

3D printing-based adjusting mechanism for manually operated multileaf collimators (P-1118)

Facts

- Patient-specific beam shape templates for manually operated multileaf collimators
- Templates are generated on a commonly used 3D printer
- Cost-effective, accurate and implementable at short notice

Abstract

Intensity-modulated radiotherapy (IMRT) is an important tool for cancer treatment. It concentrates high radiation doses in complex target volumes, while sparing the surrounding tissues.

New technologies like manually operated multileaf collimators (MLC) allow inexpensive and reliable cobalt machine-based IMRT. For this purpose the respective treatment planning system identifies the patient-specific beam shape that defines the position of the individual leaves of an MLC.

Technology

The invention describes a method for the transfer of patient-specific beam shape information to a commonly used 3D printer. The 3D printer then creates a field template that precisely and correctly defines the patient-specific beam shape by passive positioning of the leaves of an MLC (see Fig. 1).

Development Stage

The method is ready to use and can be implemented within a short period of time

Advantages and Commercial Opportunity

The method is cost effective due to the fact that the beam shape template can be printed on a commonly used 3D printer.

A purpose-built milling cutter, milling head and blanks for the generation of templates are not needed.

The 3D printed templates are particularly suitable for manually operated MLCs used for cobalt machines.

Inventors

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Intellectual Property

A priority patent application "Einstellvorrichtung für Kollimatoren" was filed June 3, 2014 at the DPMA, Germany.

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Fig. 1: Schematic workflow. The patient-specific beam shape information is generated by a TPS (Treatment Planning System) based on e.g. computed tomography (CT) or magnetic resonance imaging (MRI), and transferred to the 3D printer. The subsequently generated beam shape template is then used for the correct positioning of the MLC leaves.

