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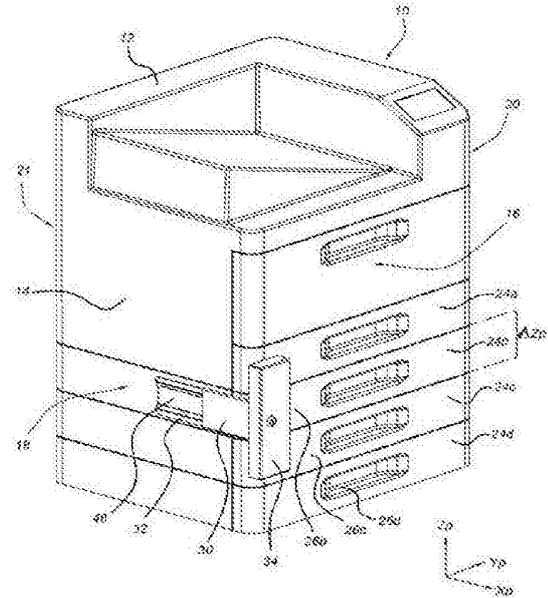
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Tray Locking Device for Reproduction System.

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A tray locking device (30) for restricting motion of a media tray (24b) with respect to a casing (14) of a graphic reproduction system (12). The tray locking device comprises first and second members (32, 34) that are slidably arranged. The first member has a base portion with an elongated attachment area (46) for receiving an adhesive film, adapted for fixing the tray locking device to an outer surface (18) of the casing of the graphic reproduction system.



Tray Locking Device for Reproduction System

TECHNICAL FIELD

[0001] The invention relates to a tray locking device for restricting motion of a media
5 tray with respect to a casing of a graphic reproduction system, and to a reproduction
system assembly including a graphic reproduction system with such a tray locking device.

[0002] Furthermore, the invention relates to a method for upgrading a graphic
reproduction system.

10 BACKGROUND ART

[0003] A typical printer apparatus prints a toner image via a fuser onto a piece of
paper or other printable medium. Typically, the paper is fed from a media tray to the fuser
mechanism before printing. Afterwards, the paper with printed image is conveyed from the
printer output to an output station or tray.

15 [0004] A tray locking device generally serves to secure one or several paper trays of a
printer system against unauthorized opening, e.g. to prevent the contents of the tray from
being accessed or removed. Low cost tray locking devices for securing paper trays are
known. A known locking device comprises a bracket designed to be mounted onto a lateral
side panel of the printer casing near the corresponding tray, using bolts or screws to fix the
20 bracket to the panel. Typically, existing threaded holes in or near the panel are used to
secure the bolts or screws for the bracket, to avoid damaging the panel. Existing threaded
holes on the lateral surface are often located near the front surface where the tray resides,
but become sparse towards a central region of the panel. As a result, the known locking
device requires a bracket that extends vertically along the lateral surface, to cover
25 sufficient fixation points for stabilizing the bracket. The known locking device is therefore
not suitable for installing onto a small printer system that has only few fixation points and
only a single media tray, nor is it suitable for securing only selected trays from a plurality
of trays.

30 SUMMARY OF INVENTION

[0005] It would be desirable to provide a tray locking device for graphic reproduction
systems, which easy to install onto many available reproduction system models and which
is adaptable for securing a selected one or selected group of trays.

[0006] Therefore, according to a first aspect, there is provided a tray locking device for restricting motion of a media tray with respect to a casing of a graphic reproduction system, wherein the tray locking device comprises: - a first member, including: a base portion with an elongated shape along a first direction, and a lock receiving member for cooperating with a locking member; - a second member, including a base receiving portion for engaging with the base portion to allow a sliding motion between the first member and the second member along the first direction while restricting movability in second and third directions transverse to the first direction, and an interface portion provided with the locking member, for cooperating with the lock receiving member to establish an interlocked state between with the first member and the second member wherein movability along the first direction is restricted. The base portion has an elongated attachment area along the first direction, which is adapted for receiving an adhesive film for fixing the locking device to an outer surface of the casing of the graphic reproduction system.

[0007] The term “graphic reproduction system” is used here in a broad sense, and generally refers to printers, copiers, fax machines, scanners, and finishers. The proposed locking device may also be used to protect output trays of booklet makers or discharge bins of paper shredders.

[0008] The first member with elongated base portion may be locally attached with its elongated attachment area and adhesive film to a lateral region of the casing, preferably near a selected tray. The length of the elongated attachment area and strength of the adhesive film should be sufficient to support the weight of the locking device in an attached locked state, while keeping the media tray secured in a closed position. The elongated second member may be easily slid with its base receiving portion onto the first member, and selectively fixed with the lock to the first member.

[0009] The proposed tray locking device is highly versatile, as it can be easily and quickly applied onto systems that are already installed and operational, without using additional fasteners or permanent modification of the system’s outer surface. The proposed locking device may also be applied to (lateral) surfaces near parts of systems that require safeguarding from inappropriate access or operation. For example, the locking device may also be adhered to a lateral surface near a patch-panel for data signal connectors (e.g. an USB interface), near a control panel for operating the device, or near a shutter or lid for a

computer interface (e.g. keyboard) or toner cartridge as, etc. Access to confidential information, misuse of or damaging of the machine may thus be prevented.

[0010] According to an embodiment, the elongated attachment area of the base portion extends along the first and third directions, and the base portion comprises two flanges that are bent towards or opposite to the second direction. The bent flanges significantly increase a stiffness (resistance) of the first member against lateral bending forces towards the second direction.

[0011] According to a further embodiment, the base portion is formed from a plate with a pair of opposite edges extending along the first direction, and the two bent flanges extend along the pair of opposite edges. Preferably, the plate is substantially rectangular and spans a plane, with the flanges bent out of the plane.

[0012] According to a further embodiment, at least one of the two flanges is doubly bent, to form: - a distal flange portion that extends along the first direction in a plane at a non-zero distance from and substantially parallel with the elongated attachment area, and - an intermediate flange portion that is slanted or curved towards the second direction away from the elongated attachment area, and which connects the distal flange portion with the elongated attachment area. The doubly bent flange(s) may further increase the stiffness (resistance) of the first member against lateral bending forces towards the second direction, and the distal flange portion(s) may additionally form (an) support and alignment surface(s) for the base receiving portion of the second member.

[0013] According to yet a further embodiment, the distal flange portion and the intermediate flange portion extend substantially along the entire corresponding opposite edge. In this way, the intermediate and distal flange portions may yield optimal bending stiffness while requiring only two bending operations.

[0014] According to an embodiment, the base portion has an elongated shape, with a first length along the first direction and a first height along the third direction, wherein a ratio of the first height over the first length is in a range of 1:2 or smaller. This minimum ratio ensures that the base portion has sufficient length to provide ample support and prevent the attached locking device in an engaged state from detaching from and/or rotating downwards with respect to the surface of the casing. Typically, the first height is about equal to a typical height of a tray front, which may be about 8 centimeters. A typical first length may then be 16 centimeters or larger, for example about 25 centimeters.

[0015] According to an embodiment, the base receiving portion of the second member extends along the first direction and the third direction. The base receiving portion comprises further opposite edges that are bent towards or opposite to the second direction to restrict movability of the first member along the second and third directions.

5 [0016] According to an embodiment, the base receiving portion is formed from a further plate with a pair of further opposite edges that extend along the first direction. Preferably the further plate is substantially rectangular.

[0017] According to a further embodiment, each of the further opposite edges of the base receiving portion is bent via the second direction back to the third direction to form a
10 rail adapted for accommodating a corresponding opposite edge of the first member and for restricting movability of the first member along the second and third directions. The further opposite edges may for example be bent to form U-shaped rails that extend along the first direction.

[0018] By combined use of first member with bent flanges along opposite edges and
15 second member with bent further opposite edges forming rails, a sliding arrangement is obtained that is relatively easy to manufacture yet has a very high resistance against lateral bending of the locking device in the engaged state.

[0019] According to yet a further embodiment, the rails along the further opposite
20 edges of the second member are adapted for accommodating corresponding flange portions of the first member, while leaving a lateral space between the base receiving portion and the elongated attachment area. The flange portion and the elongated attachment area may for example be spaced at a distance along the second direction in a range of 5 millimeters to 15 millimeters, yielding a similar lateral space between the base receiving portion and the elongated attachment area.

25 [0020] In an embodiment, the base receiving portion extends along the first and third directions, and the interface portion extends along the second and third directions. In this embodiment, the base receiving portion and the interface portion are substantially at a right angle, and preferably form an L-shape.

[0021] According to an embodiment, the first height of the base portion is smaller than
30 or substantially identical to a height of a tray front of the media tray. This ensures that the base portion and the base receiving portion may be formed with a sufficiently small height to selectively secure only one tray, while leaving other trays unobstructed and corresponding lateral regions available for other purposes.

[0022] According to a further embodiment, the interface portion of the second member has a second height along the third direction that is larger than the first height of the base portion of the first member. The second height may for example be substantially equal to an integer multiple of the first height. The second member may thus extend along a combined height of a plurality of trays, whereas the first member only extends up to a single tray height. Distinct second members with different heights may then be selectively coupled to the first member, to adjust the number of trays that need to be secured.

[0023] According to an embodiment, the lock receiving member on the first member is formed by a slit at one distal end of the base portion in the first direction. Here, the locking member on the second member comprises a cam for cooperating with the slit to establish the interlocked state.

[0024] According to a second aspect, and in accordance with the advantages and effects described herein above, there is provided a reproduction system assembly, comprising: - a graphic reproduction system with at least one medium tray; - a tray locking device with a first member and a second member according to the first aspect, wherein an elongated flat engagement area of a base portion of the first member is attached via an adhesive film to a lateral surface of a casing of the graphic reproduction system.

[0025] According to a third aspect, there is provided a method for upgrading a graphic reproduction system. Here, the graphic reproduction system comprises a casing with a first surface and a second surface located adjacent to and at an angle with the first surface, and the casing is provided with a media tray located on the first surface and an attachment area on the second surface. The method comprises: - providing a tray locking device with a first member and a second member according to the first aspect; - attaching an elongated attachment area of a base portion of the first member via an adhesive film to the attachment area of the casing.

[0026] According to an embodiment, the method comprises slidingly engaging a base receiving portion of the second member with the attached further area of the first member.

BRIEF DESCRIPTION OF DRAWINGS

[0027] Embodiments will now be described, by way of example only, with reference to the accompanying schematic drawings in which corresponding reference symbols indicate corresponding parts, and in which:

[0028] Figure 1 schematically shows a printer system assembly according to an embodiment of the invention;

[0029] Figures 2a and 2b present perspective views of a paper tray locking device according to an embodiment;

[0030] Figures 3a-3c illustrate a method for attaching an embodiment of a paper tray locking device to a conventional printer system, and

5 [0031] Figures 4-6 show paper tray locking devices according to alternative embodiments.

[0032] The figures are meant for illustrative purposes only, and do not serve as restriction of the scope or the protection as laid down by the claims.

10 DESCRIPTION OF EMBODIMENTS

[0033] The following is a description of certain embodiments of the invention, given by way of example only and with reference to the figures.

First locking device embodiment: Figure 1

15 [0034] Figure 1 shows a printer system assembly 10 comprising a printer system 12 and a paper tray locking device 30 according to an embodiment of the invention. The printer system 12 may be a conventional printer system known in the art. The printer system 12 is adapted for printing text and photographic information on sheets of paper or other printable media.

20 [0035] The term “printable medium” herein refers generally to a physical object with a surface that is adapted for printing thereon. The term “printable sheet” refers herein to a printable medium that has a flat planar shape (having typical dimensions defined by in-plane length and width in the order of 10 millimeters to 1000 millimeters, and out-of-plane thickness in the order of 0.05 millimeters to 0.5 millimeters), for example a sheet of paper,
25 plastic, or other physical substrate suitable or even specifically adapted for printing images and characters thereon.

[0036] The printer system 12 in Figure 1 comprises a casing 14 provided with a front surface 16, a rear surface 21, and two opposite lateral surfaces 18, 20. The printer system 12 has multiple media trays 24a-24d. In this description, paper trays are jointly indicated
30 with reference numeral 24, or separately indicated by distinct indices 24i (i = a, b, c, d ...). The paper trays 24 are slidably accommodated in and with respect to the printer casing 14 along the longitudinal direction, indicated by axis Xp in Figure 1. Each paper tray 24i comprises a cassette portion for holding a stack of paper sheets (not shown), and a front

portion 26a-26d (also generically indicated with 26i or jointly indicated with 26). Each tray 24i may hold a stack of printable sheets of predetermined dimensions (e.g. A3- or A4-sized sheets of paper). The front portion 26 may have a handle for facilitating sliding of the paper tray 24i out of the printer casing 14 along the longitudinal direction X_p . By moving a selected paper tray 24i into an opened position, the user may place paper into (or remove paper from) the opened paper tray 24i. In a closed state, the paper contained by the corresponding paper tray 24i may be supplied to a paper feeding mechanism (not shown) of the printer system 12.

[0037] In this example, the longitudinal direction X_p corresponds with a primary direction along which the user approaches and interfaces with the printer system 12. The lateral direction Y_p refers to a direction in a horizontal plane that is perpendicular to the longitudinal direction X_p . The vertical direction Z_p extends perpendicularly upwards from a plane spanned by the longitudinal and lateral directions X_p , Y_p .

[0038] The printer system 12 in Figure 1 comprises the first and second lateral surfaces 18, 20 on opposite sides of the casing 14. These first and second lateral surfaces 18, 20 face predominantly toward the positive and negative lateral directions $+Y_p$ and $-Y_p$ respectively. At least one lateral surface 18 is provided with an attachment area 22 that is substantially planar (see Figure 3a). The attachment area 22 extends over a vertical region corresponding to a height ΔZ_p of the front 26i of the paper tray 24i (e.g. tray 24b in figure 3a). Preferably, the attachment area 22 is sufficiently smooth and clean (or otherwise made suitable) to serve as a receiving region for an adhesive.

[0039] The printer system assembly 10 in figure 1 further comprises at least one tray locking device 30 according to an embodiment. In general, the tray locking device 30 is formed by at least two separate members 32, 34 that are adapted to cooperate and establish a locking engagement. The embodiment of the tray locking device 30 shown in Figure 1 comprises a first member 32 and a second member 34.

[0040] The first member 32 has a base portion with an elongated (preferably substantially flat) attachment area for receiving an adhesive film for fixing the locking device 30 to the lateral surface 18 of the printer casing 14. This attachment area is elongated in the first direction X_l and comprises two flanges that are bent away from the lateral surface along the second direction, to increase a mechanical rigidity with respect to bending of the locking device 30 towards the second direction Y_l . These elements will be explained in more detail with reference to Figures 2a and 2b.

Second locking device embodiment: Figures 2a-2b

[0041] Another embodiment of a tray locking device 130 is shown in more detail in Figures 2a and 2b. Features in the tray locking device 130 that have already been described above with reference to the first embodiment (Figure 1) may also be present in the locking device 130 in Figures 2a-2b, and will not all be discussed here again. For the discussion with reference to Figures 2a-2b, similar reference numbers are used for similar features, but differing by one hundred to distinguish the embodiments.

[0042] In Figures 2a-2b, the first member 132 of the tray locking device 130 forms a fixing member, and the second member 134 forms a lock interface member. In this embodiment, the first direction X1 corresponds with a direction along which the first member 132 and the second member 134 are slidably arranged. The second direction Y1 extends laterally and perpendicular to the first direction X1. The third direction Z1 extends perpendicularly upwards from a plane spanned by the first and second directions X1, Y1.

[0043] In a preferred operational orientation wherein the tray locking device 130 is fixed to the printer system 12 (Figure 1), the Cartesian coordinate systems of the printer system 12 and the paper tray locking device 130 are substantially aligned (i.e. directions Xp, Yp, and Zp are substantially aligned with directions X1, Y1, and Z1 respectively).

[0044] The first member 132 is elongated in the first direction X1, and comprises a base portion 140 in a central region, which extends in the first and third directions X1, Z1. The base portion 140 defines an elongated attachment area 146 that is adapted for engaging the attachment area 22 of the printer casing 14 (Figure 3a). The elongated attachment area 146 may be provided with a layer of adhesive material 148, for fixing the first member 132 to the printer system 12. The adhesive material 148 may for example comprise a strip of strongly adhesive double-sided tape, which extends from a first longitudinal end in the first direction X1 along the further attachment area 146. The adhesive material 148 is preferably protected by a cover sheet, if not used for attachment to the printer casing 14.

[0045] The elongated attachment area 146 forms a substantially flat (i.e. planar) rectangle that extends in the first and third directions X1, Z1. As shown in Figures 2a and 2b, the base portion 140 of the first member 132 may have a folded profile. The base portion 140 has a substantially rectangular shape with a pair of opposite edges extending in the first direction X1. These opposite edges each comprise a flange that is doubly bent to define an intermediate flange portion 142a, 142b and a distal flange portion 144a, 144b. The distal flange portions 144a, 144b extend along the first direction X1 in a plane at a non-

zero distance from but substantially parallel with the elongated attachment area 146. The intermediate flange portions 142a, 142b are slanted towards the second direction Y1 away from the elongated attachment area 140, and each connect a respective distal flange portion 144a, 144b with the elongated attachment area 146. This configuration with two doubly-bent flanges 142a, 142b, 144a, 144b serves to increase the mechanical stiffness and prohibits users from bending the locking device 130 laterally away from the lateral surface 18 of the printer casing 14, thereby undesirably releasing the paper tray 24i.

[0046] At a second longitudinal end, the base portion 140 comprises a lock receiving member 150. In this embodiment, the lock receiving member is formed by a slit 150 that is adapted for receiving a cam 166 of a lock 164. The slit 150 is longitudinally bounded by a tab 152.

[0047] In the embodiment of Figures 2a-2b, the second member 134 comprises an interface portion 160. This interface portion 160 has a front surface 164 provided with a lock 166. The lock interface portion 160 and the lock 166 face the (positive) first direction XI. In this embodiment, the lock 166 comprises a rotatable cam 168 and a cylinder 166 for adjusting an angular position of the cam 168 with respect to the head portion 160. The cylinder 166 and the cam 168 are adapted to be rotationally manipulated by a user via an associated key (not shown). In this embodiment, the cam 168 of the second member 134 and the slit 150 of the first member 150 are adapted to assume an inter-locking arrangement, provided that the first and second members 132, 134 are in the engaged state (explained below), and that the cam 168 is rotated into the slit 150.

[0048] The second member 134 further comprises a base receiving portion 162, for accommodating the base portion 140 of the first member 132.

[0049] It may be helpful to set forth definitions of certain states of the proposed locking device embodiments. These states are explained with reference to the second embodiment of the locking device 130, but pertain to other embodiments as well.

[0050] In a “released state”, the first member 132 and the second member 134 form separated units (from each other as well as from the printer system 12).

[0051] In an “engaged state”, the first member 132 and the second member 134 are mutually engaged in a mechanically connected manner (e.g. via a sliding coupling motion).

[0052] In an “attached unlocked state”, the first member 132 is fixed with the base portion 140 to the attachment area 122 of the lateral surface 18 of the printer casing 14.

The second member 134 may either be in the engaged state with or disengaged from the first member 132.

[0053] In an “attached locked state”, the first member 132 is fixed with the base portion 140 to the attachment area 22 of the lateral surface 18 of the printer casing 14, while the first member 132 and the second member 134 are in the engaged state with the lock 166 closed to restrict or even prevent motion of the corresponding paper tray 24i with respect to the printer casing 14.

[0054] In the embodiment shown in Figures 2a-2b, the base receiving portion 162 extends along the first direction X1 and the third direction Z1. The base receiving portion 162 protrudes rearwards from a lateral region of the interface portion 160 and towards the (negative) first direction X1. Here, the base receiving portion 162 and the interface portion 160 are oriented at a right angle to form an L-shape.

[0055] The base receiving portion 162 comprises further opposite edges 170a, 170b that are bent opposite to the second direction Y1, to define guiding rails for the first member 132 and to increase a mechanical stiffness of the base receiving portion 162 against bending towards the second direction Y1.

[0056] The further opposite edges 170a, 170b are each bent into a U-shaped rails that extends along the first direction X1. Each of the rails is adapted to receive a corresponding flange portion 144a, 144b of the first member 132. Thus, for the first and second members 132, 134 in the engaged but unlocked state, a relative motion of the first and second members 132, 134 along the second and/or third directions Y1, Z1 will be restricted, while a sliding motion along the first direction X1 will still be possible.

[0057] Via actuation of the lock 166 and engagement of the cam 168 and the slit 150, the attached locked state will be established, wherein the first member 132 becomes immovable with respect to the second member 134.

Method for attaching a locking device: Figures 3a-3c

[0058] Figures 3a-3c illustrate a method for attaching an embodiment of a paper tray locking device to a conventional printer system.

[0059] Figure 3a shows a printer system 12 with a casing 14, as described with reference to Figure 1. Attaching the locking device initially comprises defining an attachment area 22. In this example, the attachment area 22 is located on the first lateral surface 18 of the printer casing 14. The attachment area 22 may for example be defined by

dry-fitting the locking device 30 in the engaged state onto the printer casing 14, so that the first member 32 and the second member 34 are mechanically connected and their proper positions with respect to the printer casing 14 and the media trays 24i may be determined. Defining the attachment area 22 may comprise delineating (marking) a periphery of the first member 32 onto the first lateral surface 18. As optional pre-processing steps, the defined attachment area 22 may be cleaned (e.g. by an alcohol-based or ammonium-based cleaning fluid) and/or by applying an adhesion promoter to the attachment area 22. The use of an adhesion promoter may significantly improve the bonding of the first member 32 onto to printer casing 14 and thus the load capacity for the locking device (e.g. by a factor of 1.5 to 2), but may also require precautionary measures due to the potential toxicity.

[0060] The protective liner of the adhesive tape 48 in the elongated attachment area 146 may then be removed, to expose the adhesive film of the tape 48. The exposed adhesive film is now ready to be brought into contact with the prepared attachment area 22 on the lateral surface 18 of the casing 14.

[0061] Figure 3b shows that the first member 32 has been adhered with the flat base portion 40 (and the adhesive film 48) onto to the attachment area 22. Here, the first member 32 has been attached with the slit 50 ate the distal end of the base portion 40 protruding forward beyond the front surfaces 26i of the media trays 24i. The first member 32 is now in the attached unlocked state.

[0062] Figure 3c illustrates that the second member 34 may now be slid onto the first member 32, to establish the engaged state.

[0063] In the case that the locking device 30 has been attached with a slight misalignment, the user may optionally be able to slightly reposition the attached locking device 30. This requires that the tape 48 in a bonded but uncured state still allows slight relative translation or rotation of the first member 32 with respect to the attachment area 22. If the locking device 30 has been properly aligned, the second member may be temporarily removed 34. This allows a user to press the first member 32 firmly with its base portion 40 against the attachment area 22 of the lateral surface 18, to improve the bonding. The adhesive film of the tape 48 may cure by waiting for a sufficient time period before re-attaching the second member 32 again.

[0064] When the first and second members 32, 34 are in the engaged state, the lock 66 on the second member 34 may be closed to secure the engagement between the first and second members 32, 34. The attached locked state is thereby realized, which serves tp

restrict or even prevent motion of the corresponding paper tray 24i with respect to the printer casing 14.

Other embodiments: Figures 4-6 and other alternatives

5 [0065] Figures 4-6 show paper tray locking devices 230, 330, 430 according to alternative embodiments. The interface portions of the respective second members 234, 334, 434 have different heights along the third direction Z1. The heights of the interface portions in Figures 5 and 6 are substantially larger than the first height of the base portion of the respective first members 332, 432. Figures 5 and 6 illustrate that the respective
10 interface portions of the second members 334, 434 may extend from the first member towards only one side or to both sides along the third direction Z1. Only a single first member needs to be fixed to the casing of the reproduction system. Different second members 234, 334, 434 with different heights may then be selectively attached to this single first member, to adjust the number of trays that need to be secured.

15 [0066] The descriptions above are intended to be illustrative, not limiting. It will be apparent to the person skilled in the art that alternative and equivalent embodiments of the invention can be conceived and reduced to practice, without departing from the scope of the claims set out below.

[0067] For example, the described media tray locking device embodiments may be
20 applied to other types of graphic reproduction systems (in addition to printer systems), e.g. to copiers, fax machines, scanners, and finishers. The locking device may also be used to protect a media tray of a booklet maker or a discharge tray or bin for a paper shredder. Use of the locking device for protecting hatches, shutters, panels, drawers etc. of other systems is also contemplated.

25 [0068] Note that for reasons of conciseness, the reference numbers corresponding to similar elements in the various embodiments (e.g. elements 130, 230 similar to element 30) have been collectively indicated in the claims by their base numbers only i.e. without the multiples of hundreds. This does not suggest that the claim elements should be construed as referring only to features corresponding to the base numbers.

30

LIST OF REFERENCE SYMBOLS

Similar reference numbers that have been used in the description to indicate similar elements (but differing only in the hundreds) have been omitted from the list below, but should be considered implicitly included.

5	10	printer system assembly
	12	printer system (graphic reproduction system)
	14	printer casing
	16	first surface (front surface)
	18	second surface (first lateral surface)
10	20	third surface (second lateral surface)
	21	fourth surface (rear surface)
	22	attachment area
	24i	paper tray (i = a, b, c, d, ...)
	26i	tray front (e.g. with grip) (i = a, b, c, d, ...)
15	30	paper tray locking device
	32	first member (e.g. folded plate)
	34	second member (e.g. lock head)
	40	base portion
	42a-b	slanted portion
20	44a-b	flange portion
	46	elongated attachment area
	48	adhesive film (e.g. glue strip)
	50	lock receiving member or void (e.g. slit)
	52	tab
25	60	interface portion
	62	base receiving portion (e.g. receiving plate)
	64	interface surface
	66	lock (e.g. cylinder and cam lock)
	68	latching member (e.g. cam)
30	70a-b	bent flange (e.g. curved flange forming rails)
	Xp	first printer direction (e.g. longitudinal printer direction)
	Yp	second printer direction (e.g. lateral printer direction)
	Zp	third printer direction (e.g. vertical printer direction)

	X1	first lock direction (e.g. longitudinal lock direction)
	Y1	second lock direction (e.g. lateral lock direction)
	Z1	third lock direction (e.g. vertical lock direction)
	$\Delta X1$	first length
5	$\Delta Z1$	first height
	$\Delta Z2$	second height
	ΔZp	height of tray front

CONCLUSIES

1. Een ladeafsluitinrichting (30) voor het beperken van beweging van een medialade (24) ten opzichte van een behuizing (14) van een grafisch reproductiesysteem (12), waarbij de ladeafsluitinrichting omvat:
- een eerste orgaan (32), omvattende:
 - een basisdeel (40) met een langwerpige vorm langs een eerste richting (XI), en
 - een slotrecipiërend element (50) voor het samenwerken met een slotelement (68);
 - een tweede orgaan (34), omvattende:
 - een basisrecipiërend deel (62) voor koppeling met het basisdeel om een glijdende beweging tussen het eerste orgaan en het tweede orgaan langs de eerste richting (XI) toe te staan en tegelijkertijd beweegbaarheid in tweede en derde richtingen (YI, ZI) te beperken, en
 - een interfacedeel (60) voorzien van het slotelement (68), voor het samenwerken met het slotrecipiërend deel om een vergrendelde toestand te realiseren tussen het eerste orgaan en het tweede orgaan waarin beweegbaarheid langs de eerste richting (XI) beperkt is;
- waarbij het basisdeel een langwerpig bevestigingsgebied (36) heeft voor het ontvangen van een plaklaag (48) voor bevestiging van de ladeafsluitinrichting aan een buitenoppervlak (18) van de behuizing van het grafische reproductiesysteem.
2. De ladeafsluitinrichting (30) volgens conclusie 1, waarbij het langwerpige bevestigingsgebied (46) van het basisdeel (40) zich uitstrekt langs de eerste en derde richtingen (XI, ZI), en waarbij het basisdeel twee opstaande randen (42, 44) omvat die naar of tegengesteld aan de tweede richting (YI) gebogen zijn.
3. De ladeafsluitinrichting (30) volgens conclusie 2, waarbij het basisdeel (40) gevormd is uit een plaat met een tweetal tegenoverliggende randen die zich uitstrekken langs de eerste richting (XI), en waarbij de twee opstaande randen (42, 44) zich uitstrekken langs het tweetal tegenoverliggende randen.

4. De ladeafsluitinrichting (30) volgens een van de conclusies 2 – 3, waarbij ten minste een van de twee opstaande randen (42, 44) dubbel gebogen is, teneinde te vormen:
- een afgelegen randdeel (44) dat zich in een vlak langs de eerste richting (Xl) op een eindige afstand van en hoofdzakelijk evenwijdig aan het langwerpige bevestigingsgebied (46) uitstrekt, en
 - een tussenliggend randdeel (42) dat schuin of gekromd in de tweede richting (Yi) weg van het langwerpige bevestigingsgebied loopt, en dat het afgelegen randdeel verbindt met het langwerpige bevestigingsgebied.
- 5
- 10 5. De ladeafsluitinrichting (30) volgens conclusie 4, waarbij het afgelegen randdeel (44) en het tussenliggende randdeel (42) zich hoofdzakelijk langs de gehele corresponderende tegenoverliggende rand uitstrekken.
6. De ladeafsluitinrichting (30) volgens een van de conclusies 1 – 5, waarbij het basisrecipiërende deel (62) van het tweede orgaan (34) zich langs de eerste richting (Xl) en de derde richting (Zl) uitstrekt, en waarbij het basisrecipiërende deel verdere tegenoverliggende randen (70) omvat die gebogen zijn naar of tegengesteld aan de tweede richting (Yl) om beweegbaarheid van het eerste orgaan (32) langs de tweede en derde richtingen (Yl, Zl) te beperken.
- 15
- 20 7. De ladeafsluitinrichting (30) volgens conclusie 6, waarbij het basisrecipiërende deel (62) gevormd is uit een verdere plaat waarbij de verdere tegenoverliggende randen (70) zich langs de eerste richting (Xl) uitstrekken.
- 25 8. De ladeafsluitinrichting (30) volgens een van de conclusies 6 – 7, waarbij elk van de verdere tegenoverliggende randen (70) van het basisrecipiërende deel (62) via de tweede richting (Yl) terug naar de derde richting (Zl) gebogen is om een rail te vormen voor het onderbrengen van een corresponderende tegenoverliggende rand van het eerste orgaan (32) en voor het beperken van de beweegbaarheid van het eerste orgaan (32)
- 30 langs de tweede en derde richtingen (Yl, Zl).
9. De ladeafsluitinrichting (30) volgens een van de conclusies 1 – 8, waarbij het basisrecipiërende deel (62) zich langs de eerste en derde richtingen (Xl, Zl) uitstrekt,

waarbij het interfacedeel (60) zich langs de tweede en derde richtingen (Y1, Z1) uitstrekt, en waarbij het basisreceptiërende deel en het interfacedeel hoofdzakelijk onder een rechte hoek staan, en bij voorkeur een L-vorm definiëren.

- 5 10. De ladeafsluitinrichting (30) volgens een van de conclusies 1 - 9, waarbij een eerste hoogte ($\Delta Z1$) van het basisdeel (40) kleiner is dan of hoofdzakelijk gelijk is aan een hoogte (ΔZp) van een ladevoorkant (26) van de mediumlade (24).
- 10 11. De ladeafsluitinrichting (30) volgens conclusie 10, waarbij het interfacedeel (60) van het tweede orgaan (34) een tweede hoogte ($\Delta Z2$) langs de derde richting (Z1) heeft die groter is dan de eerste hoogte ($\Delta Z1$) van het basisdeel (40) van het eerste orgaan (32).
- 15 12. De ladeafsluitinrichting (30) volgens een van de conclusies 1 – 11, waarbij het slotreceptiërende element (50) op het eerste orgaan (32) gevormd is door een gleuf (50) aan een in de eerste richting (X1) gelegen uiteinde van het basisdeel (40), en waarbij het slotelement (68) op het tweede orgaan (34) een sluitnok (68) omvat voor samenwerking met de gleuf om de gesloten toestand te realiseren.
- 20 13. Een reproductiesysteem samenstel (10), omvattende:
- een grafisch reproductiesysteem (12) met ten minste een mediumlade (24);
 - een ladeafsluitinrichting (30) met een eerste orgaan (32) en een tweede orgaan (34) volgens een van de conclusies 1 - 12, waarbij een langwerpige vlak koppelgebied (46) van een basisdeel (40) van het eerste orgaan door middel van een plaklaag (48) is bevestigd aan een zijoppervlak (18) van een behuizing (14) van het grafische reproductiesysteem (12).
- 25
- 30 14. Een werkwijze voor het opwaarderen van een grafisch reproductiesysteem (12), waarbij het grafische reproductiesysteem een behuizing (14) omvat met een eerste oppervlak (16) en een tweede oppervlak (18) die gelegen is nabij en onder een hoek met het eerste oppervlak, waarbij de behuizing voorzien is van een mediumlade (24) gelegen aan het eerste oppervlak (16), en van een bevestigingsgebied (22) aan het tweede oppervlak (18), waarbij de werkwijze omvat:

- het verschaffen van een ladeafsluitinrichting (30) met een eerste orgaan (32) en een tweede orgaan (34) volgens een van de conclusies 1 - 12;

- het door middel van een plaklaag (48) bevestigen van een langwerpig bevestigingsgebied (46) van een basisdeel (40) van het eerste orgaan (32) aan het bevestigingsgebied van de behuizing.

5

15. De werkwijze volgens conclusie 14 omvattende:

- het glijdend bevestigen van een basisreceptiërend deel (62) van het tweede orgaan (34) aan het vastgemaakte verdere gebied (46) van het eerste orgaan (32).

10

Fig. 1

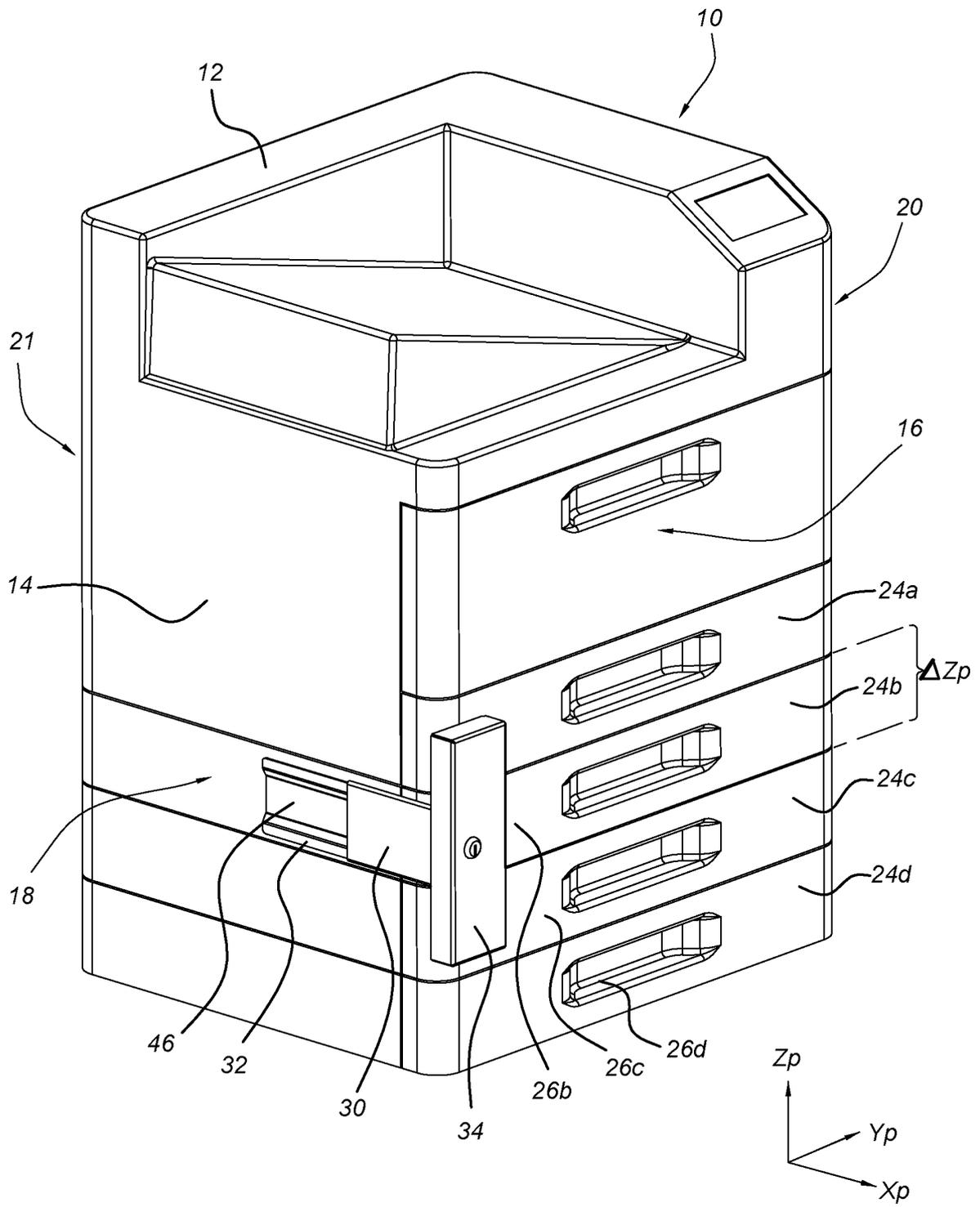


Fig. 2a

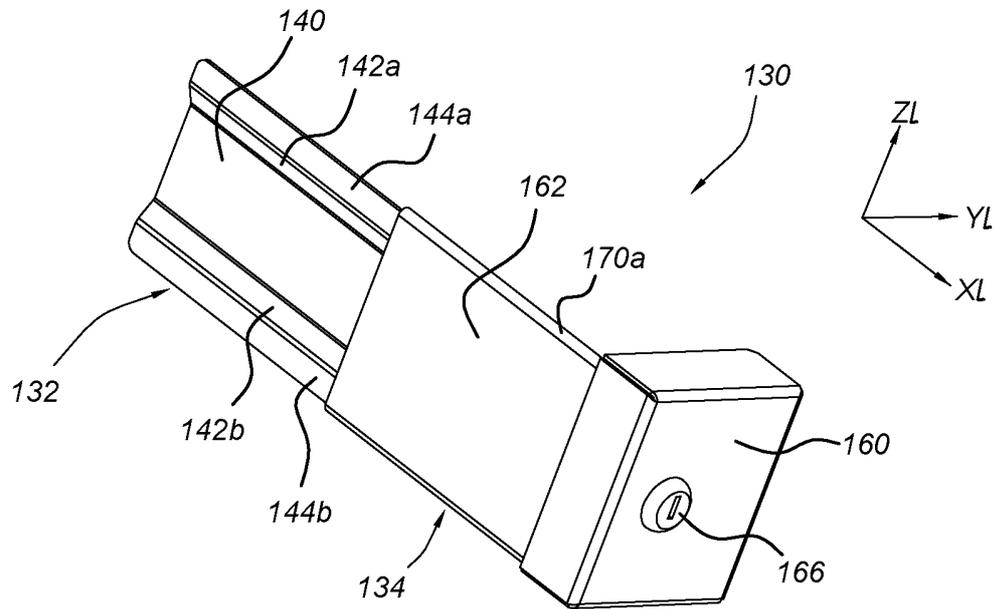


Fig. 2b

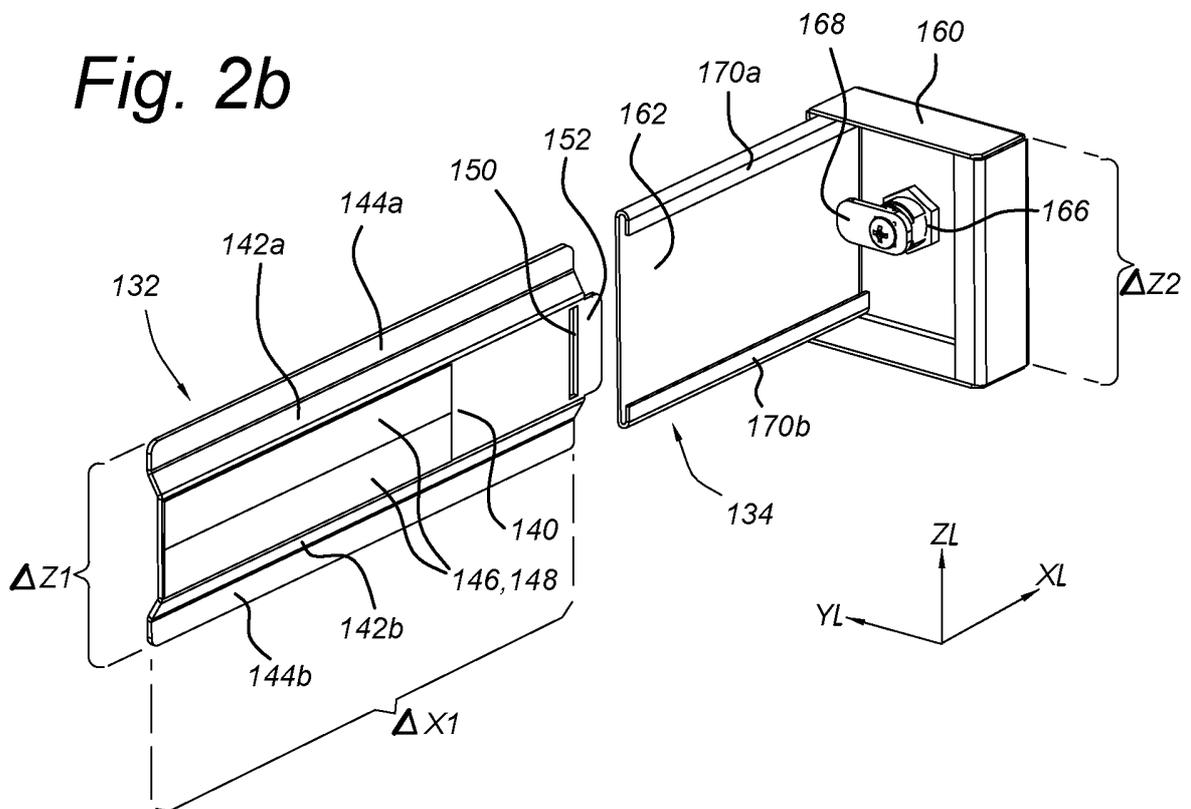


Fig. 3a

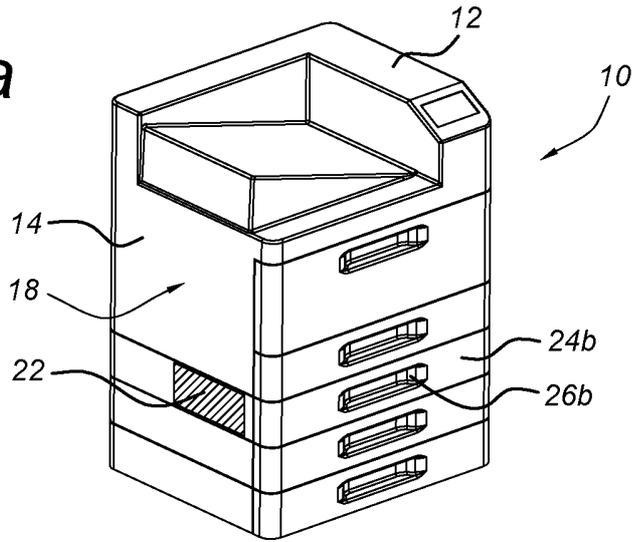


Fig. 3b

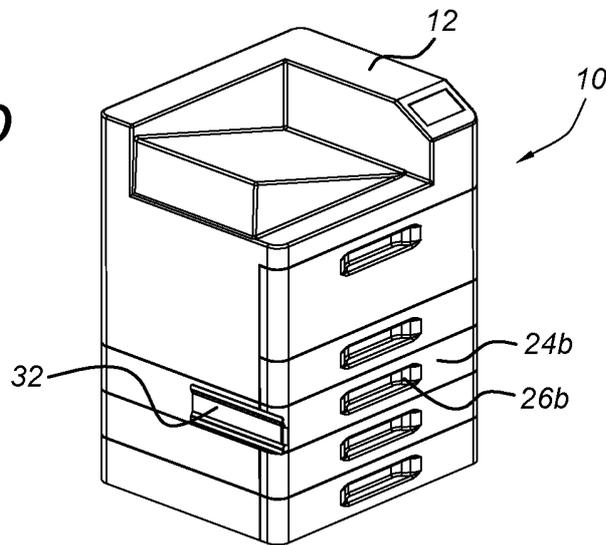
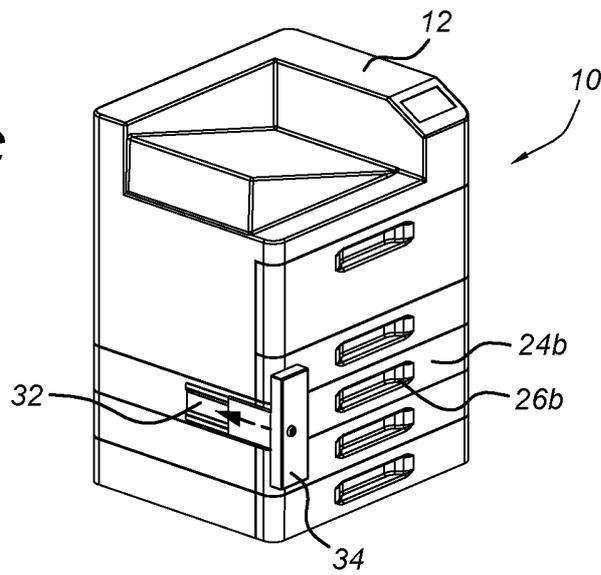


Fig. 3c



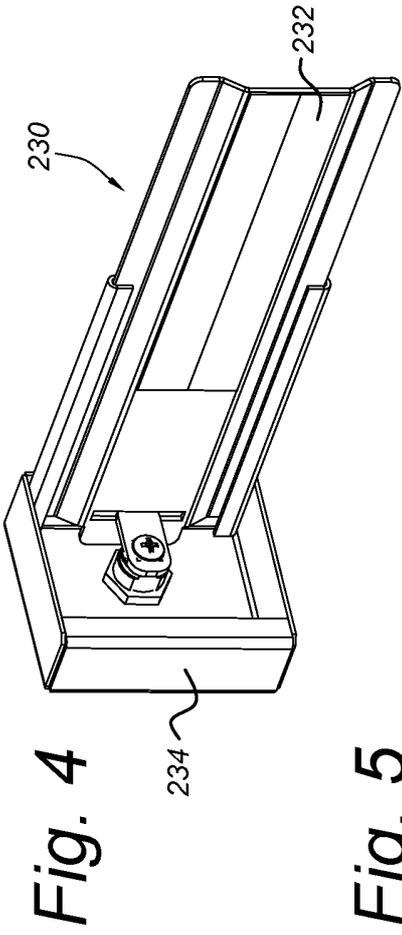
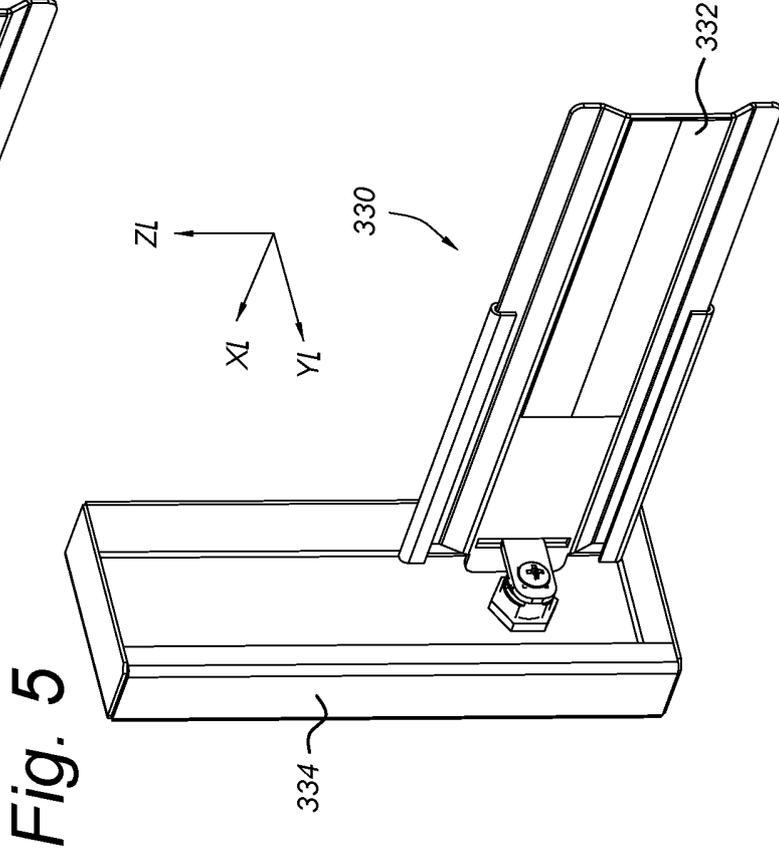
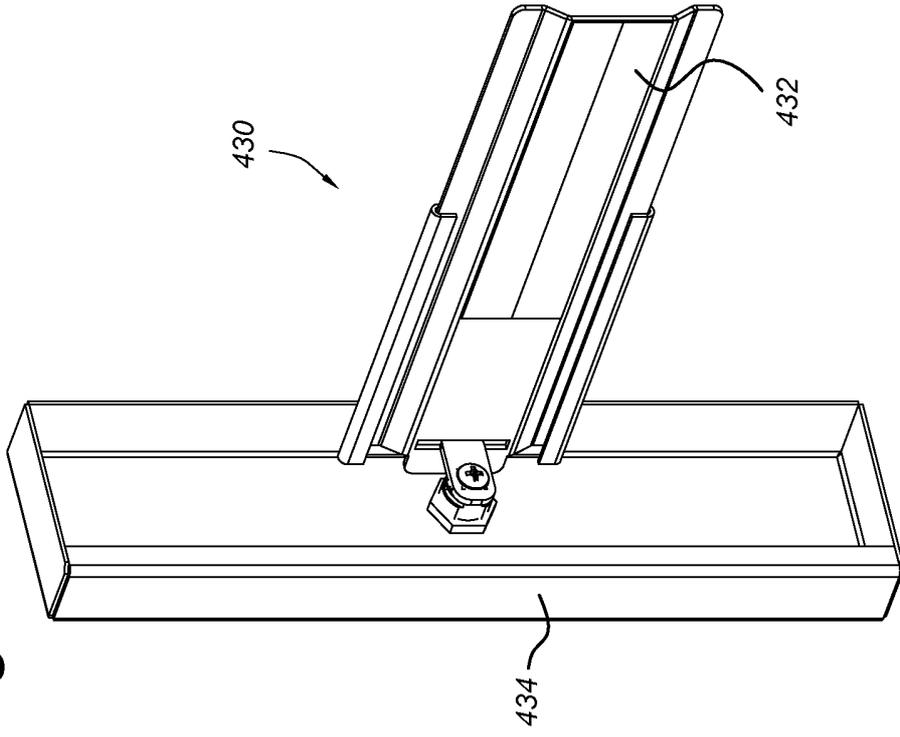


Fig. 6



ABSTRACT

A tray locking device (30) for restricting motion of a media tray (24b) with respect to a casing (14) of a graphic reproduction system (12). The tray locking device comprises
5 first and second members (32, 34) that are slidably arranged. The first member has a base portion with an elongated attachment area (46) for receiving an adhesive film, adapted for fixing the tray locking device to an outer surface (18) of the casing of the graphic reproduction system.

10 [FIG. 1]

SAMENWERKINGSVERDRAG (PCT)

RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

IDENTIFICATIE VAN DE NATIONALE AANVRAGE	KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE P6055283NL
Nederlandse aanvraag nr. 2014591	Indieningsdatum 08-04-2015
	Ingeroepen voorrangsdatum
Aanvrager (Naam) VZ Industries B.V.	
Datum van het verzoek voor een onderzoek van internationaal type 11-07-2015	Door de instantie voor Internationaal Onderzoek aan het verzoek voor een onderzoek van internationaal type toegekend nr. SN64498
I. CLASSIFICATIE VAN HET ONDERWERP (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven) Volgens de internationale classificatie (IPC) B41J13/10	
II. ONDERZOCHE TE GEBIEDEN VAN DE TECHNIEK Onderzochte minimumdocumentatie	
Classificatiesysteem	Classificatiesymbolen
IPC	B41J E05B G03G
Onderzochte andere documentatie dan de minimum documentatie, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen	
III. <input type="checkbox"/>	GEEN ONDERZOEK MOGELIJK VOOR BEPAALDE CONCLUSIES (opmerkingen op aanvulgebied)
IV. <input type="checkbox"/>	GEBREK AAN EENHEID VAN UITVINDING (opmerkingen op aanvulgebied)

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar
de stand van de techniek

NL 2014591

A. CLASSIFICATIE VAN HET ONDERWERP
INV. B41J13/10
ADD.

Volgens de Internationale Classificatie van octrooien (IPC) of zowel volgens de nationale classificatie als volgens de IPC.

B. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK

Onderzochte minimum documentatie (classificatie gevolgd door classificatievymcodes)

B41J ED5B G03G

Onderzochte andere documentatie dan de minimum documentatie, voor dergelijke documenten, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

Tijdens het onderzoek geraadpleegde elektronische gegevensbestanden (naam van de gegevensbestanden en, waar uitvoerbaar, gebruikte trefwoorden)

EPO-Internal, WPI Data

C. VAN BELANGS GEACHTE DOCUMENTEN

Categorie *	Geselecteerde documenten, eventueel met aanduiding van aspecten van belang zijnde passages	Van belang voor conclusie n°
A	US 2007/251405 A1 (KUROKAWA YASUHIRO [JP] ET AL) 1 november 2007 (2007-11-01) * samenvatting * * alinea [0028] - alinea [0025]; figuren 1,2,3a,3b * *****	1-15

Verder documenten worden vermeld in het verzoek van vak C.

Leden van dezelfde octroofamilie zijn vermeld in een bijlage

* Speciale categorieën van aangehaalde documenten

"A" niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft

"C" in de octrooiaanvraag vermeld

"E" eerdere octrooi(ausvinding), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven

"L" om andere redenen vermeldde literatuur

"O" met schriftelijke stand van de techniek

"P" tussen de voortgangdatum en de indieningsdatum gepubliceerde literatuur

"T" na de indieningsdatum of de voortgangdatum gepubliceerde literatuur die niet bezwaarlijk is voor de octrooiaanvraag, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding

"X" de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur

"Y" de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geselecteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht

"Z" lid van dezelfde octroofamilie of overeenkomstige octrooipublicatie

Datum waarop het onderzoek naar de stand van de techniek van internationaal type werd voltooid

22 december 2015

Verzenddatum van het rapport van het onderzoek naar de stand van de techniek van internationaal type

Naam en adres van de instantie

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Fax: (+31-70) 340-3218

De bevoegde ambtenaar

Wehr, Wolfhard

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

informatie over leden van dezelfde octroofamilie

Nummer van het verzoek om een onderzoek naar
de stand van de techniek

NL 2014591

In het rapport genoemd octrooigezinsft	Datum van publicatie	Overeenkomstige geschrift(en)	Datum van publicatie	
US 2007251405	A1	01-11-2007	CN 101063838 A	31-10-2007
			JP 4678329 B2	27-04-2011
			JP 2007297170 A	15-11-2007
			US 2007251405 A1	01-11-2007

WRITTEN OPINION

File No. SN64498	Filing date (day/month/year) 08.04.2015	Priority date (day/month/year)	Application No. NL2014591
International Patent Classification (IPC) INV. B41J13/10			
Applicant VZ Industries B.V.			

This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the application
- Box No. VIII Certain observations on the application

Examiner Wehr, Wolfhard

WRITTEN OPINION

Box No. I Basis of this opinion

1. This opinion has been established on the basis of the latest set of claims filed before the start of the search.
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - a sequence listing
 - table(s) related to the sequence listing
 - b. format of material:
 - on paper
 - in electronic form
 - c. time of filing/furnishing:
 - contained in the application as filed.
 - filed together with the application in electronic form.
 - furnished subsequently for the purposes of search.
3. In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty	Yes: Claims	1-15
	No: Claims	
Inventive step	Yes: Claims	1-15
	No: Claims	
Industrial applicability	Yes: Claims	1-15
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following document:

D1 US 2007/251405 A1 (KUROKAWA YASUHIRO [JP] ET AL) 1 november
 2007 (2007-11-01)

D1 is regarded as being the prior art closest to the subject-matter of **claim 1** and discloses (the references in parentheses applying to D1)

een ladeafsluitinrichting (20, 24, 26) voor het beperken van beweging van een medialade (18) ten opzichte van een behuizing (12) van een grafisch reproductiesysteem (10), waarbij de ladeafsluitinrichting omvat:

- een eerste orgaan (20, 20A, 20B, 20C), omvattende:
 - een basisdeel (20B) met een langwerpige vorm langs een eerste richting (see Fig. 2), en
 - een slotreceptiërend element (20C) voor het samenwerken met een slotelement (26, 26A);
 - een tweede orgaan (24), omvattende:
 - een interfacedeel (25) voorzien van het slotelement (26A), voor het samenwerken met het slotreceptiërend deel om een vergrendelde toestand te realiseren tussen het eerste orgaan (20, 20A, 20B, 20C) en het tweede orgaan (24) waarin beweegbaarheid langs de eerste richting beperkt is (see Fig. 1 and Fig. 2);
- waarbij het basisdeel een langwerpig bevestigingsgebied heeft (20B) voor (suitable for!) het ontvangen van een plaklaag (the flat shape of element 20B would allow an adhesive layer to be applied to this element 20B) voor bevestiging van de ladeafsluitinrichting aan een buitenoppervlak van de behuizing (12) van het grafische reproductiesysteem (see Fig. 2).

The subject-matter of claim 1 therefore differs from this known tray locking device in that the second member comprises

- een basisreceptiërend deel voor koppeling met het basisdeel om een glijdende beweging tussen het eerste orgaan en het tweede orgaan langs de eerste richting toe te staan en tegelijkertijd beweegbaarheid in tweede en derde richtingen te beperken.

and is therefore new.

The problem to be solved by the present invention may be regarded as providing an alternative for the known tray locking device.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step:

The second member in D1 comprises an element 26 in Fig. 2 as an "interface portion" in the sense of claim 1, and this element (rod 16) of the lock can be inserted into a hole of the first member and - during the same mounting movement - into a hole of the paper tray, when the holes are positioned in corresponding positions.

There is no hint in D1 at a base receiving portion, as part of the second member, for an engagement with the base portion of the first member to make a sliding motion between the first member and the second member along the first direction possible (this "first direction" is the longitudinal direction in which the element 20B extends: see Fig. 2).

Claims 2 to 12 are dependent on claim 1 and as such also meet the requirements of novelty and inventive step.

The independent **claim 13** concerns a reproduction system assembly comprising the second member (with the base receiving portion) defined in claim 1; it is discussed in the context with claim 1, above, that the arrangement of this second member is new and inventive. In addition, there is no hint in D1 at the adhesive film specified in detail in claim 13. It follows that also claim 13 meets the requirements of novelty and inventive step.

The independent **claim 14** is directed to a method for upgrading a graphic reproduction system. The claim specifies also the usage of the second member defined in claim 1. The arrangement of this second member cooperating with the first member is regarded as new and inventive, as it is discussed above in the context with claim 1. In addition, there is no hint in D1 at the adhesive film specified in detail in claim 14. It follows that also claim 14 meets the requirements of novelty and inventive step.

Claims 15 is dependent on claim 14 and as such also meets the requirements of novelty and inventive step.

* * *