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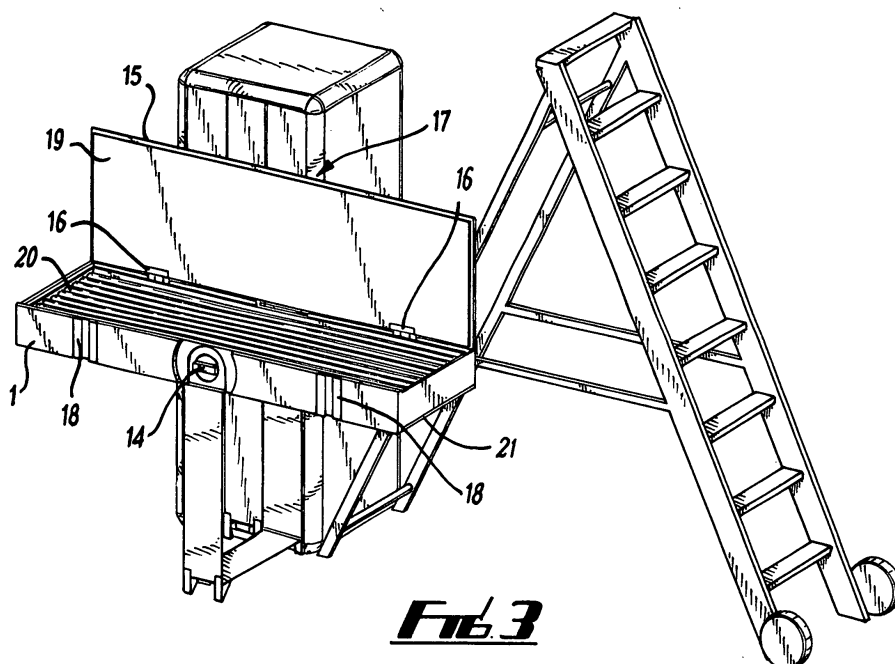
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(54) **Support apparatus**

(57) A support apparatus has a platform (1) for storage of fluorescent light bulb tubes (20) or other objects. The rotatable platform (1) requires relatively little floor space when stored, but provides convenient use of the platform (1) for the placing or retrieval of objects in storage. The platform (1) may also be used as a table (24). The platform (1) is rotatably coupled to a mount (2), which is movable between a first position in which the platform

(1) is retained against rotation and a second position in which the platform (1) is rotatable so as to provide access to the platform (1). One embodiment is a double-sided drawer (1) which is stored on end then pulled out and rotated to the horizontal about its centre of gravity (9) for easy access to both sides of the drawer (20, 22) for storage of fluorescent bulbs. A ladder (4) is also provided having the support apparatus affixed.



Description

[0001] The present invention relates to a support apparatus, in particular suitable for the storage of fluorescent light bulbs.

[0002] In the UK each year, approximately 100 million fluorescent light bulb tubes are discarded. These tubes can contain mercury vapour and phosphor dust in addition to other contaminants such as cadmium. Recycling and treatment of the waste tubes is both desirable and necessary. Legislation such as the European Union Waste Electrical and Electronic Equipment (WEEE) Directive classifies fluorescent tubes as hazardous waste and imposes requirements for the safe and environmentally friendly disposal of fluorescent tubes.

[0003] There are significant problems in the logistics of containing and transporting waste tubes both in the work place where tubes are mostly used and in transit to recycling facilities. Prior art fluorescent tube storage apparatus includes storage of tubes in boxes, chests and drawers. A problem with such storage schemes is that floor space is taken up by the storage apparatus. Furthermore, fluorescent tubes are usually distributed around buildings, and it is inconvenient to move such storage apparatus around so as to be close to the places at which used tubes are changed.

[0004] Also known in the prior art is apparatus such as storage lockers, storage bins, storage tubes and cartons. These storage schemes may be configured to take up relatively less floor space, however there are problems loading bulbs into the storage containers and retrieving them because of the length variation in linear tubes. Furthermore, such apparatus is not suitable for nonlinear tubes which are becoming more common and include coiled, bent and folded tube designs.

[0005] Each of the known tube storage apparatuses include some kind of storage platform to support the tubes. This can include the internal walls of a carton or the internal surface of a drawer or box. When a user places a tube onto such a platform it is convenient for the user to access the platform with the platform in a substantially horizontal plane so that gravity assists in the positioning of the tube on the platform, irrespective of whether additional means for securing the tube on the platform are provided. However, prior art apparatus for tube storage that provide vertical access to a substantially horizontal platform, such as boxes, chests and drawers, have the disadvantage of requiring a relatively large amount of floor space.

[0006] It is an object of the present invention to provide a platform that not only requires relatively little floor space when stored, but also provides convenient use of the platform for the placing or retrieval of objects in storage.

[0007] According to the first aspect of the present invention there is provided a support apparatus comprising a platform rotatably coupled to a mount, the mount being movable between a first position in which the platform is retained against rotation and a second position in which

the platform is rotatable so as to provide access to a first working surface of the platform.

[0008] Thus the apparatus provides storage of the platform with the mount in the first position and access to a working surface of the platform with the mount in the second position.

[0009] Preferably the platform is substantially vertical with the mount in the first position.

[0010] Therefore the apparatus takes up less floor space with the platform stored because the platform is stored on end but is accessed flat.

[0011] Preferably the platform is rotatable about the centre of gravity of the platform.

[0012] Thus the rotation is balanced requiring less effort by the user and the rotating platform does not extend far horizontally from the mount, further conserving floor space during retrieval of the platform.

[0013] Preferably the platform is rotatably coupled to the mount about an axis of rotation.

[0014] Preferably the mount is movable between the first position and the second position by translation in a direction parallel to the axis of rotation.

[0015] Thus the movement of the mount sweeps out a minimal area of floor space.

[0016] Preferably the axis of rotation is coincident with the centre of gravity of the platform.

[0017] Preferably the apparatus comprises a ladder attachment so as to provide a means for coupling to a ladder.

[0018] This is particularly useful when the apparatus is used for storing fluorescent tubes to be mounted on a ceiling and the ladder is used for access to the ceiling for the replacement of fluorescent tubes.

[0019] Preferably the platform is rotatably coupled to the mount at opposing sides of the platform.

[0020] Preferably the mount is U-shaped.

[0021] Preferably the mount comprises a foot for contact with the floor.

[0022] Preferably the foot is at the base of the U shape.

[0023] The incorporation of the foot into the mount provides additional stability of the apparatus when the mount is moved into the second position.

[0024] Preferably the apparatus comprises a catch operable to inhibit the rotation of the platform.

[0025] Preferably the apparatus comprises a handle for moving the mount between the first position and the second position.

[0026] Preferably the apparatus comprises a handle for rotating the platform.

[0027] Preferably the handle for moving the mount is the handle for rotating the platform.

[0028] Preferably the platform comprises a securing means for securing objects.

[0029] Preferably the securing means comprises a means for securing a fluorescent light bulb tube.

[0030] Preferably the securing means comprises a lid.

[0031] Preferably the lid is coupled to the platform by at least one hinge.

[0032] Preferably, the securing means comprises a strap.

[0033] Preferably, the securing means comprises a clip.

[0034] Preferably, the clip is affixed to the platform.

[0035] Preferably the securing means comprises at least one deformable member.

[0036] Optionally the at least one deformable member comprises at least one cut out.

[0037] Preferably the at least one deformable member is mounted on the platform.

[0038] Preferably the at least one deformable member is mounted on the lid.

[0039] Preferably the at least one deformable member comprises foam.

[0040] Preferably the apparatus further comprises a lid securing means.

[0041] Preferably the platform is rotatable so as to provide access to a second working surface of the platform.

[0042] Preferably the second working surface is on the opposite side of the platform from the first surface.

[0043] In this way the platform may be double sided, for example for storage of new tubes on one side and used tubes on the other side.

[0044] Preferably the platform is a drawer.

[0045] According to the second aspect of the present invention there is provided a ladder comprising the support apparatus according to the first aspect.

[0046] Preferably the ladder is a step ladder.

[0047] Embodiments of the present invention will now be described by way of example only with reference to the following figures in which:

Figure 1 shows a fluorescent tube support apparatus and a step ladder, with the apparatus in a storage configuration;

Figure 2 shows a support apparatus with a drawer and mount extended to retrieval position before rotation;

Figure 3 shows a fluorescent tube storage drawer rotated to a retrieval configuration;

Figure 4 shows the retrieved configuration for access to the flip side to a double sided drawer;

Figure 5 shows a support apparatus being transported on a wheeled step ladder;

Figure 6 shows a support apparatus having only one drawer with the apparatus being affixed to a step ladder; and

Figure 7 shows a ladder having the apparatus incorporated so as to provide an integrated table.

[0048] With reference to figure 1 the support apparatus

is shown having three platforms 1 which are drawers. Each is rotatably coupled to a mount 2. In this embodiment in the storage configuration the drawers and mount are enclosed in a cabinet 3. The drawers are retained against rotation. A step ladder 4 is shown having legs 5 that have hooks that are received by cavities, indents, lips, etc in the cabinet 3 such that the cabinet can be carried by the step ladder with the hooks cooperating with the cavities, etc. The other legs of the step ladder 6 are fitted with wheels. Wheels (not shown) may also, or alternatively, be fitted to the support apparatus.

[0049] With reference to figure 2 a drawer 1 has been moved into a second position in which the drawer is no longer retained against rotation and it is therefore rotatable. In this way the apparatus provides storage of the drawer with the mount in the first position as shown in figure 1 and retrieval of the drawer with the mount in the second position as shown in figure 2. The mount is rotatably coupled to the drawer at opposing sides of the drawer 7, 8. The mount conforms to the perimeter 10, 11, 12 of the drawer in a U-shape. The u-shape of the mount allows secure connection to the drawer while not interfering with the contents of the drawer because the mount attaches to the outside of the drawer. At the base of the U-shape the mount has feet 13 that are in contact with the floor when the drawer and mount are moved into the second position. This provides additional stability to the apparatus so that the cabinet does not topple over when the drawer is pulled out. The feet also provide stability for the step ladder, if it is still cooperating with the cabinet. The drawer is rotatable around the axis 9. Because the axis of rotation 9 is coincident with the centre of gravity of the drawer it is easy for a user to rotate the drawer.

[0050] With reference to figure 3 the drawer is shown rotated into a horizontal position. A catch (not shown) keeps the drawer in the horizontal position. The use of a ball catch (not shown) and strike (not shown) allow the drawer to be held in a horizontal position until the user applies a rotational torque to the drawer above a threshold in order to overcome the rotation-inhibiting effect of the catch. Alternatively, the catch may be manually engaged or disengaged. The catch or another catch may also be arranged to catch the drawer in other positions such as a vertical position ready for storage.

[0051] The handle 14 may be either part of the mount or part of the platform. In this embodiment the handle is rigidly attached to the drawer and is used both for pulling out the drawer into the position ready for rotation as well as rotating the drawer into its horizontal retrieval configuration.

[0052] The drawer has a lid 15 attached to it by hinges 16. A lid securing means is provided by a further catch 17 (not shown) that is used to keep the lid open while the user accesses the contents of the drawer. Other lid securing means 18 are provided for keeping the lid closed. The lid is lined with deformable foam 19 such that when the lid is closed the tubes 20 stored in the drawer are in

contact with the foam which is compressed so as to hold the tubes in place. A further layer of foam (not shown) may line the base of the drawer. Either the foam on the lid or the foam in the base may optionally be moulded or have cut outs to further secure the tubes or guide the users in the positioning of tubes in the drawer. Other means of securing the contents of the drawer include straps or clips, for example. Such clips may be affixed to or moulded into the base of the drawer. In this embodiment a drawer is used, although a simple flat platform, having clips or other means for securing mounted on or moulded into it, could also be used.

[0053] The lower side of the drawer shown in figure 3 also has a lid 21.

[0054] With reference to figure 4 the drawer 1 of figure 3 has been rotated through 180° such that the lid 21 is on top and has been opened.

[0055] This double sided drawer contains, for example, new fluorescent tubes 22 on one side as shown in Figure 2 and used fluorescent tubes 20 on the other side, as shown in figure 3.

[0056] Drawers can be removed separately from the cabinet, for example, to be taken away for recycling of their contents. Optionally the mount is removed with the drawer from the cabinet. Such detachable drawer can be swapped out with replacement drawers.

[0057] With reference to figure 5, the step ladder 4, is shown having been folded so that the legs 5 and 6 are brought together and the hooks on the legs 5 of the step ladder are engaged with the cavities on the cabinet 3 so as to retain the cabinet against the step ladder while the step ladder is wheeled around.

[0058] With reference to figures 1 to 5 the use of the apparatus will be described.

[0059] The user approaches the cabinet 3, grasps the handle 14 and pulls the mount 2 and the drawer 1 out of the cabinet. With the drawer extended, the feet 13 directly below the handle are in contact with the floor providing additional stability to the cabinet. The user then rotates the handle causing rotation of the drawer from an upright (vertical) storage position into a flat (horizontal) position. A ball catch and strike cause the drawer to be caught in the horizontal position. The user then releases a catch 18 and opens the lid 15 and secures it with a further catch 17. The user then conveniently places objects in the drawer, for example fluorescent tubes, or removes objects from the drawer. The tubes may be linear of different lengths, or shaped. With the base of the drawer lined by foam, fluorescent tubes can be placed gently into the drawer and arranged carefully so as not to be touching while being held in place in the drawer by gravity. The user then closes the lid 15 which is also lined with foam 19, thereby sandwiching the fluorescent tubes in place between the two layers of foam. The user secures the lid closed with the catch 18 then applies a small torque to the drawer using the handle to overcome the threshold necessary to release the ball catch (not shown). The torque applied by the user may be augmented by press-

ing on the top surface of the lid away from the axis of rotation. The handle 14 is then used to rotate the drawer through 180° so that the user can access the drawer having a lid 21 that had previously been on the underside of the drawer when the lid 15 was open. The ball catch again holds the drawer in a horizontal position. Next, the user rotates the drawer into its vertical position using the handle and pushes the drawer and mount back into the cabinet where the drawer is prevented from rotating. Finally, the user can pick up the cabinet using a step ladder having hooks that engage with a lip, recess, etc at the base on the exterior of the cabinet and tilt the cabinet up onto the step ladder that has wheels so that the cabinet can be moved around.

[0060] With reference to figure 6 a second embodiment of the present invention is shown with a step ladder having a cabinet 23 mounted on it that contains a single drawer and mount. The drawer is shown rotated to the horizontal position with the mount extended. The apparatus may be permanently affixed to the step ladder or detachable from it. A further embodiment has the mount connected directly to the step ladder by a hinge (not shown) extending along the length of a leg of the step ladder, so that the drawer and mount can rotate about the leg of the step ladder.

[0061] With reference to figure 7, a further embodiment has a platform that is for use as a table 24. The table is shown supporting objects 25. Such a table can also be used as a pasting table, conveniently attached to a step ladder which is also used for hanging wallpaper. An advantage of the integrated stepladder pasting table that has feet on the mount is that further stability is provided for the step ladder.

[0062] Improvements and modifications may be incorporated herein without deviating from the scope of the invention.

Claims

1. A support apparatus comprising a platform (1) rotatably coupled to a mount (2), the mount being movable between a first position in which the platform is retained against rotation and a second position in which the platform is rotatable so as to provide access to a first working surface (20) of the platform.
2. The support apparatus of claim 1, wherein the platform (1) is substantially vertical with the mount (2) in the first position.
3. The support apparatus of claim 1 or 2, wherein the platform (1) is rotatable about the centre of gravity of the platform (1).
4. The support apparatus of any previous claim, wherein the platform (1) is rotatably coupled to the mount (2) about an axis of rotation (9).

5. The support apparatus of claim 4, wherein the mount (2) is movable between the first position and the second position by translation in a direction parallel to the axis of rotation (9).
6. The support apparatus of claim 4 or 5, wherein the axis of rotation (9) is coincident with the centre of gravity of the platform (1).
7. The support apparatus of any previous claim, wherein the apparatus comprises a ladder attachment so as to provide a means for coupling to a ladder (4).
8. The support apparatus of any previous claim, wherein the platform (1) is rotatably coupled to the mount (2) at opposing sides (7, 8) of the platform (1).
9. The support apparatus of any previous claim, wherein the mount (2) is U-shaped.
10. The support apparatus of any previous claim, wherein the mount (2) comprises a foot (13) for contact with the floor.
11. The support apparatus of claim 10 depending on claim 9, wherein the foot (13) is at the base of the U shape.
12. The support apparatus of any previous claim, wherein the apparatus comprises a catch operable to inhibit the rotation of the platform (1).
13. The support apparatus of any previous claim, wherein the apparatus comprises a handle (14) for moving the mount (2) between the first position and the second position.
14. The support apparatus of any previous claim, wherein the apparatus comprises a handle (14) for rotating the platform (1).
15. The support apparatus of claim 14 depending on claim 13, wherein the handle (14) for moving the mount (2) is the handle (14) for rotating the platform (1).
16. The support apparatus of any previous claim, wherein the platform (1) comprises a securing means (15) for securing objects.
17. The support apparatus of claim 16, wherein the securing means (15) comprises a means for securing a fluorescent light bulb tube (20).
18. The support apparatus of claim 16 or 17, wherein the securing means comprises a lid (15).
19. The support apparatus of claim 18, wherein the lid (15) is coupled to the platform (1) by at least one hinge (16).
20. The support apparatus of claim 16 or 17, wherein the securing means comprises a strap.
21. The support apparatus of claim 16 or 17, wherein the securing means comprises a clip.
22. The support apparatus of claim 21, wherein the clip is affixed to the platform (1).
23. The support apparatus of any of claims claim 16 to 22, wherein the securing means comprises at least one deformable member (19).
24. The support apparatus of claim 23, wherein the at least one deformable member (19) comprises at least one cut out.
25. The support apparatus of claims 23 or 24, wherein the at least one deformable member (19) is mounted on the platform (1).
26. The support apparatus of claims 23 or 24, wherein the at least one deformable member (19) is mounted on the lid (15).
27. The support apparatus of any of claims 23 to 26, wherein the at least one deformable member (19) comprises foam.
28. The support apparatus of any previous claim, wherein the apparatus further comprises a lid securing means (18).
29. The support apparatus of any previous claim, wherein the platform (1) is rotatable so as to provide access to a second working surface (22) of the platform (1).
30. The support apparatus of claim 29, wherein the second working surface (22) is on the opposite side of the platform (1) from the first surface (20).
31. The support apparatus of any previous claim, wherein the platform (1) is a drawer.
32. A ladder (4) comprising the support apparatus according to any previous claim.
33. The ladder (4) of claim 32, wherein the ladder (4) is a step ladder.

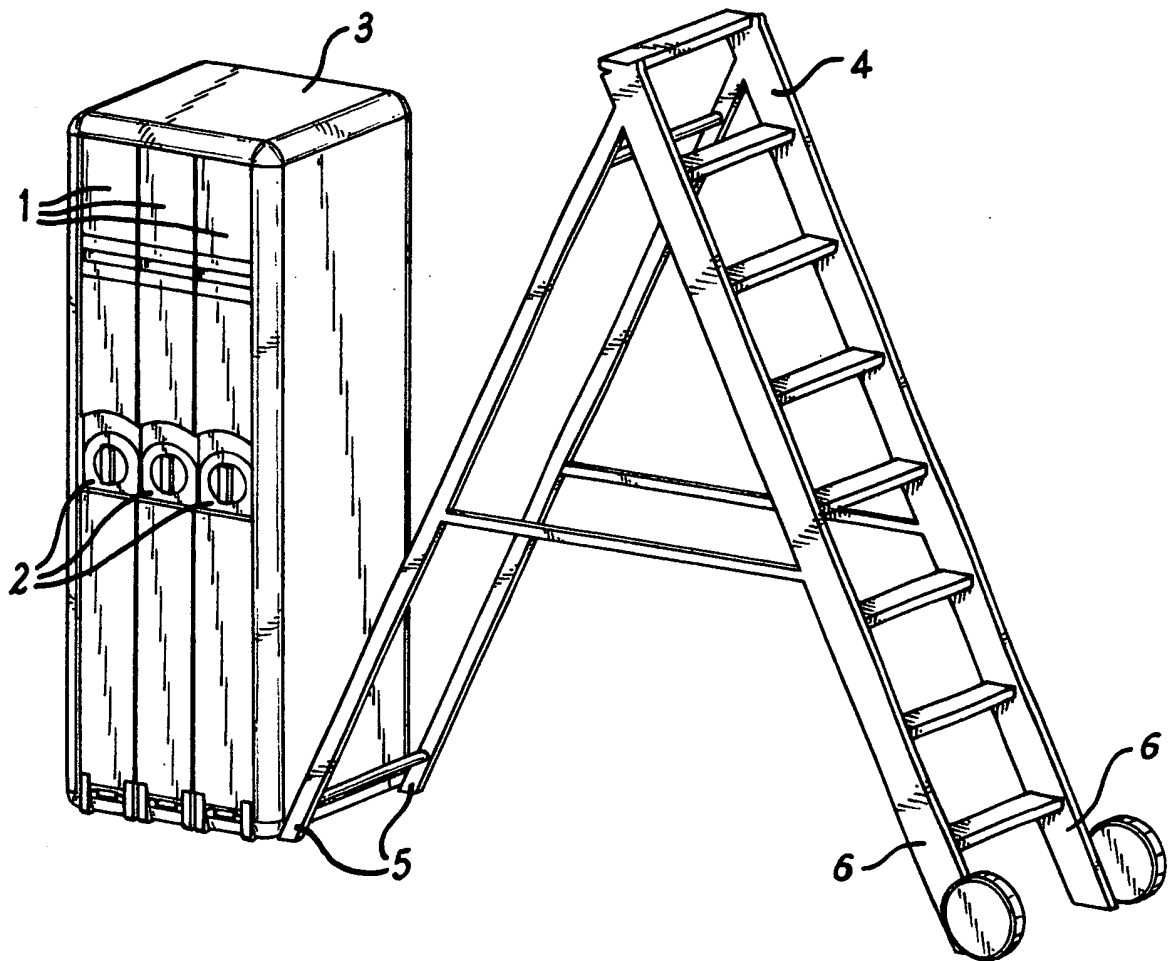


FIG. 1

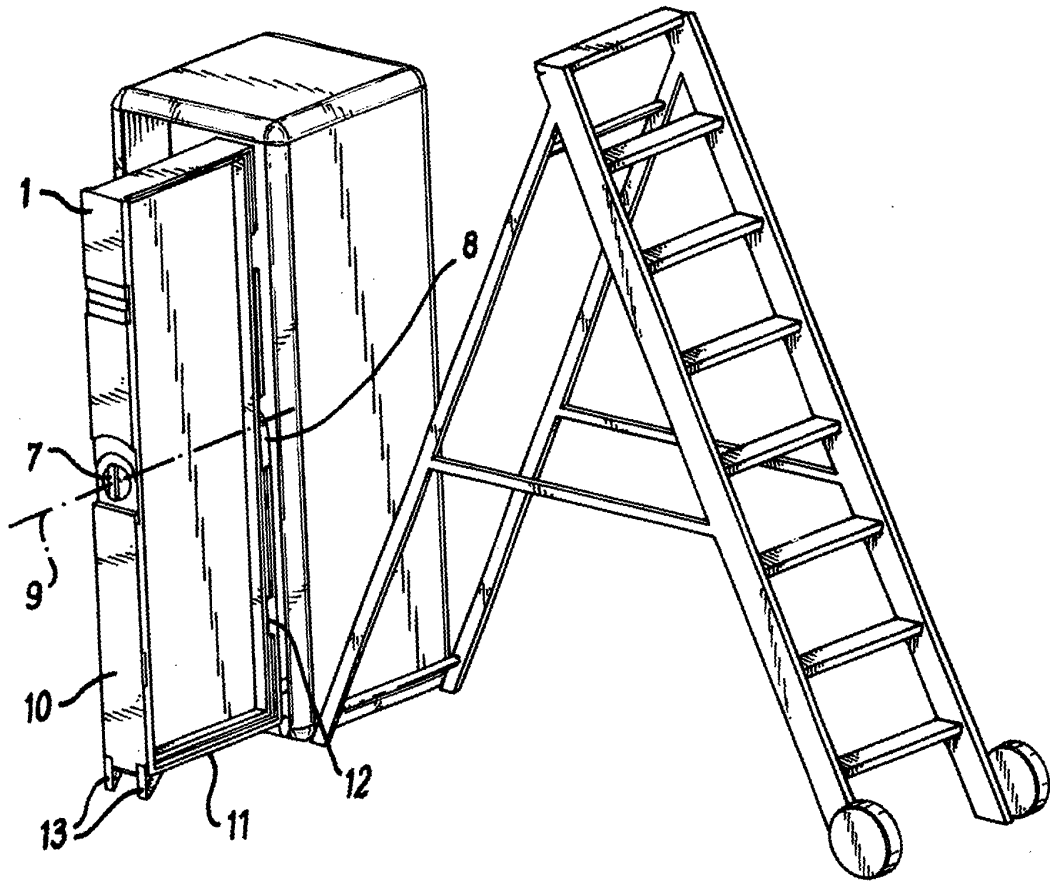


FIG. 2

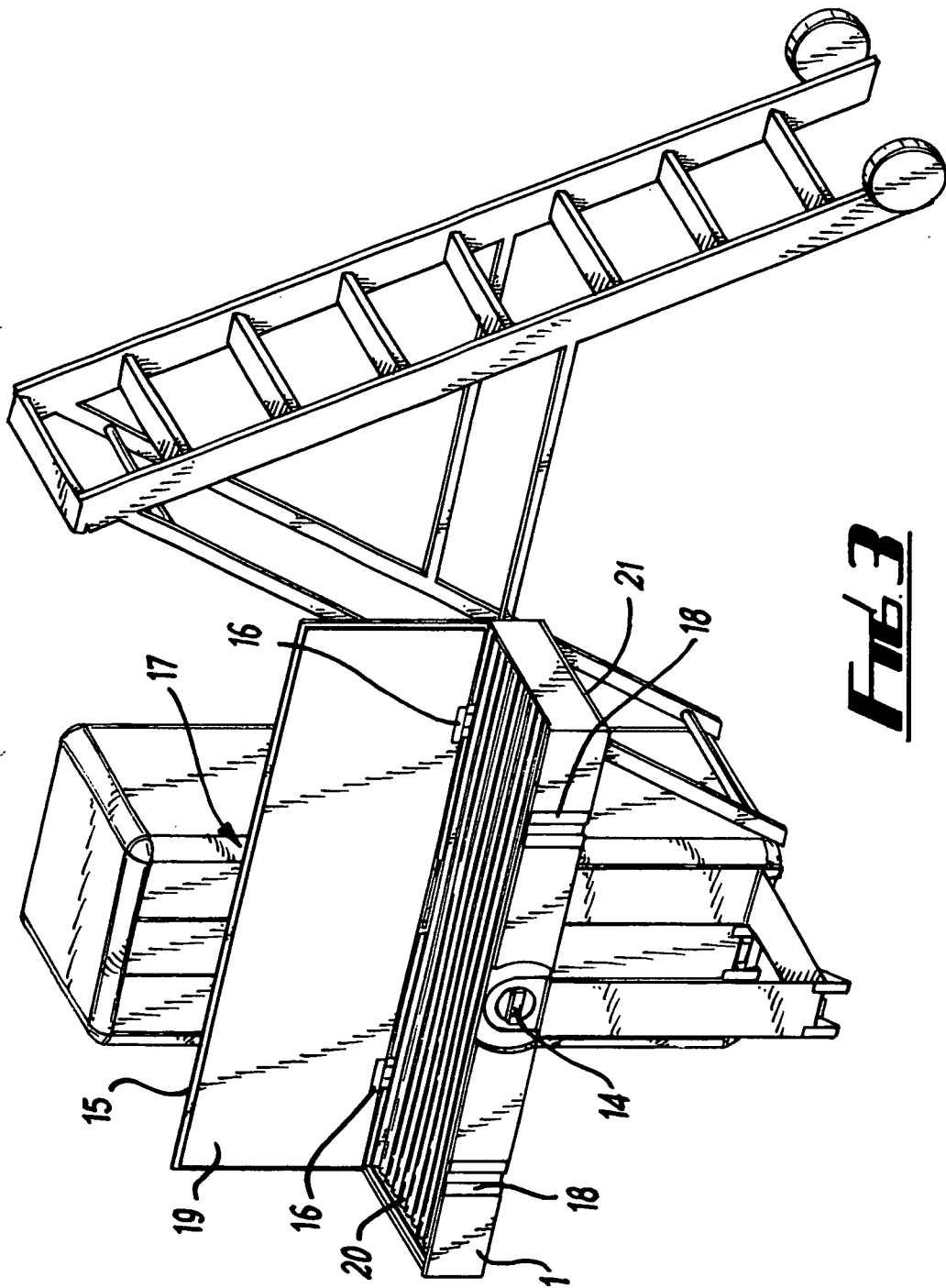


Fig. 3

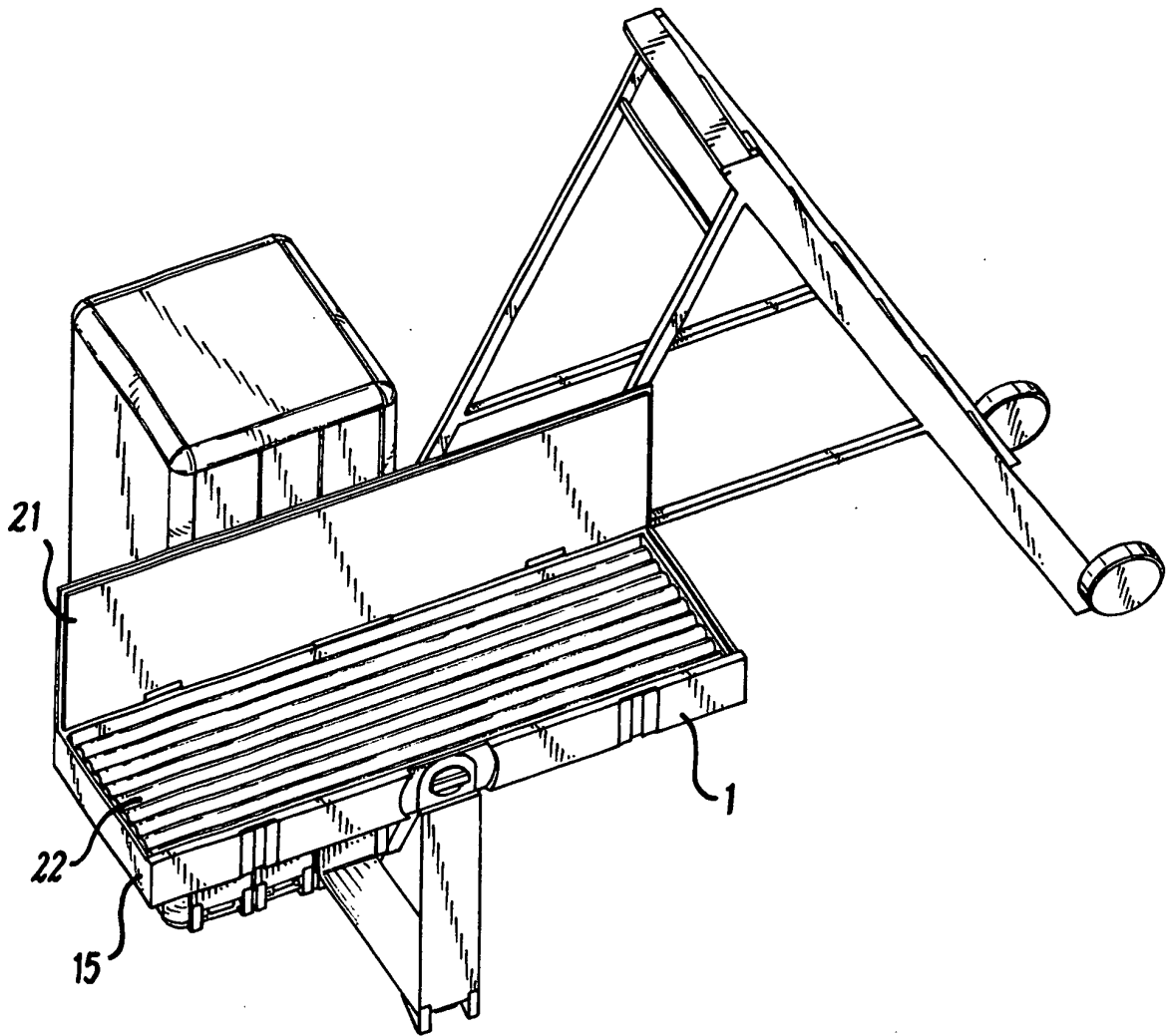


FIG. 4

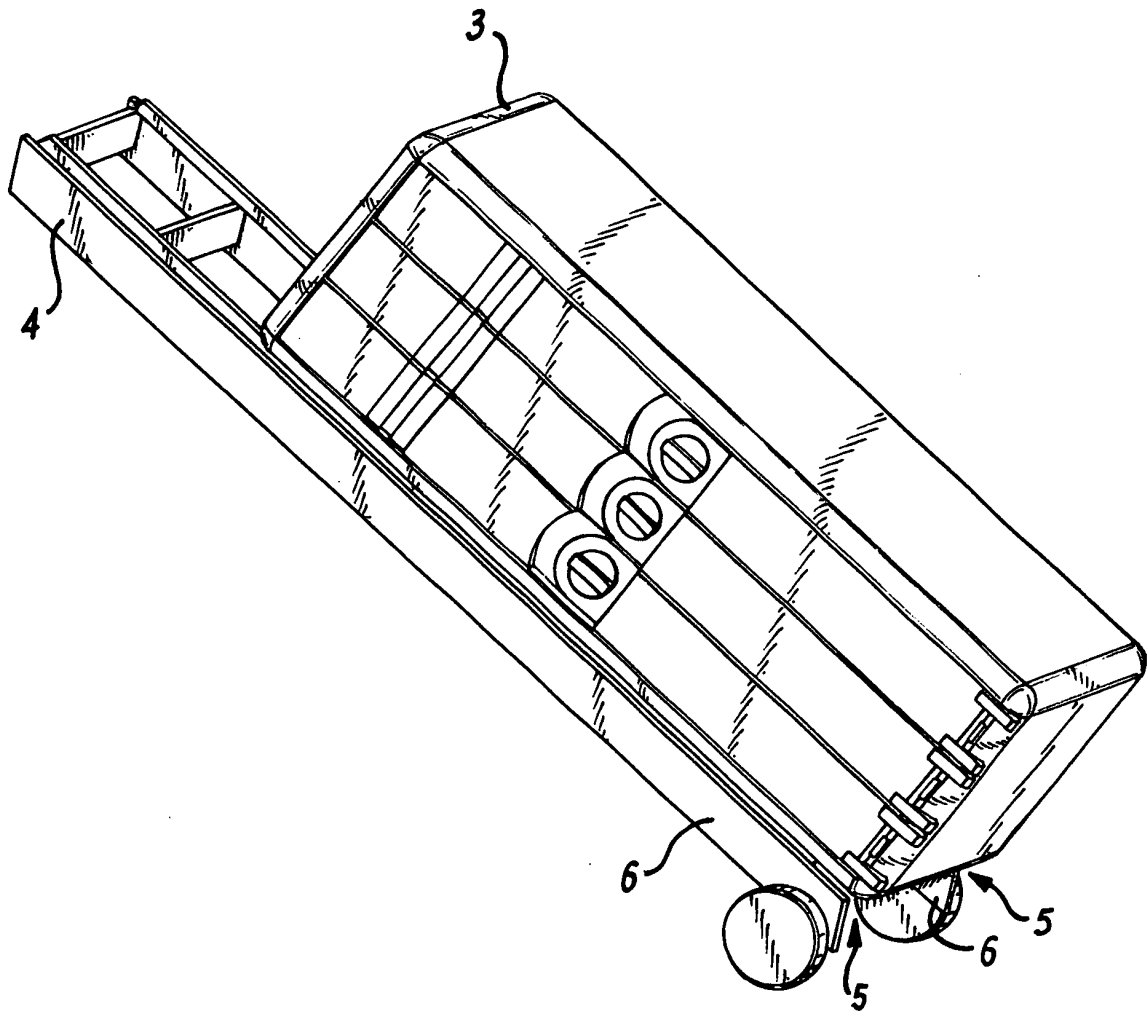


Fig. 5

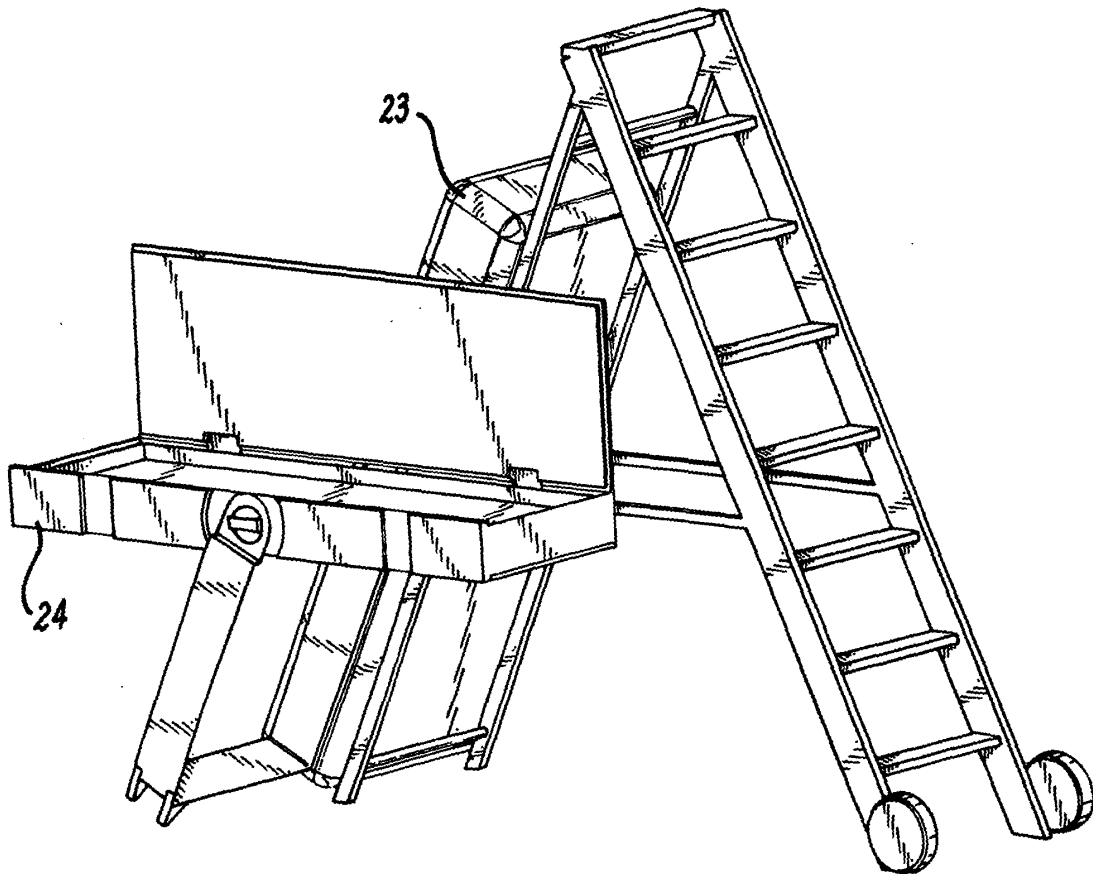
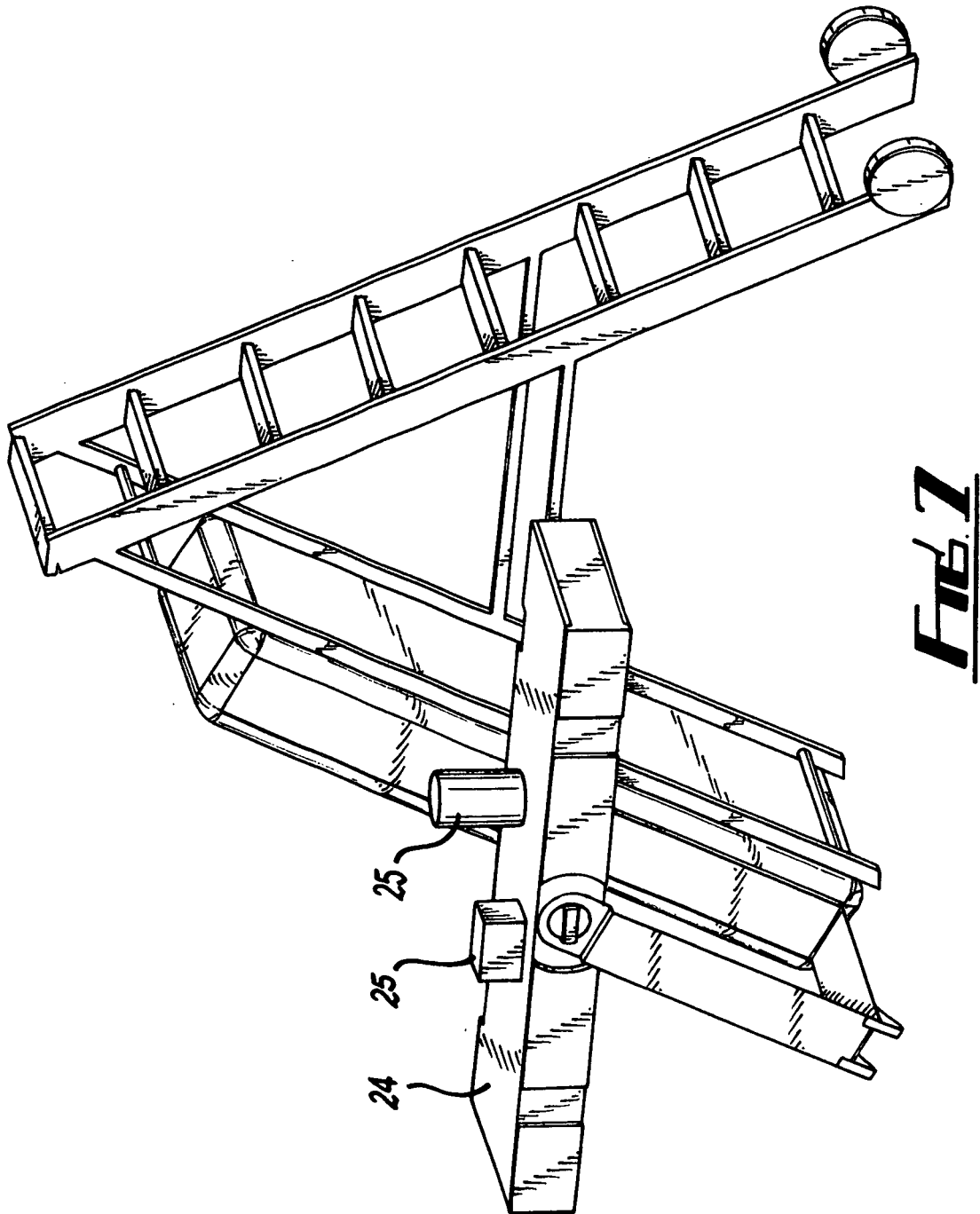


FIG. 6





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	US 5 248 030 A1 (TAROZZI RICHARD A [US]) 28 September 1993 (1993-09-28) * figures 3-5 *	1,4	TECHNICAL FIELDS SEARCHED (IPC) E06C B25H B65G H01J A47B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 16 March 2007	Examiner Popma, Ronald
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 06 25 5785

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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16-03-2007

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