FINGERNAIL HEALTH ASSESSMENT DEVICE

Introduction

Fingernail health is extremely important in the fields of cosmetics and dermatology. Aspects such as brittleness, elasticity, fungal infections and appearance all need to be monitored carefully. The global beauty market is valued at roughly US$270 billion, with nail polish and other nail product sales accounting for at least $780 million. The revenue for the nail industry in the U.S. for 2012 was roughly $7.47 billion and in Asia it was much higher. Yet there is no device that exists which can successfully quantify and monitor the health of the human fingernail and control the safety of beauty products. The market for nail polish and care is currently outperforming the sales of lipsticks—the gold standard as a marker of the beauty industry in western countries and emerging markets. In particular, the global market for antifungal therapeutics reached nearly US$11.8 billion in 2013.

Innovation

We have developed a ground-breaking, miniature and portable ultrasonic device to assess and image the condition of fingernails both on the surface topology as well as below to evaluate subungual defects in real-time. This high-frequency ultrasonic system can provide both qualitative and quantitative data, which can be used by both dermatologist and patient to understand and diagnose fingernail health.

Advantages

- Real-time: This device quantifies and produces clear images of the fingernail to identify problems with and track treatment progress of such situations as nail disorders or fungal infections.
- Portable: Small hand-held device can be integrated with mobile phones, laptops and tablets.
- Painless: Non-invasive.
- Quick: Each scan takes approximately 2-5 seconds to complete.
- User-friendly: Simple operation for user and an easy interface to quickly view or diagnose problems.
- Radiation free: Requires no harmful external radiation.

Opportunity

We are looking for a co-development and/or investment partner. Our goals are:

1. Attract funding to develop our technology further.
2. Access patient populations through clinical partner channels for clinical trials.

We anticipate a 1-2 year development process before reaching commercialization readiness.

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Established in 2008, The Institute for Diagnostic Imaging Research (IDIR) is a multi-disciplinary, collaborative research and innovation centre whose primary focus is the development of innovative diagnostic imaging technologies and products. Affiliated with the University of Windsor in Ontario, Canada, the Institute has been consistently recognized as a world leader in the development of technologies that save time, money and lives. ICE Ventures is a global commercialization entity supporting IDIR innovations and start-up activities that include business development, deal brokering and company creation. ICE Ventures leverages its vast global network of recognized professionals to build strong international partnerships for its companies.

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Technology

The methods currently employed for human fingernail diagnosis are either based on qualitative visual inspection or performing a biopsy on part of the nail for analysis. Our device provides highly accurate quantitative measurements without any nail removal.

The current system utilizes either a 50 MHz scanner or a 10 MHz hand held probe to produce an A scan, B-scan and C/M-scan images of the human fingernail. Algorithms and software allow the extraction of vital biomechanical information such as fingernail thickness, brittleness, elasticity, etc.

The device can be altered to also produce images (C/M-scans) allowing for both the visualization of the layers of the fingernail as well as the underlying tissue. The device is portable for clinical use. A protocol exists in order to normalize data acquired from consecutive scans, which are required in to gather meaningful data sets.

Current Development Stage

A prototype has been developed and several patents have been filed. Currently the prototype is being miniaturized and optimized for consumer use. Our device can be used in research and development to evaluate the effects of nail products and also in dermatology clinics and salons to track the efficacy of treatments/creams/pills.

Development of a therapeutic ultrasound mode is in progress. This will allow to help stimulate cell growth in patients who have lost their fingernails due to cancer treatments.

Patent Status

A full PCT patent application has been filed on January 16, 2010 (E.U. #08757184.0). A full Canadian patent application has been filed on May 24, 2013 (CA #2,692,074). A U.S. provisional patent has been filed and a full U.S. application has been filed 06/02/2008 (U.S. #12/131,279).

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