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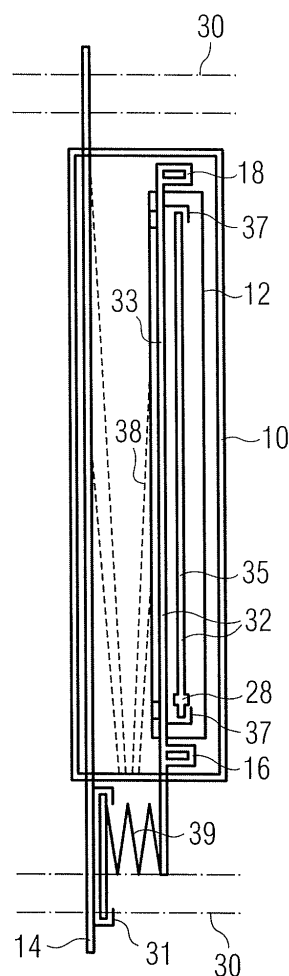
This application was filed on 01-12-2010 as a divisional application to the application mentioned under INID code 62.

(54) **Pocket for mail items**

(57) The invention relates to a pocket (5) for accepting items (38), comprising: a partition (14) arranged to form a backbone of said pocket (5) and to be guided on at least one rod (30); a bag (10) arranged about said partition (14); and means for attaching said bag (10) to said partition (14).

The pocket is characterized by a separator sheet (32) arranged within the bag (10) and attached to the partition (14); and a belt (12) arranged between the items (38) and the separator sheet (32).

FIG 2



Description

[0001] The present invention is directed to pockets or bags for items, such as mail items. The terms pockets and bags will be used interchangeably throughout the application to indicate a means for accommodating particular items therein.

[0002] US patent number 6,715,614 describes example bags which may be used with the present invention. The present invention may be used with other bags and items as envisioned by one skilled in the art. The present invention will be described herein below with respect to the above noted bags and with respect to mail items and the sorting of same.

[0003] U.S. Patent Application Publication US 2005/241968 discloses an expandable and collapsible holder which has a top surface and a bottom, releasable surface. Opposing side walls are hinge mounted between the top surface and the bottom surface. A latch mechanism and actuator such as a solenoid control the opening of the bottom, releasable surface. A system is also provided which uses the expandable holder.

[0004] One system for mail sorting is known as Delivery Point Packaging (DPP). DPP's provide a volume of mail in a carrier based delivery point sequence. An example DPP system is the Autocaser system which may comprise two U-shaped casing towers arranged side by side. Each tower carries, on a given number of levels, vertical oriented slots. The slots may be grouped in containers or pods wherein most or all mail for a delivery point is inserted. The insertion may be effected by autonomous moving vehicles. Each of the vehicles may carry one piece of mail. Each of the two casing towers may be further connected to two loading points. Each loading point may further be connected to one or more feeders via a conveyor system. After the mail is appropriately sorted, it is packaged. One form of packaging is polywrapping. Here, a select number of mail items are emptied directly into a polywrapper which envelopes the select number in a polywrap for easier handling. The polywrapper may be loaded either from the side or from the top. The process is repeated for each pocket, generally sequentially, until the pod is empty and ready to be re-sorted back into the casing tower.

[0005] A difficulty with the above process is the extraction of mail items from the pocket while preserving the pocket shape. Heretofore systems relied upon a bezel which may be cumbersome and complicated to implement and use. An additional difficulty lay in maintaining mail items in pockets during pocket handling. A still further difficulty lay with the mail extraction process as a whole, a process which like the bezel is cumbersome and complicated to implement and use.

[0006] Objects of the present invention include addressing the above and related problems in this art.

[0007] A pocket according to the invention comprises the features of claim 1. Additional features of the present invention are set out in dependent claims appended here-

to.

[0008] As such, the invention is directed to a pocket for accepting items, comprising a partition arranged to form a backbone of said pocket and to be guided on at least one rod, a bag arranged about said partition, and means for attaching said bag to said partition. The bag is further characterized by a separator sheet arranged within the bag and attached to the partition, and a belt arranged between the items and the separator sheet.

[0009] A preferred embodiment is directed to a pocket having a partition which may function as a support structure. The partition includes a pair of clamps which may be coupled into place to clamp the bag to the partition. Such a design replaces heretofore used bezel devices. The pocket or bag may further be fixed to the partition by clamps. As indicated above, the present invention may be implemented with a series of bags. Accordingly, the actually number of pockets or bags is a matter of design choice.

[0010] The partitions include ends shaped to interact with and otherwise be accommodated by at least one rod. Accordingly, the partition with its respective pocket or bag may be selectively and laterally positioned along the at least one rod. The at least one rod may be a pair of substantially parallel and planar rods belonging to a pod or fixed to the side walls of carrier segments of a horizontal carrier.

[0011] The pocket may further include a separator sheet having a post connected to the partition. The connection may be effected via a spring, such as a leaf spring. Accordingly, a space between partition and separator sheet is formed, within which the mail items may be accommodated. The separator sheet further includes a pair of posts arranged to extend substantially the length of the bag when the separator sheet and partition retracted from the bag. A belt is arranged to flow freely about the separator sheet and between the mail items and separator sheet and further fixed at one location of the separator sheet, such as the post. A hook is attached to the separator sheet and arranged to extend out from a bag. The hook may be externally engaged to retract the separator sheet from the bag. When retracted, remains substantially motionless with respect to the mail items while peeling away and/or following the retracting separator sheet such that the relative motion of the separator sheet with respect to the mail items does not displace the mail items.

[0012] In addition, the pocket may further comprise: a post attached to a partition; a separator sheet attached to said post; and a belt arranged about said separator sheet and attached to said post, such that when said separator sheet is moved substantially no relative motion exists between said belt and said items.

[0013] The pockets as described above may be used in a method of transferring bags within which items are stacked into a container, the method comprising the steps of: retracting said bags from a pod, said pod comprising a plurality of bags each attached to a plate, each

plate being attached to a pair of rods; placing said bags into a container; disengaging each of said bags from each of a respective plate; retracting each of said plates from a respective bag and container; relocate said plates to a replenishment station; replenishing said bags; and inserting said plates and bags into a pod.

[0014] Embodiments of the present invention will be discussed in more detail below with reference to the appended drawings, wherein:

- Figure 1 depicts a view of the pocket;
- Figure 2 depicts a cross sectional view of the pocket; and
- Figure 3 depicts a method of handling a pocket.

[0015] The pocket will be described with general reference to figures 1 and 2 wherein like numerals refer to like parts. Figure 1 depicts pocket 5 including a bag 10 arranged about a partition 14. Partition 14 is depicted extending out of the bag 10 and including a pair of overhangs 26 and 36. The overhangs are arranged to interact with rods 30 so that the partition, and with it the depicted pocket 5, can selectively and laterally positioned along the rods 30. The partition includes a pair of clamps 20 arranged to affix the bag 10 to the partition 14. The clamps may be arranged to interact with a specially shaped rod which, as will be detailed below, when turned uncouples and/or couples the clamps.

[0016] As depicted in figure 2, a separator sheet 32 is arranged within bag 10 and attached to the partition 14 via leaf spring 39. Mail items 38, to be stored in the bag 10, are located between separator sheet 32 and partition 14. The separator sheet includes two parts, a first 33 connected to the partition and including a pair of opposing overhangs 37, a second 35 running within the overhangs 37 in a lateral direction of the bag. A hook 28 (figure 1), is attached to the second part 35. The separator sheet 32 further includes two posts 18 and 16 extending the approximate length of the bag so as to assist in maintaining the bags shape as will be detailed below. Alternatively, the two posts may be arranged to slide within the partition. A belt 12 is arranged to run freely about the length of the separator sheet 35 and between the mail items 38 and separator sheet 35. Another belt (not shown) may be arranged about the partition itself. As depicted, the belt 12 is affixed to post 33 at a limited location; however, as indicated above, the belt may be attached at other locations. Accordingly, when hook 28 is pulled in a direction out of the bag, the relative motion of the separator sheet is absorbed and otherwise displaced by the belt so as not to disturb the mail items 38. In addition, the post 33 is translatable on the partition. Accordingly, additional overhangs 31 facilitate the translatable motion.

[0017] Figure 3 depicts method steps associated with bag extraction. Like numerals, as used above, will be repeated herein for like elements.

[0018] In step 40, bag 10 is accommodated, horizon-

tally, in pod 54. Rods 30 are depicted extending substantially perpendicularly out of the page. The rods include ends which are arranged to be gripped by a gripper (not shown). The gripper may comprise two parallel cantilevered-rods which operate by being positioned with the above-mentioned rods via center cones. The gripper may have a substantially similar shape to the rods so as to facilitate expanded translatory range of the partitions and therefore bags. This provides for additional room in separating the bags along the rod and gripping rods making it easier to later lower a particular bag into a particular container. Paddles and/or cross bar mechanisms (not shown) may be used to position the bags along the rods. For example, if paddles are used, bags may be compressed together so as to selectively fit within a desired container. Alternatively, the bags may be separated to a particular distance for item safety and/or handling purposes. Select positioning of the gripper, paddles and cross bar mechanisms is known in the art.

[0019] In step 42, after engaging the rods 30, bag 10 is retracted from pod 54. In general, when retracted, the bags may be supported by sliding on a bottom of the pod.

[0020] In step 44, the bag is turned substantially ninety degrees so as to come to rest above a container 50. The turning is affected by repositioning the gripper. The bag may be further stabilized via the effects of gravity. The container 50 may be one of many located at a mail container filling station. When implemented with a plurality of bags, each may be laterally displaced along the rods and further displaced by relocation of the grippers so as to position a particular bag over a particular container. The bags may be further separated so as to affect labeling with, for example, destination address information. The labeling may be located at an upper edge of the bags and be effected by use of ink jet or laser printing. Alternatively, the labeling may be located at other locations of the bags. Known means may be used during labeling. In addition, a measurement of mail bag thickness may be effected during the separation process, the measurement process being undertaken by means known in the art.

[0021] In step 44, bag 10 is lowered into container 50, clamps (figures 1 and 2) are decoupled so as to release the partition from the bag itself and the partition and separator sheet are removed from the bag 10 leaving the bag within the container 50. As was indicated above, individual ones of multiple bags may be lowered into respective containers. Should one of the multiple bags be lowered and disengaged while the others remain engaged, the turning of the rod to disengage would not be used, and rather other disengaging means would be implemented. As further indicated above, particularly shaped rods and/or clamps and/or a particular interaction between the two may be used to effect decoupling. For example, the rods may include irregular cross-sections arranged to be twisted at a particular angle. Other decoupling means may be used as envisioned by one skilled in the art. As indicated, once decoupled, the par-

titions and separator sheets are removed from the bags (arrow 48), while the post 33 and two posts 16 and 18 remain in place. By virtue of the belt rotation, the mail items remain in place undisturbed by the removal. In addition, if a belt is arranged about the partition, this belt allows for removal of the partition without disturbance to the mail items or bag. Accordingly, in another embodiment, use of the belt about the partition may substitute for the two posts. Returning to the depicted embodiment, the two posts 16 and 18 remain in place so as to maintain the bags' shape. After substantially complete removal of the bag, the posts are also retracted by means known in the art.

[0022] In step 46, the bags are now ready for replenishment. Arrow 52 indicates the lowering of the partition into the bag and the subsequent removal of the bag from the replenishment station 56.

Claims

1. A pocket (5) for accepting items (38), comprising:
 - a partition (14) arranged to form a backbone of said pocket (5) and to be guided on at least one rod (30);
 - a bag (10) arranged about said partition (14); and
 - means for attaching said bag (10) to said partition (14); **characterized by**
 - a separator sheet (32) arranged within the bag (10) and attached to the partition (14); and
 - a belt (12) arranged between the items (38) and the separator sheet (32).
2. The pocket according to claim 1, wherein said belt (12) is arranged about said separator sheet (32), such that when said separator sheet (32) is moved, substantially no relative motion exists between said belt (12) and said items (38).
3. The pocket according to any of the preceding claims further **characterized in that** said separator sheet (32) comprises a first and a second part (33, 35),
 - wherein said first part (33) is connected to the partition (14) and includes a pair of opposing overhangs (37), and
 - wherein said second part (35) runs within the overhangs (37) in a lateral direction of the bag (10).
4. The pocket according to claim 3, wherein said belt (12) is arranged to run freely about the length of the second part (35) of the separator sheet (32) and between the items (38) and the first part (33) of the separator sheet (32).
5. The pocket according to any of the preceding claims 3-4, wherein said belt (12) is affixed to the first part (33) of the separator sheet (32) at a limited location.
6. The pocket according to any of the preceding claims 3-5, wherein a hook (28) is attached to the second part (35).
7. The pocket according to claim 6, wherein said belt (12) is arranged such that it absorbs and otherwise displaces the relative motion of the separator sheet (32) when the hook (28) is pulled in direction out of the bag (10).
8. The pocket according to any of the preceding claims, wherein said separator sheet (32) is attached to said partition (14) by a leaf spring (39).
9. The pocket according to any of the preceding claims, wherein the separator sheet (32) comprises two posts (16, 18) extending the approximate length of the bag (10).
10. The pocket according to any of the preceding claims, wherein the partition (14) includes a pair of clamps (20) arranged to affix the bag (10) to the partition (14).

FIG 1

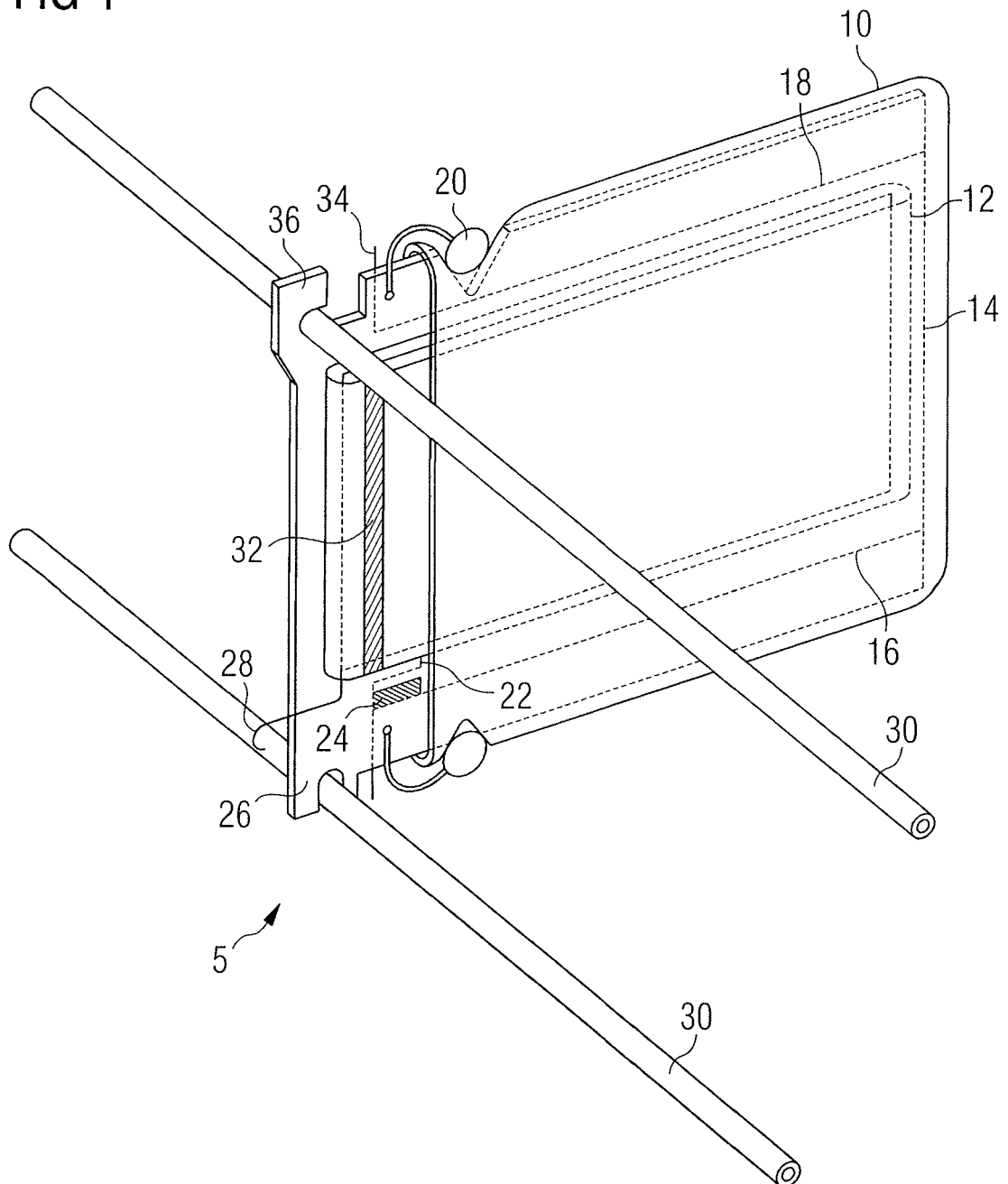


FIG 2

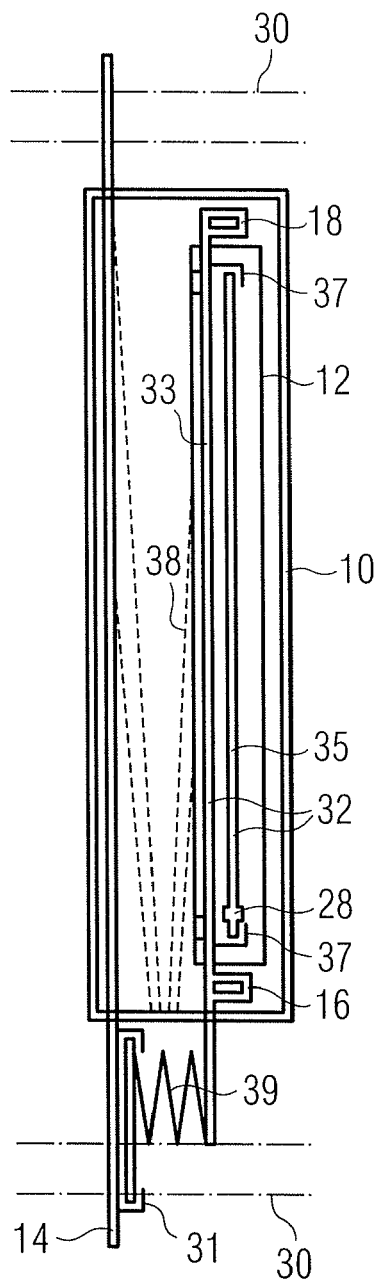
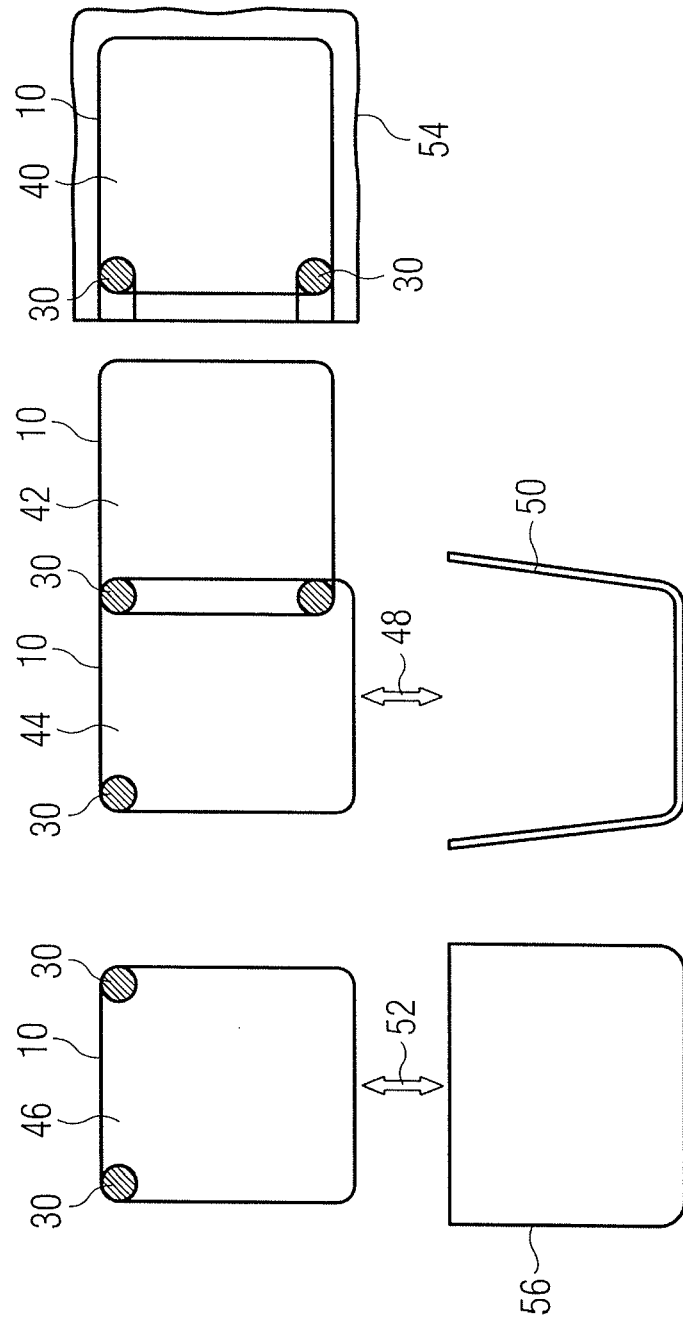


FIG 3



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 6715614 B [0002]
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