

CLAIMS

1. A method of moving vacuum system components within a sub fab, said method comprising:
 - 5 moving said transport device adjacent to a vacuum system component;
lowering a load bearing mechanism of said transport device;
using the loading mechanism of said transport device to pull said vacuum system component through an open back face of a support frame of said transport device such that it is supported by said load bearing mechanism;
 - 10 raising said load bearing mechanism;
driving said transport device to a different location within said sub fab;
performing one of lowering or raising said load bearing mechanism; and
unloading said vacuum system component.
- 15 2. A transport device for transporting loads in a confined space, said transport device comprising:
 - rollable elements configured to both support and move said transport device on a surface;
 - a drive mechanism for driving said rollable elements;
 - 20 a load bearing mechanism mounted to be movable between a lowered position adjacent to said surface and at least one raised position;
a support frame configured to support said load bearing mechanism and comprising a front wall, two side walls and an open back, said load bearing mechanism being mounted such that said side walls and front wall of said
 - 25 support frame extend around said load bearing mechanism in at least one of said raised and lowered positions;
at least one actuator mounted on one of said walls of said support frame for controllably raising and lowering said load bearing mechanism; wherein
said rollable elements are mounted adjacent to said side walls of said
 - 30 support frame and support said two side walls at four locations, such that a centre of gravity of said transport device is between said four locations.

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3. A transport device according to claim 2, wherein said load bearing mechanism comprises a base plate, said base plate being mounted such that said side walls and front wall of said support frame extend beyond a perimeter of said base plate.

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4. A transport device according to claim 2 or 3, wherein said rollable elements comprise four wheels.

5. A transport device according to claim 4, wherein each of said four wheels are independently drivable allowing for translational and rotational movement of said transport device.

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6. A transport device according to any of claims 2 to 5, wherein said transport device comprises a loading mechanism configured to pull a load through said open back of said support frame when said load bearing mechanism is in said lowered position

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7. A transport device according to claim 6, wherein said side walls each comprise horizontally extending guides configured to support and guide said loading mechanism from a position towards said front wall to a position towards said back face of said support frame and an actuator configured to drive said loading mechanism along said guides.

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8. A transport device according to claim 6 or 7, wherein said loading mechanism comprises a magnet for pulling said load through said open back of said support frame.

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9. A transport device according to claim 8, wherein said magnet comprises a permanent magnet such as a rare earth magnet.

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10. A transport device according to any of claims 2 to 9, wherein said transport device comprises:

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sensors configured to sense a volume around said transport device; and
control circuitry configured to control said drive mechanism, said control
circuitry being configured to receive signals from said sensors and to control said
drive mechanism in response to said signals to inhibit said transport device from
5 colliding with objects sensed by said sensors.

11. A transport device according to any of claims 2 to 10, wherein said
transport device comprises an autonomous transport device.

10 12. A transport device according to any of claims 2 to 11, wherein said
transport device comprises at least three guides, one mounted in each of said
planes comprising said side walls and front wall, and each extending vertically
and being configured to guide said load bearing mechanism between said raised
and lowered positions.

15 13. A transport device according to any of claims 2 to 12, wherein said at least
one actuator is configured to controllably move said load bearing mechanism
between a lowered and a plurality of different raised positions.

20 14. A transport device according to claim 12 and 13, said transport device
further comprising a frame comprising corner members extending vertically
upwards from said support frame of said transport device, wherein said transport
device comprises four of said guides, said four of said guides being attached to
or forming part of said corner members of said frame and being configured to
25 guide said load bearing mechanism from said lowered position to said plurality of
raised positions.

15. A transport device according to claim 14 when dependent on claim 3,
wherein said base plate comprises barrier members extending vertically upwards
30 from a front and sides of said base plate.