

- [54] **DIESTER CROSSLINKED POLYGLUCAN HYDROGELS AND RETICULATED SPONGES THEREOF**
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- [22] Filed: **Apr. 14, 1975**
- [21] Appl. No.: **568,030**

**Related U.S. Application Data**

- [63] Continuation-in-part of Ser. No. 490,968, July 23, 1974, abandoned.
- [52] U.S. Cl. .... **128/296; 424/28; 424/180; 536/112; 536/1; 536/110; 536/119**
- [51] Int. Cl.<sup>2</sup> ..... **F23L 3/00**
- [58] Field of Search ..... **260/234, 234 R, 209 D**

**References Cited**

**UNITED STATES PATENTS**

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[57] **ABSTRACT**

Novel hydrogel compositions of diester crosslinked polyglucans and a process for their preparation are

provided. Amylose, dextran, and pullulan succinates and glutarates when crosslinked as described were found to not only have use as general fluid sorbants but also to have exceptional hemostatic activity, adherence to a wound, and bioabsorption without causing undue irritation of the tissue or toxic effects. Reticulated hydrogel sponges made of the crosslinked diesters which are particularly useful as general fluid sorbants, and those of amylose succinate and amylose glutarate are most excellent bioabsorbable hemostatic agents. The sponges are made by lyophilizing water-soluble salts of the mono- or half-esters, such as water-soluble salts of amylose succinate or amylose glutarate, under process conditions of the invention in the presence of a reticulating agent which causes a controlled melting of the salt solution as it nears the dry state during the lyophilizing step. The resulting reticulated, porous, open-celled sponge is then crosslinked by heating the sponge under dehydrating conditions to form diester-crosslinks. The sponge is highly porous, is moderately strong, and has the ability to retain up to 40 times its weight of isotonic saline. When neutralized with physiologically acceptable salts, the sponge has exceptional hemostatic activity, adherence to bleeding tissue, and bioabsorption without causing substantial irritation of the tissue or toxic effects.

The invention also comprises a process of providing hemostasis at the site of a wound, employing the diester cross-linked polyglucan hydrogels or reticulated sponges thereof.

**40 Claims, 4 Drawing Figures**