



US005359574A

# United States Patent [19]

[11] Patent Number: **5,359,574**

**Nadolink**

[45] Date of Patent: **Oct. 25, 1994**

[54] **ELECTROMAGNETICALLY ACTIVATED COMPLIANT WAVY-WALL**

[75] Inventor: **Richard H. Nadolink**, Portsmouth, R.I.

[73] Assignee: **The United States of America as represented by the Secretary of the Navy**, Washington, D.C.

[21] Appl. No.: **113,378**

[22] Filed: **Aug. 27, 1993**

[51] Int. Cl.<sup>5</sup> ..... **H04K 3/00**

[52] U.S. Cl. .... **367/1**

[58] Field of Search ..... **367/1, 168; 244/204, 244/130; 381/71, 86; 114/67 R; 310/338**

[56] **References Cited**

**U.S. PATENT DOCUMENTS**

- 4,363,991 12/1982 Edelman ..... 310/338
- 4,516,747 5/1985 Lurz ..... 244/204

*Primary Examiner*—Daniel T. Pihulic  
*Attorney, Agent, or Firm*—Michael J. McGowan;  
Prithvi C. Lall; Michael F. Oglo

[57] **ABSTRACT**

Electromagnets are disposed in an elastomeric coating affixed to a body exposed to a fluid. Controllable magnetic forces created by the electromagnets produce a wavy-wall configuration in the surface of the coating which may be static, dynamic, or static in part and dynamic in part, and which interfaces with the fluid to controllably alter noise, turbulence and drag characteristics of the body mechanically. Electrodes may be fixed on the surface of the coating to produce electric force fields for interacting with the magnetic fields and the wavy-wall, to produce magnetohydrodynamically generated Lorentz forces which controllably further alter noise, turbulence and drag characteristics of the body.

**11 Claims, 5 Drawing Sheets**

