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Solving the Long Garment Bottleneck in Fashion Automation



How Nomagic engineered and deployed dedicated **long-item picking** across live production sites in under two months.

13	4	83%	8
Robots in Active Fleet	Customer Sites	Intervention Reduction	Weeks Concept to Production

Edge cases holding back automation

Full warehouse automation in the fashion industry has been delayed by a small group of non-standard formats, including shoeboxes, long garments, garments on hangers, accessories. Standard polybagged apparel represents the bulk of distribution center volume and has been automated for years. Complex edge cases, however, remained out of reach.

Polybagged apparel makes up a large share of fashion fulfillment center volume. It has never been easy to automate: the packaging is reflective, the contents shift, and no two items deform the same way. Nomagic's robots have handled these challenges reliably across tens of millions of picks in live operations at multiple customer sites.

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Yet full warehouse automation in fashion has been held back by a small group of non-standard formats, including shoeboxes, long garments, garments on hangers, and accessories. Following the successful deployment of the Shoebox Picker, long or bulky items which require special manipulation treatment were the next major bottleneck. In a matter of weeks, Nomagic engineered a dedicated long-item picking system to resolve this operational issue directly in live fulfillment environments.

> Our goal is mastery in picking. Full autonomy and a strong ROI only come when a robot handles the difficult edge cases too, not just the easy majority. We solved shoeboxes first. Long items are a much smaller share of a fashion assortment, but they still have a significant impact on how well automation performs, so we solved them too.
>
> Kacper Nowicki, CEO and Co-founder, Nomagic

Operational challenges

Standard robotic pick stations fail when handling floor-length garments. Coats, maxi dresses, and hung apparel exceed standard envelope dimensions and cause physical interference across nearly every component in a typical cell.

- → *Long garments get caught on the robot station's frame as the robot moves them.*
- → *Long items are hard to set down accurately in the small space where they get scanned.*
- → *Barcodes are often hidden in folds, so they're difficult to scan.*
- → *Large garments are floppy and change shape when the robot grabs them, making them hard to hold securely.*
- → *Garments on hangers only fit into the sorting bags if they're rolled up with the hanger tucked inside.*

Every physical fault forces an operator to clear the cell manually. Configuring stations to skip these items created an equally disruptive bottleneck. Long garments frequently lie across the top of a mixed-SKU container, blocking access to standard inventory underneath and forcing the entire bin to be rejected.

Solution architecture

Nomagic resolved these operational failure points by integrating three key components:

GripAI, Nomagic's self-learning model

The software detects overlength items in the source bin, calculating the optimal grasp point and clearance path before arm movement begins.

Dedicated long-item gripper

Dual suction cups and a swiveling joint secure heavy apparel and lift items clear of cell frames. The robot swaps to this tool automatically on demand.

Clearance-based motion planning

The robot plans its path around each garment's size, so long items hanging from the arm don't collide with the station elements.

Exception handling workflows

When a long item appears in a bin, the system works through four steps:

1. ***Detection.*** *Grip AI model analyzes bin content and recognizes that it contains a long item.*
2. ***Planning.*** *The model decides the best way to pick up that specific item, based on its size, shape, and position in the bin.*
3. ***Picking.*** *The robot automatically switches to a tool suited for long items and picks the garment.*
4. ***Placing.*** *The garment goes into a dedicated exception container, separate from the sorter. This clears the way for the robot to pick the remaining items in the bin as usual.*



As a result, long items are handled automatically, the rest of the bin keeps moving, and no manual intervention is needed.

From business need to live solution in 8 weeks

Nomagic engineered and deployed the solution across the fleet in under two months from the initial requirement. Today, the system is active across 13 production robots at four customer sites. In live operations, this deployment reduced manual cell interventions caused by long items by up to 83%.

> Long garments were causing us recurring line stoppages, forcing us to clear stalled cells or manually re-sort rejected bins. It was a constant issue on the floor. Dedicated long-item picking solved that failure point immediately. The cells run continuously now, and our operators don't have to step in.

Operations Lead, Tier-1 European Fashion Retailer

Automating the full catalog

Long garments like coats and maxi dresses are a practical manipulation problem for warehouse robots: they're floppy, catch on equipment, and often block other items in the bin. Nomagic solved it with a self-learning AI system that recognizes long items, plans each pick, and guides them safely through the station, paired with a highly efficient dedicated gripper that lifts and holds these garments securely.

Deployed in under two months, the solution now runs on 13 robots across 4 customer sites. With up to 83% fewer interventions, this is Physical AI built for high throughput and high reliability.

Ready to automate your full fashion assortment?
Let's talk.

