United States Patent [19]

Gotoh

[54] **HEAD LAMP DEVICE FOR VEHICLE**

[75] Inventor: **Shinichiro Gotoh**, Wako, Japan

[73] Assignee: **Honda Giken Kogyo Kabushiki Kaisha**, Tokyo, Japan

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[30] **Foreign Application Priority Data**

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[51] **Int. Cl.^{6}** **B60Q 1/08**
[52] **U.S. Cl.** **362/37**; 362/466; 362/465; 315/82
[58] **Field of Search** 362/37, 40, 466, 362/524, 465; 315/79, 82

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Primary Examiner—Thomas M. Sember
Attorney, Agent, or Firm—Carrier, Blackman & Associates, P.C.; Joseph P. Carrier; William D. Blackman

[57] **ABSTRACT**

A head lamp device for a vehicle capable of changing a lighting region in front of the vehicle in right and left directions, in which change of the lighting region is suppressed so as not to give the driver a sense of incongruity when a steering wheel is operated in one direction and then rapidly in the other as in case of counter-steering. The device comprises a lighting region changing mechanism for changing the lighting region of the head lamp; a steering angle sensor for detecting a steering angle; a turning movement detector for detecting a turning movement of the vehicle body in right and left directions; a first lighting angle calculating mechanism for calculating a first lighting angle based on the steering angle detected by the steering angle sensor; a second lighting angle calculating mechanism for calculating a second lighting angle based on the turning movement detected by the turning movement detector; a lighting angle deciding mechanism for deciding a final lighting angle from the first lighting angle and the second lighting angle; and a controller for controlling the lighting region changing means to change the lighting region on the basis of the final lighting angle.
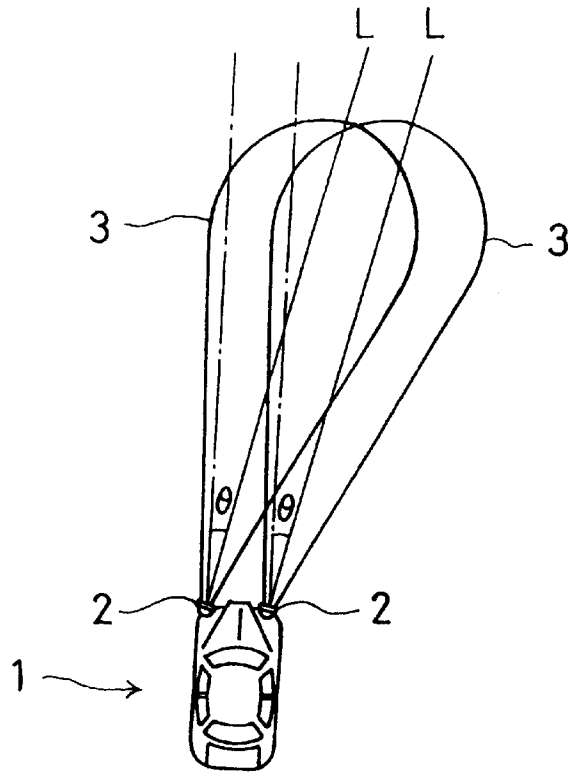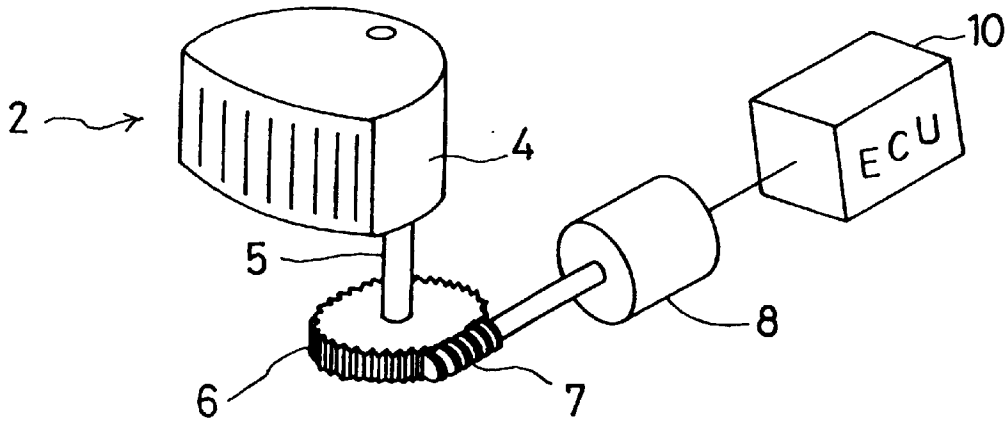
19 Claims, 6 Drawing Sheets

FIG. 1

FIG. 2

FIG. 3

FIG. 4

FIG. 5

LIGHT REGION
CHANGE CONTROL ROUTINE

S 1 — V, ϕ, ω READING

S 2 — $\theta_1 = K (V) \cdot \phi$

S 3 — $R = v / \omega$

S 4 — $\theta_2 = \cos^{-1} \{(R-x)/R\}$

S 5 — $\theta_1 \times \theta_2 > 0$ — N

S 6 — $|\theta_1| > |\theta_2|$ — N

S 7 — $\theta \leftarrow \theta_1$

S 8 — $\theta \leftarrow \theta_2$

S 9 — LIGHT DISTRIBUTION CONTROL WITH θ

RETURN
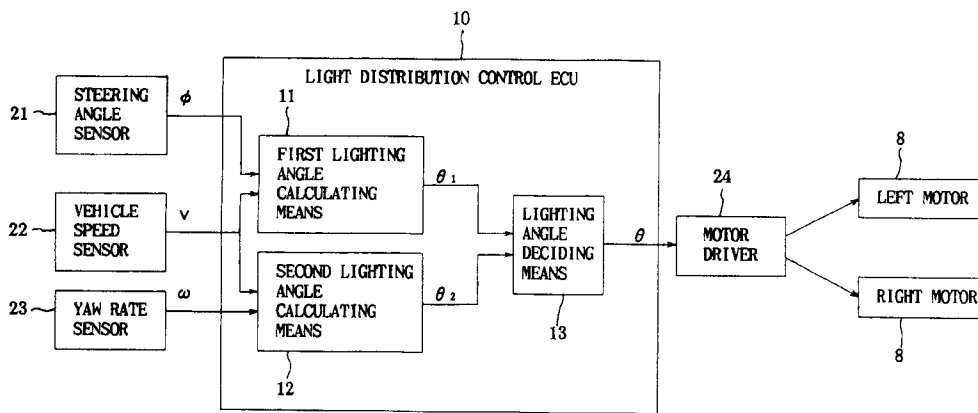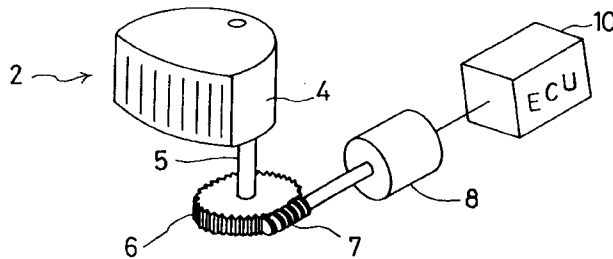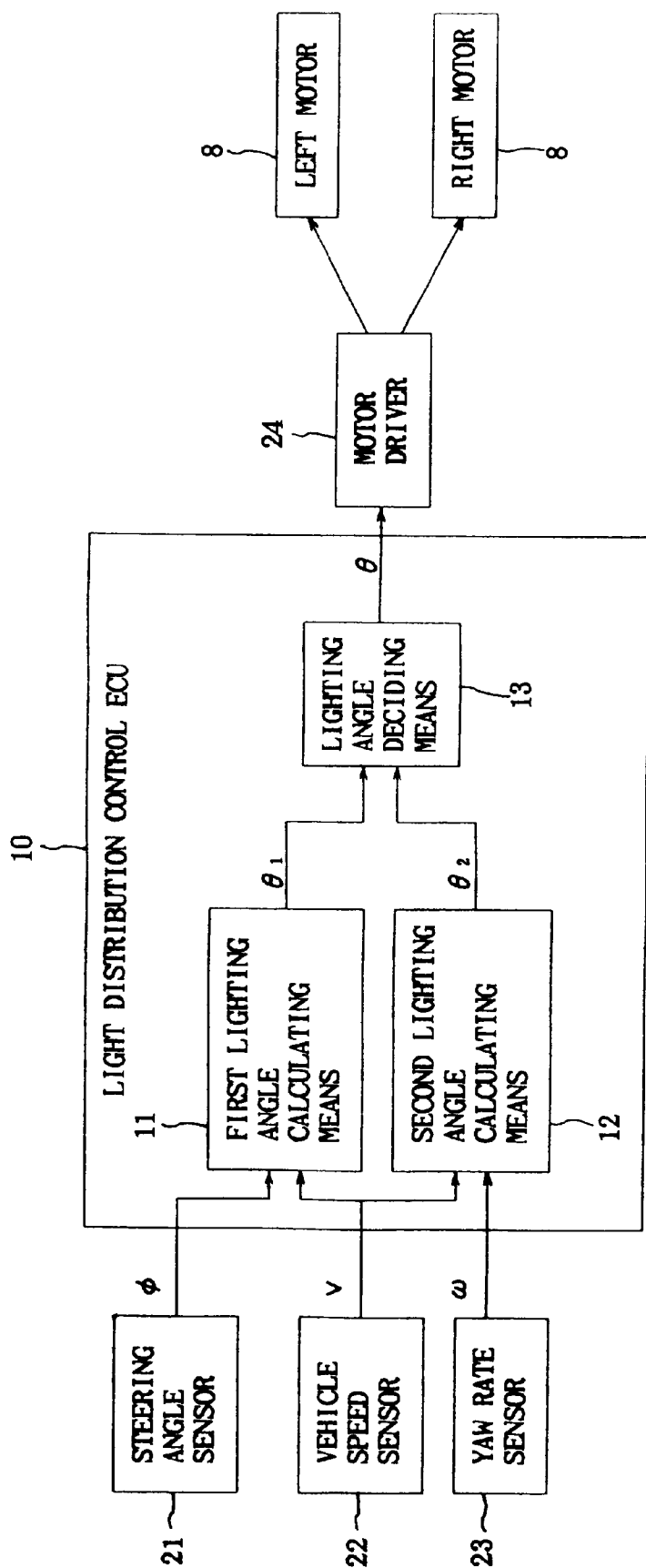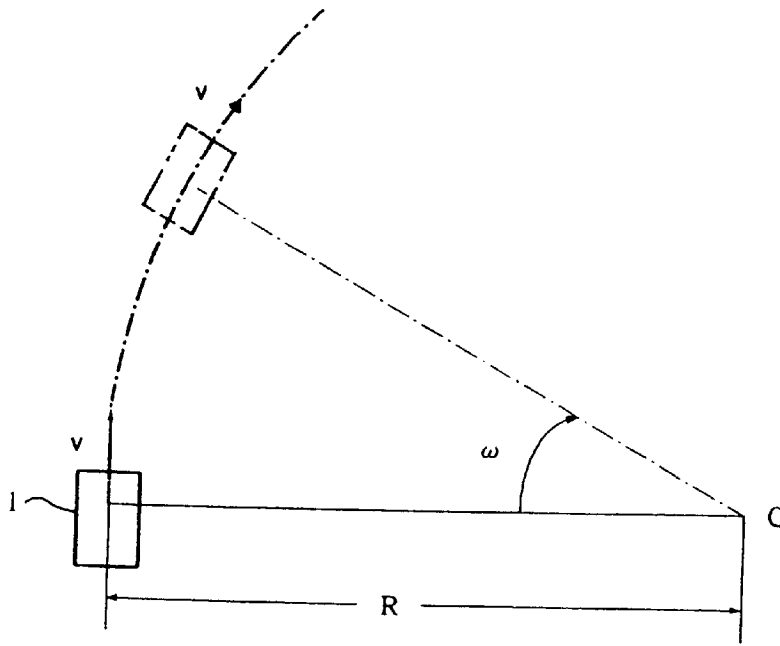
FIG. 6

DOCKET ALARM
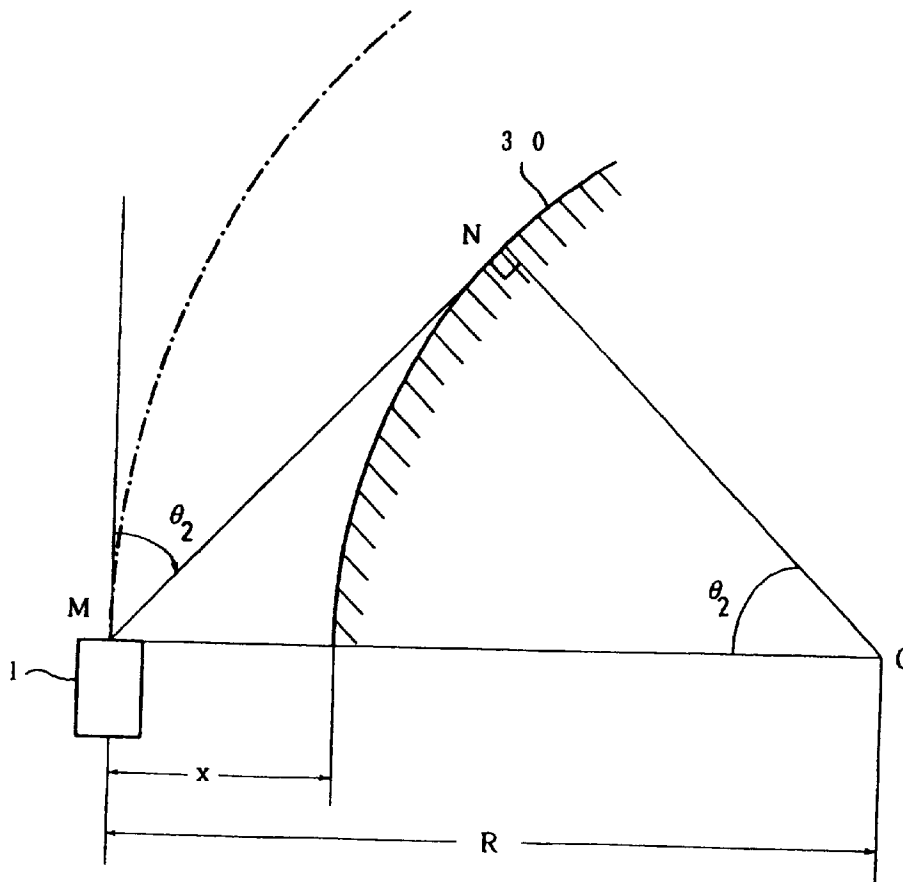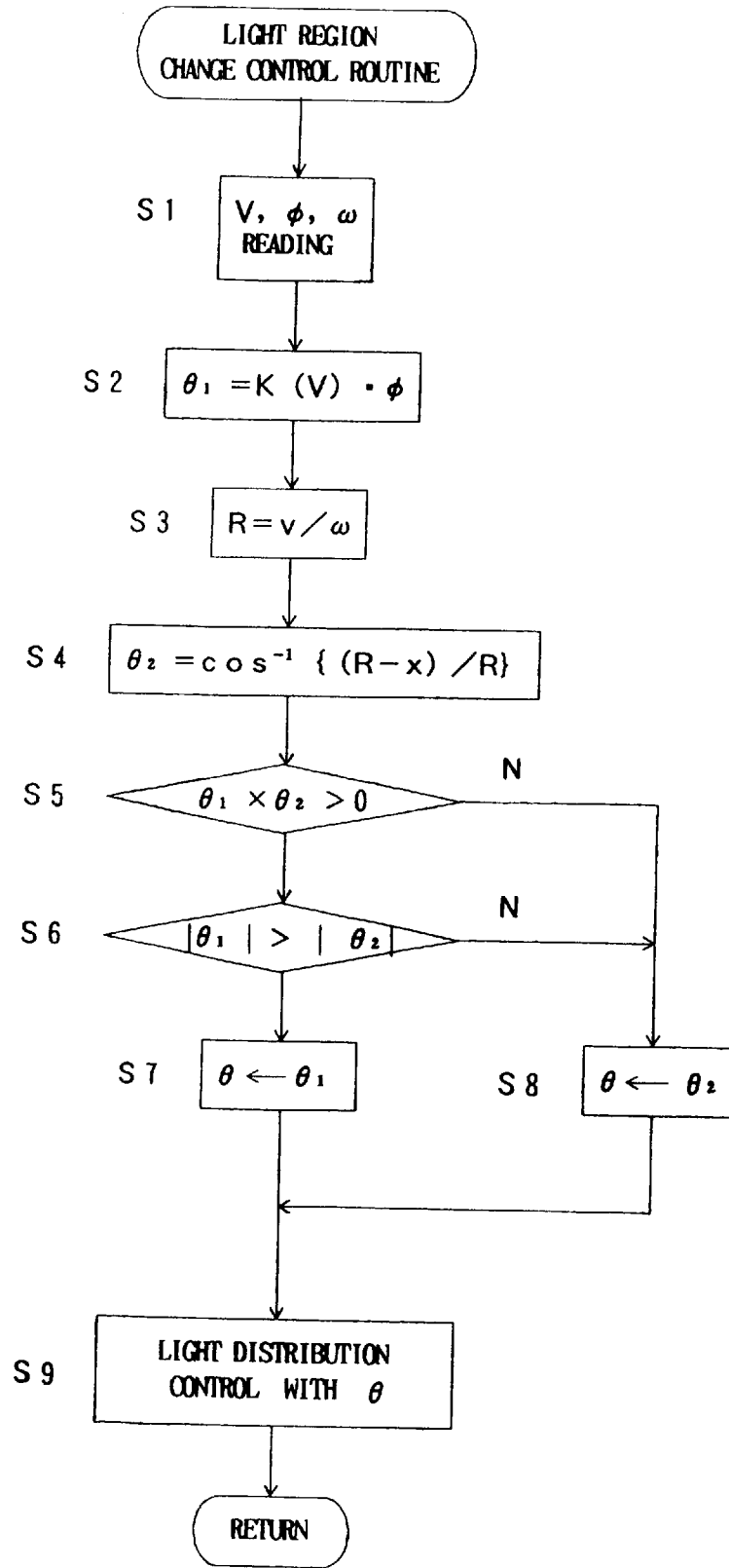
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