United States Patent [19]

Cioca

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[54] **COLLAGEN-THROMBIN COMPOSITIONS**

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[52] **U.S. Cl.** **424/94**; 106/124; 106/161; 424/14; 514/801

[58] **Field of Search** 424/101, 359, 28; 106/124, 161, 122

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,928,566	12/1975	Briggs	424/101
4,271,070	6/1981	Miyata et al.	106/161
4,412,947	11/1983	Cioca	106/124
4,414,976	11/1983	Schwarz et al.	106/161
4,442,655	4/1984	Stroetmann	424/101

OTHER PUBLICATIONS

Derwent Abstract: South African Application No. 82/0123, Nov. 1982, Eberhard Zimmerman et al.

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[57] **ABSTRACT**

A method of forming a collagen-thrombin hemostatic composition is comprised of forming a homogeneous aqueous admixture of collagen and thrombin at a basic pH and lyophilizing the collagen-thrombin admixture to form a stable collagen sponge having thrombin therein. The collagen utilized in the process is absorbable when placed in vivo. Additionally, a lyophilized collagen product is comprised of collagen which is absorbable when placed in vivo and thrombin distributed within the collagen. The collagen product is storage stable.

10 Claims, No Drawings