

A METHOD AND A DEVICE FOR HEATING AT LEAST TWO ELEMENTS BY MEANS OF
LASER BEAMS OF HIGH ENERGY DENSITY

ABSTRACT

A process and a device for joining or separating various workpieces, in particular made of plastic or plastic and other materials, by means of curtain-like laser beams. To join workpieces in a particular joining area of the contact surface, a mask, made of a laser-impermeable material, is arranged between the laser source and the workpieces to be joined. The laser beam and the mask are moved relative to each other. To generate high energy density in the joining area, laser beams of at least two diode lasers are brought together, and subsequently, differing laser line lengths are generated by means of a zoom optics arrangement. Via a beam splitter, a first laser beam aligned perpendicularly to the surface of the mask, is joined by at least one secondary laser beam arranged perpendicularly to the first laser beam, and the resulting laser beam is directed onto the mask. Laser beams either of different wavelengths or of the same wavelength but of different polarisation are used. In another arrangement, several laser beams are focussed parallel to each other onto the joining area by means of a lens. The method and the device not only provide adequate energy density in spite of the output of the individual lasers being insufficient per se, but also makes possible flexible adjustment of the line length.

Figure 1.

