

Omnidirectional MRI Catheter Resonator for Interventional Procedures

Tech ID: 27284 / UC Case 2014-086-0

INVENTION NOVELTY

This invention describes an orientation-independent device that can create bright and highly localized signal enhancement during magnetic resonance imaging.

VALUE PROPOSITION

Current interventional procedures utilize X-ray fluoroscopy via radiopaque markers to locate catheters and other devices in order to distinguish them from native vasculature. However, this method is limited to visualizing the lumens of blood vessels while patients and medical practitioners are exposed to large doses of ionizing radiation. Therefore, there is a need for an alternative method to improve tissue resolution and reduce radiation exposure during interventional procedures.

This novel invention provides the following advantages:

- ▶ Provides **bright and highly localized signal** enhancement.
- ▶ **High-resolution** imaging of tissue.
- ▶ **Safe, robust, and fully biocompatible.**
- ▶ **Real-time** navigation.
- ▶ Suitable for both **X-ray fluoroscopy and interventional MRI.**

TECHNOLOGY DESCRIPTION

Inventors in the Department of Interventional Radiology and Biomedical Imaging at the University of California, San Francisco have developed a device for use in interventional MRI. The MRI catheter resonator is a completely integrated resonant marker. It is scalable from large introducer sheaths (>9 French) to microcatheters (≤ 3 French). The resonant marker is integrated seamlessly, which ensures biocompatibility as the marker is completely encapsulated in the inert plastic of the interventional device.

Furthermore, the resonant structure may also be modified to change rigidity and flex points without altering resonance, and the angled solenoid and double helices provide direction-independent resonance. Other proposed resonator technologies use discrete, non-scalable capacitors and are limited to operation in one vector relative to the B1 field of the scanner, which limits their use in clinical applications.

LOOKING FOR PARTNERS

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OTHER INFORMATION

KEYWORDS

MRI Catheter, Resonator,
 Interventional Therapy

CATEGORIZED AS

- ▶ **Imaging**
 - ▶ Medical
- ▶ **Medical**
 - ▶ Delivery Systems
 - ▶ Devices
 - ▶ Diagnostics
 - ▶ Disease: Cancer
 - ▶ Disease: Cardiovascular and Circulatory System
 - ▶ Disease: Central Nervous System

To develop and commercialize this technology for interventional MRI procedures

RELATED CASES

2014-086-0

APPLICATION

- ▶ Neuro interventional radiology (e.g. ischemic stroke thrombolysis, hemorrhagic stroke, cerebral aneurysm embolization, etc.)
- ▶ Cardiology (e.g. cardiac arrhythmia ablation, coronary intervention, etc.)
- ▶ Deep brain stimulation
- ▶ Guided biopsy
- ▶ Tumor ablation
- ▶ Drug delivery

STAGE OF DEVELOPMENT

Proof of Principal

DATA AVAILABILITY

Under CDA/NDA

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,714,143	08/01/2023	2014-086

Additional Patent Pending

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