

US006030108A

United States Patent [19]

Ishiharada et al.

[11] Patent Number: 6,030,108

[45] **Date of Patent:** Feb. 29, 2000

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[57] ABSTRACT

The light transmission hose included in the waterproof lighting apparatus according to the present invention is of a watertight structure, so it can easily be used as laid in or on water without any special protective means. Since the light source is installed in a location apart from water, it can be easily maintained and lamp replacement is also easy. By selecting a desired one of the kinds of light source, the illumination can be changed, resulting in a great effect of illumination. If provided with a powerful light source, the waterproof lighting apparatus according to the present invention can be used for warning any hazardous area to walkers, bicycle riders, car drivers, ships, aircraft and the like vehicles. Even if the lighting apparatus is located far away, the light from the light-emitting portion permits the walker or vehicle driver to readily be aware of a hazardous area.

5 Claims, 33 Drawing Sheets

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[54] WATERPROOF LIGHTING APPARATUS [75] Inventors: Minoru Ishiharada, Tokyo; Itsuo Tanuma, Saitama-ken; Kazuo Naito, Kanagawa-ken; Yasuhiko Matsumuro, Tokuyo; Takao Aoki, Kanagawa-ken; Kiyoshi Koyama, Kanagawa-ken, all of Japan [73] Assignee: Bridgestone Corporation, Tokyo, Japan [21] Appl. No.: 08/103,226 [22] Filed: Aug. 9, 1993 [30] Foreign Application Priority Data Aug. 7, 1992 Japan 4-232840 Aug. 21, 1992 [JP] Japan 4-245612 Aug. 25, 1992 [JP] Japan 4-248594 [51] Int. Cl.⁷ F21V 8/00

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Field of Search 362/32, 293, 101,

362/96, 559, 582, 562; 385/123, 125, 100

362/559; 362/582; 385/123

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FIG.1

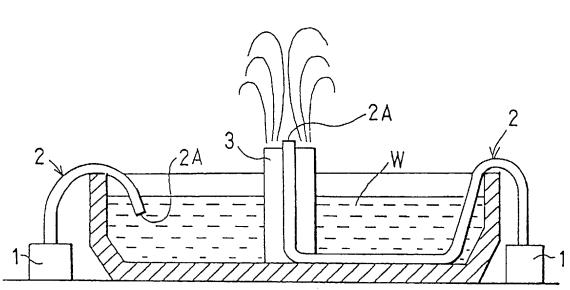


FIG. 2

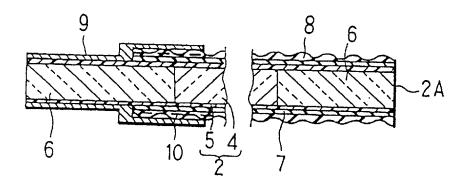
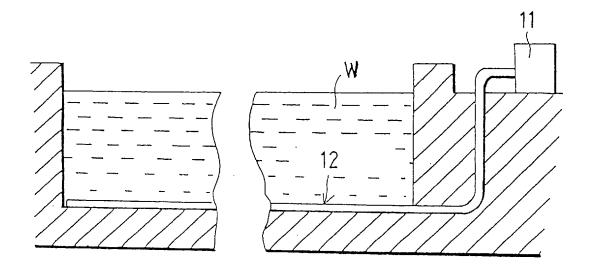


FIG.3



F1G.4

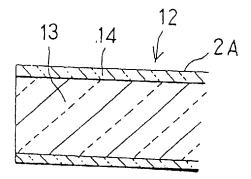


FIG.5

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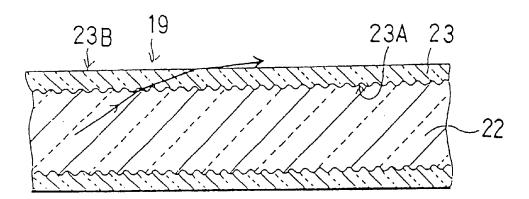


FIG.6

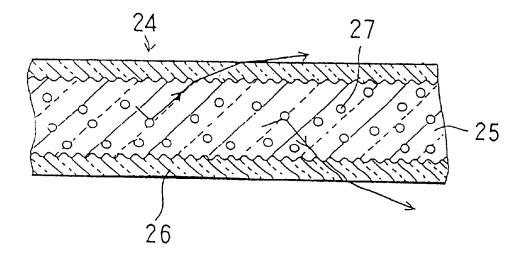




FIG. 7(A)

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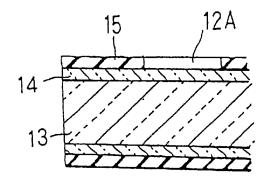


FIG. 7(B)

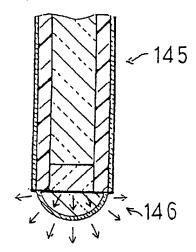
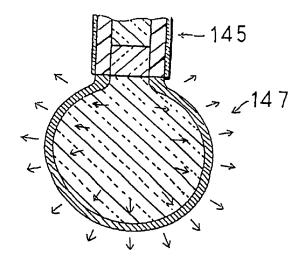


FIG. 7(C)



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