United States Patent [19]

Miyauchi et al.

[11] **Patent Number:** **4,868,720**

[45] **Date of Patent:** **Sep. 19, 1989**

[54] **ROAD SURFACE-SENSITIVE BEAM PATTERN LEVELING SYSTEM FOR A VEHICLE HEADLAMP**

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[21] Appl. No.: **206,449**

[22] Filed: **Jun. 14, 1988**

[30] **Foreign Application Priority Data**

Aug. 17, 1987 [JP] Japan 62-203804

[51] **Int. Cl.⁴** B60Q 1/10; B60Q 11/00; B62J 6/00
[52] **U.S. Cl.** 362/69; 362/71; 362/72; 362/287
[58] **Field of Search** 362/66, 69, 71, 72, 362/285, 287, 429

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[57] **ABSTRACT**

A motorcycle headlamp capable of emitting a light beam with a beam pattern calculated to provide optimum forward illumination. In order to maintain the beam pattern in a level position about the lamp axis despite the lateral tipping of the motorcycle, at least one road sensor is employed for detecting the lateral angular position of the vehicle with respect to the road surface by transmitting radiation such as an ultrasonic wave or infrared rays toward the road surface and receiving its reflection from the road surface. Electric signals representative of lateral vehicle inclination are fed to a central processor unit, which then causes energization of a reversible electric motor built into the headlamp unit for leveling the beam pattern by revolving the bulb and control lens of the headlamp unit relative to the lamp housing. Thus, as the lateral angular position of the vehicle is detected in reference to the road surface, instead of to the perpendicular, the beam pattern can be maintained in the level position with respect to the road surface regardless of whether the road is banked or unbanked. Several different methods of detecting lateral vehicle inclination are disclosed.

17 Claims, 20 Drawing Sheets

Fig. 1

14 — BEAM PATTERN ANGLE DETECTOR

16 — BEAM PATTERN LEVELING MECHANISM

10 — CPU

20 — HEADLAMP LIGHTING SWITCH

12 — VEHICLE INCLINATION DETECTOR
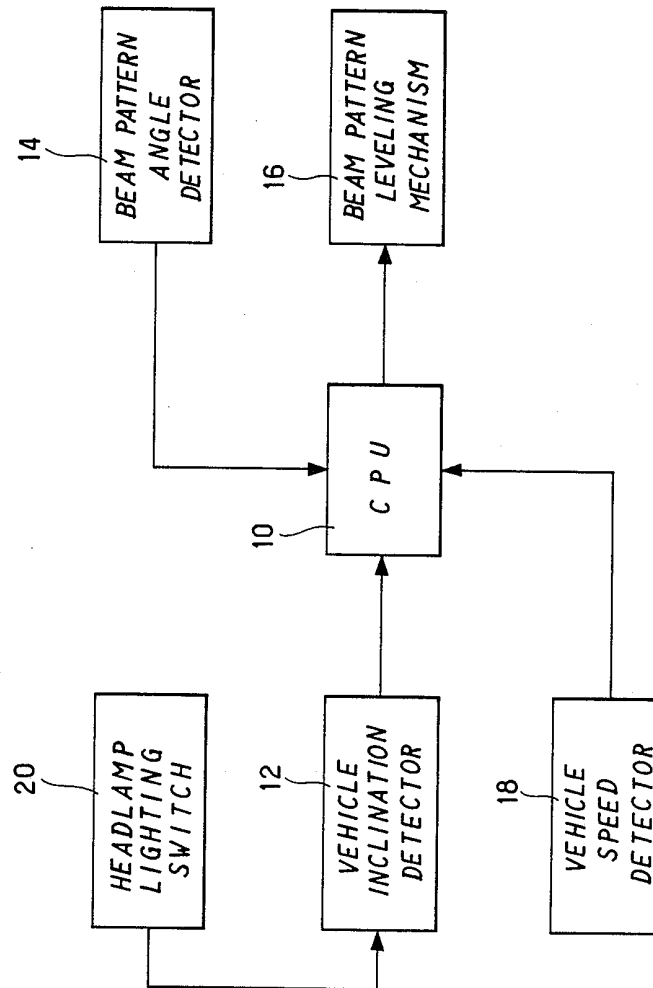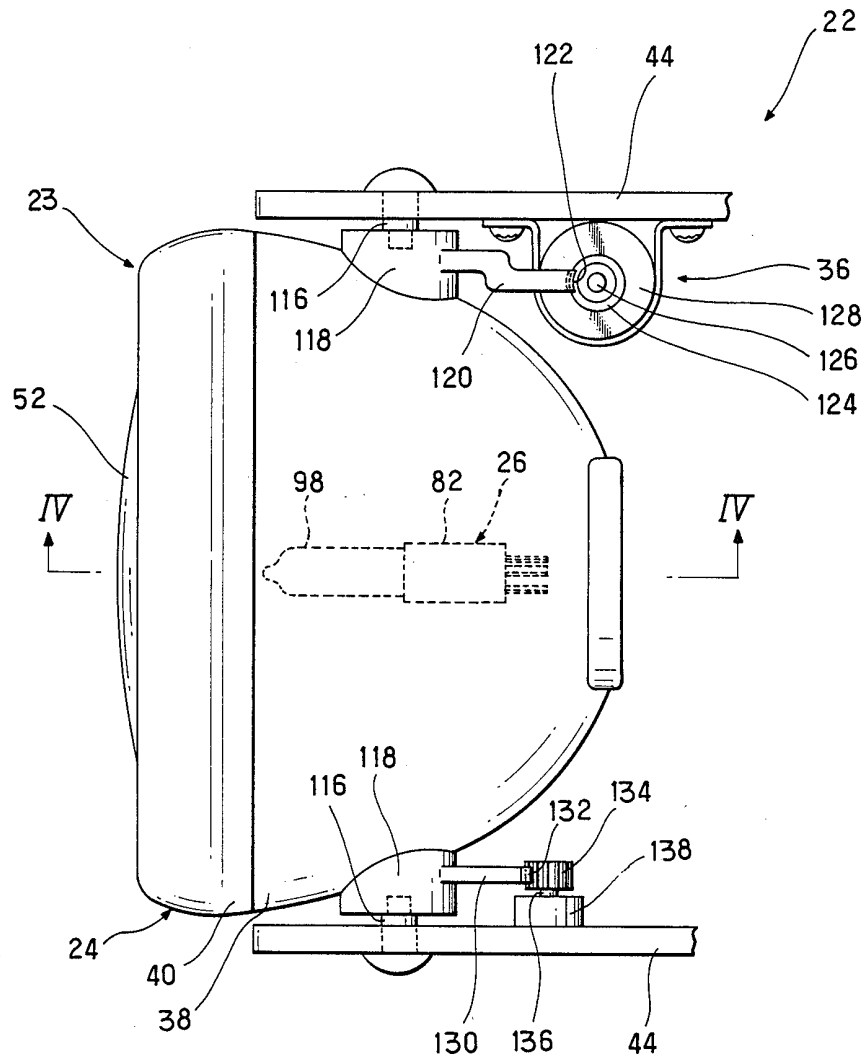
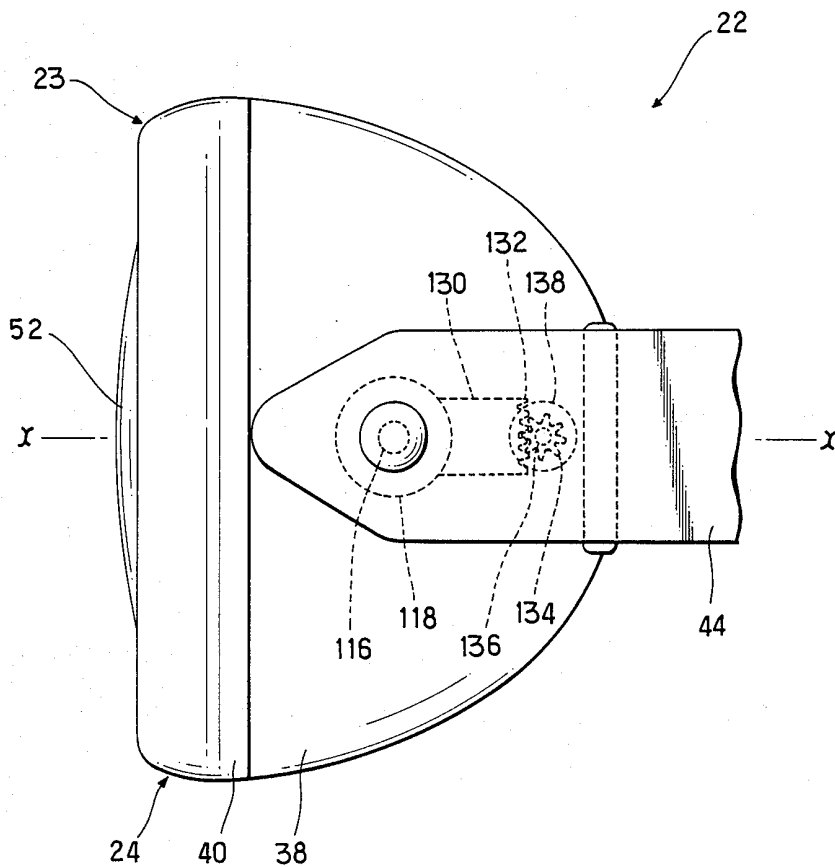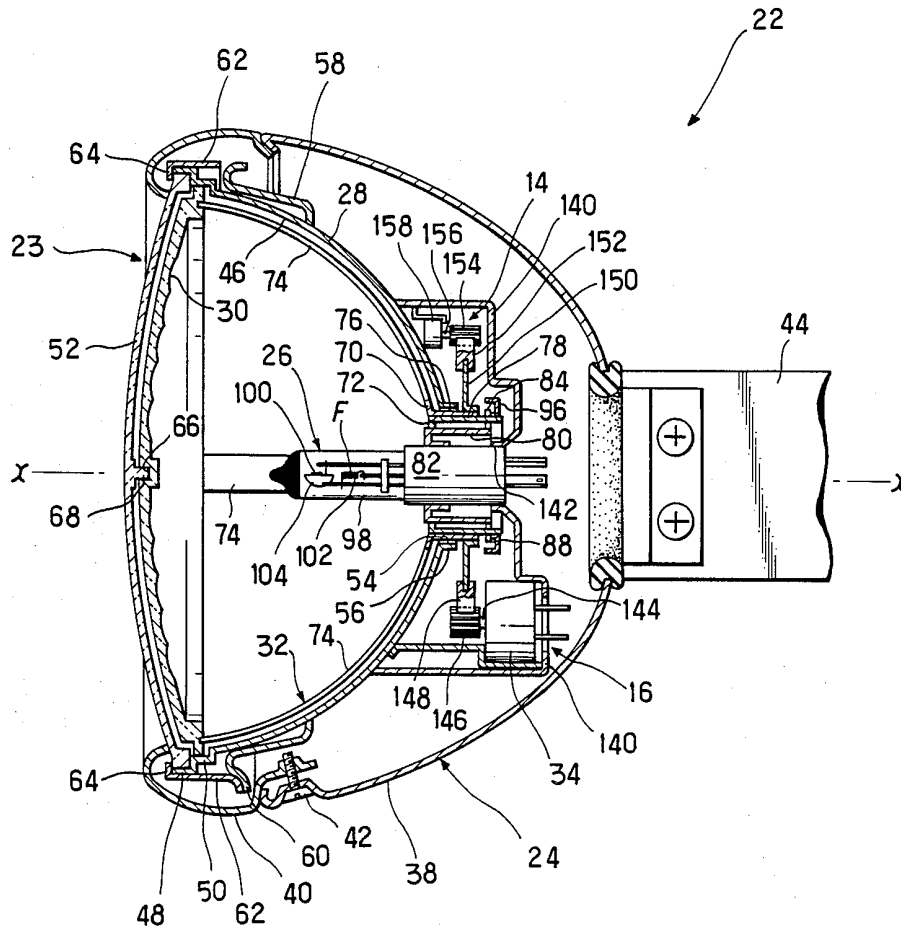18 — VEHICLE SPEED DETECTOR
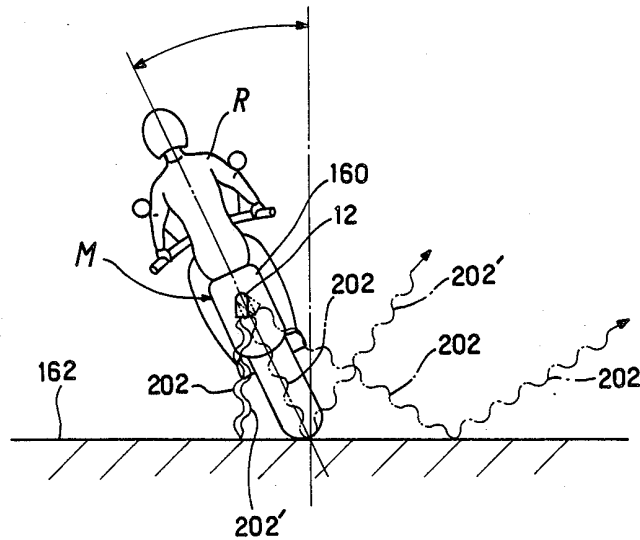
Fig. 2

Fig. 3

Fig. 4

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