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[54] **ESSENTIALLY LINEAR POLYMER HAVING A PLURALITY OF AMIDE, IMIDE, AND ESTER GROUPS THEREIN AND A METHOD OF MAKING THE SAME**

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[58] **Field of Search** ..... 260/47 CP, 65, 75 N, 260/75 UA, 78 UA, 47 UA, 78 TF

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[57] **ABSTRACT**

An essentially linear polymer having a plurality of amide, imide and ester groups therein, which is the condensation product of (1) at least one polycarboxylic acid five member ring forming reactant, (2) at least one ethylenically unsaturated polycarboxylic acid five or six member lactam ring forming reactant, (3) at least one polyfunctional amino five or six member ring forming reactant, (4) at least one glycol, (5) at least one other polyfunctional hydroxyl compound, and (6) at least one other carboxylic acid ester reactant chosen from the group consisting of the acids, esters, anhydrides, and akylesters of terephthalic, isophthalic, and benzophenone dicarboxylic acids. The molar ratio of the functional hydroxyl groups of said glycol and hydroxyl compound to the functional ester forming carboxyl groups of said acid reactants is greater than about 1.3 to 1. The molar ratio of the functional imide-forming groups of said polycarboxylic acid five member ring forming reactant and said polyfunctional amino reactant to the functional lactam-forming groups of said ethylenically unsaturated acid reactant and said polyfunctional amino reactant are greater than about 0.5 to 1 and less than about 3.0 to 1. The molar ratio of said functional ester forming carboxyl groups to said functional imide-forming and lactam-forming groups are greater than about 1.0 to 1 and less than about 3.0 to 1. The method of forming said polymer includes placing the reactants in a solvent of the polymer having a boiling point in excess of about 150° C. such as cresylic acid, heating the reactants and solvent at atmospheric pressure from about 120° C. to about 220° C., adding a suitable condensation catalyst after a reaction commences, and diluting or cooling resulting polymer solution to terminate the reaction.

15 Claims, 1 Drawing Figure