



US005661260A

# United States Patent [19]

[11] Patent Number: **5,661,260**

Cho et al.

[45] Date of Patent: **Aug. 26, 1997**

[54] **FIN ASSEMBLY FOR A VEHICLE** 5,235,930 8/1993 Pendleton ..... 114/312

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### [57] ABSTRACT

[21] Appl. No.: **649,834**

A fin assembly for effecting guidance of a vehicle through a fluid medium includes an electromagnet fixed in a portion of the vehicle, and a rigid shaft fixed to a hull portion of the vehicle and extending outwardly therefrom and in alignment with the electromagnet. A fin is rotatably mounted on the shaft and is, at least in part, a permanent magnet. A switch assembly is provided in the vehicle for effecting in a first portion of the electromagnet an attractive force between the electromagnet and the permanent magnet, and in a second portion of the electromagnet a repelling force therebetween, to cause the fin to rotate on the shaft in a selected direction to effect the guidance of the vehicle.

[22] Filed: **May 1, 1996**

[51] Int. Cl.<sup>6</sup> ..... **B63H 20/12**

[52] U.S. Cl. .... **114/126; 318/580**

[58] **Field of Search** ..... 318/588, 580; 114/152, 331, 144 R, 144 A, 144 E, 330, 126, 162, 144 RE; 310/152, 67 R; 307/109

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**9 Claims, 4 Drawing Sheets**

