

Piezo-controlled Positioning and Driving of Multi Leaf Collimators (P-973)

Key Facts

- Novel concept for driving and controlling of multi leaf collimators based on the piezo electric effect
- Leaf bedding and positioning is directly combined with leaf driving
- Enables a faster and more precise leaf controlling with almost no friction and tolerance
- Convenient and space-saving compared to normal electric motors

Abstract

Currently, multi leaf collimators (MLC) are established and state of the art in numerous devices for radiotherapy used for cancer treatment. However, the established MLC comprising 80 and more leaves require an enormous space at the level of the leaves for corresponding drive and controlling elements if realized with normal electric motors. Since space is very limited within the head of linear accelerators the invention proposes a new small and convenient driving/controlling device based on piezoelectricity, which is directly coupled to the leaves and their driving rods.

Development Stage

A prototype of the piezo-driven multi leaf collimator is in preparation in order to test it in pilot studies.

Applications and Commercial Opportunity

The technology can be used for developing and distribution of a new generation of multi leaf collimators driven and controlled by piezoelectricity.

Advantages

- Compared to normal electric motors the piezo-driven leaf needs no further transmission elements between motor and leaf.
- This results in a reduction of needed devices and of the leaf length saving material costs.
- Simplified control of driving element enables faster and more precise leaf positioning with higher velocity and ramp action.

- No mechanic vernier adjustments are needed anymore.

Inventors

The invention was jointly conceived by Gernot Echner, Steffen Seeber and Klaus Schewiola, Division of Medical Physics in Radiation Oncology (E040).

Intellectual Property

International patent application "Leaf module for a multi-leaf collimator and multi-leaf collimator" [WO2012156389](#) nationalized in Europe ([EP2709725](#)) and USA (US14/117,693).

Further Information

No other public information is currently available, but further information (speaking with the inventor) is available under a signed Confidential Disclosure Agreement (CDA).

Response Time

If you have an interest in this technology, please contact DKFZ by December 9, 2011.

DKFZ Contact:

Dr. Frieder Kern
Deutsches Krebsforschungszentrum
Technology Transfer Office T010
Email: F.Kern@dkfz.de
Tel.: +49-(0)6221-42-2952
Fax: +49-(0)6221-42-2956

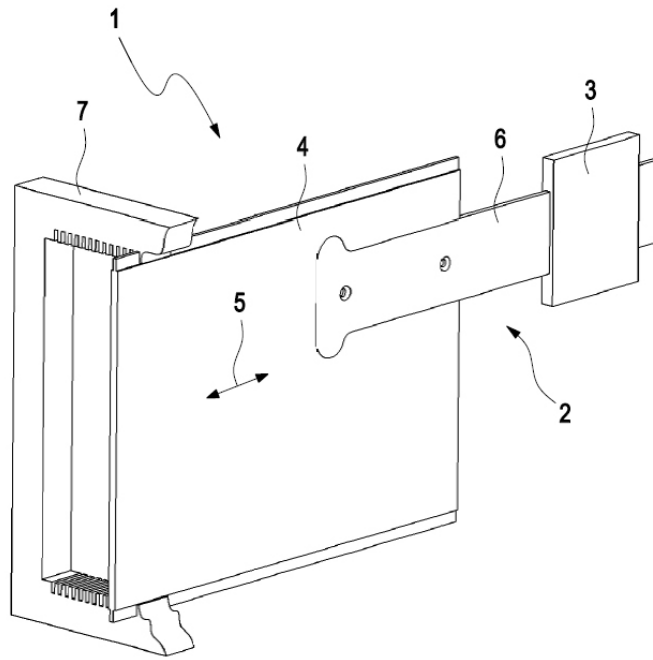


Figure 1:
A leaf module of a MLC arranged in a linear guiding unit (3 = piezo element).

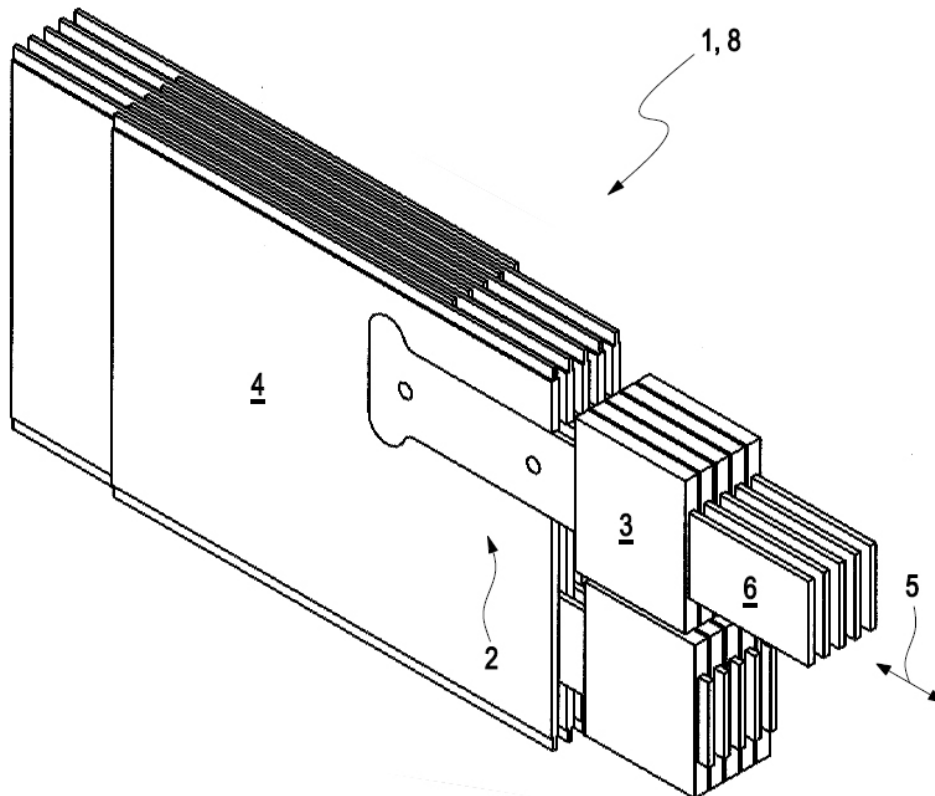


Figure 2:
An assembly of leaf modules in MLC with linear guiding units (3 = piezo elements).