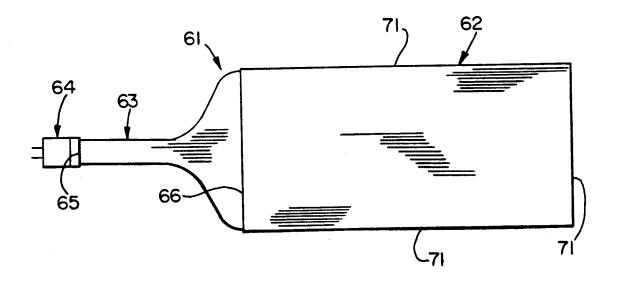
United States Patent [19] 5,005,108 [11] Patent Number: Date of Patent: Apr. 2, 1991 Pristash et al. [45] 4,519,017 5/1985 Daniel . [54] THIN PANEL ILLUMINATOR 6/1987 4,677,531 Szeles 362/32 [75] Inventors: David J. Pristash, Brecksville; 4,729,067 3/1988 Ohe 362/31 Jeffery R. Parker, Concord, both of 4,761,047 8/1988 Mori 362/32 8/1988 Awai et al. 362/32 4,763,984 8/1988 Cheslak. 4,765,701 [73] Assignee: Lumitex, Inc., Cleveland, Ohio 4,802,066 1/1989 Mori 362/31 [21] Appl. No.: 309,424 [22] Filed: Feb. 10, 1989 Primary Examiner—Stephen F. Husar Assistant Examiner-Sue Hagarman [51] Int. Cl.⁵ F21V 7/04 Attorney, Agent, or Firm-Renner, Otto, Boisselle & [52] **U.S. Cl.** **362/31**; 362/32; Sklar 362/26 [57] **ABSTRACT** [56] References Cited Thin panel illuminator includes a solid transparent panel member having one or more deformed output regions U.S. PATENT DOCUMENTS which cause light entering the panel along an input edge 2,480,178 8/1949 Zinberg 350/96.10 thereof to be emitted along the length of the panel. 7/1962 Albinger, Jr. 362/32 3.043.947 Light may be transmitted to one or more panel input 3,721,815 3/1973 Wall 362/32 3,760,179 9/1973 Addington, Jr. 40/546 edges from one or more light sources utilizing transition devices which convert easily focused light generally to 4,128,332 12/1978 Rowe 362/32

4,257,084 3/1981 Reynolds 362/27 4,323,951 4/1982 Pasco 362/31

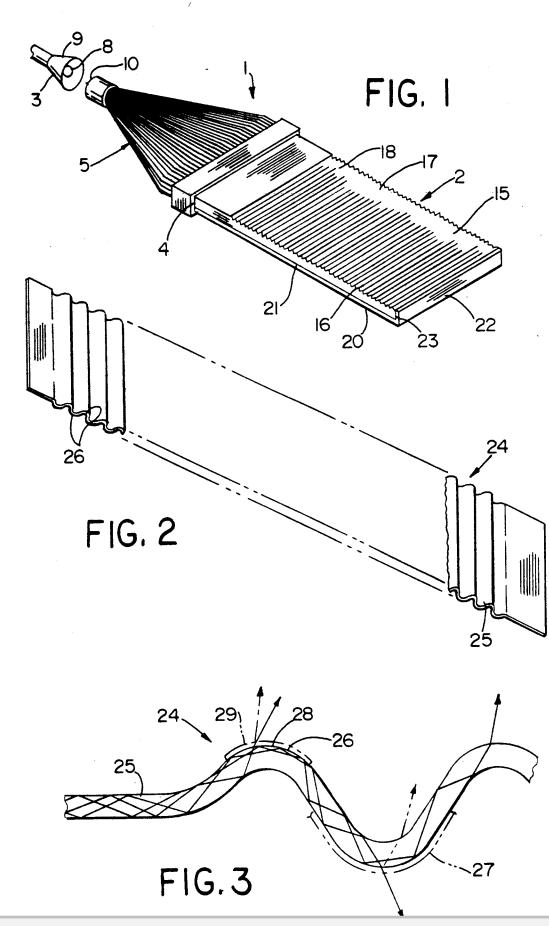
4,373,282 2/1983 Wragg 350/126

76 Claims, 6 Drawing Sheets

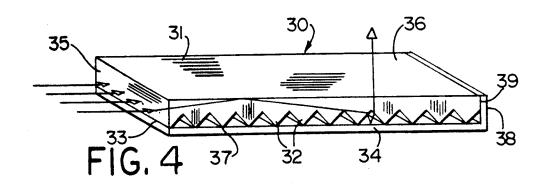
the shape of the panel input surfaces.

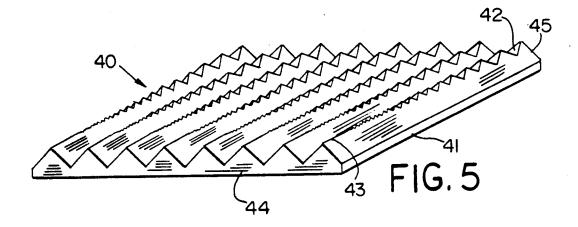


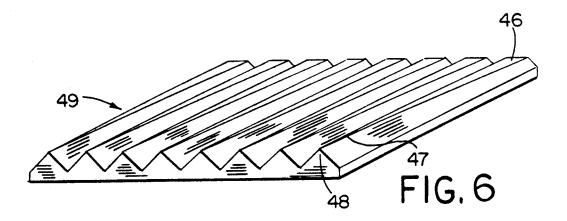
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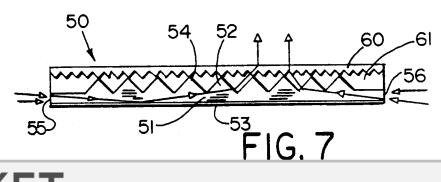




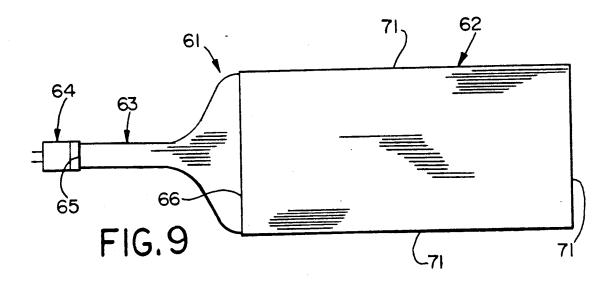




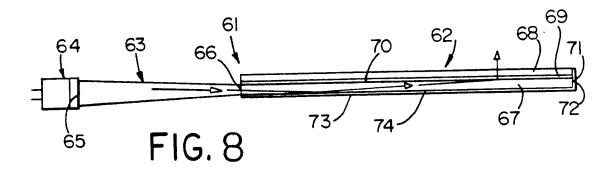


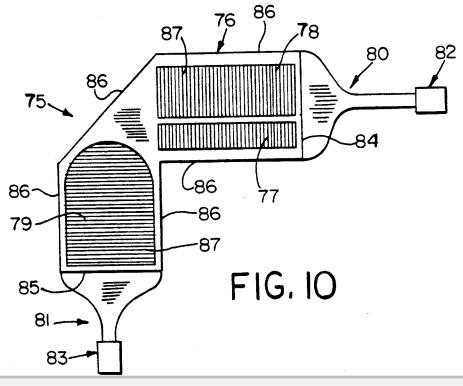




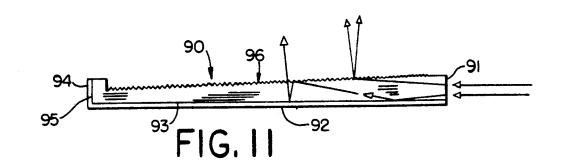


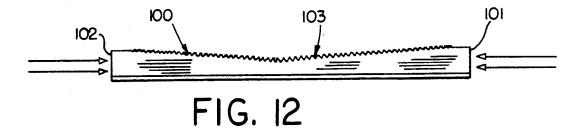
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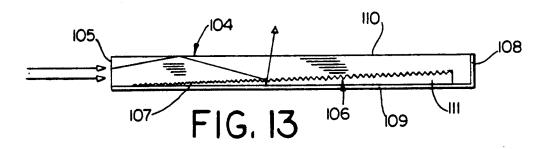


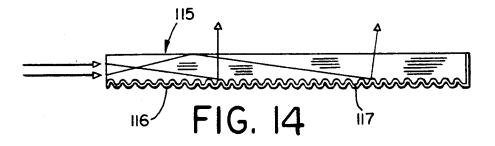


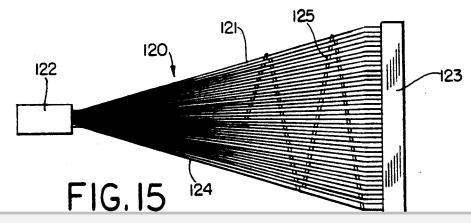














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