US008381591B2

(12) **United States Patent**
Maev et al.

(10) **Patent No.: US 8,381,591 B2**
(45) **Date of Patent: Feb. 26, 2013**

(54) **ELECTRODE CAP FOR ULTRASONIC TESTING**

(75) Inventors: **Roman Gr. Maev**, Windsor (CA); **Andriy M. Chertov**, Windsor (CA)

(73) Assignee: **Tessonics Corporation**, Birmingham, MI (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 296 days.

(21) Appl. No.: **12/726,453**

(22) Filed: **Mar. 18, 2010**

(65) **Prior Publication Data**

US 2010/0242608 A1 Sep. 30, 2010

Related U.S. Application Data

(60) Provisional application No. 61/163,968, filed on Mar. 27, 2009.

(51) **Int. Cl.**
G01N 29/04 (2006.01)

(52) **U.S. Cl.** **73/588**

(58) **Field of Classification Search** 73/588
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,096,205	A	5/1914	Taylor	
4,588,870	A	5/1986	Nadkarni et al.	
6,297,467	B1	10/2001	Maev et al.	
7,265,313	B2	9/2007	Stevenson et al.	
2009/0031812	A1 *	2/2009	Shibata et al.	73/622

FOREIGN PATENT DOCUMENTS

EP	0284177	9/1988

* cited by examiner

Primary Examiner — Hezron E Williams
Assistant Examiner — Gregory J Redmann
(74) *Attorney, Agent, or Firm* — Carlson, Gaskey & Olds PC

(57) **ABSTRACT**

An example electrode cap includes a bored portion of an electrode cap. The bored portion establishes a bore that extends longitudinally from one end of the electrode cap and terminates at a surface having a radius relative to the longitudinal axis. A tip portion of the electrode cap extends from the surface toward another end of the electrode cap. An example method of maintaining a focal point of an ultrasonic wave includes propagating an ultrasonic wave from a transducer through a bore and a tip portion of an electrode cap and receiving a reflection of the ultrasonic wave. The method further includes determining information about a welded area using the reflection and adjusting a radius of a surface of the electrode cap to position a focal point of the ultrasonic wave within the tip portion.

16 Claims, 2 Drawing Sheets