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United States Patent [19]

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Terashima et al.

[45] Date of Patent: **Mar. 31, 1998**

[54] POWER WINDOW CONTROL DEVICE

5,334,876	8/1994	Washeleski et al.	318/469 X
5,399,950	3/1995	Lu et al.	318/469 X
5,483,135	1/1996	Parks	318/469
5,539,290	7/1996	Lu et al.	318/469 X

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FOREIGN PATENT DOCUMENTS

[73] Assignee: **Nippondenso Co., Ltd., Kariya, Japan**

60-185625	9/1985	Japan .
64-039278	2/1989	Japan .

[21] Appl. No.: **570,083**

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[22] Filed: **Dec. 11, 1995**

[30] Foreign Application Priority Data

Dec. 13, 1994 [JP] Japan 6-308701

[51] Int. Cl.⁶ **G05D 3/20**

[52] U.S. Cl. **318/453; 314/455; 314/466; 314/434**

[58] Field of Search 318/280, 291, 318/293, 447, 453, 455, 466, 468, 469, 470, 432-434

[57] ABSTRACT

When a window glass catches an obstacle and driving current of a driving motor increases to a set maximum value, the driving current is controlled within the maximum set value to limit the obstacle catching force. Because the motor is controlled by a duty ratio of PWM signal, the motor speed can be controlled with ease and stable control of the motor is ensured.

[56] References Cited

U.S. PATENT DOCUMENTS

4,870,333 9/1989 Itoh et al. 318/286

21 Claims, 5 Drawing Sheets

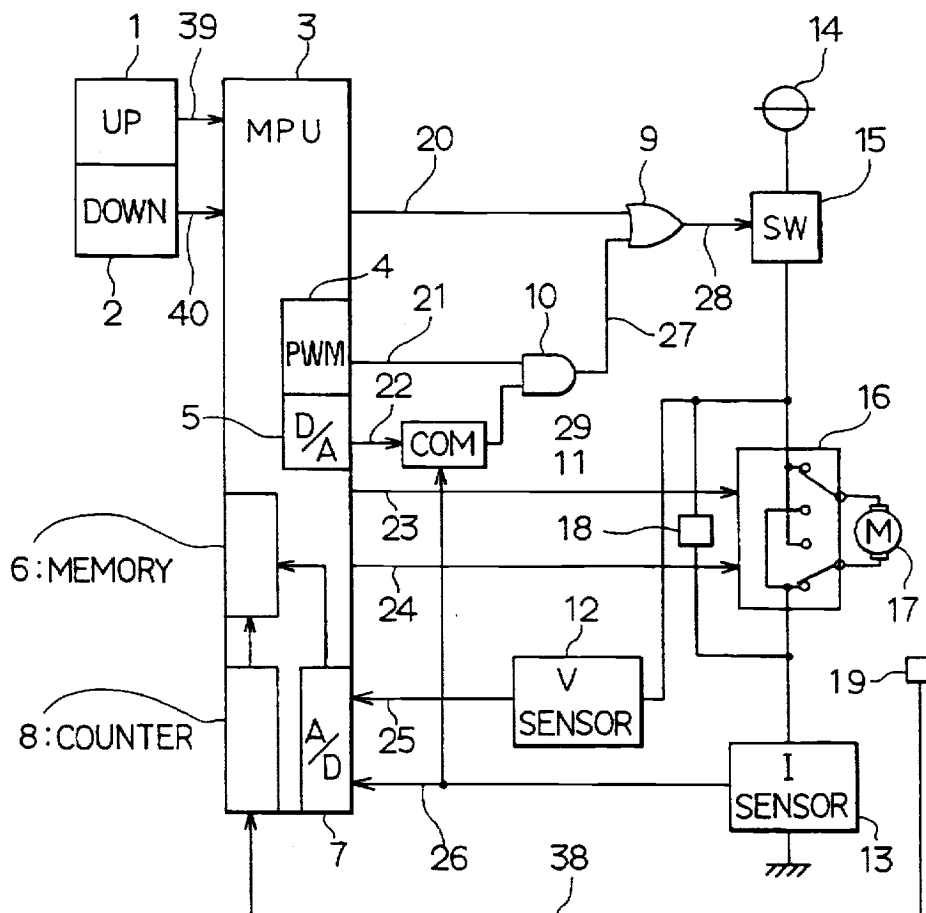


FIG. 1

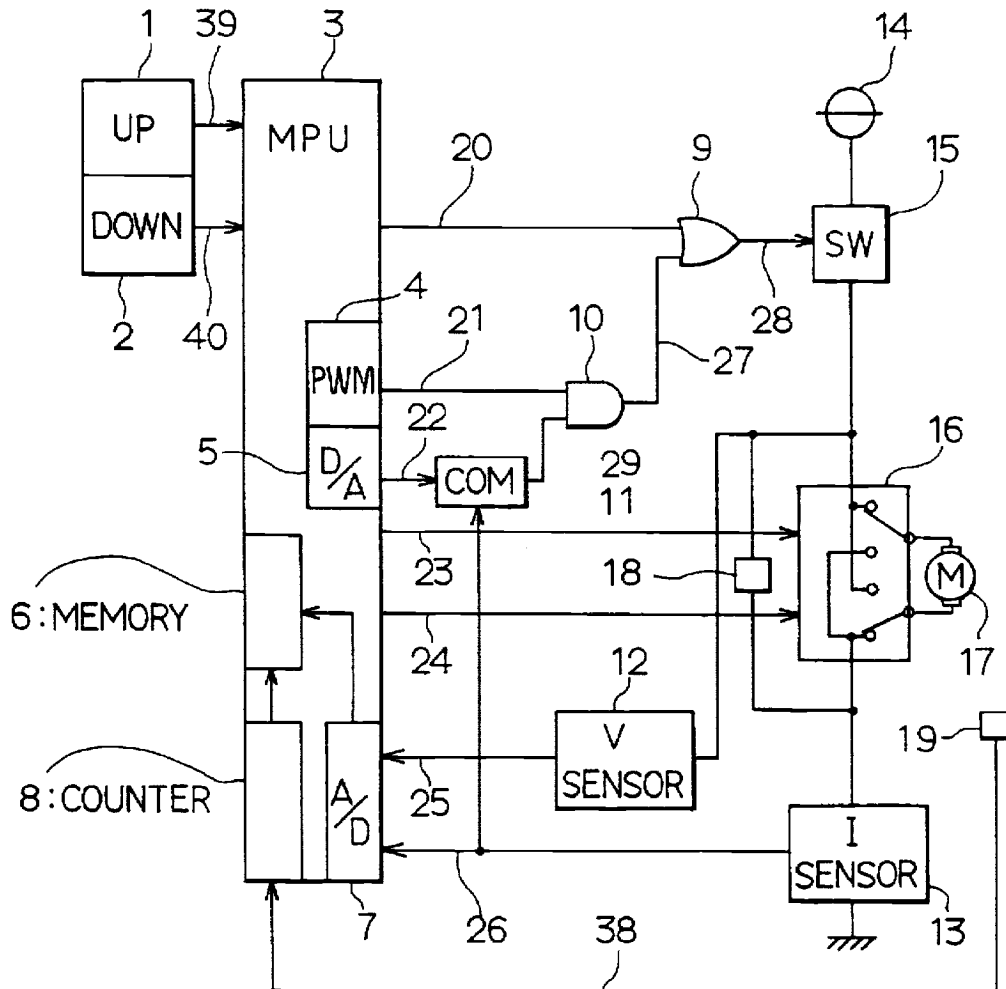


FIG. 2

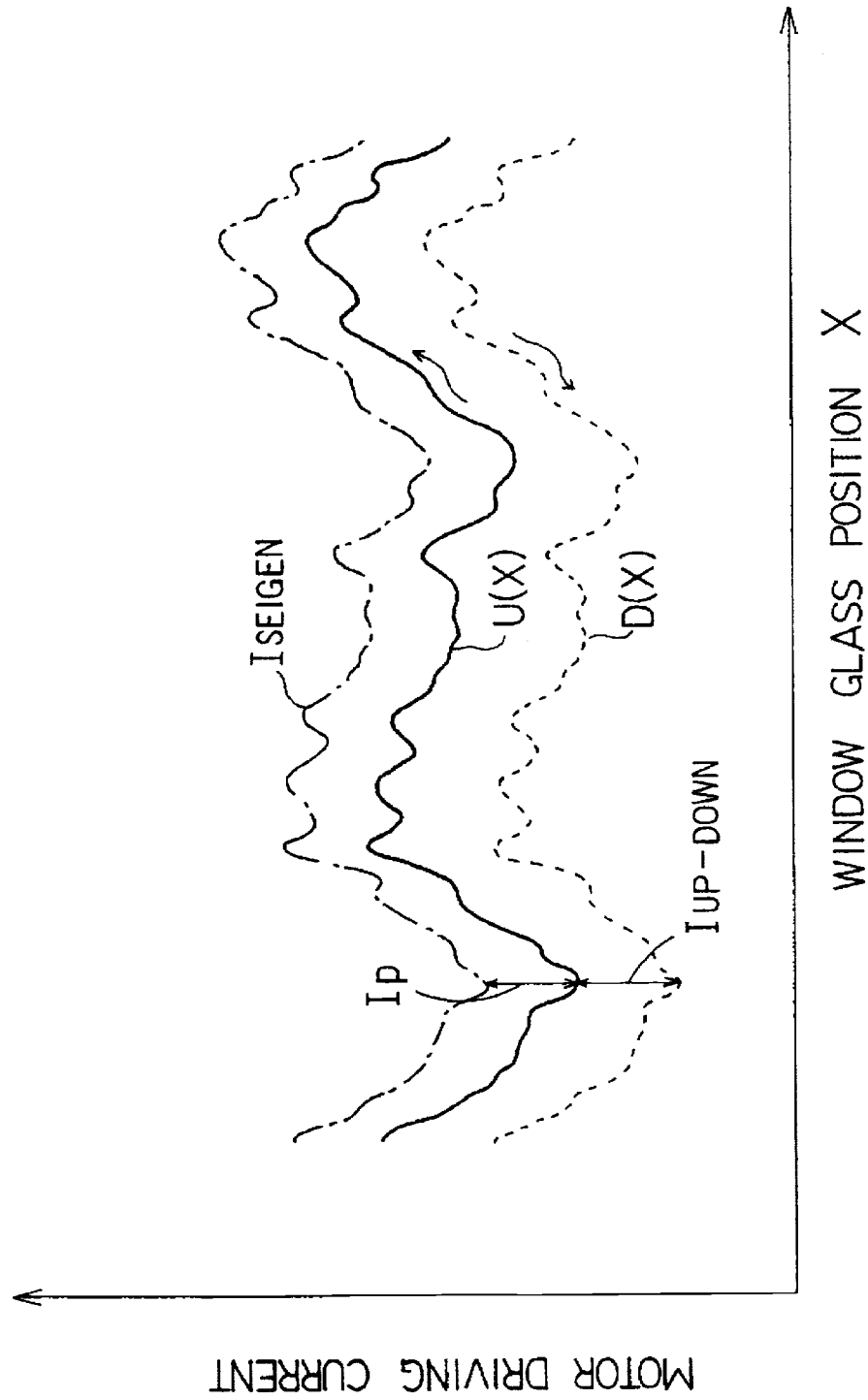


FIG. 3

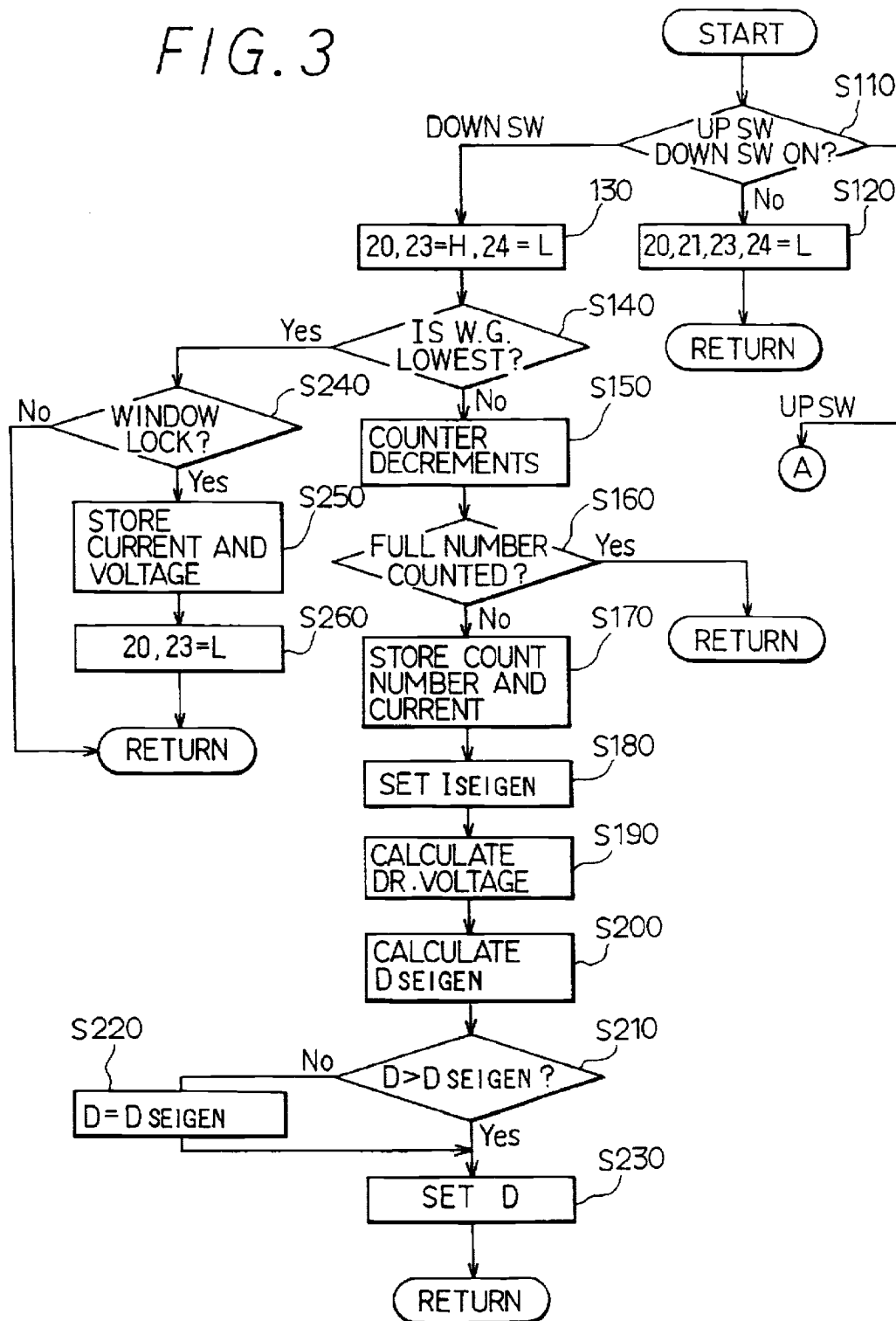
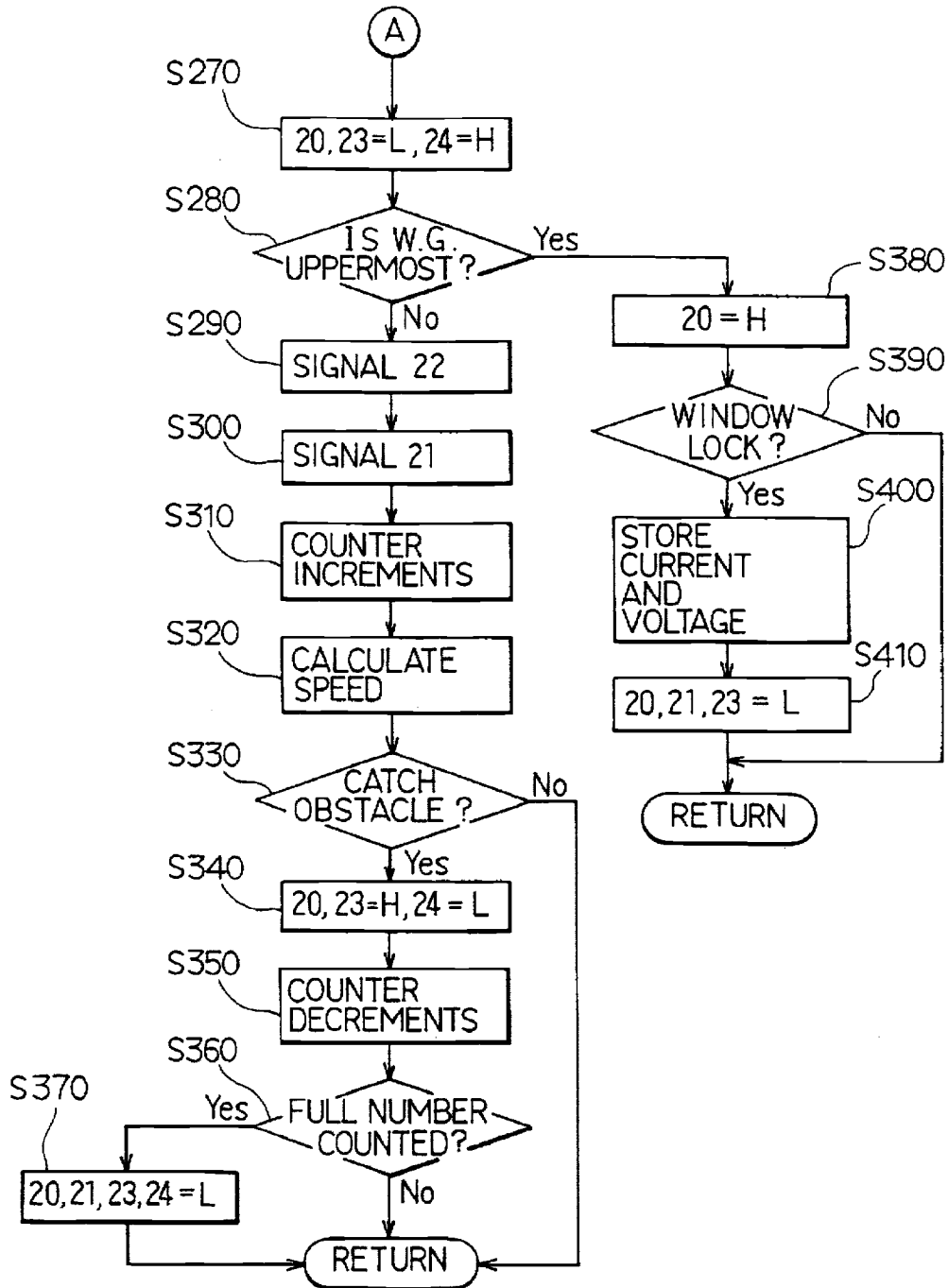


FIG. 4



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