A DEVICE AND A METHOD FOR IMAGING A FREEZE ZONE OF A CRYOSURGICAL PROCESS

IITM Technology Available for Licensing

PROBLEM STATEMENT

- In the present era, abnormal cells/tissues tumors are present in different parts of a subject's body (liver, prostate, cervix and any other parts of the body).
- With advent of technology, **a cryosurgical process** involving a minimal invasive process is performed to destroy such cells/tissues in the subject's body.
- The cryosurgical process involves introducing a cryosurgical device like ultrasonic probes and/or other associated device. However the devices are **not compatible** to **extract essential details** of ice ball, such as location of the tip of the cryosurgical device and the remaining surface of the iceball.
- The technical problem discussed in the present invention is "***how to provide a device for imaging a freeze zone for a better control of the cryosurgical process***".
- The present invention addresses said problems efficiently.

TECHNOLOGY CATEGORY/ MARKET

Technology: Ultrasonic Sensor (Cryosurgical device)**;**
Industry: Healthcare, Pharmaceutical,
Application: Imaging system, device for inspection
Market: The global **Ultrasound Equipment** market is expected to grow at a **CAGR** of **7.5%** during the forecast period of 2021 to **2028** & projected to valued **USD 12.93B** by **2028**;

TECHNOLOGY

- Present invention describes a **device for imaging a freeze zone** of a cryosurgical process in **a body of a subject**.
- More specifically said invention is featured stating that the device which includes at least one **ultrasonic transducer** and a plurality of **ultrasonic waveguides**. (Refer. Figs.1 & 2)

IMAGES

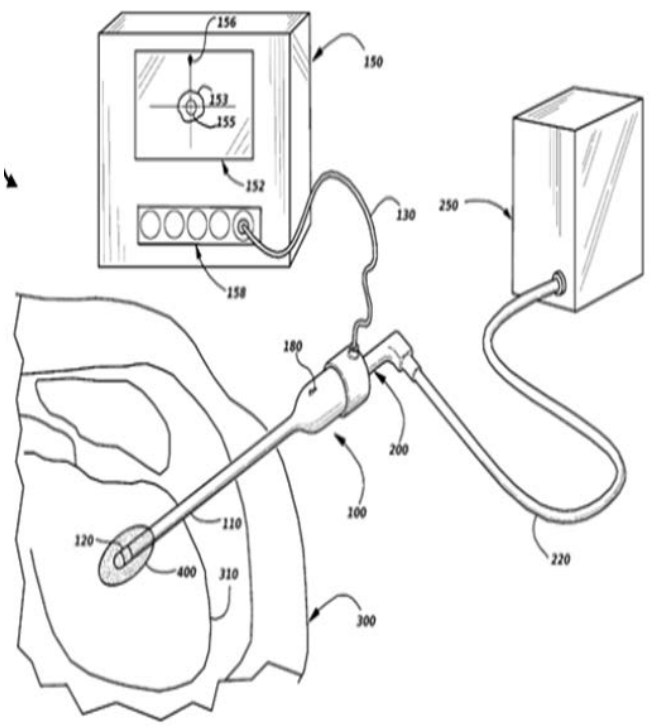

Figure 1: Illustrates three-dimensional view of cryogenic probe and the imaging probe of the system inserted in a body performing the cryosurgical process

INTELLECTUAL PROPERTY

IITM IDF Ref.: 2064;
IN 531852 (Patent Granted)

TRL (TECHNOLOGY READINESS LEVEL)

TRL- 3, Proof of Concept Ready Stage

RESEARCH LAB

Prof. Prabhu Rajagopal
Prof. Venkataratnam G
Dept. of Mechanical Engineering, IIT Madras

CONTACT US
Dr. Dara Ajay, Head
Technology Transfer Office,
IPM Cell- IC&SR, IIT Madras

IITM TTO Website:
https://ipm.icsr.in/ipm/

Email: smipm-icsr@icsrpis.iitm.ac.in
sm-marketing@imail.iitm.ac.in
Phone: +91-44-2257 9756/ 9719

A DEVICE AND A METHOD FOR IMAGING A FREEZE ZONE OF A CRYOSURGICAL PROCESS

IITM Technology Available for Licensing

TECHNOLOGY

- The featured of the claimed device comprises hereinbelow shown in smart chart:

One ultrasonic transducer, configured to emit and receive ultrasonic waves;

A plurality of ultrasonic waveguides, connectable at a proximal end to the at least one ultrasonic transducer and a distal end of each of the plurality of ultrasonic waveguides, away from the proximal end, is disposed coaxial with a cryogen probe configured to produce the freeze zone in the body of the subject;

A control unit, communicatively coupled to the at least one ultrasonic transducer and said control unit is configured to generate an image of the freeze zone;

- The device is featured by stating that disposing the plurality of ultrasonic of ultrasonic waveguides coaxially around the cryogenic probe provides a 360° view of the ice ball. (Shown in Fig 2)

KEY FEATURES / VALUE PROPOSITION

❖ ***Technical Perspective*:**

- The configuration of device for imaging the freeze zone provides **better control** of the cryosurgical process and **minimizes destruction of healthy tissues** surrounding a lesion.

❖ ***Industrial Perspective*:**

- Claimed device facilitates the configuration which enables the use of **cost-efficient traditional transducers** that works at room temperature to image the freeze zone.

- The configuration facilitates in manual or automatic stopping of the cooling process after the size of the freeze zone is large enough to cryoablate the target region as studied from the received signals or from the images as shown in figures.

IMAGES

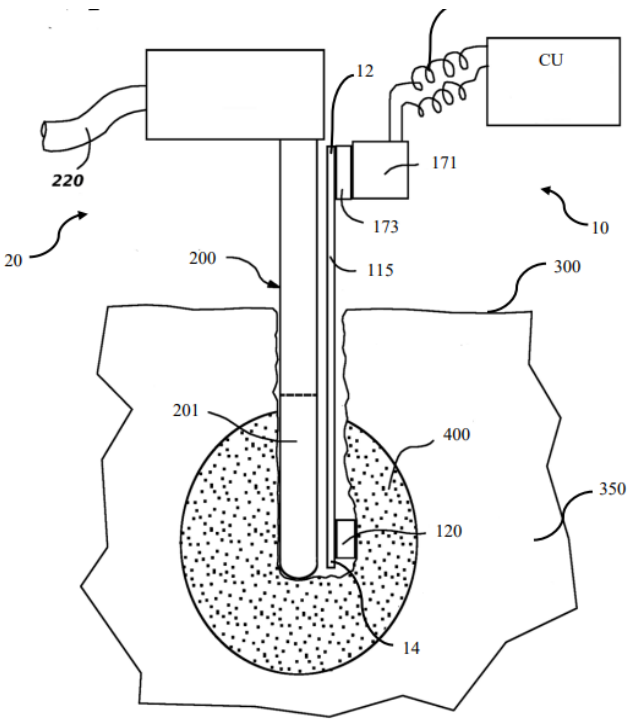

Figure 2: Illustrates a System for conducting a cryosurgical process

CONTACT US
Dr. Dara Ajay, Head
Technology Transfer Office,
IPM Cell- IC&SR, IIT Madras

IITM TTO Website:
https://ipm.icsr.in/ipm/

Email: smipm-icsr@icsrpis.iitm.ac.in
sm-marketing@imail.iitm.ac.in
Phone: +91-44-2257 9756/ 9719