

Linear Servo Multileaf Collimator for radiotherapy (P-1044)

Facts

- reduced size and weight
- dynamic leaf movements up to 4 m/s
- direct fixation of the linear servo rod to the associated leaf
- position sensors implemented in the linear drives

Abstract

The aim of radiation therapy is to eradicate a tumor without causing significant damage to contiguous normal tissue. Spatial conformation of the dose to the target allows the application of high doses to the tumor volume. For precise field shaping the multileaf collimators (MLC) have been broadly established. The linear servo MLC presented here provides various advantages over conventionally employed MLCs.

The Technology

The MLC presented here uses linear servo motors instead of conventional electric motors. This concept has the following advantages (see also Fig.):

- reduced assembly size, weight and mechanical transmission parts
- extremely high positional accuracy without mechanical loose effects
- linear motors allow simplified control loop algorithm and reduced dead time
- dynamic movements of the diaphragm elements up to 4 m/s in the patient plane
- direct fixation of the linear motor rod to the associated diaphragm element
- simplified mechanical assembly, easier serviceability, no mechanical backlash
- position sensors are already implemented in the linear drives
- no dead time compensation for control loop is needed when driving sense changes.

Development Stage

The 3D engineering drawings for the linear servo MLC are already in place; linear motors of various manufacturers are currently being tested.

Inventors

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Intellectual Property

Priority patent application "Contour collimator for radiotherapy" was filed March 22, 2013 at the EPO. Europe granted [EP 2976771](#), China granted [CN105229749](#), USA granted [US 9,905,323](#)

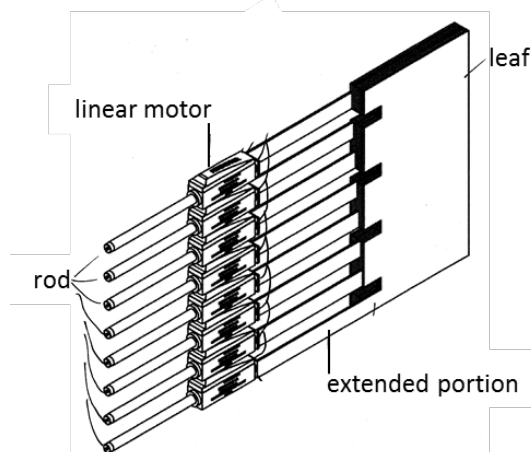


Fig.: Perspective view of a left portion of the linear servo MLC (eight arranged *linear motor-leaf units* are shown)

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