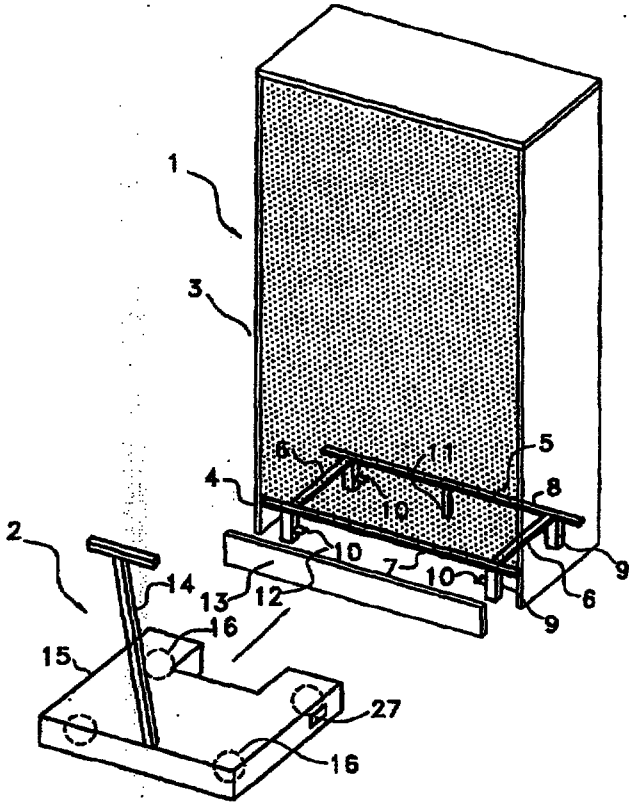




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(21) International Application Number: PCT/GB97/01626 (22) International Filing Date: 17 June 1997 (17.06.97) (30) Priority Data: 9612777 19 June 1996 (19.06.96) GB (71) Applicant (for all designated States except US): FURNITURE SYSTEMS LIMITED [GB/GB]; Warpsgrove Lane, Chalgrove, Oxfordshire OX44 7TH (GB). (72) Inventor; and (75) Inventor/Applicant (for US only): PENTLAND, Ian, William [GB/GB]; Steadwell House, Church End, Leckhampstead, Bucks MK48 5NN (GB). (74) Agent: RAYNOR, Simon, Mark; Urquhart-Dykes & Lord, Midsummer House, 411C Midsummer Boulevard, Central Milton Keynes, Buckinghamshire MK9 3BN (GB).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.
(54) Title: THREE STORAGE SYSTEMS, A SYSTEM FOR THE TRANSPORTATION OF STORAGE UNITS, A STORAGE UNIT, A STORAGE CABINET, A SYSTEM FOR THE TRANSPORTATION OF ARTICLES AND A METHOD OF TRANSPORTING ARTICLES		
(57) Abstract The invention refers to three storage systems, a system for the transportation of storage units, a storage unit, a storage cabinet, a system for the transportation of articles and a method of transporting articles. The storage systems include a storage unit (1) having a base structure (4), and a trolley device (2) for transporting the storage unit (1). Said trolley device (2) includes a lifting member (15) engageable with the base structure (4), the arrangement being such that the lifting member (15) may be brought into engagement with the base structure (4), e.g. by insertion through a forwardly-facing opening (12) in the base structure (4). The base part of the trolley device (2) may include a plurality of castors (16) or the like for enabling movement of the trolley device (2). The system for the transportation of storage units includes a base structure (4) for attachment to a storage unit (1) rather than a storage unit (1) having a base structure (4). The storage cabinet is for storing documents and the like, and includes an upper storage part (3) and a base structure (4) located underneath the storage part (3). 		

THREE STORAGE SYSTEMS, A SYSTEM FOR THE TRANSPORTATION OF STORAGE UNITS, A STORAGE UNIT, A STORAGE CABINET, A SYSTEM FOR THE TRANSPORTATION OF ARTICLES AND A METHOD OF TRANSPORTING ARTICLES

The present invention relates to a storage system and to a
5 storage unit, for example a cabinet. The invention further
relates a system for and a method of transporting articles.

In particular, but not exclusively, the invention relates
to a storage system suitable for use in an office. For
10 example, the storage unit may be a storage cabinet, a
cupboard, a bookcase or a drawer unit.

One disadvantage of most existing storage systems is that
when the arrangement of the office furniture has to be
15 changed, or a storage unit has to be moved from one place
to another, it is usually necessary to empty any contents
from the storage units before they can be moved. This
involves considerable inconvenience and effort, as well as
creating the risk of losing or mis-filing documents when
20 they are returned to the storage units. It is, therefore,
a great advantage if the storage units can be moved without
being emptied, although this is not normally possible owing
to the great weight of the contents.

25 A storage system is known that allows the storage units to
be moved without first being emptied. In this system, each
storage unit has engagement points on either side that can
be engaged by a specialised trolley device, allowing the
unit to be lifted and moved to its new position.

30 The main disadvantage of this system is that in order to
lift a storage unit, the trolley has to have access to both
sides of the unit. In practice, this is often not possible
either because the unit has been positioned in a corner
35 with one of the engagement points flush against a wall, or
because several units have been placed next to one another
with no gaps in between. Although this problem could be
avoided by leaving gaps on both sides of the units that is,
of course, wasteful of space. Another disadvantage of the

known system is that the engagement points are unsightly, which is a genuine consideration in a modern office environment.

- 5 It is an object of the present invention to provide a storage system that mitigates at least some of the aforementioned disadvantages.

According to the present invention there is provided a
10 storage system including a storage unit having a base structure and a trolley device for transporting the storage unit, said trolley device including a lifting member engageable with the base structure, the arrangement being such that the lifting member may be brought into engagement
15 with the base structure without requiring access to the sides of the storage unit.

Because the trolley device does not require access to the sides of the storage unit, the units may be placed side-by-
20 side with no wasted space, or flush against a dividing wall. When it becomes necessary to move a storage unit to a different position, this can be achieved easily without the need to empty the storage unit.

25 Advantageously, the base structure includes a forwardly-facing opening, the lifting member being brought into engagement with the base structure by insertion through said opening. Preferably, the opening is provided at ground level. This allows the trolley device to be
30 inserted underneath the storage unit so improving the stability of the unit when it is lifted and avoiding the need for a counterweight on the trolley device. The lifting mechanism can also be relatively simple and uncomplicated.

35

The storage unit may include a removable or movable panel adapted to cover said opening. This hides the base

structure and improves the aesthetic appearance of the storage unit.

Advantageously, the width of the lifting member is less
5 than the width of the storage unit.

The lifting member may be arranged to provide for transverse movement of the storage unit relative to the trolley device, so allowing the storage unit to be moved to
10 a position where its centre of gravity is located centrally of the trolley.

The trolley device may include a lifting mechanism for raising the lifting member. The lifting mechanism may be
15 arranged to cause simultaneous lifting and transverse movement of the lifting member. The lifting mechanism preferably includes an interlock to prevent the lifting member being raised when it is not properly engaged with the base structure.

20

The system may include means for clamping the storage unit to the trolley device. The system may be arranged such that lifting of the storage unit causes the unit to be clamped to the trolley device.

25

The present invention further provides a system for the transportation of storage units, the system including a base structure for attachment to a storage unit and a trolley device for transporting the base structure and the
30 storage unit attached thereto, said trolley device including a lifting member engageable with the base structure, the arrangement being such that the lifting member may be brought into engagement with the base structure without requiring access to the sides of the
35 storage unit.

According to another aspect of the present invention there

is provided a storage system including a storage unit having a base structure and a trolley device for transporting the storage unit,

5 said base structure comprising first and second side members, a connecting member connecting said first and second side members and a bracket member extending inwards from each of said first and second side members, said base structure having a forwardly-facing opening,

10 said trolley device including a lifting structure that is engageable with the base structure, said lifting structure comprising a lower member having a plurality of castors or like means for enabling movement of the trolley device; an upper member mounted on said lower member for vertical movement relative thereto and an actuator for
15 generating vertical movement of said upper member between a lowered position and a raised position;

the arrangement being such that when the storage unit is standing on the floor, the height of the bracket members is less than the height of the lower member and the height
20 of the connecting member is greater than the height of the upper member in the lowered position, whereby the lifting structure of the trolley device may be inserted into the opening in the base structure between the connecting member and the bracket members and,

25 when the upper member is lifted to the raised position, the upper member engages the connecting member, thereby lifting the storage unit and clamping the storage unit to the trolley device by bringing the bracket members into engagement with the lower member.

30

Advantageously, said upper member is mounted on said lower member for vertical and transverse movement relative thereto and said actuator is adapted to generate both vertical and transverse movement of said upper member as
35 said upper member is lifted from a lowered position to a raised position.

According to another aspect of the present invention there is provided a storage system including a storage unit having a base structure and a trolley device for transporting the storage unit,

5 said base structure comprising first and second side members and a connecting member connecting said first and second side members, said base structure having a forwardly-facing opening,

 said trolley device including a lifting structure that
10 is engageable with the base structure, said lifting structure comprising a lower member having a plurality of castors or like means for enabling movement of the trolley device; an upper member mounted on said lower member for vertical and transverse movement relative thereto and an
15 actuator for generating vertical and transverse movement of said upper member between a lowered position and a raised, transversely displaced position;

 the arrangement being such that when the storage unit is standing on the floor, the height of the connecting
20 member is greater than the height of the upper member in the lowered position, whereby the lifting structure of the trolley device may be inserted into the opening in the base structure beneath said connecting member and,

 when the upper member is lifted to the raised
25 position, the upper member engages the connecting member, thereby lifting the storage unit and transporting the storage unit transversely to a position of increased stability.

30 According to another aspect of the present invention there is provided a storage unit for use with a storage system as described herein.

 According to another aspect of the present invention there
35 is provided a storage cabinet for storing documents and the like, said cabinet including an upper, storage part and a base structure located underneath the storage part,

said base structure comprising first and second side members and a connecting member connecting said first and second side members, said base structure having a forwardly-facing opening,

5 said base structure being engageable with a trolley device including a lifting structure that may be inserted into the opening in the base structure beneath said connecting member, whereby the cabinet may be lifted and transported to a new position without removing the contents
10 therefrom.

According to a further aspect of the invention there is provided a system for the transportation of articles, the system comprising at least one article having a base
15 structure, and a trolley device for transporting the article, said trolley device including a lifting member that may be brought into engagement with the base structure to lift the article.

20 According to a further aspect of the invention there is provided a method of transporting articles, wherein each said article has a base structure, the method comprising arranging a trolley device having a lifting member underneath said base structure, raising the lifting member
25 to engage the base structure and thereby lift the article, and transporting the lifted article on the trolley device.

Embodiments of the invention will now be described, by way of example, and with reference to the accompanying
30 drawings, of which:

Figure 1 is a perspective view of the storage system, including a storage unit and a trolley device;

35 Figure 2 is a perspective view of the base part of the trolley device, showing the main internal components of the lifting mechanism;

Figure 3 is a perspective view showing the base part of the trolley device located underneath the support frame of the storage unit;

- 5 Figure 4 is an end view showing the base part of the trolley device located underneath the support frame of the storage unit;

Figure 5 is a side view of a part of the lifting mechanism
10 of the trolley device;

Figures 6, 7 and 8 are side views showing the process of lifting a storage unit using the trolley device;

- 15 Figure 9 is a perspective view of the base part of the trolley device according to a second embodiment of the invention, in which the lifting mechanism is pneumatically operated;

- 20 Figure 10 is a side view of a part of the pneumatic circuit of the trolley shown in Figure 9;

Figure 11 is a plan view of an electrical trolley device;

- 25 Figure 12 is a front elevation of the trolley device shown in Figure 11;

Figure 13 is a side elevation of the trolley device shown in Figure 11;

30

Figure 14 is a cross-section of the trolley device shown in Figure 11 on line XIV-XIV;

Figure 15 is a plan view of a hydraulic trolley device;

35

Figure 16 is a cross-section of the trolley device shown in Figure 15 on line XVI-XVI;

Figure 17 is a side elevation of the trolley device shown in Figure 15; and

Figure 18 is a front elevation of the trolley device shown in Figure 15.

As shown in Figure 1, the storage system consists of a storage unit indicated generally by the reference number 1 and a trolley device indicated generally by the reference number 2.

The storage unit 1, which may be a cupboard, cabinet, bookcase, shelving unit or other type of office furniture, consists of an upper storage part 3 of conventional design and a base structure 4 that includes a support frame 5. The support frame 5 may, for example, be a welded steel structure, that supports the weight of the storage unit 1. The support frame 5 consists of a framework of two side bars 6 and front and rear connecting bars 7, 8, to which there are attached four legs 9. Each leg 9 includes an inwardly-facing bracket 10 at about half the height of the leg. A further leg 11 extends downwards from the centre of the rear connecting bar 8. The support frame 5 is enclosed substantially within the storage unit 1, so as not to detract from the appearance of the unit.

The base structure 4 has a forwardly-facing opening 12 at ground level between the two front legs 9 and below the front bar 7. A removable panel (or skirt) 13 may be attached to the two front legs 9 to hide the opening 12. When the panel 13 is attached, the storage unit 1 is entirely conventional in appearance. Alternatively, the panel 13 may be attached to the storage unit 1 by means of a hinge, so that it can be moved to an open position to provide access to the opening 12.

The trolley device 2 includes a handle 14 and a base part

15 having four castors or wheels 16 arranged one at each of its four corners. As shown in Figures 2, 3 and 4 and in more detail in Figures 11 to 14, the base part 15 includes a bottom plate 17 to which the castors 16 are attached, and
5 a top plate 18 that is adapted for upwards and rearwards movement relative to the bottom plate 17. A pair of stop plates 19 extend upwards from the upper surface of the top plate 18 (as shown in Figure 3).

10 Located between the bottom plate 17 and the top plate 18 there is provided a lifting mechanism, which is shown most clearly in Figure 2. The lifting mechanism comprises a set of four sloped ramps 20 provided on the bottom plate 17 and four rollers 21 that are mounted on the underside of the
15 top plate 18 and arranged to run on the ramps 20. A pin 21a (see Figures 12 to 14) is associated with each of the rollers 21 and extends horizontally underneath the ramp 20 to prevent the top plate 18 being detached from the bottom plate 17.

20

An electric motor 22 is attached to the bottom plate 17 and is arranged to drive a worm 23 that engages a threaded drive member 24, which is connected to the underside of the top plate 18 by two pivot links 24a (shown in Figs. 11, 13
25 and 14). The motor 22 may be powered by a rechargeable battery 25 or from the mains electricity supply. Alternatively, the motor 22 may be replaced by a simple crank handle (not shown).

30 When the motor 22 is activated, the top plate 18 is drawn rearwards towards the motor, so causing the rollers 21 to rise up the ramps 20. The top plate 18 is thus raised relative to the floor and the bottom plate 17 and is simultaneously drawn rearwards, towards the handle 14.
35 Reversing the motor obviously causes the top plate 18 to move downwards and forwards away from the handle 14.

The current consumption of the motor is monitored by an electronic mapping device (not shown) that senses when the cabinet is in a fully lifted and locked position. The device also provides status indications to the user, by
5 means of a display panel 25a.

The lifting mechanism includes a mechanical safety interlock, which is shown in Figure 5. The interlock consists of a mechanical push latch 26 with a spring return
10 that interlocks with the worm 23 to engage the drive mechanism when the latch is fully depressed. The push latch 26 engages the central leg 11 of the support frame 5 when the trolley device 2 is correctly located under the storage unit 1 and, if the trolley device is not correctly
15 located, so that the push latch 26 is not depressed, the drive mechanism will remain disengaged so preventing the top plate 18 from being raised.

The trolley device 2 may include an additional latch
20 mechanism 27 on either side of the base portion 15, to ensure that the trolley is correctly located under the storage unit 1. Microswitches (not shown) may also be provided to switch off the electric motor 22 when the top plate 18 reaches a fully raised or fully lowered position.

25

When it is necessary to move the storage unit 1, the removable panel 13 is first removed to reveal the opening 12, and the base part 15 of the trolley device 2 is then aligned with the opening as shown in Figure 6 and pushed
30 underneath the storage unit 1 to the position shown in Figure 7, where the stop plates 19 engage the front of the supporting frame 5. It should be noted that in this position, prior to lifting, the front castors 16 are located underneath the storage unit 1 and the base part 15
35 of the trolley device 2 does not extend far beyond the rear of the storage unit 1. The trolley device 2 may thus be used to lift a storage unit 1 that is placed almost flush

against a wall or partition.

The top plate 18 of the trolley device 2 will then lie just below the connecting bars 7,8 and the bottom plate 17 will
5 be just above the four inwardly-facing brackets 10 on the legs 9 of the storage unit 1, as is shown in Figure 4.

When the lifting mechanism is activated, the top plate 18 rises up on the ramps 20 so that it first engages the
10 connecting bars 7,8 and then lifts the storage unit 1. As the unit 1 is lifted, the base part 15 of the trolley device 2, comprising top plate 18 and bottom plate 17, increases in thickness, thereby bringing the brackets 10 on the legs 9 of the unit 1 firmly into engagement with the
15 underside of the bottom plate 17. This clamps the storage unit securely to the trolley device 2. The trolley device 2 and the lifted unit 1 thus form a stable assembly that cannot easily be tipped over.

20 Before the unit is lifted, the centre line of the storage unit 1 is some distance in front of the centre line of the trolley device 2 as shown in Figure 7. This would affect the stability of the unit if it were to be lifted straight upwards in that position. This problem is however avoided
25 because as the unit 1 is lifted, the top plate 18 is simultaneously drawn rearwards towards the handle 14 so that, in the fully raised position, the centre lines of the unit 1 and the trolley 2 coincide substantially with one another, as is shown in Figure 8. The storage unit 1 is
30 then located centrally between the front and rear castors 16, which ensures the stability of the unit.

The stability of the lifted unit 1 is enhanced further by making the width of the base part 2 such that it is a close
35 fit between the legs 9, which ensures that the trolley device 2 is centrally located between the sides of the storage unit 1 and that the castors are as far apart

widthwise as possible.

An alternative pneumatic version of the lifting mechanism 18 is shown in Figures 9 and 10. In this version, the base
5 part 2 is in the form of a rigid box having a top plate 31, two side walls 32 and a front wall 33. A base plate 35 that carries the castors is located underneath the box. The lower edges of the side walls 32 and the front wall 33 are turned inwards so as to engage the lower surface of the
10 rigid plate 35, thus limiting the upwards movement of the top plate 31.

Located between the top plate 31 and the base plate 35 there is provided an inflatable bag 38, which is connected
15 via a connecting line 39 to a cylinder 40 of compressed gas. A three-way valve 41 is provided in the connecting line 39 and is controlled by a switch (not shown) on the trolley handle. Moving the switch to a first position allows gas to flow from the cylinder 40 into the bag 38,
20 thereby raising the top plate 31. Moving the switch to a second position allows air to escape from the bag, so allowing the top plate 31 to fall.

As shown in Figure 10, the pneumatic circuit also includes
25 an interlock switch 45 in the connecting line 39, which is operated by engagement with the central leg 11 on the support frame 5 when the trolley device 2 is correctly located under the storage unit 1. When the trolley device 2 is correctly located, the interlock switch 35 is
30 activated, allowing gas to flow into the bag and so lift the storage unit. However, if the trolley device is not correctly located, so that the interlock switch 45 is not activated, this prevents gas entering the bag and so prevents the storage unit being lifted.

35

A hydraulic version of the trolley device 2 is shown in Figures 15 to 18. The base part 15 is divided into three

sections, comprising two side units 50a,b and a central plate 52 that connects the two side units 50a,b rigidly together. Each side unit 50a,b includes a bottom plate 17 having two castors 16 and a movable top plate 18, which is
5 attached to the bottom plate 17 by means of two pairs of pivot links 54. A hydraulic cylinder 56a,b is arranged to drive the top plate 18 upwards and rearwards, as guided by rotation of the pivot links 54. A handle 14 for manoeuvring the trolley is connected to the central
10 connecting plate 52 by means of a pivot pin 55.

The central plate 52, which connects the two side units 50a,b rigidly together, may have a variety of widths and the trolley device 2 can thus be adapted to fit storage
15 units 1 of different widths by exchanging the central plate 52 for another of a different width.

The central plate 52 includes a hydraulic pump 58 that may be actuated by means of a foot pedal 60 mounted on a pivot
20 pin 61. The pump 58 is connected in series via the first hydraulic cylinder 56a, which is double-acting cylinder, to the second hydraulic cylinder 56b, which is a single-acting cylinder. This hydraulic arrangement ensures that the first and second hydraulic cylinders 56a,b operate
25 synchronously with each other, so that the storage unit is lifted evenly. Hydraulic pressure may be released by operating a hydraulic release valve 62 that is mounted on the central plate 52 and connected in series between the pump 58 and the first cylinder 56a.

30 Various modifications of the storage system are, of course, possible and the embodiments described herein are intended to illustrate only examples of a storage system according to the invention. For example, the lifting mechanism may
35 take various other forms and different methods of securing the storage unit to the trolley device are also envisaged.

It is further envisaged that the base structure 4 of the storage unit 1, comprising the support frame 5 and a surrounding plinth including the removable panel 13, may be sold separately for retro-fitting to existing storage furniture, for example by bolting the support frame 5 to the bottom of the furniture. It is intended that a base structure 4 in combination with a trolley device 2 should be within the scope of the present invention.

- 10 It is yet further envisaged that the system described herein may, with certain obvious modifications, be applied to other heavy articles, such as vending machines or washing machines, making them easier to move and reducing the risk of injury or of damage to furniture or décor.
- 15 Such an application of the system is intended to be within the scope of the present invention.



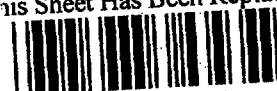
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Claims

1. A storage system including a storage unit having a
5 base structure and a trolley device for transporting the
storage unit, said trolley device including a lifting
member engageable with the base structure, the arrangement
being such that the lifting member may be brought into
engagement with the base structure without requiring access
10 to the sides of the storage unit.
2. A storage system according to claim 1, in which the
base structure includes a forwardly-facing opening, the
arrangement being such that the lifting member may be
15 brought into engagement with the base structure by
insertion through said opening.
3. A storage system according to claim 1 or claim 2,
wherein said opening is provided at ground level.
20
4. A storage system according to claim 2 or claim 3, in
which the base structure includes a panel adapted to cover
said opening.
- 25 5. A storage system according to any one of the preceding
claims, in which the width of the lifting member is less
than the width of the storage unit.
6. A storage system according to any one of the preceding
30 claims, in which the lifting member is arranged to provide
for transverse movement of the storage unit relative to the
trolley device.
7. A storage system according to any one of the preceding
35 claims, in which the trolley device includes a lifting
mechanism for raising the lifting member.

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8. A storage system according to claim 7 when dependent on claim 6, in which the lifting mechanism is arranged to cause simultaneous lifting and transverse movement of the lifting member.

5

9. A storage system according to claim 7 or claim 8, in which the lifting mechanism includes an interlock to prevent the lifting member being raised when it is not properly engaged with the base structure.

10

10. A storage system according to any one of the preceding claims, including means for clamping the storage unit to the trolley device.

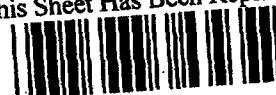
15 11. A storage system according to claim 10, wherein lifting of the storage unit causes the unit to be clamped to the trolley device.

20 12. A system for the transportation of storage units, the system including a base structure for attachment to a storage unit and a trolley device for transporting the base structure and the storage unit attached thereto, said trolley device including a lifting member engageable with the base structure, the arrangement being such that the
25 lifting member may be brought into engagement with the base structure without requiring access to the sides of the storage unit.

30 13. A storage system including a storage unit having a base structure and a trolley device for transporting the storage unit,

said base structure comprising first and second side members, a connecting member connecting said first and second side members and a bracket member extending inwards
35 from each of said first and second side members, said base structure having a forwardly-facing opening,

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said trolley device including a lifting structure that is engageable with the base structure, said lifting structure comprising a lower member having a plurality of castors or like means for enabling movement of the trolley device; an upper member mounted on said lower member for vertical movement relative thereto and an actuator for generating vertical movement of said upper member between a lowered position and a raised position;

the arrangement being such that when the storage unit is standing on the floor, the height of the bracket members is less than the height of the lower member and the height of the connecting member is greater than the height of the upper member in the lowered position, whereby the lifting structure of the trolley device may be inserted into the opening in the base structure between the connecting member and the bracket members and,

when the upper member is lifted to the raised position, the upper member engages the connecting member, thereby lifting the storage unit and clamping the storage unit to the trolley device by bringing the bracket members into engagement with the lower member.

14. A storage system according to claim 13, wherein said upper member is mounted on said lower member for vertical and transverse movement relative thereto and said actuator is adapted to generate both vertical and transverse movement of said upper member as said upper member is lifted from a lowered position to a raised position.

15. A storage system including a storage unit having a base structure and a trolley device for transporting the storage unit,

said base structure comprising first and second side members and a connecting member connecting said first and second side members, said base structure having a forwardly-facing opening,



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- said trolley device including a lifting structure that is engageable with the base structure, said lifting structure comprising a lower member having a plurality of castors or like means for enabling movement of the trolley device; an upper member mounted on said lower member for vertical and transverse movement relative thereto and an actuator for generating vertical and transverse movement of said upper member between a lowered position and a raised, transversely displaced position;
- 10 the arrangement being such that when the storage unit is standing on the floor, the height of the connecting member is greater than the height of the upper member in the lowered position, whereby the lifting structure of the trolley device may be inserted into the opening in the base structure beneath said connecting member and,
- 15 when the upper member is lifted to the raised position, the upper member engages the connecting member, thereby lifting the storage unit and transporting the storage unit transversely to a position of increased stability.
- 20
16. A storage unit for use with a storage system according to any one of the preceding claims.
- 25 17. A storage cabinet for storing documents and the like, said cabinet including an upper, storage part and a base structure located underneath the storage part,
- said base structure comprising first and second side members and a connecting member connecting said first and second side members, said base structure having a forwardly-facing opening,
- 30
- said base structure being engageable with a trolley device including a lifting structure that may be inserted into the opening in the base structure beneath said connecting member, whereby the cabinet may be lifted and transported to a new position without removing the contents therefrom.
- 35

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18. A system for the transportation of articles, the system comprising at least one article having a base structure, and a trolley device for transporting the article, said trolley device including a lifting member
5 that may be brought into engagement with the base structure to lift the article.

19. A method of transporting articles, wherein each said article has a base structure, the method comprising
10 arranging a trolley device having a lifting member underneath said base structure, raising the lifting member to engage the base structure and thereby lift the article, and transporting the lifted article on the trolley device.

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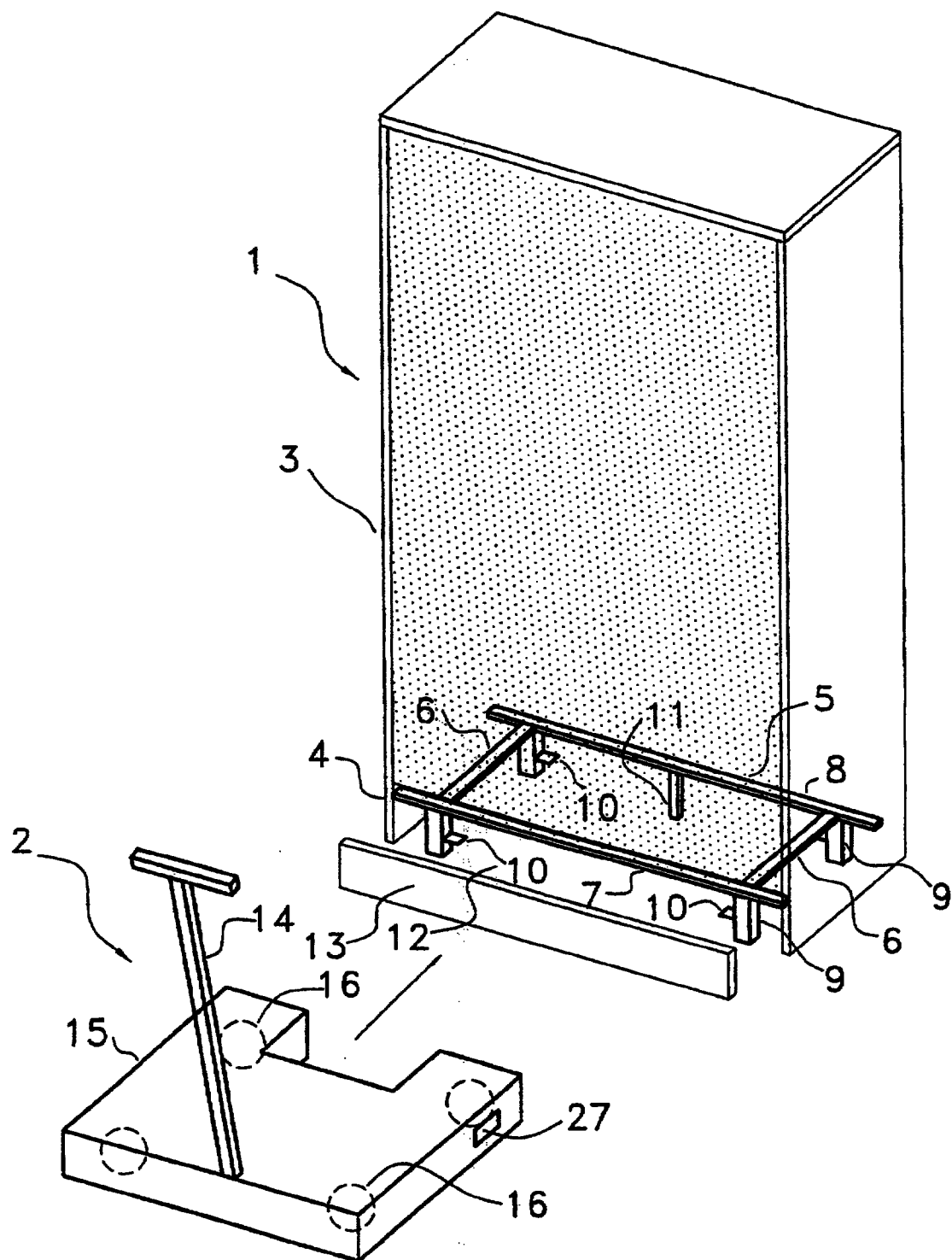


Fig. 1

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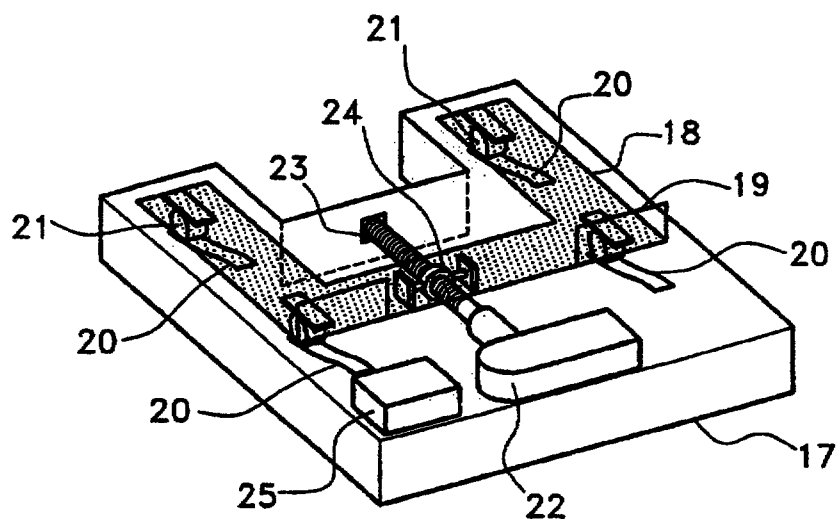


Fig. 2

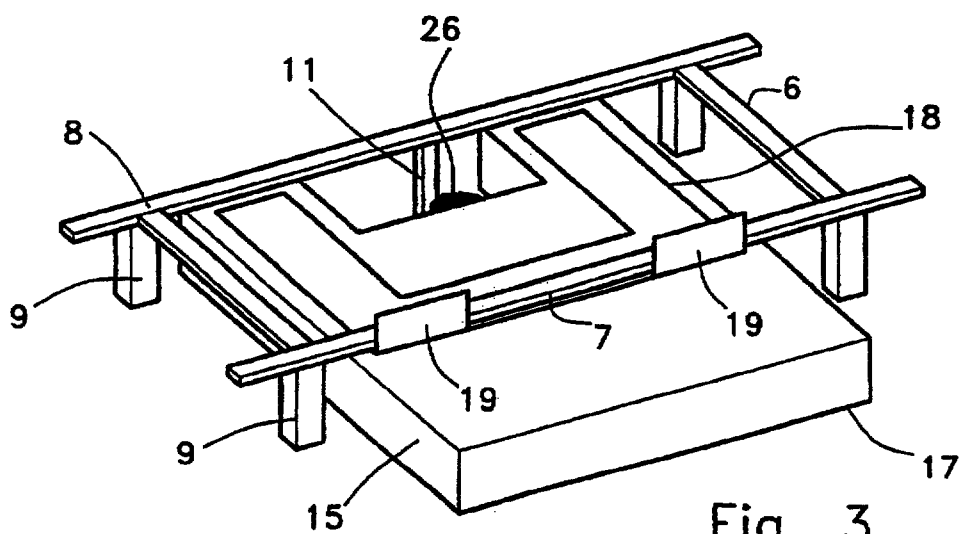


Fig. 3

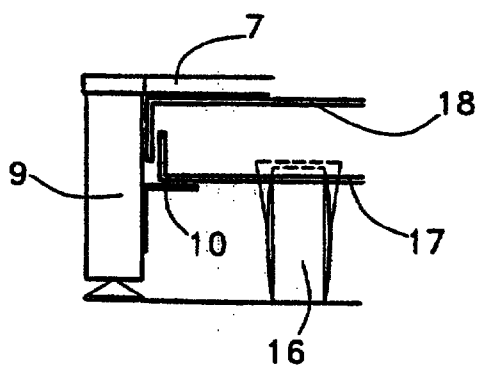


Fig. 4

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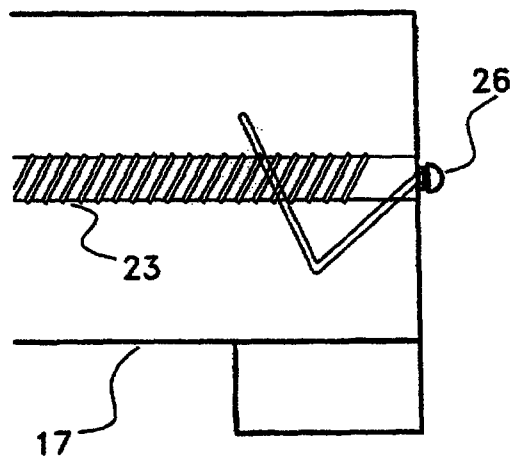


Fig. 5

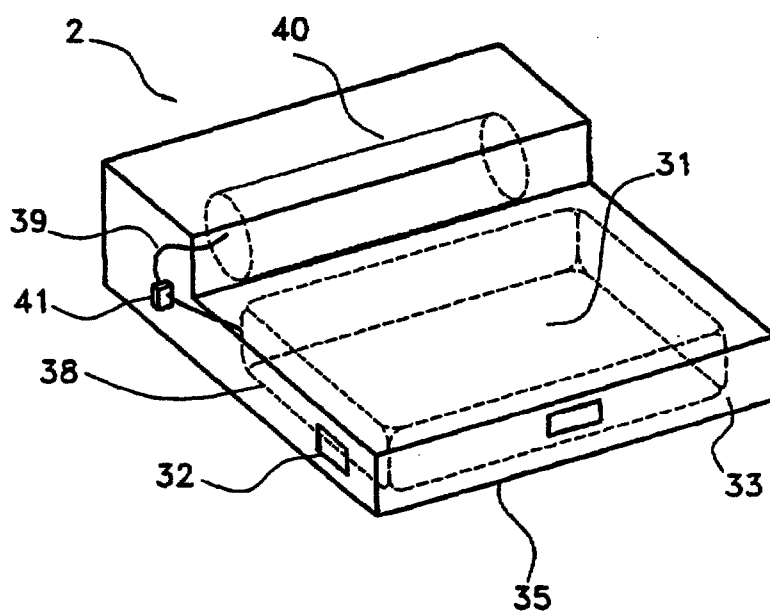


Fig. 9

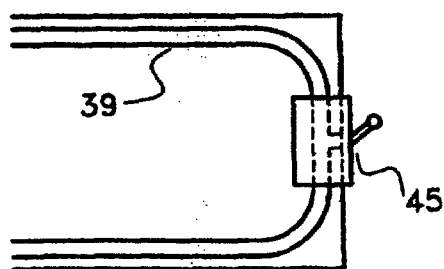


Fig. 10

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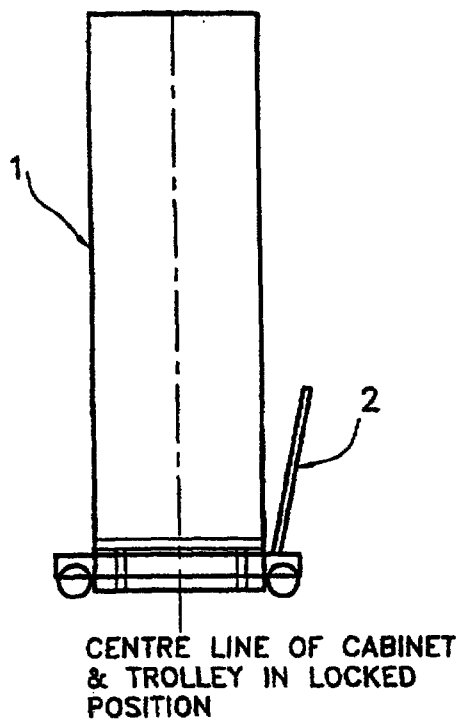
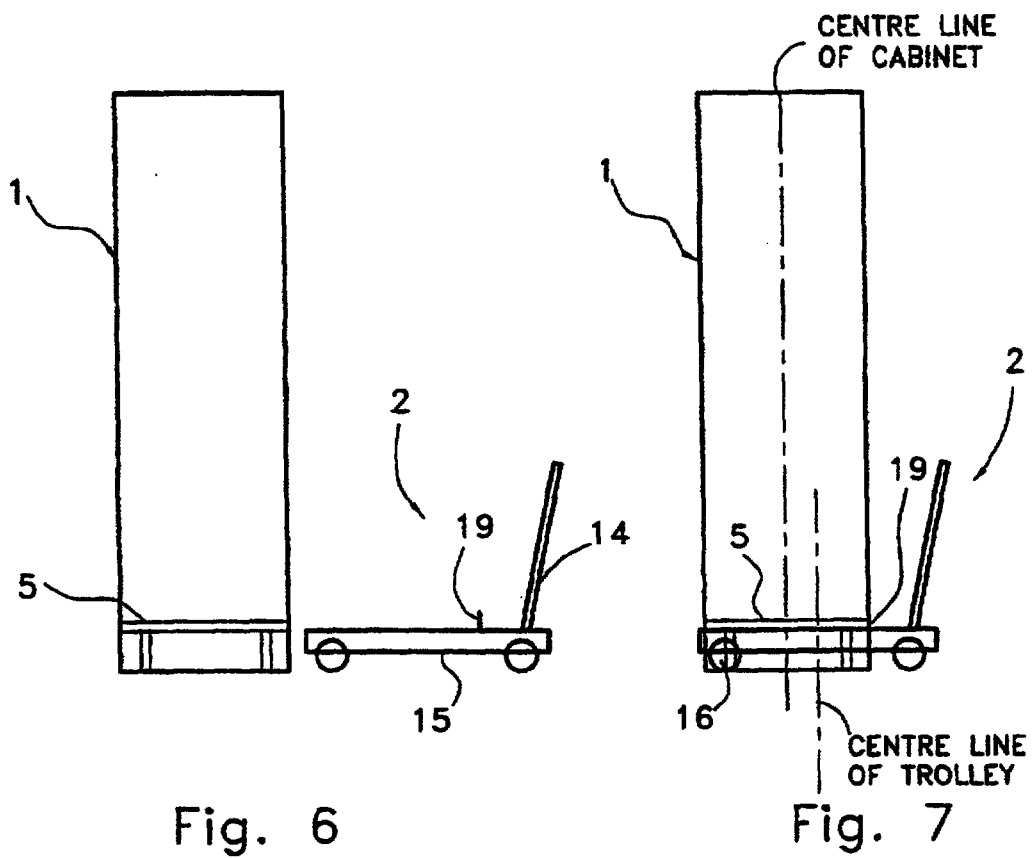


Fig. 8

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Fig. 11

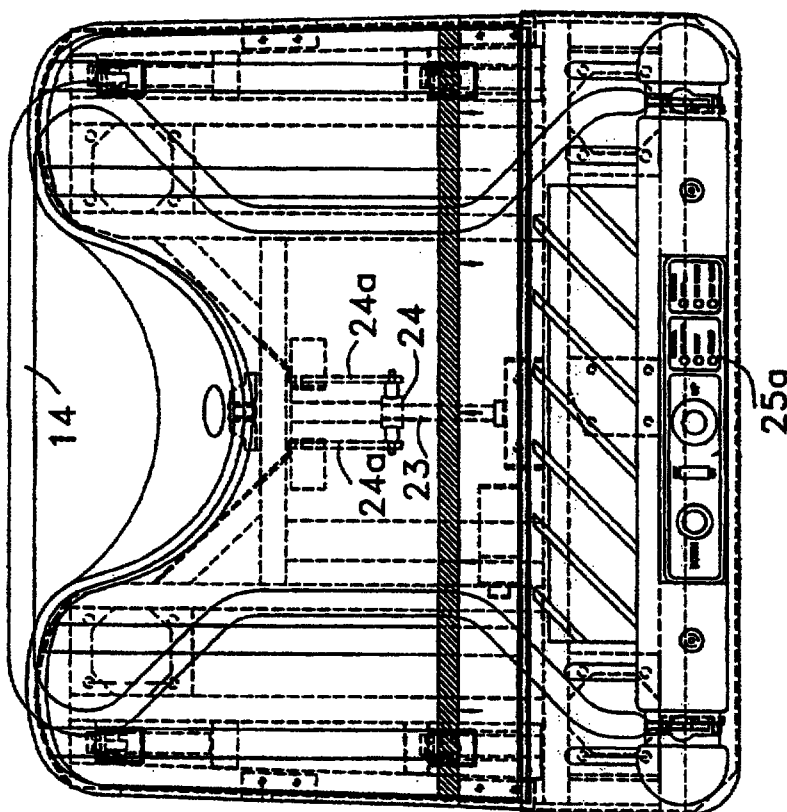


Fig. 12

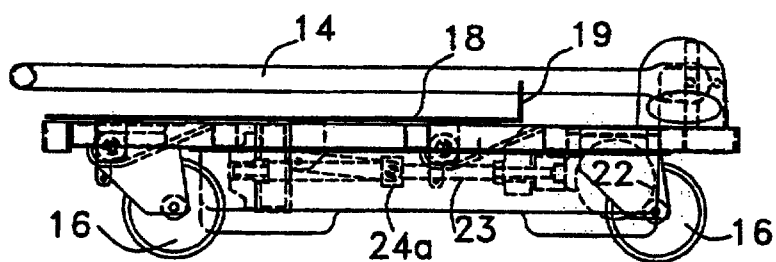
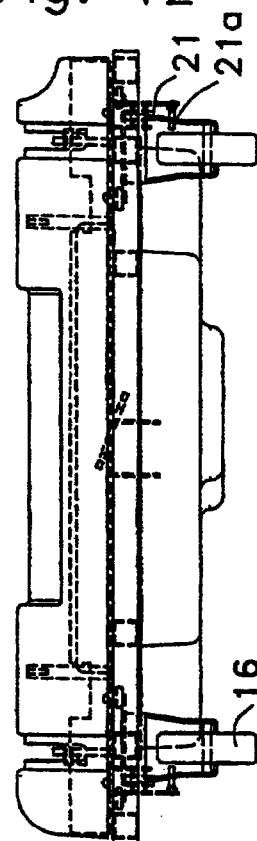


Fig. 13

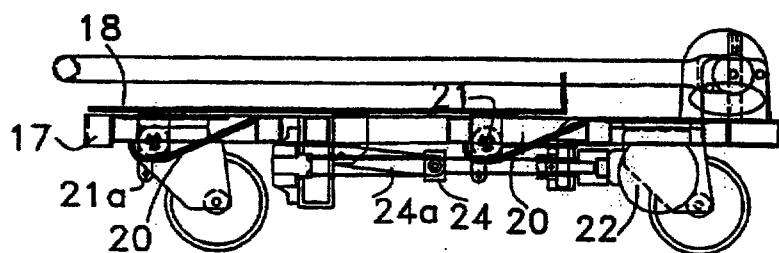
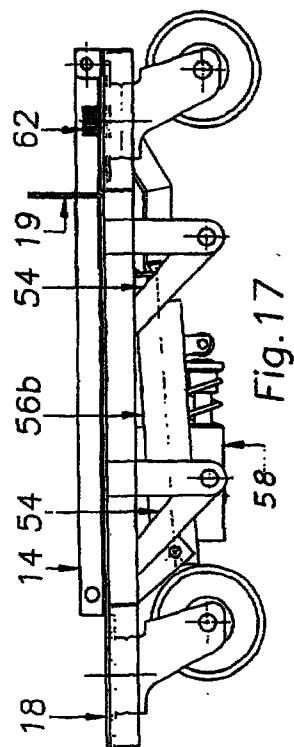
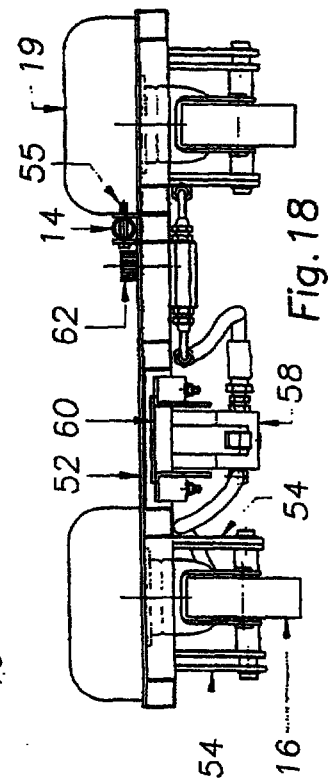
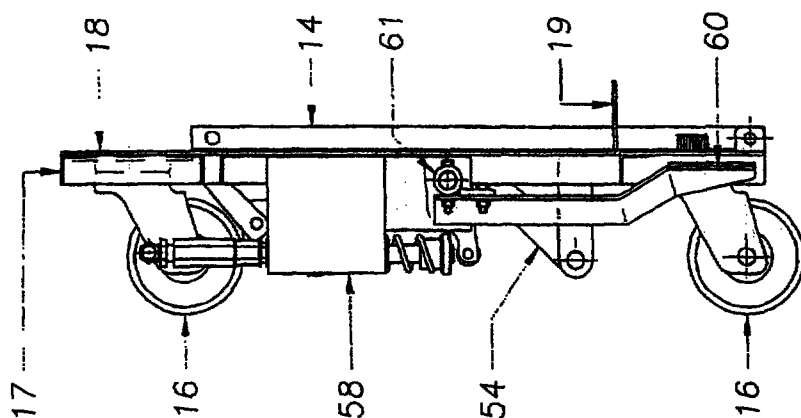
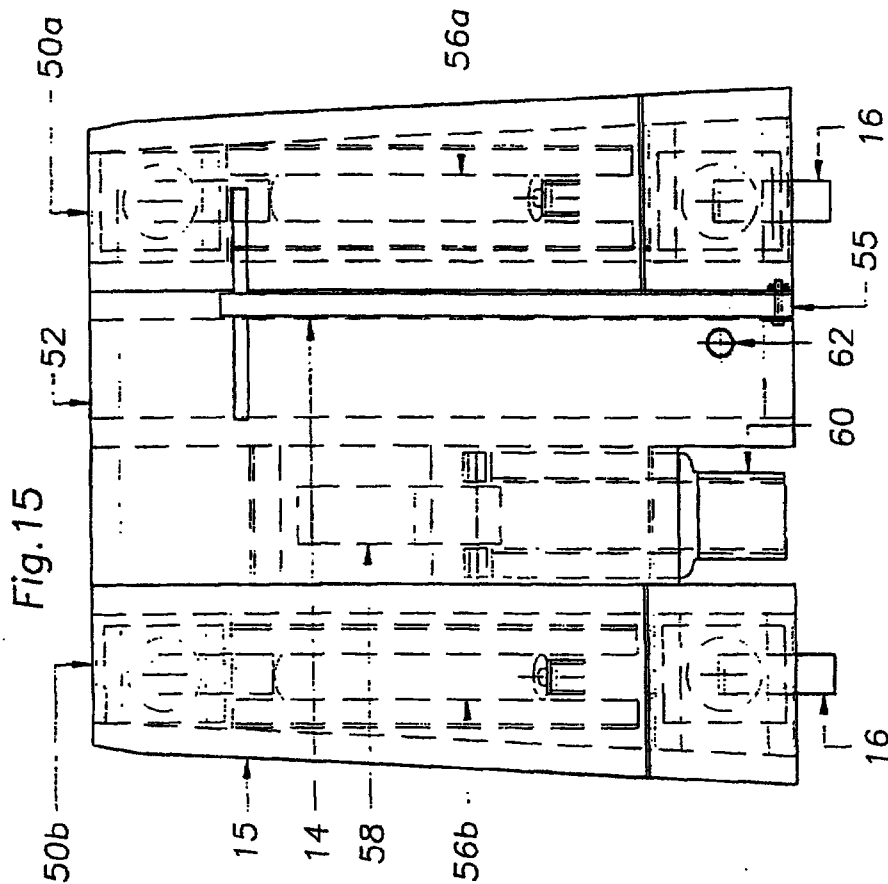


Fig. 14

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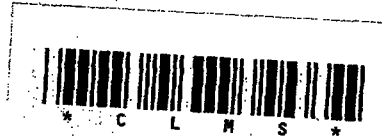


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Claims

1. A system for the transportation of articles, the system comprising an article and a trolley device for
5 transporting the article,
said article including a base structure having a forwardly-facing opening and including an upper support member and a lower support member,
said trolley device having a plurality of castors or
10 like means for enabling movement of the trolley device and a lifting structure comprising a lower trolley member, an upper trolley member mounted on said lower trolley member for vertical movement relative thereto and an actuator for raising and lowering said upper trolley member;
15 the arrangement being such that when the article is standing on the floor and the upper trolley member is in the lowered position, the lifting structure of the trolley device may be inserted into the opening in the base structure between the upper support member and the lower
20 support member,
and when the upper trolley member is raised it engages the upper support member, lifting the article and bringing the lower support member into engagement with the lower trolley member, thereby clamping the article to the trolley
25 device.
2. A system according to claim 1, wherein said upper trolley member is mounted on said lower trolley member for vertical and transverse movement relative thereto and said
30 actuator is adapted to generate both vertical and transverse movement of said upper trolley member as said upper trolley member is raised.
3. A system according to claim 1 or claim 2, in which the
35 lifting structure includes an interlock to prevent the upper trolley member being raised when the lifting structure is not properly engaged with the base structure.

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4. A ~~system according~~ to any one of the preceding claims, in which the base structure includes a panel adapted to cover said opening.
5. An article for storing documents and the like, said article including an upper, storage part and a base structure located underneath the storage part,
said base structure having a forwardly-facing opening and including an upper support member and a lower support member,
said base structure being engageable with a trolley device having a plurality of castors or like means for enabling movement of the trolley device and a lifting structure comprising a lower trolley member, an upper trolley member mounted on said lower trolley member for vertical movement relative thereto and an actuator for raising and lowering said upper trolley member;
the arrangement being such that when the article is standing on the floor and the upper trolley member is in the lowered position, the lifting structure of the trolley device may be inserted into the opening in the base structure between the upper support member and the lower support member,
and when the upper trolley member is raised it engages the upper support member, lifting the article and bringing the lower support member into engagement with the lower trolley member, thereby clamping the article to the trolley device.
6. A system for the transportation of articles, the system including a base structure for attachment to an article and a trolley device for transporting the base structure together with the attached article,
said base structure having a forwardly-facing opening and including an upper support member and a lower support member,



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said trolley device having a plurality of castors or like means for enabling movement of the trolley device and a lifting structure comprising a lower trolley member, an upper trolley member mounted on said lower trolley member
5 for vertical movement relative thereto and an actuator for raising and lowering said upper trolley member;

the arrangement being such that when the base structure is standing on the floor and the upper trolley member is in the lowered position, the lifting structure of
10 the trolley device may be inserted into the opening in the base structure between the upper support member and the lower support member,

and when the upper trolley member is raised it engages the upper support member, lifting the base structure and
15 bringing the lower support member into engagement with the lower trolley member, thereby clamping the base structure to the trolley device.

7. A method of transporting articles using a trolley
20 device,

each article having a base structure having a forwardly-facing opening and including an upper support member and a lower support member,

and said trolley device having a plurality of castors
25 or like means for enabling movement of the trolley device and a lifting structure comprising a lower trolley member, an upper trolley member mounted on said lower trolley member for vertical movement relative thereto and an actuator for raising and lowering said upper trolley
30 member;

the method comprising inserting the lifting structure of the trolley device into the opening in the base structure between the upper support member and the lower support member,

35 raising the upper trolley member such that it engages the upper support member and lifts the article, thereby bringing the lower support member into engagement with the

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lower trolley member and clamping the article to the trolley device,

and transporting the raised article on the trolley device.

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