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granted US patents**



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

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(54) **APPARATUS AND METHOD FOR
SELECTIVE ULTRASONIC DAMAGE OF
ADIPOCYTES**

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(51) **Int. Cl.**
A61H 1/00 (2006.01)
(52) **U.S. Cl.**
USPC **601/2**
(58) **Field of Classification Search**
USPC **601/2**
See application file for complete search history.

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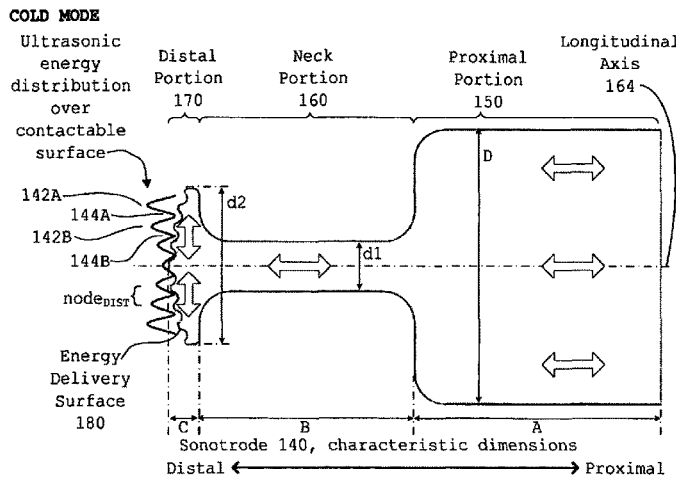
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(57) **ABSTRACT**

An apparatus and a method for treating adipose tissue located beneath a patient's skin is disclosed herein. In some embodiments, the apparatus includes a sonotrode and an ultrasound transducer operative to induce longitudinal and/or transversal ultrasound vibrations in a least a portion of the sonotrode. In some embodiments, the apparatus provides a "cold" or "transverse" mode where ultrasound energy delivered to the patient is primarily energy of transverse ultrasound waves, and a "hot" or "longitudinal" mode where ultrasound energy delivered to the patient is primarily energy of longitudinal ultrasound waves. The longitudinal waves may be useful for 'pre-heating' tissue of the patient before delivering the transverse waves.

26 Claims, 19 Drawing Sheets





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

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(54) **METHOD AND APPARATUS FOR LIGHT-BASED HAIR REMOVAL**

USPC 606/3, 8-12, 16-18; 607/88-91, 96, 607/100, 108; 128/898
See application file for complete search history.

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(73) Assignee: **Alma Lasers Ltd.**, Caesarea (IL)

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(65) **Prior Publication Data**

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Related U.S. Application Data

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A61B 19/00 (2006.01)
A61B 18/20 (2006.01)

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(57) **ABSTRACT**

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Methods and apparatus for damaging hair follicles using a series of rapidly-delivered low-fluence pulses of coherent or incoherent light are disclosed herein. In some embodiments, the pulses of coherent or incoherent light have a wavelength or wavelengths primarily in the range between 750 nm and 1500 nm. In some embodiments, applied electromagnetic radiation comprising the rapidly-delivered low-fluence pulses is effective for concomitantly heating both the sub-dermal layer (i.e. the dermis) of the tissue and the hair follicles. In some embodiments, the thermal damaging of the hair follicles is useful for facilitating hair-removal.

(58) **Field of Classification Search**

CPC A61B 18/20; A61B 18/203; A61B 2018/00452; A61B 2018/00476; A61B 2018/1807; A61B 2018/00458; A61B 2018/0047; A61B 2018/00636; A61B 2018/00779; A61B 2018/00791; A61N 5/0616; A61N 2005/0643; A61N 2005/0644

4 Claims, 9 Drawing Sheets

