High storage density and high picking efficiency solutions in the footwear industry

In warehousing operations for footwear companies, the two most important considerations are high storage density and high efficiency. How can you have both high-density storage and high picking efficiency? Sky Storage & Ground Pick, Geek+'s one-stop four-way shuttle solution, provides the answer.

Solution Highlights

High density

At the same shelf height, the storage density is 60% higher than that of traditional very narrow aisle (VNA) shelves

High efficiency

Picking efficiency is 2-3 times that of manual efficiency; with full-pallet picking, the more orders there are, the higher the picking efficiency

High flexibility

It can flexibly match fluctuating production capacity and orders by rapidly adding or removing robots

Saving labor costs

Automatic shelf placement, automatic replenishment, and automated goods-to-person picking allows employees to focus on value-added tasks

Footwear warehousing challenges

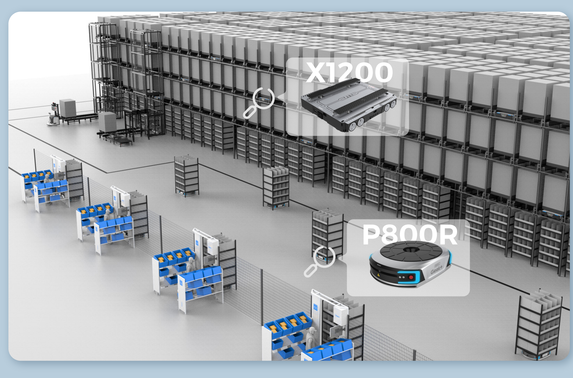
High requirements for storage capacity: Compared to other items in the apparel industry, footwear is bulky; therefore, the storage of the same quantity of footwear requires higher storage capacity
Low picking efficiency: Manual picking selects one pair at a time with one hand, leading to low efficiency
Replenishment timeliness: Stores have limited storage capacity, frequent replenishment and new updates, and have high requirements for timeliness
Flexibility requirements: When footwear seasons change or special promotions are done, demand fluctuates greatly, so flexibility is a must

Traditional solutions have many disadvantages Storage and efficiency are difficult to balance

Traditional solutions have problems such as low picking efficiency, low storage density, difficult expansion, and insufficient flexibility, meaning they cannot meet customers' needs.

	Picking on ordinary heavy-duty shelf	Picking on VNA heavy-duty racks
Risk	Shelving and picking are cross-operated, with high safety risks	The VNA channel is narrow, the forklift operation requires high certifications, and there are operational risks
Capacity	Wide forklift aisle, single depth storage, low storage density	The storage density of the whole pallet is higher, and the storage density of the whole box is lower
Labor	There is a lot of labor input in each step, and professional forklift workers are required	High labor requirements, VNA forklift operators with professional certificates are required, and it is difficult to recruit
Efficiency	The whole pallet and piece picking are operated at the same time, which affects each other and reduces the efficiency; Piece picking requires walking long distances, and the picking efficiency is low	The equipment operation requires high precision, the operation takes a long time, and the efficiency is low.
Flexibility	It is difficult to rapidly expand the storage capacity, and the upper limit of picking capacity is low, making it difficult to increase	VNA layout has very specific on-site requirements, high requirements, complicated construction and long implementation period

Geek+'s one-stop four-way shuttle solution



Solution components

- Four-way shuttle
- P800 robot
- Vertical lift
- Picking workstation
- Conveyor
- Four-way shuttle rack
- Shelves
- Charging station
- WES
- WMS
- RMS
- AI algorithms

Adaptable to business scenarios

1. B2B scenarios
2. B2B and B2C in the same warehouse

Suitable storage forms

Whole pallet storage, whole case storage, and piece storage

Solution process

01 **Putaway**
Allocate place, automatic putaway.

02 **Storage**
Multi-type, multi-strategy storage.

03 **Order dispatch**
Automatic picking task allocation.

04 **Location hit**
Multi-strategy smart location hit.

05 **Goods-to-person (G2P) picking**
Smart picking indications and dispatch to picking wall.

06 **Shelf return**
Multi-strategy intelligent shelf returns.

Restocking process

- Replenishment tasks issued by the system
- Four-way shuttle system automatic outbounding
  - Automatic replenishment of the whole pallet to the G2P area
  - Necessary replenishment picking
    - Unfinished pallets are returned to the four-way shuttle area for storage
    - Manual replenishment to the goods-to-person area

Solution value

60%-70%+
storage capacity improvement

99.9%
accuracy

200%-300%
efficiency improvement

3-4 years
quick ROI

Case study

Background

A well-known 3PL customer's footwear B2B and B2C same-warehouse business; the warehouse has a net height of 9 meters and handles piece picking, as well as picking of whole pallets and whole cases

Solution

Geek+'s four-way shuttle solution with picking robots on the ground floor for piece storage and floors 2-4 devoted to four-way shuttle pallet storage
A total of 12 four-way shuttles, 3 vertical lifts, and 53 P800R picking robots were deployed

Customer pain points

- Large site footprint and low storage density
- Inefficient manual picking and high labor load
- Tight human resources and high costs
- Insufficiently flexible production warehouse capacity

Geek+ impacts

Labor saving

Efficient picking of whole pallets, automated shelving, outbounding, and piece picking

Space saving

Integration of storage area and picking area, making full use of warehouse height

Operating costs saving

Improve the efficiency of each step, maximize storage area usage

Fast payback

ROI in around 4 years

Flexible implementation

Flexibility to increase the number of robots in stages and improve operating capacity

Parameter

Dimensions	L1090*W830*H275mm
Rated Load	1000kg
Payload Size	L1020*W1220*H2800
Speed	2m/s unloaded, 1.6m/s loaded
Acceleration	1m/s2
Positional Accuracy	＜±10mm
Security	Infrared obstacle avoidance, Support for ladar
Navigation	QR code
Working Temperature	-10~45℃

P800R

Dimensions	L1090*W1030*H160mm
Rated Load	1200kg
Payload Size	L1200*W1000*H1800mm
Speed	1.5m/s unloaded, 1.2m/s loaded
Acceleration	0.3m/s2
Positional Accuracy	±2mm
Security	Laser obstacle avoidance, goods inspection, derailment prevention, etc.
Navigation	RFID+ location pieces
Working Temperature	0~45℃

X1200

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