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(57) Abstract :

The invention provides a smart shredder for processing e-waste and plastics, incorporating advanced features such as a variable-speed motor, adjustable blade spacing, and an electronic control unit (ECU) for real-time parameter adjustments. The shredder enables precise control over particle size, improving material processing efficiency. It also features a user-friendly interface, overload protection, foreign object detection, and emergency stop mechanisms for enhanced safety. Optical sensors provide real-time feedback on shredded particle size, ensuring consistency in the output. This innovative shredding system is suitable for a wide range of industries, including plastic recycling, biomass processing, and e-waste management, offering improved recycling efficiency, safety, and reduced operational costs.

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