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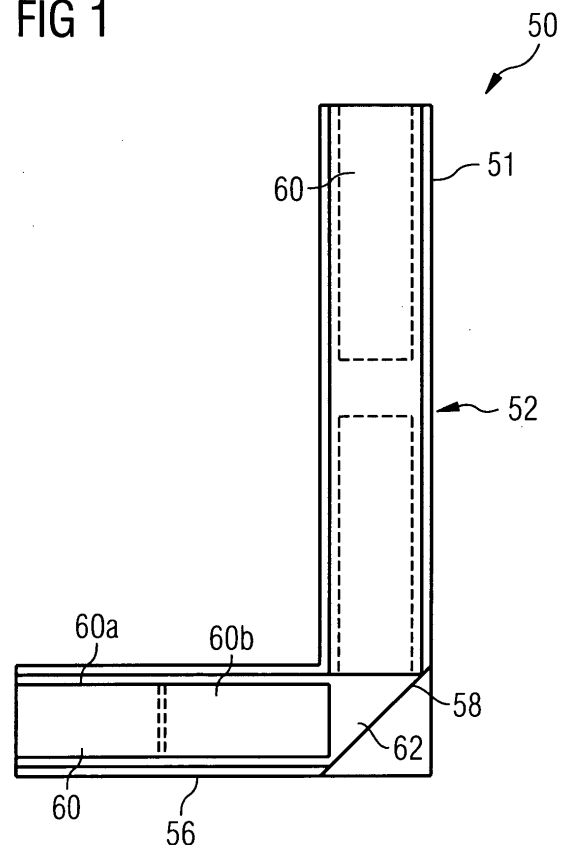
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(54) **Method and apparatus for separating sorted mail items in a mail processing system**

(57) A method of separating mail items (38) of a first group from mail items (38) of a second group determines a boundary between the first and second group. A moveable distributing part (56) is placed at the boundary next to a side of a selected mail item (38) that belongs to the first or second group. The distributing part (56) carries indicators (60), for example, adhesive labels. The indicators (60) are advanced on the distributing part (56) to position a foremost indicator (60) next to the side of the selected mail item. The foremost indicator (60) is brought into contact with the side of the selected mail item, so that this indicator (60) adheres to the selected mail item. The applied indicator (60) protrudes from the selected mail item to visibly indicate a boundary between two groups.

FIG 1



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Description

Background of the Invention

[0001] The various embodiments described herein relate generally to a mail processing system. More particularly, these embodiments relate to a method and apparatus for separating sorted mail items in such a system.

[0002] Each day postal services process mail items for delivery to millions of individual domestic addresses. As used throughout this application, mail items refer to letters, magazines, books and other such flat items. Before mail carriers begin to walk through or drive through their delivery routes, a mail processing system at a processing site sorts all mail items for the carriers and prepares the sorted articles for delivery to a multitude of domestic addresses. A carrier's responsibility includes putting all of these articles into an appropriate sequence for efficient delivery to the domestic addresses.

[0003] The mail processing system is highly automated to handle the amount of daily articles. Some mail processing systems may include a delivery point packaging (DPP) system that, for example, separates the articles, reads their destination addresses and groups the articles based upon their respective destination addresses. An exemplary DPP system is an automatic casing 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 resorted back into the casing tower.

[0004] U.S. Patent No. 6,715,614 describes a mail case system that is manually filled and facilitates sequence-sorting various types of mail into individual bags. Each bag represents a unique delivery point. The mail case uses multi-bag inserts so that the bags for several stops can be set up quickly for sorting. At the end of the sorting operation, the entire insert may be pulled down from the case as a single unit to maintain the established delivery point sequence. This eliminates the carrier's need to find separation points or to combine selections from multiple sequenced stacks of mail during the delivery operation. This results in improved delivery efficiency.

[0005] U.S. Patent No. 6,943,312 describes a method for marking sections of items (e.g., mail or postal items)

in a stack of sorted items. These sections of a stack are marked for the respective carrier delivery and/or for different stopping points of the distribution order. The described method is an improvement over using separator cards used in the prior art for marking sections of a stack. The cards are generally larger than the average mail item and need to be sorted and processed. They are either single-use cards or need to be returned to the post office by the carrier. To avoid such separator cards, U.S. Patent No. 6,943,312 automatically marks the last and/or the first and the last mail items of a section of a stack using visible, easily removable stickers, which are applied by an automatic sticker dispenser. A sticker dispenser is located in a sorting machine between a reading unit and a distribution unit and presses the sticker on a specified place of the selected mail item which is read and sorted according to the sorting plan. The mail item is transferred past the sticker dispenser during this process and, upon reaching the intended location of application of the respective mail item, the application of the sticker occurs during the transfer past the sticker dispenser.

[0006] The application of such stickers is limited to cases where individual mail items pass the dispenser so that the dispenser can press the sticker on the appropriate mail item. The application of stickers on individual mail items is not suitable for systems, such as the mail case system of U.S. Patent No. 6, 715, 614, where a sticker has to be applied at a leading edge of a mail item. A so-applied sticker may be damaged during the transport, or may negatively affect the transport.

Summary of Certain Inventive Aspects

[0007] There is, therefore, a need for an improved technique for separating mail items of a delivery point from mail items of another delivery point. More particularly, such a technique should be applicable while the mail items of a delivery point are still in a pocket.

[0008] Accordingly, one aspect involves a method of separating mail items of a first group from mail items of a second group. A boundary between the first and second group is determined, and a moveable distributing part is placed at the boundary next to a side of a selected mail item that belongs to the first or second group. The distributing part carries indicators and positions a foremost indicator next to a side of the selected mail item. The distributing part is withdrawn while the foremost indicator is separated from the distributing part. The foremost indicator is brought into contact with the side of the selected mail item so that this indicator adheres to the selected mail item. The applied indicator protrudes from the selected mail item to visibly indicate a boundary between two groups of mail items.

[0009] Another aspect involves an apparatus for applying indicators to separate mail items of a first group from mail items of a second group. The apparatus includes a distributing part configured to advance the indicators and a pressing plate, wherein the pressing plate

and the distributing part are movable with respect to each other. The indicators advance between the distributing part and the pressing plate. The distributing part is configured to withdraw with respect to the pressing plate so as to allow the pressing plate to press the indicator against a selected mail item.

Brief Description of the Drawings

[0010] These and other aspects, advantages and novel features of the embodiments described herein will become apparent upon reading the following detailed description and upon reference to the accompanying drawings. In the drawings, same elements have the same reference numerals. In the following list of figures:

Figure 1 is a schematic illustration of one embodiment of an apparatus for applying flags; and
Figures 2A - 2F depict different steps of a process of applying flags.

Detailed Description of Certain Inventive Embodiments

[0011] The various embodiments are described herein with respect to a mail processing system that sorts mail items for a first group, such as a delivery point, in a pocket. However, it is contemplated that the apparatus and method described hereinafter are not limited to such sorting and packaging in pockets, but can be equally used with mail items that are otherwise arranged, as long as separation indicia exist that indicate a separation of different groups of mail items.

[0012] Figure 1 shows a schematic illustration of one embodiment of an apparatus 50 for separating mail items 38 of a first group from mail items of another group. In the embodiment described herein, the groups are mail items for different delivery points. A control system of the mail processing system moves the apparatus 50 or the pods 54, or both, to a determined boundary between neighboring delivery points. For example, in a stack of mail items 38, the boundary indicates the separation between the first mail item of a delivery point and the last mail item of a neighboring delivery point. In one embodiment, the boundary is given by the separator sheet 32 of a pocket 5.

[0013] The apparatus 50 is configured for applying indicators 60 to selected mail items 36. The indicators 60 are in one embodiment adhesive labels 60 on a liner 62, e.g., flag labels. However, it is contemplated that other indicators 60 may be used, such as RFID tags, as well.

[0014] Advantageously, the apparatus 50 applies the labels 60, while the mail items are still in pockets 5. That is, the apparatus 50 is in one embodiment used in a situation, in which the pockets 5 are filled with mail items.

[0015] In the embodiment of Figure 1, which shows a side view of the apparatus 50, the apparatus 50 includes a support 52 having a receiving part 51, a distributing part 56 and a connecting part 58 that joins the receiving

and distributing parts 51, 56. In the illustrated embodiment, the connecting part 58 joins the parts 51, 56 at an angle of about 90°, and is configured as a bending edge. However, in another embodiment, the connecting part 58 may join the parts 51, 56 at other angles, including 180°, i.e., the parts 51, 56 are arranged along a straight line. Further, both parts 51, 56 have a system to guide the liner 62 when a force is applied to the liner 62 to pull the liner 62.

[0016] Figure 1 shows further a series of flag labels 60 on a liner 62. Each flag label 60 has an adhesive part 60a and a non-adhesive flag part 60b. The adhesive part 60a has an adhesive applied to a rear side that removably secures a flag label 60 to the liner 62. Labels having an adhesive applied to a rear side to removably adhere to a liner are generally known for a variety of applications.

[0017] The bending edge of the connecting part 58 causes the flag labels 60 to turn by 90°. While the receiving part 51 transports the flag labels 60, in Figure 1 from right to left, so that the flag labels 60 face away from the receiving part 51 (visible lines are shown as solid lines), whereas the distributing part 56 transports the flag labels 60, in Figure 1 downwards, so that the flag labels 60 face the distributing part 56 (not visible lines are shown as dashed lines).

[0018] The apparatus 50 is configured to selectively supply a flag label 60 to a selected mail item, for example, while in a pocket 5. For that purpose, the apparatus 50 is coupled to a drive mechanism that moves the apparatus 50 to insert the distributing part 56 next to a mail item 38 to be labeled at least partially into a pocket 5, applies a force to the liner 62 while retrieving the distributing part 56 so that the label 60 does not move in the inertial system, but its adhesive part 60a is separated from the liner 62. Thereby, the flag label 60 is applied to the desired mail item 38. The apparatus 50 withdraws the distributing part 56 once the flag label 60 has been applied. For that purpose, the apparatus 50 includes further a pressing device, e.g., a pressing plate 64 coupled via a slide mechanism to the distributing part 51, as shown in Figures 2B - 2E.

[0019] Figures 2A - 2F depict different steps of a process of applying flag labels 60 to desired mail items. Figure 2A shows an initial status of a pocket 5 filled with mail items 38. A separator sheet 32 is located between a left wall of a pocket 5 and the mail items 38.

[0020] Figure 2B illustrates the insertion of the apparatus 50 between the separator sheet 32 and the wall of the pocket 5. In this illustration, the pressing plate 64 is next to the wall of the pocket 5 and the distributing part 56 is next to the mail article. Figure 2B, as well as Figures 2C - 2E, illustrate the apparatus 50 in a top view. The distributing part 56 provides a label 60 on a liner 62, wherein the label 60 is sandwiched between the pressing plate 64 and the distributing part 56.

[0021] Figure 2C illustrates that the separator sheet 32 is withdrawn and positioned to the right of the apparatus 50.

[0022] Figure 2D illustrates that the drive mechanism has been activated to advance the liner 62, and at the same time to partially withdraw the distributing part 56, while the slide mechanism allows the pressing plate 64 and the flag label 60 to remain in the position described with reference to Figure 2B. The flag label 60, in particular its adhesive part, is therefore separated from the liner 62, but is still held in place by the pressing plate 64 and the distributing part 56. The pressing plate 64 presses the adhesive part of the flag label 60 against the mail items 38.

[0023] Figure 2E illustrates that the pressing plate 64 has been withdrawn. As the flag label 60 is attached to the mail item 38, the flag label 60 remains in place. In the illustrated state, the non-adhesive part of the flag label 60 rests between the distributing part 56 and the pressing plate 64.

[0024] Figure 2F illustrates a final state of the pocket 5 with the flag label 60 applied to the desired mail item 38. The non-adhesive part of the flag label 60 extends sufficiently out of the mail stack so that it is visible for a mail handler.

[0025] The various embodiments described herein refer to the application of flag labels 60 while the mail items 38 are still in pockets 5. Each pocket 5 represents the mail items for a unique delivery point. However, it is contemplated that the flag labels 60 may be equally applied to desired mail items that are not in pockets 5, but otherwise arranged, as long as separation indicia exist that indicate where the apparatus 50 is to be inserted.

[0026] It is apparent that there has been disclosed an apparatus and method for separating mail items for a delivery point from mail items of another delivery point that fully satisfy the objects, means, and advantages set forth hereinbefore. For example, the embodiments allow application of small flag labels 60 directly on desired mail items 38. Each flag label 60 indicates a separation between two delivery points.

[0027] Further, due to the use of adhesive flag labels 60, a wide range of colors and material are possible, such as biodegradable plastic or paper-plastic composite materials may be used.

Claims

1. A method of separating mail items (38) of a first group of mail items from mail items of a second group, comprising:

determining a boundary between the first and second group;

placing a moveable distributing part (56) at the boundary next to a side of a selected mail item (38) that belongs to the first or second group, wherein the distributing part (56) carries indicators (60), and

wherein the distributing part (56) positions a

foremost indicator (60) next to a side of the selected mail item (38);

withdrawing the distributing part (56) while separating the foremost indicator (60) from the distributing part (56); and

bringing the foremost indicator (60) into contact with the side of the selected mail item (38), so that this indicator (60) adheres to the selected mail item (38), wherein this indicator (60) protrudes from the selected mail item (38) to visibly indicate a boundary between two groups of mail items.

2. The method of Claim 1, wherein placing the distributing part (56) includes inserting the distributing part (56) parallel to the side of the selected mail item (38).
3. The method of Claim 2, further comprising withdrawing the distributing part (56) while advancing the indicators (60).
4. The method of Claim 3, further comprising pressing the indicator (60) against the selected mail item (38).
5. The method of Claim 1, wherein placing the distributing part (56) includes inserting the distributing part (56) between a separator sheet (32), which is in contact with the selected mail item (38), and a wall of a pocket (5), which includes the mail items for one of the groups.
6. The method of Claim 5, further comprising withdrawing the separator sheet (32) at one side of the distributing part (56) and inserting the separator sheet (32) between the distributing part (56) and the wall of the pocket (5).
7. The method of Claim 6, further comprising partially withdrawing the distributing part (56).
8. The method of Claim 6, further comprising inserting the separator sheet (32) between the wall of the pocket (5) and the distributing part (56).
9. An apparatus (50) for applying indicators (60) to separate mail items (38) of a first group from mail items (38) of a second group, comprising:

a distributing part (56) configured to advance the indicators (60); and

a pressing plate (64), wherein the pressing plate (64) and the distributing part (56) are movable with respect to each other, wherein the indicators (60) advance between the distributing part (56) and the pressing plate (64), and wherein the distributing part (56) is configured to withdraw with respect to the pressing plate (64) so as to allow the pressing plate to press the indi-

cator (60) against a selected mail item (38) .

10. The apparatus of Claim 9, further comprising a receiving part (51) and a connecting part (58) that joins the receiving and distributing parts (51, 56) at a predetermined angle. 5
11. The apparatus of Claim 10, wherein the predetermined angel is about 90°. 10
12. The apparatus of Claim 10 or 11, wherein the connecting part (58) is configured as a bending edge that causes the indicators (60) to turn by about 180°. 15

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FIG 1

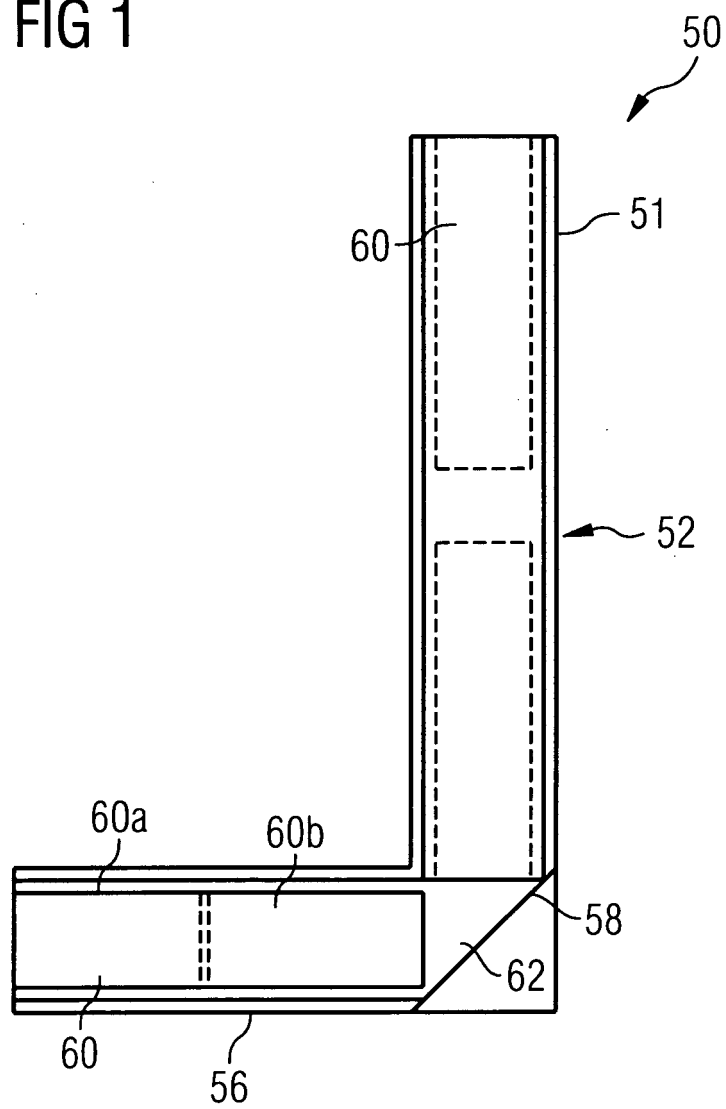


FIG 2C

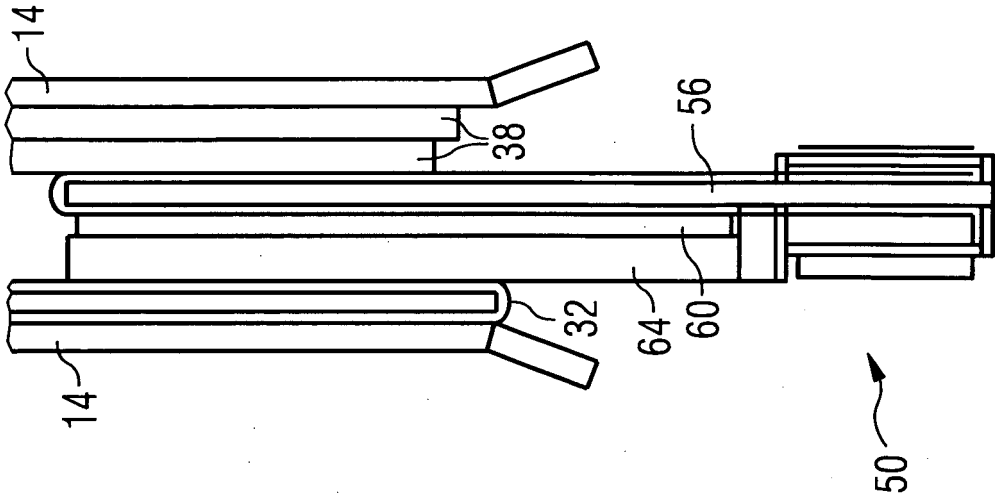


FIG 2B

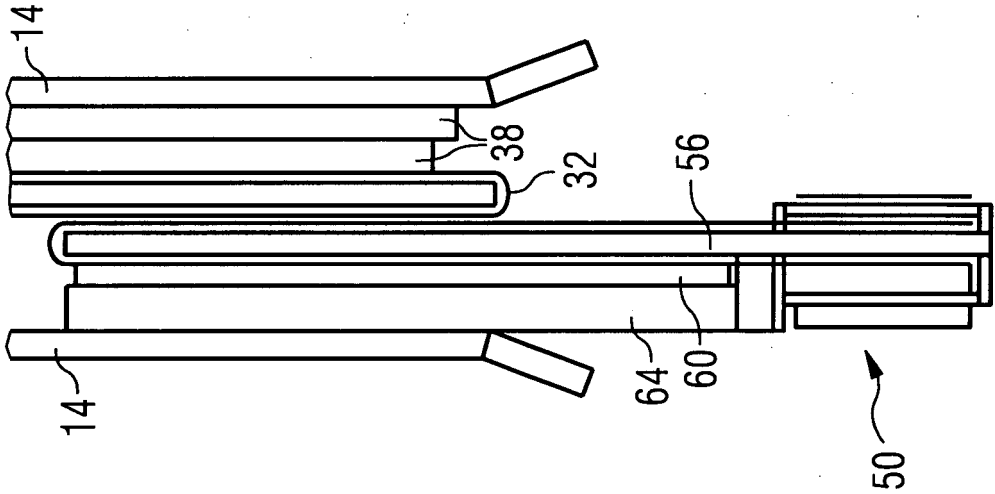


FIG 2A

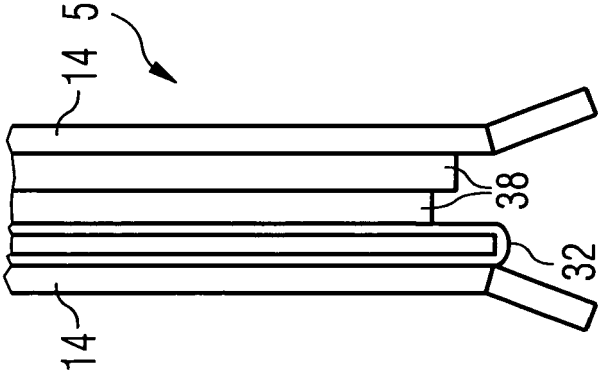


FIG 2F

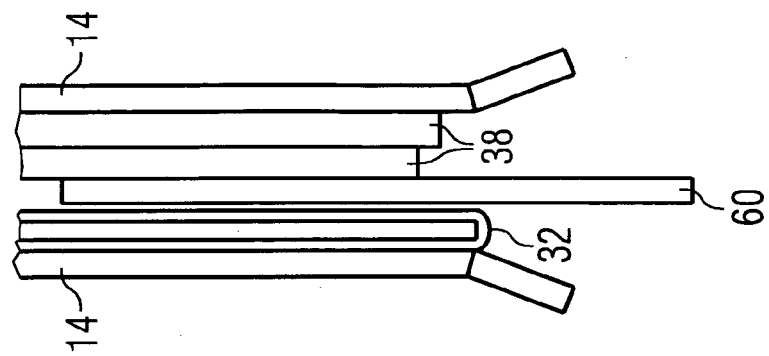


FIG 2E

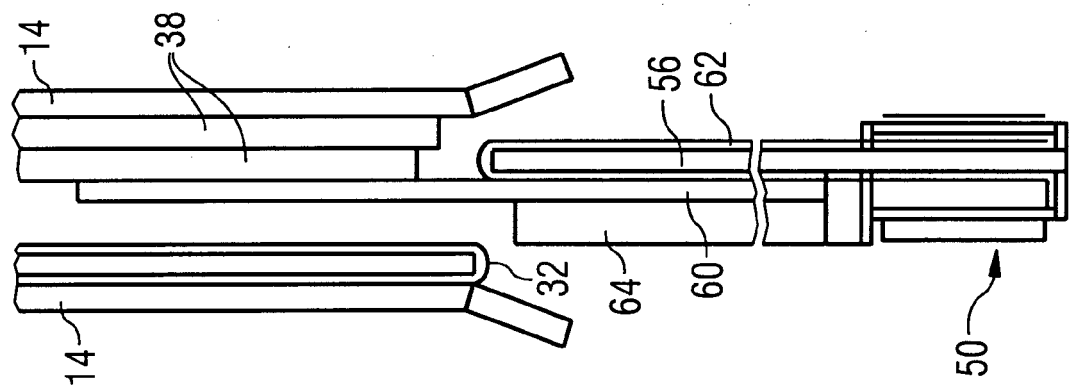
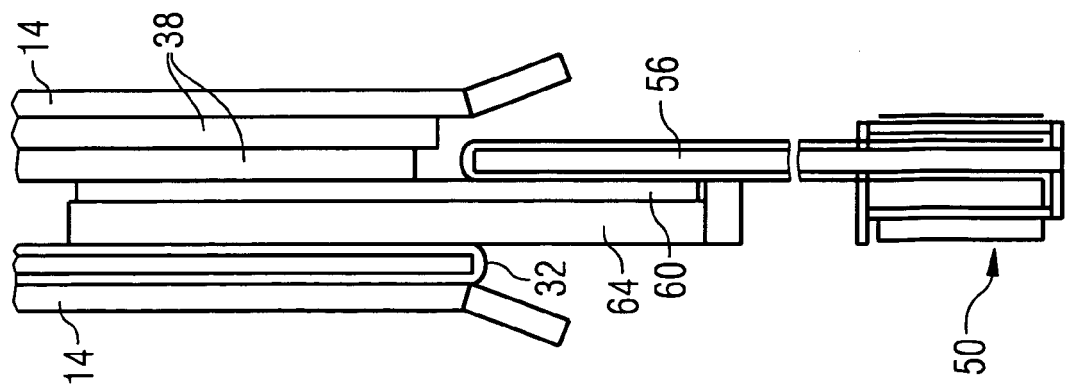


FIG 2D





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 01 3584

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 3 January 2007	Examiner Golombek, Gregor
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 06 01 3584

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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03-01-2007

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