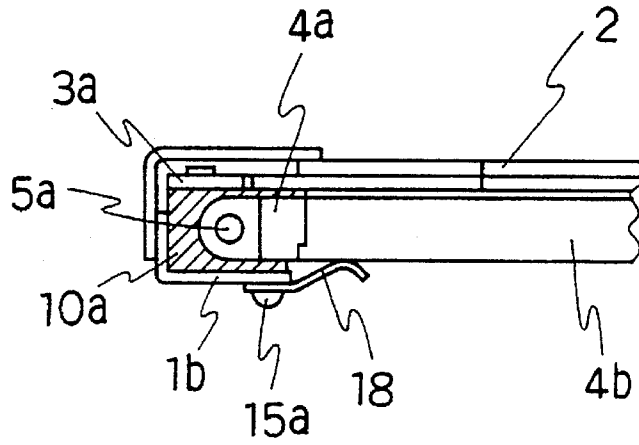


FIG. 3b

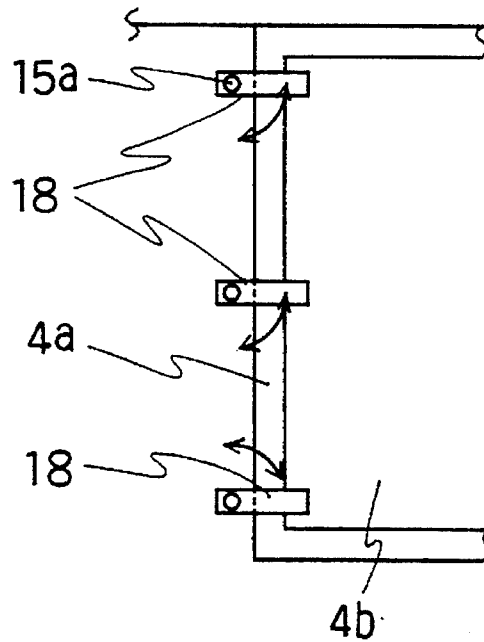


FIG. 4a

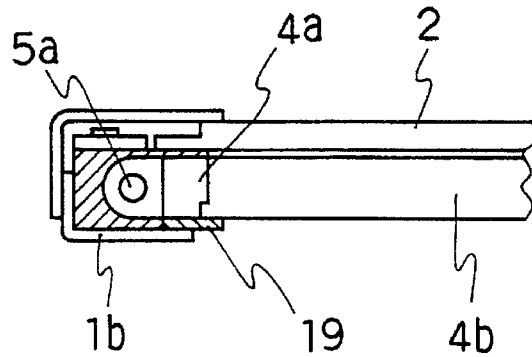
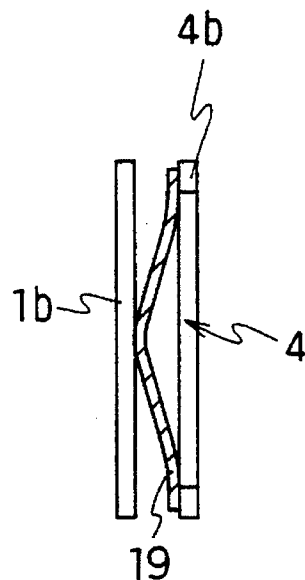


FIG. 4b



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