



US005706134A

United States Patent [19]**Konno et al.**[11] **Patent Number:** **5,706,134**[45] **Date of Patent:** **Jan. 6, 1998**[54] **LIGHT-DIFFUSING SHEET MEMBER**[75] **Inventors:** Teruaki Konno, Tokyo; Koichi Sawada; Masahiro Kitamura, both of Osaka, all of Japan[73] **Assignee:** Keiwa Shoko Kabushiki Kaisha, Osaka, Japan[21] **Appl. No.:** 658,314[22] **Filed:** Jun. 5, 1996**Related U.S. Application Data**

[63] Continuation of Ser. No. 954,304, Sep. 30, 1992, abandoned.

[30] **Foreign Application Priority Data**

Jun. 22, 1919	[JP]	Japan	4-042936 U
Oct. 9, 1991	[JP]	Japan	3-082008 U
Jan. 13, 1992	[JP]	Japan	4-000679 U

[51] **Int. Cl.⁶** G02B 5/02[52] **U.S. Cl.** 359/599; 359/452[58] **Field of Search** 359/599, 452, 359/453, 455, 456, 460; 354/452[56] **References Cited****U.S. PATENT DOCUMENTS**

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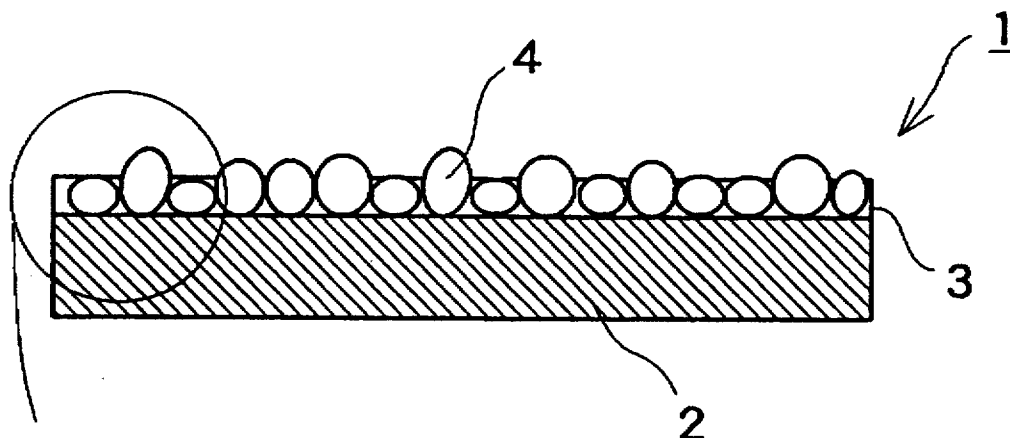
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[57] **ABSTRACT**

A light diffusing sheet member used as a diffusing plate of a liquid crystal display by which light transmitted from a light source is uniformly diffused so that the luminance of a screen of a light diffusing plate liquid crystal display portion is sufficient and a user can easily look at characters, graphics and the like displayed on the screen from different angles. A light diffusing sheet member comprises a base material sheet and a light diffusing layer applied on the top face of the base material sheet, and beads mixed therein. The beads have different sizes, and include particles buried in a synthetic resin and particles which at least partially project from the synthetic resin.

4 Claims, 5 Drawing Sheets

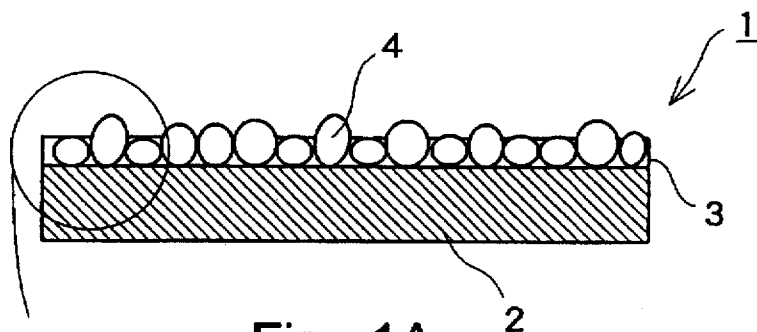


Fig. 1A

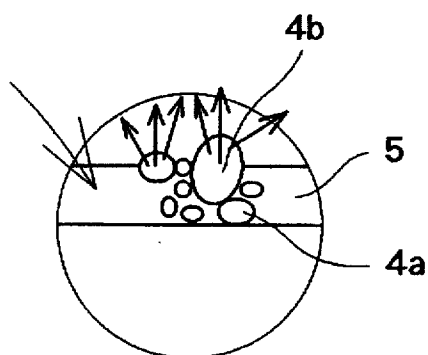


Fig. 1B

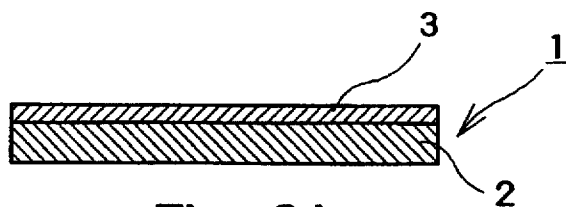


Fig. 2A

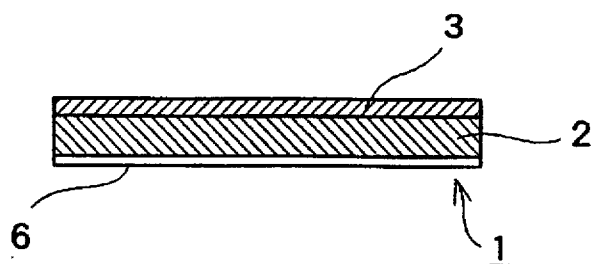


Fig. 2B

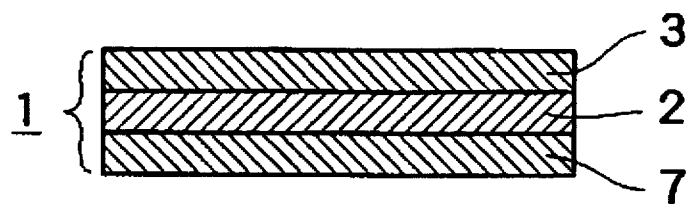


Fig. 3A

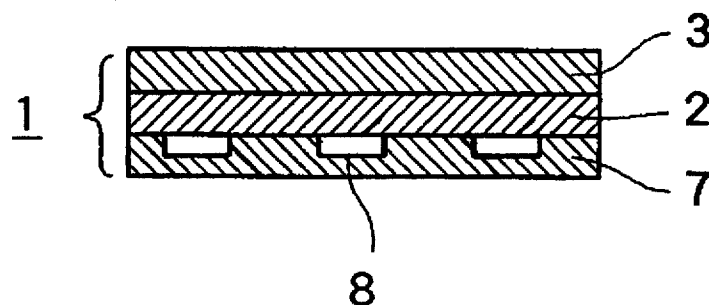


Fig. 3B

Fig. 4A

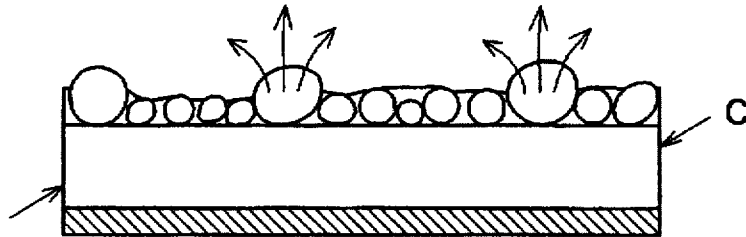
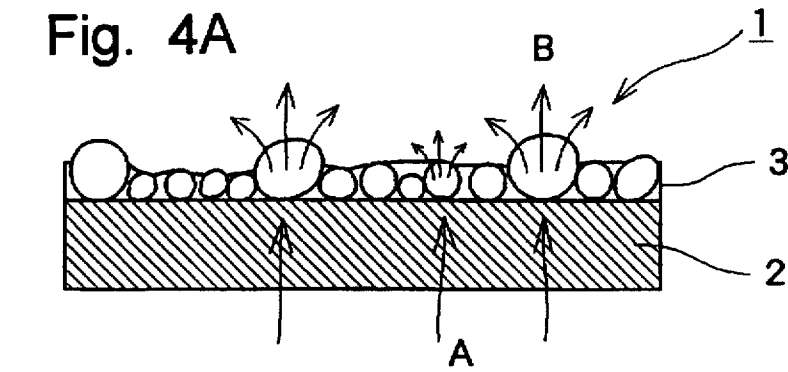


Fig. 4B

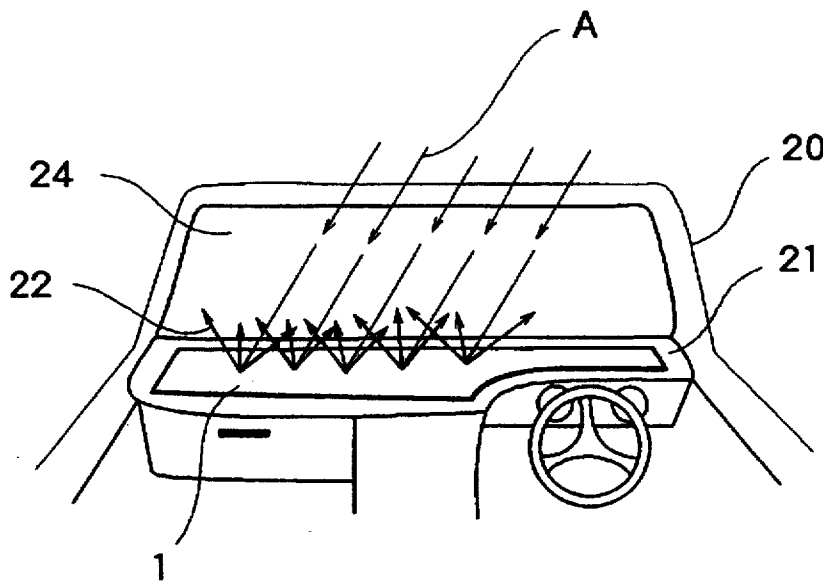


Fig. 5

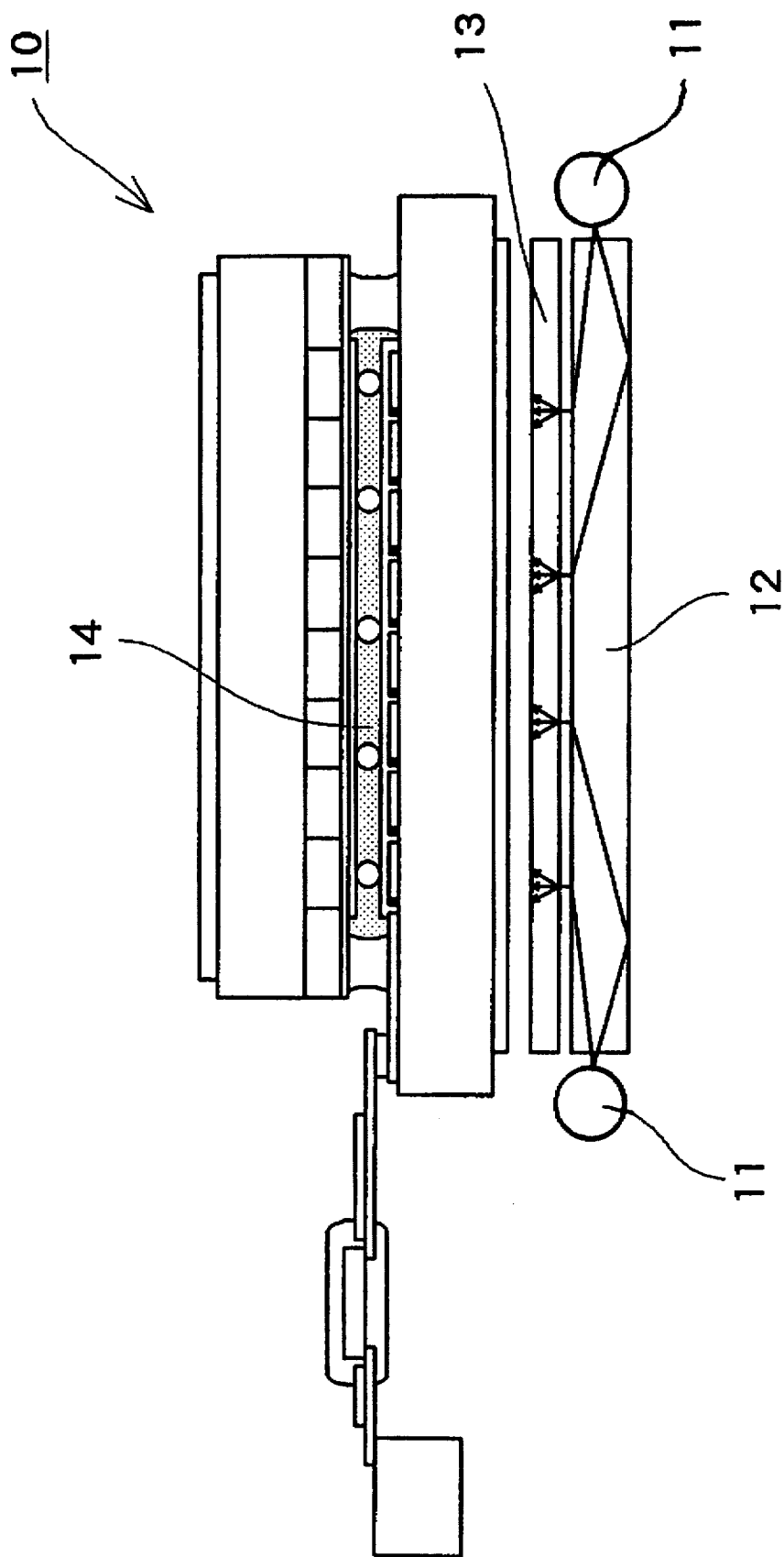


Fig. 6 PRIOR ART



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