

United States Patent [19]

[11] **Patent Number:** **4,614,115**

Pelletier et al.

[45] **Date of Patent:** **Sep. 30, 1986**

[54] **ULTRASONIC PROCESS AND APPARATUS FOR MONITORING AND MEASURING THE EVOLUTION WITH TIME OF PHYSICO-CHEMICAL, BIOLOGICAL OR BACTERIOLOGICAL PHENOMENA**

[58] **Field of Search** 73/644, 589, 599, 629, 73/627, 32 A, 290 V

[75] **Inventors:** **Jean L. Pelletier, Ploubazlanec; Michel Moreau, Yerres; Michel Bocquet, Issy.Les.Moulineaux, all of France**

[56] **References Cited**

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[57] **ABSTRACT**

[22] **PCT Filed:** **Apr. 9, 1984**

Ultrasonic process and apparatus for monitoring and measuring the evolution with time of physico-chemical and biological phenomena. There is plunged into the medium or media (4) to be monitored a bar (3) into which ultrasound (2) is injected in order to collect secondary echoes (F2, F3) due to numerous reflections from the lateral surface of the bar (3) brought into contact with the medium (4), one of the secondary echoes (F2) is selected and the evolution with time of the amplitude of this echo is recorded, this representing the evolution of the medium being monitored, in particular the setting of concrete or the polymerization of a resin.

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[30] **Foreign Application Priority Data**

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[51] **Int. Cl.⁴** **G01N 29/00**

[52] **U.S. Cl.** **73/599; 73/32 A; 73/290 V; 73/589; 73/629; 73/644**

12 Claims, 17 Drawing Figures

