US009410989B2

(12) **United States Patent**
Weller

(10) **Patent No.: US 9,410,989 B2**
(45) **Date of Patent: Aug. 9, 2016**

(54) **OSCILLOSCOPE WITH INTEGRATED GENERATOR AND INTERNAL TRIGGER**

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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 641 days.

(21) Appl. No.: **13/091,478**

(22) Filed: **Apr. 21, 2011**

(65) **Prior Publication Data**

US 2012/0268101 A1 Oct. 25, 2012

(51) **Int. Cl.**

G01R 19/00	(2006.01)
G01R 23/16	(2006.01)
G01R 13/00	(2006.01)
G01R 13/02	(2006.01)

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

CPC ***G01R 13/0218*** (2013.01); ***G01R 13/0254*** (2013.01)

(58) **Field of Classification Search**

CPC G01R 13/0254; G01R 35/002; G01R 13/0218

USPC 324/76.11, 76.22; 702/66, 67, 189

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,564,805	A *	1/1986	Winter	324/121 R
4,585,975	A *	4/1986	Wimmer	315/307
5,184,062	A *	2/1993	Ladwig	324/74
7,072,781	B1 *	7/2006	Gershon et al.	702/63
7,271,575	B2 *	9/2007	Pickerd et al.	324/76.19
7,723,978	B2	5/2010	Caffrey et al.	

OTHER PUBLICATIONS

Instek GOS-620FG. Data Sheet [online]. Good Will Instrument Co., Ltd., [retrieved on Nov. 1, 2011, and was publicly available as of the U.S. filing date of the application]. Retrieved from the Internet: <URL: https://www.testequipmentdepot.com/instek/pdf/GOS-620FG.pdf>.

Tonghui TDO3000 series, "Digital Storage Oscilloscope." Data Sheet, pp. 2-7 [online]. Changzhou Tonghui Electronics, Co., Ltd., [retrieved on Nov. 1, 2010, and was publicly available as of the U.S. filing date of the application]. Retrieved from the Internet: <URL: https://www.globalmediapro.com/att/a/2/b/3/a2b3i0/tdo3000.pdf>.

Tonghui TDO3000 series, "The perfect group of Digital Storage Oscilloscope, Function/Arbitrary Waveform Generator." Brochure, pp. 1-8 [online]. Changzhou Tonghui Electronics, Co., Ltd., [retrieved on Nov. 1, 2011, and was publicly available as of the U.S. filing date of the application]. Retrieved from the Internet: <URL: http://www.tonghui.com.cn/en/Product/digital%20storage%20oscilloscope/370.html>.

(Continued)

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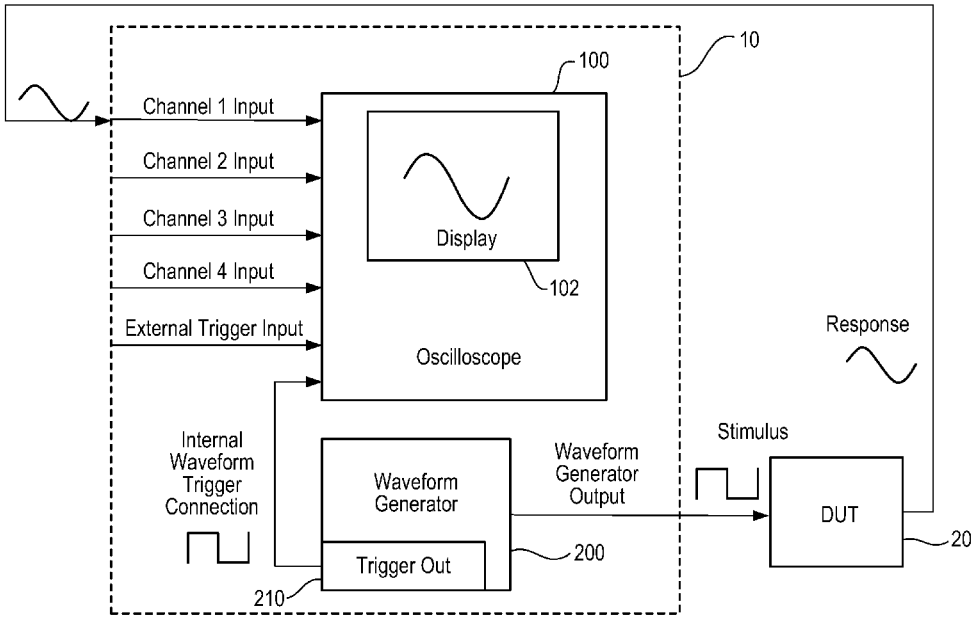
(57) **ABSTRACT**

An apparatus, includes an oscilloscope and a waveform generator. The waveform generator is integrated in a common housing with the oscilloscope, and configured to provide a stimulus signal as an output of the apparatus and to provide a trigger signal that is connected internally to the oscilloscope for triggering the oscilloscope.

20 Claims, 5 Drawing Sheets