

Autonomous Circumferential Seam Tracker Welding Machine

Applications

Autonomous seam tracking welding machines is applicable at every point of industrial machine where circumferential lap joint welding is required, like a geyser, LPG cylinder, water boiler, tubes, construction, automobiles etc. This technology minimizes the target machine error and manual labor cost.



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Categories of this invention

- Electronic & circuits (Semiconductors & Integrated circuits)
- Photonics (Images)
- Computer Science and IT

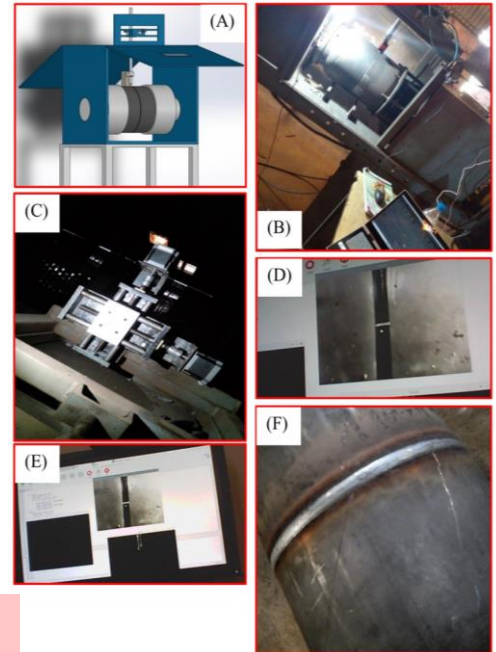


Figure.
(A) SolidWorks model of machine,
(B) Real model of experimental machine,
(C) Actuator control parts of machine,
(D) Enlarged view of seam tracking system,
(E) Different views of seam tracking system,
(F) Image of the final welded product or LPG gas cylinder



Problem Addressed

Manual welding is a tedious process due to the immobility of the welding machine. In addition, there is a high chance of getting blowholes and porosity defects in the welded part with the manual welding machine. It is crucial to avoid these defects because these defects can increase the production cost and maximize the industrial waste. Therefore, in this invention, the manual welding process is converted by a fully automatic gas cylinder seam tracking welding machine without the use of laser light.



Technology

The current technology is an autonomous seam welding machine for automatically tracking a welding seam path for performing metal inert gas (MIG) welding operation on a LPG cylinder.

Machine comprises of: a frame, a cylindrical mount, a box, a light source, a Red green and blue format (RGB) camera to capture the shadow of the circumferential lap joint of the workpiece. A microcontroller to track and process in RGB format, a welding torch to control the movement of welding operations.



Intellectual Property

Autonomous Seam Welding Machine

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Advantages

- Comparatively low cost machine in the market
- Fully autonomous
- Zero error
- Minimizes the waste and overall production cost
- Can be integrated into existing welding machine and convertible into an autonomous one



Potential Value

- 1 Welding Products Market is projected to reach USD 22.40 Billion by 2028, growing at a CAGR of 5.57% from 2021 to 2028.
- 2 The major factors driving the market are growing application in manufacturing and automotive sectors.
- 3 End-users are adapting from manual to automated seam welding machines for ease of operation.