



MSS MeatballMAGNET™



Description

The MSS Meatball Magnet™ uses AI to detect and classify “meatballs” from “steel” and separates them using selective electro-magnets. There are few limitations in regard to object weight and shape. The picking speed is a magnitude faster than any robotic solutions.

Advantages

- Improves Steel #1 quality and consistency
- Improves safety, reduces potential ergonomic injuries

Features

- Proprietary selective electro-magnets
- Positive or Negative Sort Configuration
- AI learning and statistical capabilities

Specifications

Machine widths: 32", 48", 64"
Conveyor speed: 250FPM
Electrical: 15-20kW

US Patents

No. 11,318,476
No. 11,465,158



+1 615-781-2669 | info@mssoptical.com | mssoptical.com
1101 Menzler Road, Nashville, TN 37210, USA
MSS, Inc. is a division of CP Group

Made in the
USA



MSS Meatball MAGNET™

Meatball Sorting Challenges	Meatball Magnet™ Solution
<p><u>Manual Sorting</u></p> <p>Removal of meatballs is one of the only tasks in an auto-shredder yard that is still performed by manual sorters. This poses several risks:</p> <ul style="list-style-type: none"> ○ Difficult sorting task that requires a substantial amount on-going staff training and quality monitoring. ○ Ergonomically disadvantageous: Up to 25lbs heavy items have to be lifted off the sorting belt. ○ Potentially dangerous: targeted materials can be very hot coming right off the shredder, have very sharp edges, etc. 	<p>The Meatball Magnet™ automates this function by using individual electro-magnets, positioned across the width inside the head pulley, that are selectively activated whenever a meatball is detected. This alters the trajectory of meatballs downward away from the clean steel. This increases:</p> <ul style="list-style-type: none"> ○ Steel #1 quality ○ Steel #1 quality consistency ○ Overall safety ○ Reduce potential ergonomic injuries
<p><u>Sensor Technology</u></p> <p>The contaminants on the ferrous QC lines are of different categories:</p> <ul style="list-style-type: none"> ○ Motors, transformers, alternators, etc. (“Meatballs”) ○ Rubber particles with steel wires (pieces of tire) ○ Wire harnesses ○ Textile/fabrics <p>Conventional sensors have difficulties individually classifying all the above categories. Recent advances in artificial technologies (AI) now allow it to perform the above classifications with ease.</p>	<p>Recent advances in artificial technologies (AI) now allow these classifications with ease. MSS combines AI with deep learning neural networks that exceed human performance in identifying individual items.</p> <p>An added advantage is that the availability of statistical data generated by the AI. Monitoring of real time contaminants and final Shred #1 output quality is possible on 100% of the material, not just spot checks. A cloud-based dashboard allows the operator to view, analyze and export this data at their convenience.</p>
<p><u>Sorting of Heavy Weights</u></p> <ul style="list-style-type: none"> ○ With meatballs up to 25lbs in weight, compressed air jets are not feasible. ○ A robotic arm with electro-magnetic effector would have to be very strong and too slow due to the inertia of heavy meatballs. ○ A robotic arm with clamp effector would rely on the target material being evenly spread and have plenty of empty space around it to grab it properly. 	<p>Heavy meatballs are large and will therefore activate several of the electro-magnets across the belt at once, therefore generating a larger force to pull it downward from the natural trajectory. In other words, the larger the meatballs the larger the electro-magnetic force with which they are pulled downward.</p>
<p><u>3D Shape</u></p> <ul style="list-style-type: none"> ○ Using compressed air jets on aerodynamically shaped items is difficult. ○ A robotic arm with electro-magnetic effector would have difficulties attracting the 3D shaped item properly. ○ A robotic arm with clamp effector would rely on the 3D item not rolling/moving around to being able to properly grab it and not slip out. 	<p>Because the electro-magnets are positioned less than 1/2” from the material, our proprietary design generates a much stronger electro-magnetic field and is able to pull down even oddly shaped 3D items from the natural trajectory efficiently.</p>
<p><u>Number of picks per minute</u></p> <ul style="list-style-type: none"> ○ Using a robot limits the available picks to only 15-20 per minute with one arm. Multiple arms could be required at a much higher cost and space requirement. ○ If meatballs get to the QC station in surges, robotic extraction cannot keep up. It would lead to the Steel #1 stream being unnecessarily contaminated and a lower recovery rate of the contaminants. 	<p>Running the acceleration conveyor a 250FPM is 5-10 x faster than any robotic arm solution.</p> <p>Turning the selective electro-magnets “on/off” is a magnitude faster than any robotic arm solution. Removing multiple magnetic “non-steel” items at once, for example if they happen to sit side by side on the conveyor belt, is no problem. A robotic arm cannot keep up with the picking speed.</p>

