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United States Patent [19]

[11] Patent Number: **5,779,338**

Ishikawa et al.

[45] Date of Patent: **Jul. 14, 1998**

[54] SURFACE LIGHT SOURCE DEVICE

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[75] Inventors: **Tsuyoshi Ishikawa**, Nerima-ku;
Kayoko Watai, Hasuda; **Kazuaki Yokoyama**, Ageo, all of Japan

FOREIGN PATENT DOCUMENTS

[73] Assignee: **Enplas Corporation**, Kawaguchi, Japan

3-31782	3/1991	Japan
3-189679	8/1991	Japan
94802-1993	12/1993	Japan

[21] Appl. No.: **709,118**

[22] Filed: **Sep. 6, 1996**

Primary Examiner—Stephen F. Husar
Attorney, Agent, or Firm—Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P.

Related U.S. Application Data

[62] Division of Ser. No. 290,087, Aug. 12, 1994, Pat. No. 5,575,549.

[51] Int. Cl.⁶ **F21V 8/00**

[52] U.S. Cl. **362/31; 362/27**

[58] Field of Search 362/26, 27, 31

[57] ABSTRACT

A surface light source device using a light conducting member, in which a multiplicity of concave portions are formed on an opposite surface of a light emitting surface of the light conducting member and the concave portions are arranged to have specific shapes to obtain a bright surface light source with a uniform brightness. A light diffusing material is fulfilled within the concave portions of the light conducting member so that a more uniform brightness can be obtained in an easy manner.

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U.S. PATENT DOCUMENTS

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14 Claims, 13 Drawing Sheets

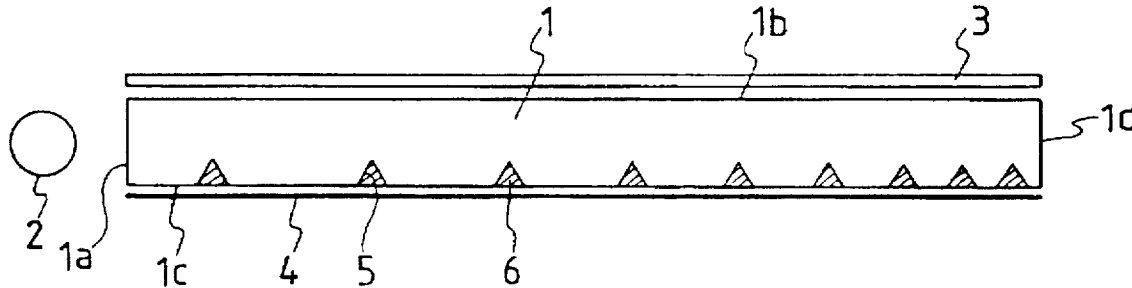


FIG. 1 PRIOR ART

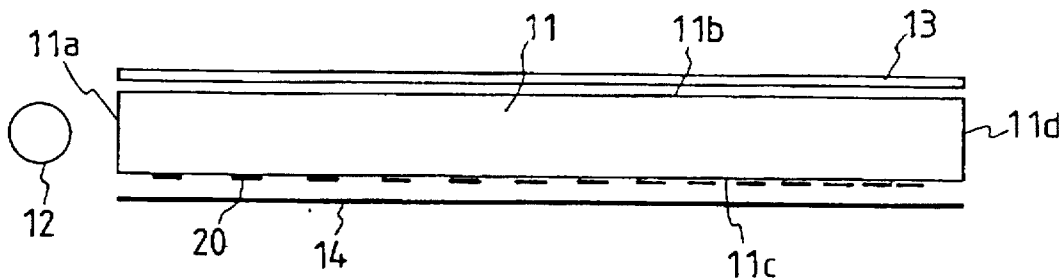


FIG. 2

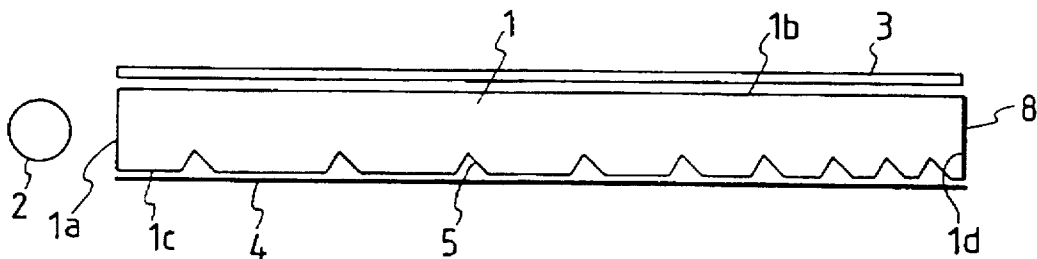


FIG. 3

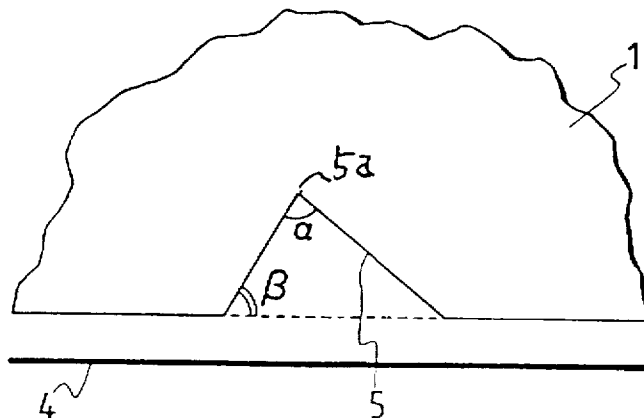


FIG. 4

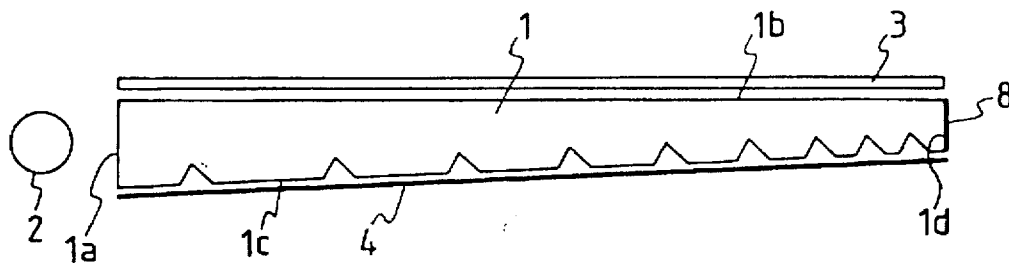


FIG. 5

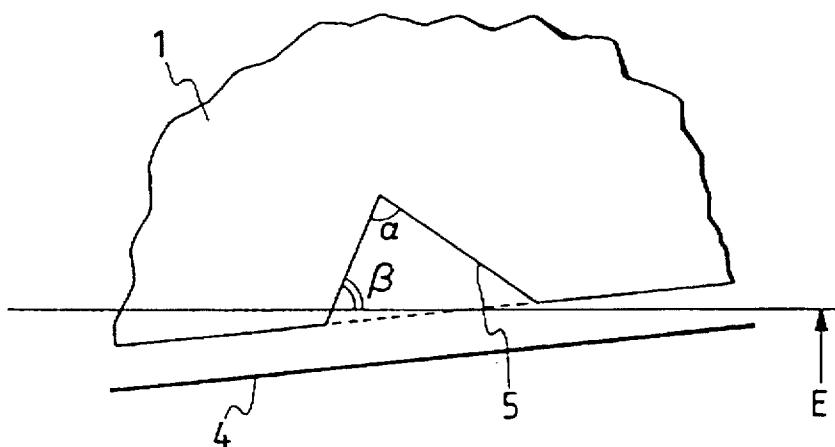


FIG. 6

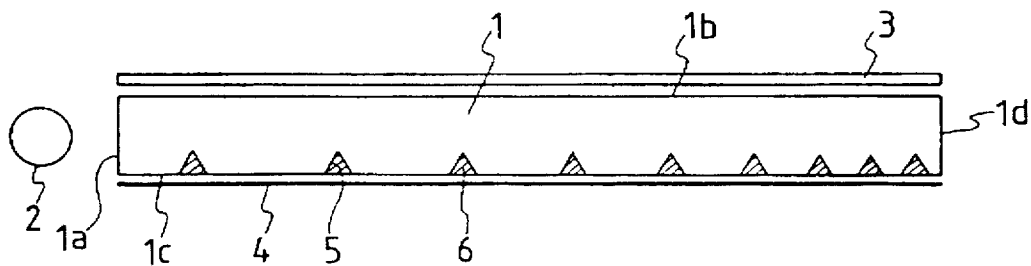


FIG. 7

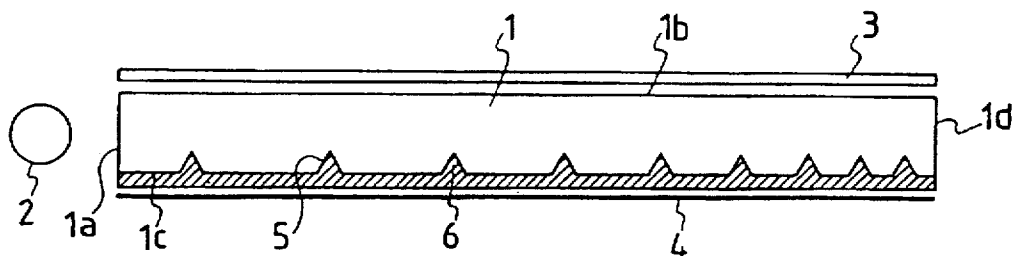


FIG. 8

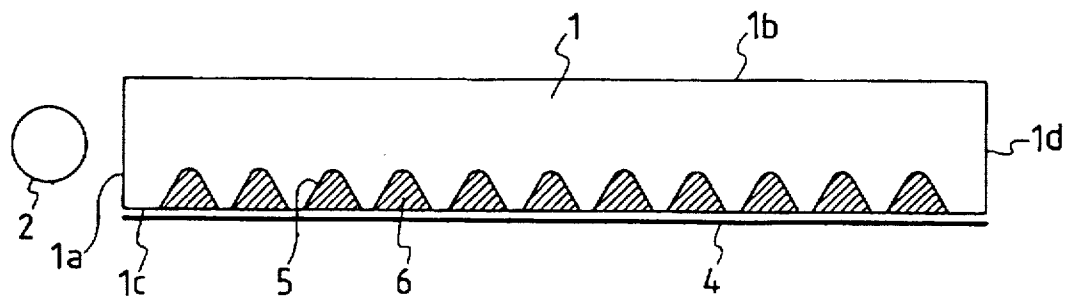


FIG. 9

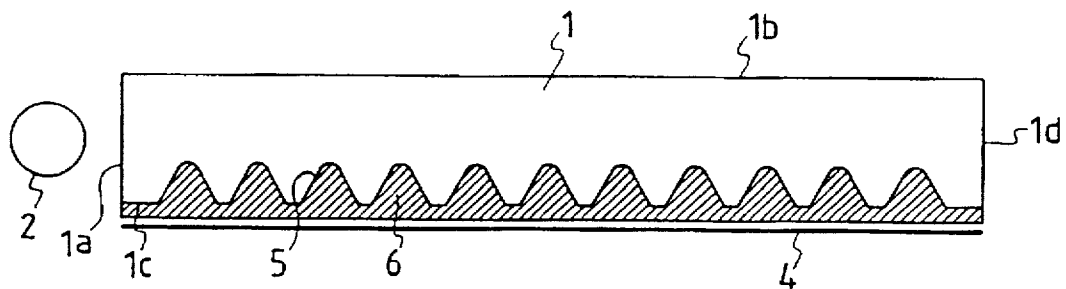


FIG. 10

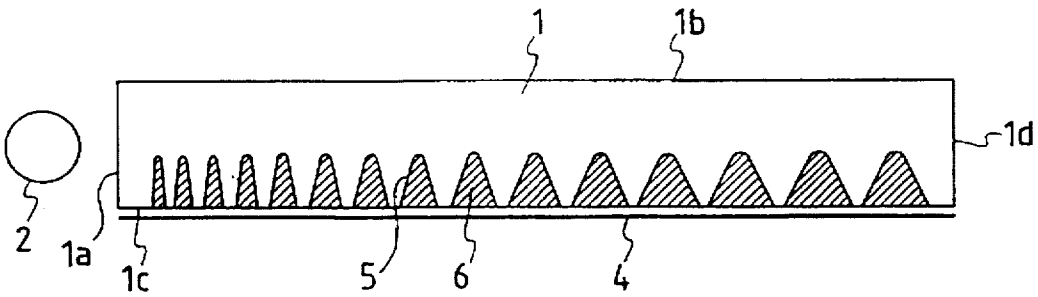


FIG. 11

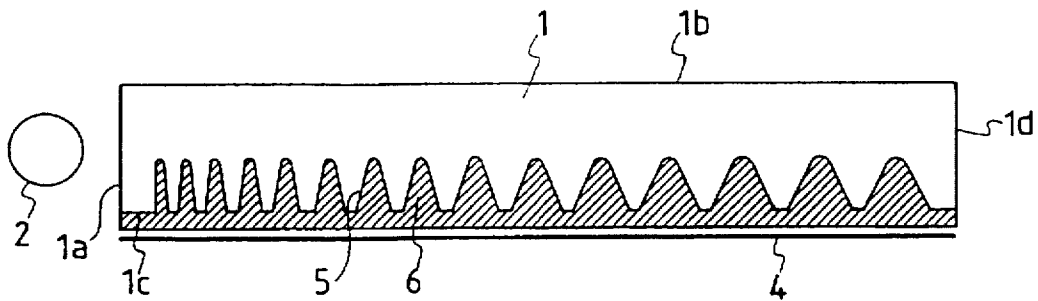
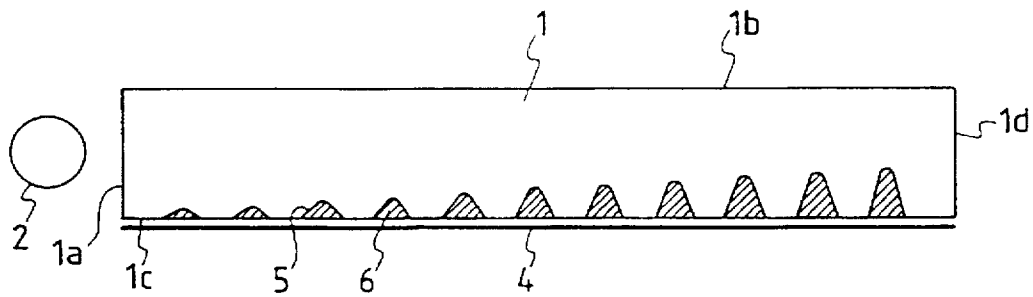


FIG. 12



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