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(54) **METATHESIS DEPOLYMERIZATION USING ACRYLATES**

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USPC 525/301, 305, 310, 938; 554/27, 30, 554/169, 219
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,512,635 A * 4/1996 Nubel C08C 19/28 525/247
7,956,132 B2 6/2011 Arriola et al.

FOREIGN PATENT DOCUMENTS

WO WO 02-079127 10/2002

OTHER PUBLICATIONS

Biermann, et al, "Acyclic Triene Metathesis Oligo- and Polymerization of High Oleic Sun Flower Oil," Macromol. Chem. Phys. 2010, 211, 854-862.*

(Continued)

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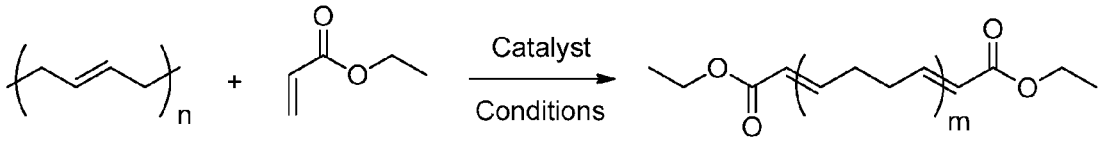
(57) **ABSTRACT**

Olefin metathesis between an acrylate monomer and a polyene comprising molecule or polymer is employed as a method of cross-metathesizing or depolymerizing the molecule. The metathesis reaction forms a telechelic acrylate molecule that is a monomer, oligomer or polymer. The telechelic acrylate molecule can be employed as a monomer for condensation polymerization.

10 Claims, 5 Drawing Sheets