ABSTRACT

An improved storage and retrieval system employing a gridded three-dimensional storage structure features workstations served by the same robotic vehicle fleet that serves the storage structure, travel-through workstations using the same robotic vehicles to carry storage units through the workstation without hand-off to any other conveyor or handler, internal sortation using orchestrated navigation of the robotic vehicles to workstation intake points, sensors on the robotic vehicles to confirm proper loading and alignment of storage units thereon, lifting mechanisms for raising the robotic vehicles into shafts of the grid from a lower track thereof, use of markers and scanners to align the robotic vehicles with the grid shafts, and workstation light curtains for hand safety, pick-counting and container content protrusion detection.

(FIG. 23)