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The Director

of the United States Patent and Trademark Office has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this United States

Patent

grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America, and if the invention is a process, of the right to exclude others from using, offering for sale or selling throughout the United States of America, products made by that process, for the term set forth in 35 U.S.C. 154(a)(2) or (c)(1), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b). See the Maintenance Fee Notice on the inside of the cover.



DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Patent Term Notice

If the application for this patent was filed on or after June 8, 1995, the term of this patent begins on the date on which this patent issues and ends twenty years from the filing date of the application or, if the application contains a specific reference to an earlier filed application or applications under 35 U.S.C. 120, 121, 365(c), or 386(c), twenty years from the filing date of the earliest such application (“the twenty-year term”), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b), and any extension as provided by 35 U.S.C. 154(b) or 156 or any disclaimer under 35 U.S.C. 253.

If this application was filed prior to June 8, 1995, the term of this patent begins on the date on which this patent issues and ends on the later of seventeen years from the date of the grant of this patent or the twenty-year term set forth above for patents resulting from applications filed on or after June 8, 1995, subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b) and any extension as provided by 35 U.S.C. 156 or any disclaimer under 35 U.S.C. 253.



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Asplund et al.

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(54) **AUTOMATED BIN STORAGE**

FOREIGN PATENT DOCUMENTS

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 337 days.

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(58) **Field of Classification Search**

None

See application file for complete search history.

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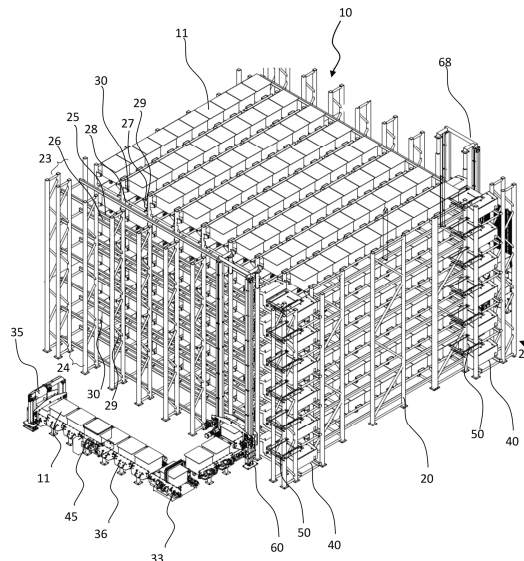
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(57) **ABSTRACT**

An automated storage comprising a storage rack configured to store storage bins, a self-propelled shuttle vehicle configured to move along the first horizontal direction of the storage rack, a self-propelled satellite vehicle configured to be carriable by the self-propelled shuttle vehicle and configured to move along the second horizontal direction of the storage rack essentially perpendicular against the first horizontal direction, wherein the self-propelled satellite vehicle is configured to carry storage bin between the self-propelled shuttle vehicle and the storage position; wherein the self-propelled satellite vehicle comprises at least one groove on the top surface of the self-propelled satellite vehicle, a pair of mutually facing guides along the second horizontal direction wherein the self-propelled satellite vehicle is configured to move on top of the pair of mutually facing guides, a pair of mutually facing bars along the second horizontal direction essentially above the said pair of mutually facing guides wherein the storage bin is to be placed on top of the pair of mutually facing bars by the lifting lugs of the storage bin.

10 Claims, 10 Drawing Sheets



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