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**United States Patent** [19][11] **Patent Number:** **5,618,551****Tardy et al.**[45] **Date of Patent:** **Apr. 8, 1997**[54] **BIOCOMPATIBLE BIORESORBABLE AND NON-TOXIC ADHESIVE COMPOSITION FOR SURGICAL USE**0253715 1/1988 European Pat. Off. .  
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0575273 12/1993 European Pat. Off. .[75] Inventors: **Michel Tardy; Jérôme Tiollier**, both of Lyons; **Jean-Louis Tayot**, La Tour De Salvagny, all of France[73] Assignee: **Imedex**, Chaponost, France[21] Appl. No.: **376,185**[22] Filed: **Jan. 20, 1995**[30] **Foreign Application Priority Data**

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[51] **Int. Cl.<sup>6</sup>** ..... **A61L 25/00**[52] **U.S. Cl.** ..... **424/426; 424/443; 424/444; 424/445; 424/484**[58] **Field of Search** ..... **424/426, 443, 424/444, 445, 484**[56] **References Cited****U.S. PATENT DOCUMENTS**3,949,073 4/1976 Daniels et al. .... 424/89  
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Wallace et al., *Chemical Abstracts*, vol. 99, #93803.*Primary Examiner*—Thurman K. Page*Assistant Examiner*—Sharon Howard*Attorney, Agent, or Firm*—Larson & Taylor[57] **ABSTRACT**

The invention relates to a biocompatible, bioresorbable and non-toxic adhesive composition for surgical use, for the bonding, in particular, of biological tissues to one another or in an implanted biomaterial, characterized in that it comprises a reactive acidic solution of non-crosslinked and potentially crosslinkable collagen or gelatin modified by oxidative cleavage, at a concentration which is preferably between approximately 5 and 30 by weight. It also relates to reactive acidic solutions and powders based on non-crosslinked collagen or gelatin modified by oxidative cleavage which are used as intermediate products in the preparation of the above-mentioned composition, and to the process for their preparation. It also relates to adhesive kits which comprise, on the one hand, the above-mentioned reactive acidic solution and, on the other hand, a neutralizing solution and which are intended for extemporaneous mixing. Finally it relates to a method of application of the adhesive, composition according to the invention. The invention is particularly useful in the areas of adhesion, haemostasis, leaktightness with respect to liquids or gases, cicatrization, filling, avoiding adhesion in surgery, embolization, as a local system for release of medicamentary active principles, etc.

**26 Claims, 1 Drawing Sheet**