

[54] **NOVEL HEPARIN DERIVATIVE, METHOD FOR PRODUCTION THEREOF, AND METHOD FOR RENDERING BIOMEDICAL MATERIALS ANTITHROMBOTIC BY USE OF THE NOVEL HEPARIN DERIVATIVE**

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[52] U.S. Cl. 427/2; 424/183; 536/21

[58] Field of Search 424/183; 536/21; 427/2

[56] **References Cited**

U.S. PATENT DOCUMENTS

- 3,211,617 10/1965 Bucourt 536/21
- 3,835,112 9/1974 Mardiquian 424/183
- 3,844,989 10/1974 Harumigs 424/183

FOREIGN PATENT DOCUMENTS

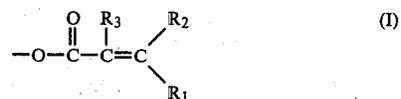
- 49-38945 4/1974 Japan 424/183

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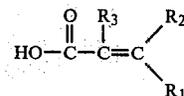
[57] **ABSTRACT**

A heparin derivative in which at least 0.5% of the entire

hydroxyl groups of heparin are in the form of an ester of the following formula



wherein R₁, R₂ and R₃ each represent a hydrogen atom or an alkyl group having 1 to 6 carbon atoms; a method for producing aforesaid heparin derivative which comprises reacting heparin with a halide or anhydride of an unsaturated carboxylic acid of the formula



wherein R₁, R₂ and R₃ are the same as defined above; and a method for imparting antithrombotic activity to a biomedical material, which comprises treating that surface of the biomedical material which makes contact with the blood with actinic light in the presence of aforesaid heparin derivative.

5 Claims, 4 Drawing Figures

