

Title (en)  
HYDRAULIC DELAY TOE VALVE SYSTEM AND METHOD

Title (de)  
HYDRAULISCHES VERZÖGERUNGSSPITZENVENTILSYSTEM UND VERFAHREN

Title (fr)  
SYSTÈME ET PROCÉDÉ DE SOUPAPE D'ORTEIL DE RETARD HYDRAULIQUE

Publication  
**EP 3138993 B1 20210120 (EN)**

Application  
**EP 16185314 A 20160823**

Priority  
US 201514840473 A 20150831

Abstract (en)  
[origin: EP3138993A2] An apparatus and method for providing a time delay in injection of pressured fluid into a geologic formation. In one aspect the invention is a toe valve activated by fluid pressure that opens ports after a predetermined time interval to allow fluid to pass from a well casing to a formation. The controlled time delay enables casing integrity testing before fluid is passed through the ports. This time delay also allows multiple valves to be used in the same well casing and provide a focused jetting action to better penetrate a concrete casing lining.

IPC 8 full level  
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**E21B 17/00** (2013.01 - CN); **E21B 34/063** (2013.01 - EP US); **E21B 34/085** (2013.01 - CN); **E21B 34/108** (2013.01 - EP);  
**E21B 43/20** (2013.01 - CN); **E21B 34/14** (2013.01 - CN EP US); **E21B 2200/06** (2020.05 - EP)

Cited by  
CN111021990A; CN113153253A; CN109296348A; US12006803B2; WO2021127789A1

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DOCDB simple family (publication)  
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