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(12) **United States Patent**  
**Ciuperca**

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(54) **HIGH PERFORMANCE, REINFORCED INSULATED PRECAST CONCRETE AND TILT-UP CONCRETE STRUCTURES AND METHODS OF MAKING SAME**

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*E04C 5/127* (2013.01); *E04C 5/16* (2013.01)

(58) **Field of Classification Search**

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*E04C 2/296*; *E04C 2/292*; *B29C 65/30325*  
See application file for complete search history.

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

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**Related U.S. Application Data**

(63) Continuation of application No. 13/834,574, filed on Mar. 15, 2013, now Pat. No. 8,844,227, and a continuation of application No. 14/499,208, filed on Sep. 28, 2014, now Pat. No. 9,003,740, and a continuation of application No. 14/684,899, filed on Apr. 13, 2015, now Pat. No. 9,290,939.

(57) **ABSTRACT**

The invention comprises a product. The product comprises a foam insulating panel, the panel having a first primary surface and an opposite second primary surface, wherein the foam insulating panel defines at least one recessed channel in the first primary surface, the at least one recessed channel being sized and shaped to provide a mold for a structural reinforcing member. The product also comprises a concrete panel formed on the first primary surface and filling the at least one recessed channel so as to provide a structural reinforcing member for the concrete panel. The product further comprises an elongate anchor member in the foam insulating panel and extending from the first primary surface of the foam insulating panel into the concrete panel. A method of making a composite reinforced insulated concrete structure is also disclosed.

(51) **Int. Cl.**

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(52) **U.S. Cl.**

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**18 Claims, 17 Drawing Sheets**

