Abstracts

Development of inductive regional heating system for breast hyperthermia

Y. Kotsuka, M. Watanabe, M. Hosoi, I. Isono and M. Izumi. "Development of inductive regional heating system for breast hyperthermia." 2000 Transactions on Microwave Theory and Techniques 48.11 (Nov. 2000, Part I [T-MTT] (Mini-Special Issue on RF/Microwave Applications in Medicine)): 1807-1814.

In response to demand for clinical use, a simple noninvasive regional heating applicator system for breast hyperthermia has been developed using ferrite cores. Since the breast is positioned between a pair of ferrite cores, it is possible to regionally heat it without considering the dimension of the breast. To find a method of controlling the heating position horizontally and vertically, magnetic-held distributions are analyzed using the three-dimensional finite-element method. Theoretical analyses suggest that a conductive thin plate and a novel eddy current absorber are effective for controlling the maximum heating position. A new applicator system operates at a frequency of 4 MHz and a maximum output power of 600 W. Heating tests using an agar phantom and rabbits show a temperature rise of more than 8/spl deg/C at a depth of 8 cm after heating for 10 min without heating fatty tissue.

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