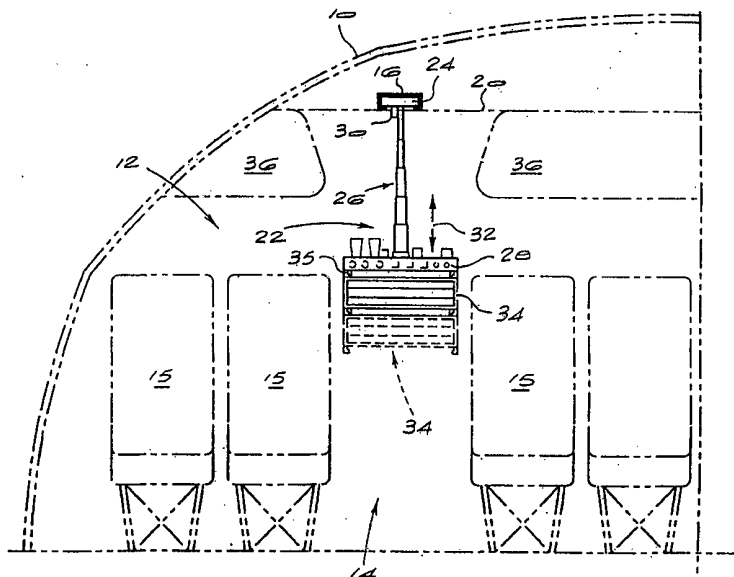




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(54) Title: TRANSPORTING A CATERING CONTAINER**(57) Abstract**

A method and transport system (22) for transporting and dispensing items to passengers in an aircraft (10). The transport system runs on an overhead track (16) positioned along the passage (14) between the passengers' seats (15). A carriage (14) is movable along the track and a catering container (34) is suspended from the carriage by means of a telescopic post (26). The post is selectively extended and contracted to lower and raise the catering container to a convenient level to facilitate serving from the catering container by a cabin attendant. The track extends to a galley or stowing bay (18) where fresh and empty catering containers can be stowed.

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TRANSPORTING A CATERING CONTAINER

BACKGROUND TO THE INVENTION

THIS invention relates to a method of transporting a catering container in a passenger craft and to a transport system for transporting a catering container.

This invention is expected to be especially applicable to catering in a passenger aircraft, and this application will exclusively be borne in mind for purposes of illustrating and describing the invention. The invention is, however, not limited to this specific application.

SUMMARY OF THE INVENTION

According to the invention there is provided a method of transporting a catering container along a passage among seated passengers in a passenger craft, the method including the steps of providing an overhead track along the passage and a carriage movable along the track, releasably suspending the catering container from the carriage by elevating means that are operable to selectively raise and lower the catering container, and transporting the catering container along the track.

The method may include raising the catering container, when passengers need to use the passage, to enable passengers to pass beneath the position of the catering container when it is in use.

The elevating means may be telescopic and raising the catering container may then be by contracting the elevating means, which may be effected electrically.

Instead, the elevating means may include one or more swing arms and raising the catering container may be by pivoting the swing arms appropriately.

The method may include locking the elevating means in a raised condition to prevent the catering container from inadvertently falling or suddenly being lowered.

The method may include braking or locking the carriage to brake the catering container against inadvertent or undesired displacement along the passage. Braking or locking may be automatic i.e. to transport the container braking or locking has to be selectively terminated, in the interests of safety.

The method may include stowing the catering container in a galley or stowing bay by routing the track appropriately to the galley or stowing bay. Stowing

may include placing the catering container in a stowing means such as a trolley or cupboard and disconnecting the catering container from the elevating means.

By way of development, the method may include providing a plurality of catering containers in a stowing means such as a trolley or cupboard, selecting a desired catering container and connecting it to the elevating means for transport. The method may correspondingly include off-loading a depleted catering container into the stowing means and loading a fresh catering container onto the elevating means.

The invention extends to a transport system for transporting a catering container along a passage of a passenger craft, the transport system including:

- an overhead track along the passage;
- a carriage movable along the track;
- elevating means carried on the carriage and being selectively raisable and lowerable;
- a catering container releasably connectable to the elevating means.

The transport system may include propelling means for propelling the carriage to and fro along the track. The propelling means may be electric.

The transport system may include braking or locking means for releasably braking the catering container against inadvertent or undesired displacement along the track. As mentioned above, the braking means or locking means may be normally actuated i.e. the braking or locking means has to be deactivated to allow displacement of the catering container along the track.

The elevating means may include a telescopic post and extending and contracting means operable to selectively extend and contract the post respectively to lower and raise the catering container.

Instead, the elevating means may include one or more swing arms which are pivotal to raise and lower the catering container. Power driven, i.e. electrically driven, pivot means may be provided to pivot the swing arm(s) in use.

The track may extend to a galley or stowing bay where catering containers can be stowed. Thus, by way of development, the transport system may include stowing means for stowing a plurality of catering containers. The stowing means may be in the form of a trolley or cupboard.

In accordance with a further aspect of the invention, there is provided an aircraft having installed therein a transport system in accordance with this invention.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is now described by way of example only, with reference to the accompanying drawings, in which:

Figure 1 shows a fragmentary, schematic plan view of a passenger aircraft with the layout of a track of a transport system according to the invention, the track extending along passages in a passenger compartment of the aircraft;

Figure 2 shows a cross-sectional view of the passenger compartment of the aircraft with the transport system *in situ*; and

Figure 3 shows a perspective view of a stowing compartment forming part of the transport system of Figure 2.

DETAILED DESCRIPTION OF THE DRAWINGS

With reference to Figure 1 of the drawings, a passenger aircraft is shown in schematic form and is generally indicated by reference numeral 10. It has a passenger compartment 12 and passages 14 extending longitudinally along the passenger compartment among the passenger seats 15.

Overhead tracks 16 are provided along the passages 14. The overhead tracks also extend through galleys or stowing bays, generally indicated by reference numeral 18.

With reference to Figure 2, the overhead track 16 is shown recessed in a roof 20 of the passenger compartment 12, the track being positioned generally centrally along the passage 14.

A transport system, generally indicated by reference numeral 22, comprises a carriage 24 is located in the track 16 and rollable along the track.

Elevating means in the form of a telescopic post 26 is carried by the carriage 24. A base 28 is connected at the bottom of the telescopic post. A drive 30, which may conveniently be an electric drive, is schematically indicated and is arranged selectively to contract and extend the telescopic post 26, as indicated by arrows 32, thereby raising and lowering the base.

The transport system 22 further comprises a plurality of catering containers, one of which is schematically indicated by reference numeral 34. The catering container and the base 28 have complimentary inter-connecting means 35, which are readily releasable to connect the catering container to the base 28. By way of development, at the bottom of the catering container, there may be connecting means similar to those of the base to enable one or more similar catering containers, shown in fragmentary detail in Figure 2, to be readily releasably connected underneath the first mentioned catering container.

Generally the telescopic post 26 will normally be raised or lowered to a convenient level to facilitate serving from the relevant catering container by a cabin attendant.

It will be appreciated that various designs and sizes of catering containers may be interconnected in the above manner. Containers may be configured to facilitate transportation of food trays or food products, beverages, newspapers and any other items which may be dispensed to passengers. Furthermore, depending on the application, the containers may incorporate additional features such as thermal insulation, heating, refrigeration, illumination or the like.

The catering containers 34 are easily displaceable along the passage by rolling the carriage 24 along the track 16. If desired, power propelling means (not shown) may be mounted on the carriage, for example in the form of an electric motor, selectively exerting propelling effort onto the track to propel the carriage along the passage 14.

It is considered important that braking or locking means are provided to brake or lock the transport system 22 from unwanted displacement along the passage 14. The braking or locking means may conveniently be operative between the carriage 24 and the track 16. Alternatively, if convenient, the braking and locking means may be incorporated in the propelling means. Furthermore, it may be desirable for the braking or locking means to be automatically actuated during normal use, to brake or lock the catering containers 34 against displacement. The transport system would then be readily releasable, for example by a cabin attendant, when the catering container is to be moved along the passage.

When a passenger wishes to use the passage beyond a position where the transport system 22 is being deployed, the telescopic post 26 may be

contracted to raise the catering containers 34 to a position where it is adjacent to the cabin luggage stowing containers 36. The passage 14 is thereby opened up and access is provided for the passenger to pass. Preferably, in such circumstances the telescopic post 26 is locked in its contracted condition. When the passenger has passed, the telescopic post can be unlocked permitting the catering containers to be lowered, and enabling catering to continue.

In the galleys or stowing bays 18, stowing means, such as a trolley 38, as shown in Figure 3, are provided. The stowing means, which may also be in the form of cupboards, housing a plurality of catering containers 34. The trolleys are mounted on casters 40 and are transported into the aircraft 10 in conventional fashion prior to the flight commencing, with the catering containers 34 charged with food, beverages, duty free goods and the like.

As can be seen in Figure 3, the catering containers 34 can selectively be slid from the bulk of the trolley 38 to be available for connection with the elevating means. Therefore the tracks 16 lead into or through the galleys or stowing bays 18 to facilitate the loading of the catering containers on the transport system. When connected, the selected catering containers are moved along the track to dispense the food, beverages and the like to the passengers.

When the contents of the catering containers 34 have been depleted, the catering containers are returned to the trolley 38 to be unloaded and stowed, while a fresh catering container can be connected and transported away for catering.

It is believed that there are a number of significant benefits relating to the invention, including:

- the transport system will not block the passages of the aircraft when deployed and may be raised to open up the passages

enabling passengers to move beneath the transport system and along the passage.

- the catering containers can more easily be transported along a passage when suspended from the carriage than in the case of conventional trolleys, which are to be wheeled along the passage.
- the transport system is guided, thereby preventing the catering containers from bumping against the passengers' seats.
- the catering containers may be lowered or raised to a convenient level to allow serving therefrom by the cabin attendants.
- the transport system may be locked or braked to prevent inadvertent displacement along the passage.

It will be appreciated that additional savings in mass and volume may be achieved in accordance with the invention. As the catering containers are stackable and modular, less space will be required in the galleys or stowing bays. Aircraft may in future have galleys or stowing bays located beneath the passenger sections of the aircraft. It is within the scope of the invention that the tracks of the transport system may be directed to different levels of the aircraft to accommodate this modification.

Also, because a single track, carriage, post and the like are used to transport any number of catering containers in succession, only the catering containers themselves have to be multiplied. Accordingly, a saving in mass is also expected to be achievable as the catering containers are light, in comparison with conventional trolleys which are regarded as bulky, cumbersome and heavy.

Also, full automation of the transport system is contemplated as being within the scope of the invention. In this way the number of cabin attendants could be minimised. For example, a passenger could order food or beverages via a console located on or next to the passenger's seat. A catering container could then be transported to the passenger.

Alternatively, the transportation system could move slowly along the passage automatically, and passengers could stop the system if desired, and dispense products from the catering containers themselves. Furthermore, infra-red or similar proximity sensors could be placed on the transport system to detect passengers that wish to pass by. When the sensor is triggered, the transport system would be elevated to provide access beneath the catering containers.

CLAIMS:

1. A method of transporting a catering container along a passage among seated passengers in a passenger craft, the method comprising steps of:
 - providing an overhead track along the passage,
 - having a carriage that is movable along the track,
 - releasably suspending the catering container from the carriage by elevating means, the elevating means being operable to selectively raise and lower the catering container, and
 - transporting the catering container along the track.
2. A method according to claim 1, further including the step of raising the catering container to enable passengers to pass under the catering container when passengers need to use the passage.
3. A method according to claim 1 or claim 2, wherein the elevating means is telescopic and the catering container is raised by contracting the telescopic elevating means.
4. A method according to claim 3, wherein the contraction of the telescopic elevating means is effected electrically.
5. A method according to claim 1 or claim 2, wherein the elevating means includes one or more swing arms and the catering container is raised by pivoting the swing arms.

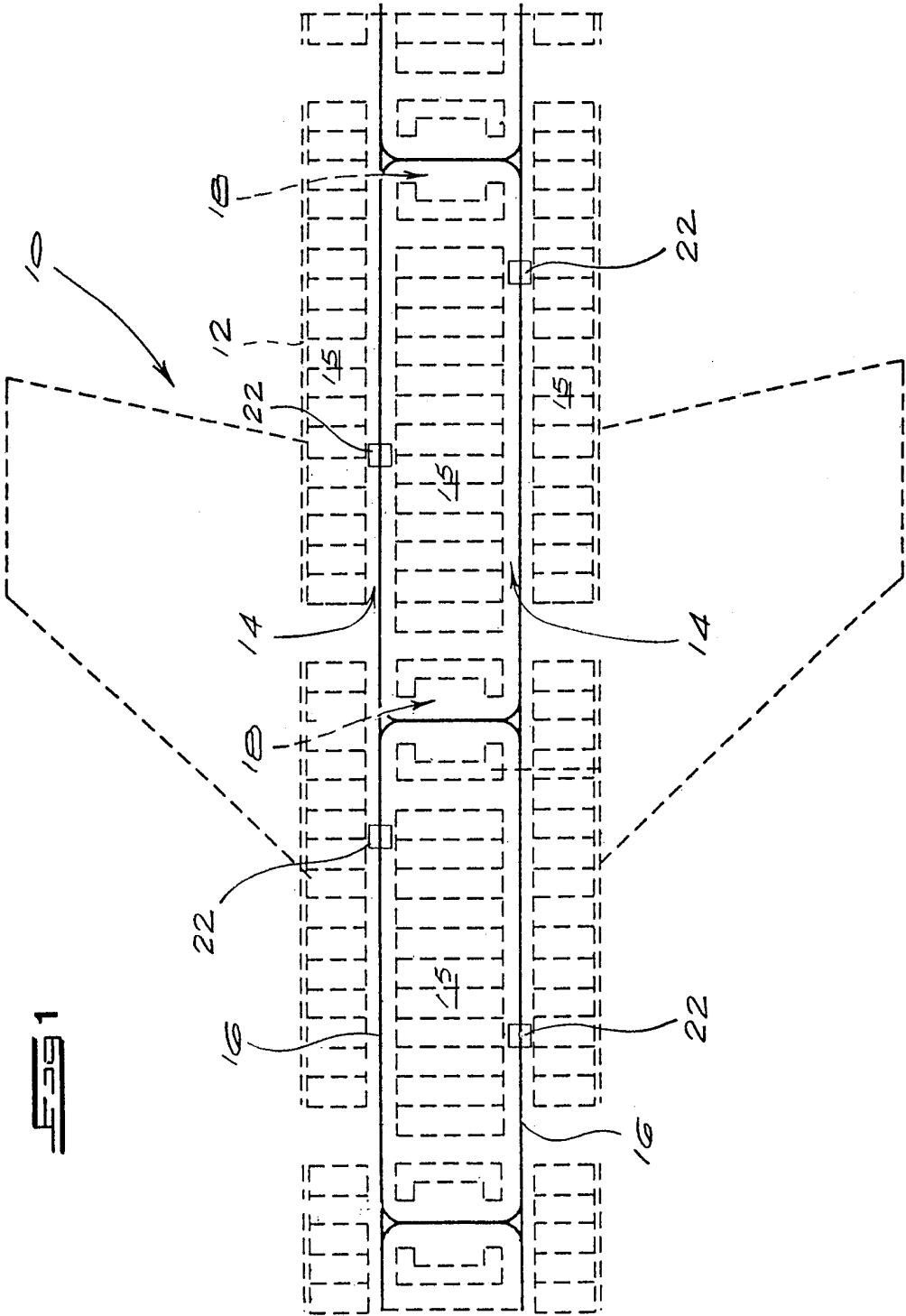
6. A method according to any one of the above claims, further including the step of releasably locking the elevating means in a raised condition to prevent the catering container from inadvertently falling or from suddenly being lowered.
7. A method according to any one of the above claims, further including the step of releasably braking or locking the carriage in a position on the track to prevent the catering container from inadvertent or undesired displacement along the passage.
8. A method according to claim 7, wherein the carriage is biased towards a locked condition that must be selectively disengaged for transportation of the catering container to take place.
9. A method according to any one of the above claims, further including the step of stowing the catering container in a galley or stowing bay, by routing the track to the galley or stowing bay.
10. A method according to claim 9, wherein stowing of the catering container includes placing the catering container in a stowing means and disconnecting the catering container from the elevating means.
11. A method according to claim 10, wherein the stowing means is a trolley or a cupboard.
12. A method according to any one of claims 1 to 9, further including the steps of providing a plurality of catering containers in a stowing

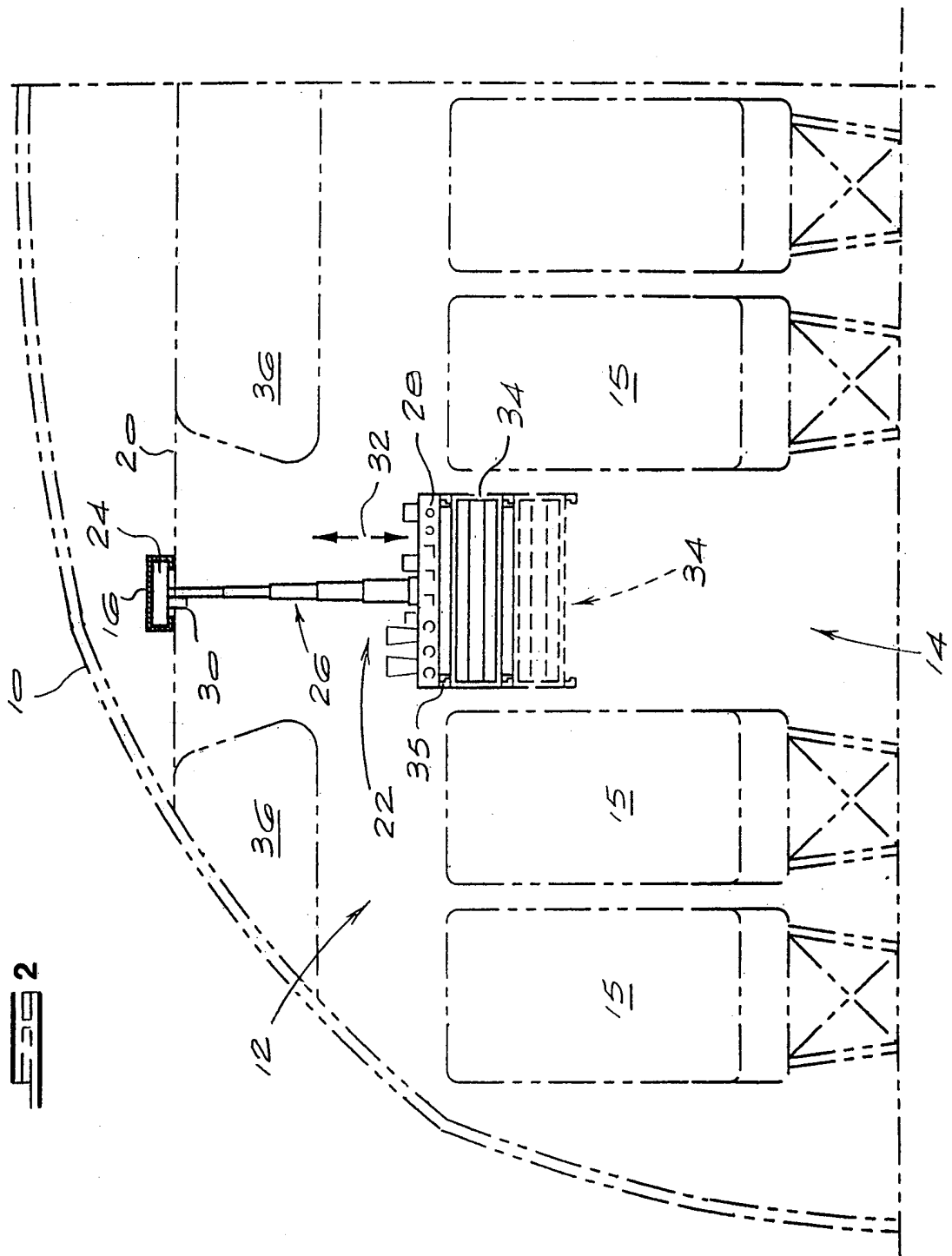
means, selecting a desired catering container and connecting it to the elevating means for transport.

13. A method according to any one of claims 1 to 9, further including the steps of off-loading a depleted catering container into a stowing means and loading a fresh catering container onto the elevating means.
14. A method according to any one of the above claims, wherein one or more of the steps are automated.
15. A transport system for transporting a catering container along a passage of a passenger craft, the transport system comprising:
 - an overhead track along the passage,
 - a carriage that is movable along the track, and
 - a catering container releasably connectable to the carriage.
16. A transport system according to claim 15, wherein the transport system includes elevating means provided on the carriage, the elevating means being selectively raisable and lowerable.
17. A transport system according to claim 15 or claim 16, further including propelling means for propelling the carriage along the track.
18. A transport system according to claim 17, wherein the propelling means is electric.

19. A transport system according to any one of claims 15 to 18, further including braking or locking means for releasably preventing the catering container from inadvertent or undesired displacement along the track.
20. A transport system according to claim 19, wherein the braking or locking means is biased towards an actuated condition, which must be released to allow displacement of the catering container along the passage.
21. A transport system according to claim 16, wherein the elevating means is a telescopic post having extending and contracting means operable selectively to lower and raise the catering container.
22. A transport system according to claim 21, wherein the extending and/or contracting means are electrically driven.
23. A transport system according to claim 16, wherein the elevating means comprises one or more swing arms, which are pivotal to raise and lower the catering container.
24. A transport system according to claim 23, wherein power driven pivot means is provided which is operable to pivot the swing arm(s).
25. A transport system according to claim 24, wherein the pivot means is electrically driven.

26. A transport system according to any one of claims 15 to 25, wherein the track extends to a galley or stowing bay where catering containers are stowed.
27. A transport system according to claim 26, wherein stowing means are provided for stowing a plurality of catering containers.
28. A transport system according to claim 27, wherein each of the stowing means is in the form of a trolley or cupboard.
29. A transport system according to any one of claims 15 to 28, wherein the transport system is at least partially automated.
30. An aircraft having installed therein a transport system according to any one of claims 15 to 29.
31. A method of transporting a catering container along a passage among seated passengers in a passenger craft substantially as herein described with reference to the accompanying drawings.
32. A transport system for transporting a catering container along a passage of a passenger craft substantially as herein described with reference to the accompanying drawings.





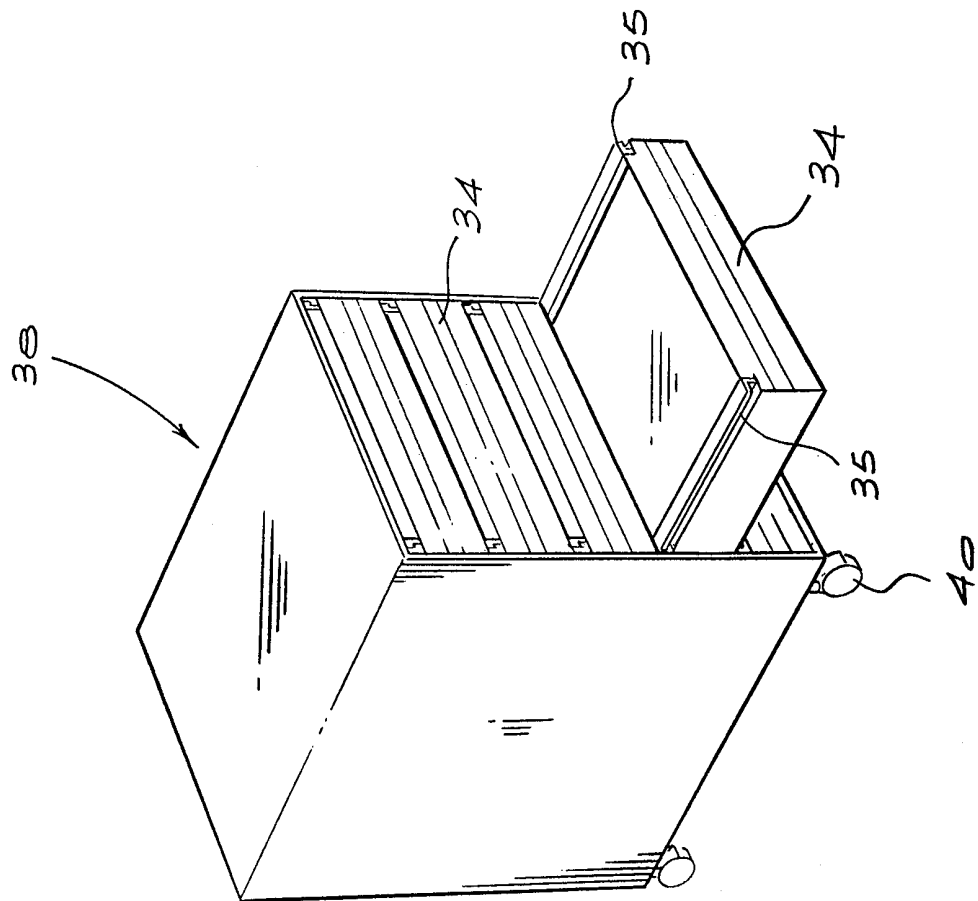


Fig. 3