METHODS OF CUTTING PROFILES WITH SHARP CURVATURE IN CO_2 LASER CUTTING

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ABSTRAK

Objektif utama projek ini adalah membina satu algoritma penjuru tajam dan memasangkannya ke dalam satu program pemotongan Laser CO_2. Dalam projek ini satu sistem 8 tiub FAF CW CO_2 laser yang dibina di Universiti Malaya dan satu meja kawalan XY digunakan untuk membelajari pemotongan profil dengan penjuru tajam. Satu program yang mempunyai kemudahan antaramuka pengguna grafik telah dibina dahulu dengan menggunakan bahasa progam Visual Basic 6 dan MINT melalui perpustakaan antaramuka MINT untuk memandu kad kawalan dan seterusnya motor. Satu pemotongan algoritma Penjuru Membulat telah dibina yang terdiri daripada satu pergerakan lengkok di antara dua bahagian pergerakan lurus supaya tiada perhentian mendadak semasa pemusingan di penjuru tajam. Laju malar diperolehi semasa pemotongan penjuru tajam. Keputusan pemotongan dan kualiti penjuru pelbagai sudut dan arah dianaliskan.

ABSTRACT

The main objective of this project is to develop a sharp curvature cutting algorithm and integrate into a CO_2 Laser Cutting (2D CAD/CAM) program. The existing 8-tube FAF CW CO_2 laser system developed at the University of Malaya together with an existing XY control table is utilized to study the cutting of sharp curvature profiles. A CO_2 laser cutting program with user-friendly graphical user interface is developed using Visual Basic 6 and MINT programming language via MINT Interface Library to drive the controller card and hence the motor. A Rounded Corner cutting algorithm is developed which blends an arc motion in between two straight line segments so that no abrupt stop is experienced during the turn at the sharp corner. Constant speed is maintained throughout the corner cutting. The cutting results and quality for different corner angle sizes and directions are analyzed and studied.

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