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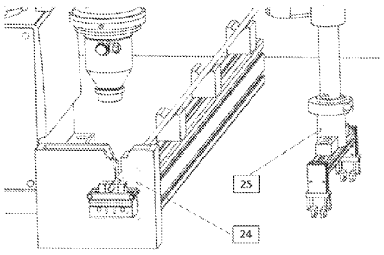
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(54) **Title:** AN APPARATUS FOR LASER WELDING TWO FREE RUNNING TUBES AND METHOD OF USING THE SAME

FIG. 11



(57) **Abstract:** : The invention presents a motorized auto welding jig fixturing device for laser welding two free running circular tubes of the similar diameter concentrically with robotic arm auto loaders, addressing the specific requirements of the industrial 4.0 advanced manufacturing coving many industrial sectors. This automated laser welding system aims to streamline the welding process, eliminating the need for human intervention of pre-alignment and pre-tact welding for the two tubes while prioritizing safety and productivity. Central to the invention is a sophisticate d rotating mechanism powered by an AC servo motor, enabling seamless loading unloading of the two workpieces concurrently onto the fixture for both tact welding process and seam welding process within the one unique jig fixturing apparatus and a robotic arm loading system for higher productivity. The fixture system ensures precise alignment and rotation of the workpieces upto 380 degrees for achieving the desired welding quality and penetration along the whole circumference of the tubes for good hermetic sealing. Compared to traditional methods, this innovative solution offers improved efficiency, consistency, and safety measures. It revolutionizes workpiece loading and integration, enhancing production efficiency and output quality while mitigating potential safety hazards, through meticulous engineering and integration of advanced technologies.