

## TECHNOLOGY OFFERS

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

*A new small and convenient driving and controlling device based on piezoelectricity, with radiotherapy applications.*

## EXECUTIVE SUMMARY

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.



Thomas Hecker, stock.adobe.com

### Category

Devices

### Indication

Radiotherapy

### Development stage

Prototype

### Seeking

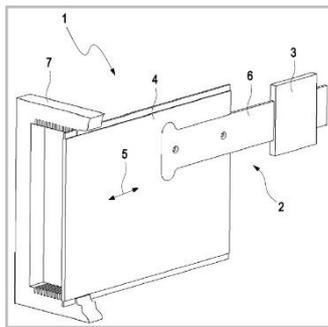
Licensing

## BENEFITS

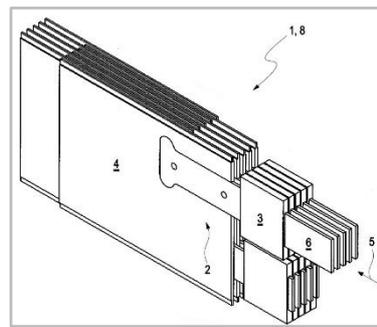
- Compared to normal electric motors the piezo-driven leaf needs no further transmission elements between motor and leaf
- This results in a reduction of needed devices and of the leaf length saving material costs
- Simplified control of driving element enables faster and more precise leaf positioning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

# TECHNOLOGY BACKGROUND

**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).



## DEVELOPMENT STAGE

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

## APPLICATIONS

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

## INTELLECTUAL PROPERTY

Patented.

- PCT has been published as WO2012156389A1.
- EP2709725B1 has been granted.
- US9031204B2 has been granted.

## PUBLICATIONS & REFERENCES

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## ABOUT THE DKFZ INNOVATION MANAGEMENT

Working at the interface of research and industry, the Innovation Management of the German Cancer Research Center (DKFZ) helps to get new cancer medications, diagnostic tests, and research instruments onto the market as quickly as possible.

The DKFZ with its more than 3,000 employees is the largest biomedical research institution in Germany. At the Center more than 1,300 scientists investigate how cancer develops, identify cancer risk factors and endeavor to find new strategies to prevent people from getting cancer. They develop novel approaches to make tumor diagnosis more precise and treatment of cancer patients more successful. DKFZ is a member of the Helmholtz Association of National Research Centers, with ninety percent of its funding coming from the German Federal Ministry of Education and Research and the remaining ten percent from the State of Baden-Württemberg