HYBRID DOCUMENT FEEDING MECHANISM AND DOCUMENT INVALIDATION DEVICE

TECHNICAL FIELD

The present disclosure relates generally to a technical field of material transport, and more specifically, relates to a hybrid document feeding mechanism and a document invalidation device.

BACKGROUND

Document, which is stored and managed in the document management device, has a valid period of use. When the valid period of the document expires, the old document needs to be invalidated by a document invalidation device. That is, the identifiable identity information recited in the document should be invalidated. The administrator takes the document to be invalidated out of the document management device and puts it into the document invalidation device for invalidation. However, as the document includes a card-type document and a book-type document having different sizes, two feeding frames with two feeding inlets are always correspondingly provided for the two different types of documents. However, this design needs to replace the feeding frame according to the documents, which increases the feeding time and reduces the feeding efficiency. Therefore, in order to improve the feeding efficiency of different documents, it is necessary to design a feeding frame with different feeding inlets simultaneously, to satisfy the feeding requirements of different documents.

SUMMARY

The object of the this disclosure is to provide a hybrid document feeding mechanism and a document invalidation device aiming at the technical problem in the prior art that the feeding time is increased for replacing the feeding frame.

In a first aspect, a hybrid document feeding mechanism, is provided, including a feeding frame with at least one feeding inlet, an adjustment mechanism for self-adaptive adjusting and switching of each feeding inlet, a fixation support which is connected with the adjustment mechanism, and a transport component which is connected with the fixation support, wherein each adjacent feeding inlets are arranged at intervals and have a feeding position difference.

Optionally, each feeding inlet includes a first feeding inlet and a second feeding inlet which are arranged at intervals along a bottom of the feeding frame, and the first feeding inlet and the second feeding inlet are mutually embedded.

Optionally, a feeding end of the first feeding inlet is provided with a first guide bevel for inserting a document, and a feeding end of the second feeding inlet is provided with a second guide bevel for inserting a document.

Optionally, a distance between a top of the first guide bevel and a bottom of the feeding frame is greater than a distance between a top of the second guide bevel and the bottom of the feeding frame, so as to form a feeding height difference between the second guide bevel and the first guide bevel.

Optionally, the adjustment mechanism includes an adjustment part which is connected with the feeding frame and a drive part which is in drive connection with the adjustment part; wherein one end of the adjustment part is movably inserted into the drive part, and the other end of the adjustment part is connected with the feeding frame through an installation part.

Optionally, the drive part adopts one of an air cylinder, a hydraulic cylinder or an electric cylinder, and the adjustment part adopts a telescopic pushrod which is in

drive connection with the drive part, a top of the adjustment part is movably inserted into an end of the drive part.

Optionally, the feeding frame is provided with an installation groove which is arranged with an installation hole matching with the installation part, wherein the adjustment part is connected with the feeding frame through the installation hole.

Optionally, a document detection sensor is arranged along a feeding position of the feeding frame and configured to determine a type of the document entering along the feeding frame.

Optionally, the adjustment mechanism also includes a guide apparatus which is arranged along both sides of the feeding frame, and the guide apparatus includes a guide column which penetrates through the feeding frame and a guide sleeve which is sleeved outside the guide column.

Optionally, the fixation support is composed of several fixation parts, which include a first fixation part connected with the drive part, a second fixation part connected with the guide sleeve and a third fixation part connected with the transport component.

Optionally, the transport component includes a drive apparatus which is fixed at the fixation support, a movable support which is in drive connection with the drive apparatus, a transmission apparatus which is rotationally connected with the movable support, and a transmission structure which is in drive connection with the transmission apparatus.

Optionally, the movable support has a connection rod which is connected with the drive apparatus, and the drive apparatus drives the movable support to move upward and downward along a vertical direction through the connection rod;

the movable support has several installation cavities, each of which is integrally formed to form the movable support.

Optionally, the transmission apparatus includes a drive source which is installed inside one installation cavity, and a driving part and a driven part which are installed inside another installation cavity and rotationally connected with the drive source, wherein driving part and the driven part are connected through a synchronous belt.

Optionally, the hybrid document feeding mechanism also includes a power source which is fixed at the fixation support and a transport apparatus which is slidably connected with the fixation support; wherein the power source drives the transport component to move along the transport apparatus through the fixation support.

In a second aspect, a document invalidation device is provided, including an installation frame, a hybrid document feeding mechanism which is arranged inside the installation frame and reciprocates between a feeding position and a target invalidation position, a document invalidation mechanism which is arranged along the installation frame and adjacent to the target invalidation position, and a waste recycling mechanism which is arranged below the document invalidation mechanism.

The hybrid document feeding mechanism and document invalidation device provided in this disclosure have following the beneficial effects. The hybrid document feeding mechanism includes a feeding frame with at least one feeding inlet, an adjustment mechanism for self-adaptive adjusting and switching of each feeding inlet, a fixation support which is connected with the adjustment mechanism, and a transport component which is connected with the fixation support, wherein each adjacent feeding inlets are arranged at intervals and have a feeding position difference. By using this hybrid document feeding mechanism, the same one feeding frame can quickly realize the feeding of different documents, which saves

costs, improves the feeding efficiency, and improves the invalidation efficiency of the document invalidation device.

BRIEF DESCRIPTION OF THE DRAWINGS

In order to more clearly illustrate the technical solution in the embodiment of the present disclosure, the drawings used in the embodiments or prior arts will be briefly introduced. It is obvious that the drawings in the following description are only some embodiments of the this disclosure. For ordinary technicians in the present art, they can also obtain other drawings without paying creative labor according to these drawings.

Fig. 1 is an structure diagram of a hybrid document feeding mechanism provided by an embodiment of this disclosure.

Fig. 2 is an structure diagram of a feeding frame of a hybrid document feeding mechanism provided by an embodiment of this disclosure.

Fig. 3 is an structure diagram from another perspective of a feeding frame of a hybrid document feeding mechanism provided by an embodiment of this disclosure.

Fig. 4 is an structure diagram of a fixation support of a hybrid document feeding mechanism provided by an embodiment of this disclosure.

Fig. 5 is a first partial structure diagram of a hybrid document feeding mechanism provided by an embodiment of this disclosure.

Fig. 6 is a first partial structure diagram from another perspective of a hybrid document feeding mechanism provided by an embodiment of this disclosure.

Fig. 7 is an structure diagram of a hybrid document feeding mechanism provided by another embodiment of this disclosure.

Fig. 8 is an structure diagram of a document invalidation device provided by an embodiment of this disclosure.

The reference number for each component in the drawings are as follows.

Hybrid document feeding mechanism	1	Feeding inlet	10
Feeding frame	20	Adjustment mechanism	30
Fixation support	40	Transport component	50
First feeding inlet	101	Second feeding inlet	102
First guide bevel	1011	Second guide bevel	1021
Adjustment part	301	Drive part	302
Installation part	303	Installation groove	21
Installation hole	22	Guide apparatus	31
Guide column	311	Guide sleeve	312
Connection position	201	Fixation part	41
First fixation part	411	Second fixation part	412
Third fixation part	413	Drive apparatus	51
Movable support	52	Transmission apparatus	53
Transmission structure	54	Connection rod	521
Drive source	531	Driving part	532
Driven part	533	Transmission shaft	541
Transmission roller	542	Power source	70
Transport apparatus	80	Sliding block	801
Sliding rail	802	Document invalidation device	200
Installation frame	204	Document invalidation mechanism	202
Waste recycling mechanism	203		

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In order to make the object, technical scheme and advantages of the this disclosure clearer, the this disclosure will be further described in detail in combination with the drawings and the embodiments. It should be understood that the specific embodiments described herein are only used to explain the this disclosure and are not used to limit the this disclosure.

It should be noted that when an element/component is mentioned as being "fixed" or "arranged" on another element/component, it can be directly on another element/component or it may be indirectly fixed or arranged on another element/component through a third element/component. When an element/component is mentioned as being "connected" with another element/component, it may be directly connected with another element/component or it may be indirectly connected to another element/component through a third component.

It should be noted that the technical terms, such as “length”, “width”, “upper”, “lower”, “front”, “back”, “left”, “right”, “vertical”, “horizontal”, “top”, “bottom”, “inner”, “outer”, indicating the orientation or position relationship are based on the orientation or position relationship shown in the attached drawings. They are just for the description convenience and simplifying, rather than indicating or implying that the device or element referred to must have the specific orientation, or be constructed and operated in the specific orientation, and cannot be understood as the limitation of the this disclosure.

In addition, the terms "first" and "second" are used for descriptive purposes only and cannot be understood as indicating or implying the relative importance or implicitly indicating the number of technical features. Thus, the features defined with "first" and "second" can explicitly or implicitly include one or more of these features. In the description of the this disclosure, “several” or “a plurality of” means two or more, unless otherwise is specifically defined.

Please refer to Figures 1 to 8, simultaneously. This disclosure provides a hybrid document feeding mechanism 1, which includes a feeding frame 20 with at least one feeding inlet 10, an adjustment mechanism 30 for self-adaptive adjusting and switching of each feeding inlet 10, a fixation support 40 which is connected with the adjustment mechanism 30 and a transport component 50 which is

connected with the fixation support 40. Each adjacent feeding inlets 10 are arranged at intervals and have a feeding position difference. In this embodiment, the hybrid document feeding mechanism 1 is applicable to different types of documents, including card-type documents, such as Singapore ID card, Hong Kong and Macao ID card, social security card, bank card and so on, as well as book-type documents, such as passport, residence booklet and so on. Of course, the hybrid document feeding mechanism 1 is applicable to other materials with different specifications, rather than is limited to documents. In this way, when different documents need to enter along the feeding inlet 10, the adjustment mechanism 30 automatically adjusts and switches the corresponding feeding inlet 10 according to the type of document. When the document enters, the transport component 50 drives the document to move, which realizes the rapid feeding and transport of different documents, and improves the feeding efficiency.

Please refer to Figure 1 and Figure 2, simultaneously. Further, each feeding inlet 10 includes a first feeding inlet 101 and a second feeding inlet 102 which are arranged at intervals along a bottom of the feeding frame 20, and the first feeding inlet 101 and the second feeding inlet 102 have a feeding position difference between them. Preferably, in this embodiment, the first feeding inlet 101 and the second feeding inlet 102 correspond to the book-type document and the card-type document respectively, that is, the book-type document enters along the first feeding inlet 101 and the card-type document enters along the second feeding inlet 102, and there are a horizontal feeding position difference and a vertical feeding position difference between the first feeding inlet 101 and the second feeding inlet 102, and the first feeding inlet 101 and the second feeding inlet 102 are arranged at intervals.

Please refer to Figure 1 and Figure 2, simultaneously. Furthermore, each feeding inlet 10 includes a first feeding inlet 101 and a second feeding inlet 102

arranged at intervals along the bottom of the feeding frame 20, wherein the first feeding inlet 101 and the second feeding inlet 102 are mutually embedded. In this embodiment, the first feeding inlet 101 and the second feeding inlet 102 are embedded at the bottom of the feeding frame 20. Because the length and width of the book-type document are greater than the length and width of the card-type document, both ends of the first feeding inlet 101 respectively abut against left and right ends of the bottom of the feeding frame 20, and both ends of the second feeding inlet 102 are embedded along a middle position of the bottom of the feeding frame 20, which form a pattern that the first feeding inlet 101 covers the outside of the second feeding inlet 102. Such arrangement is convenient for the book-type document and card-type document to feed quickly along the different feeding inlets 10 at the bottom of the same feeding frame 20, without replacing the feeding frame. The structure design is simple, convenient for production and improves efficiency.

Please refer to Figure 1 and Figure 2, simultaneously. Furthermore, a feeding end of the first feeding inlet 101 is provided with a first guide bevel 1011 for inserting the document, and a feeding end of the second feeding inlet 102 is provided with a second guide bevel 1021 for inserting the document. The second guide bevel 1021 and the first guide bevel 1011 have a feeding height difference therebetween. In this embodiment, the feeding end of the first feeding inlet 101 is provided with the first guide bevel 1011 for inserting the book-type document, and the feeding end of the second feeding inlet 102 is provided with the second guide bevel 1021 for inserting the card-type document, wherein the distance between the top of the first guide bevel 1011 and the bottom of the feeding frame 20 is greater than the distance between the top of the second guide bevel 1021 and the bottom of the feeding frame 20. That is, the height of the first guide bevel 1011 is greater than the height of the second guide bevel 1021. In this way, the feeding height difference for

the book-type document and the card-type document to enter the feeding frame 20 is formed. In addition, the first guide bevel 1011 and the second guide bevel 1021 are similar to a horn shape, so that when the document passes through, even if there is a slight position deviation between the first feeding inlet 101 and the second feeding inlet 102, the entry of the document is not hampered. The insertion end of the document contacts the first guide bevel 1011 and the second guide bevel 1021, and moves along the first guide bevel 1011 and the second guide bevel 102 which also play a guidance role. In this embodiment, two different feeding inlets 10 are arranged at the bottom of one feeding frame 20, which shortens the feeding time of different documents and improves the efficiency of document transport.

Please refer to Figure 1. Furthermore, the adjustment mechanism 30 includes an adjustment part 301 which is connected with the feeding frame 20 and a drive part 302 which is in drive connection with the adjustment part 301. One end of the adjustment part 301 is movably inserted into the drive part 302, and the other end of the adjustment part 301 is connected with the feeding frame 20 through an installation part 303. Preferably, the installation part 303 is arranged at an upper surface of the adjustment part 301. Specifically, in this embodiment, the drive part 302 adopts one of an air cylinder, a hydraulic cylinder or an electric cylinder, and the adjustment part 301 adopts a telescopic pushrod which is in drive connection with the drive part 302, a top of the adjustment part 301 is movably inserted into an end of the drive part 302. Preferably, the telescopic pushrod adopts a cylindrical and square rod body, and the adjustment part 301 can move upward and downward in the vertical direction along the drive part 302. Since the other end of the adjustment part 301 is connected with the feeding frame 20, the feeding frame 20 can move upward and downward in the vertical direction. In addition, in this embodiment, the installation part 303 includes an avoidance groove which is recessed at one end of the adjustment part 301 and a connection hole penetrating

through the avoidance groove. The connection hole adopts a round hole, an oval hole or a square hole, which is not subject to specific restriction here.

Please refer to Figure 1 and Figure 3, simultaneously. Further, the feeding frame 20 is provided with an installation groove 21, which is provided with an installation hole 22 matching with the installation part 303. The adjustment part 301 is connected with the feeding frame 20 through the installation hole 22. In this embodiment, the installation groove 21 uses a U-shaped groove with a certain depth and thickness. The installation groove 21 is provided with a threaded installation hole 22 which is arranged in a transverse direction. The installation hole 22 is connected with the connection hole to avoid the groove through embedded screws or other connection columns, so that the other end of the adjustment part 301 is placed inside the installation groove 21. In addition, the end of the adjustment part 301 which is adjacent to the installation groove 21 is placed inside the feeding frame 20. When the drive part 302 drives the adjustment part 301 to move upward and downward, it drives the feeding frame 20 to move upward and downward in the vertical direction, so that the first feeding inlet 101 and the second feeding inlet 102 can be switched quickly and accurately to realize the feeding of different documents. In this embodiment, in order to determine whether the document entering along the feeding frame 20 is a card-type document or a book-type document, a document detection sensor is arranged at the feeding position of the feeding frame 20. When the document detection sensor detects that the document entering along the feeding position of the feeding frame 20 is a book-type document, the drive part 302 drives the adjustment part 301 to move upward in the vertical direction thus lifting the feeding frame 20 vertically. Then the first feeding inlet 101 is opened and the book-type document can be fed in. When the document detection sensor detects that the document entered along the feeding position of the feeding frame 20 is a card-type document, the drive part

302 drives the adjustment part 301 to move downward in the vertical direction thus lowering the feeding frame 20 downward vertically. Then the first feeding inlet 101 is closed and the second feeding inlet 102 is opened to feed in the card-type document along the second feeding inlet 102. This arrangement can quickly realize the feeding of different documents and improve the feeding efficiency.

Please refer to Figure 1 and Figure 3, simultaneously. Further, the adjustment mechanism 30 further includes a guide apparatus 31 which is arranged along both sides of the feeding frame 20, and the guide apparatus 31 includes a guide column 311 which penetrates through the feeding frame 20 and a guide sleeve 312 which is sleeved outside the guide column 311. Specifically, two connection positions 201 are correspondingly arranged along both sides of the feeding frame 20, and two guide columns 311 are respectively sleeved along the two connection positions 201. Preferably, each connection position 201 uses connection through-holes penetrating through left and right sides of the feeding frame 20, and the guide column 311 can penetrate through each connection position 201 and move relatively along each connection position 201. In this embodiment, each connection position 201 uses a circular hole, an elliptical hole, a square hole, etc., and the guide column 311 uses a cylinder, an elliptical cylinder or a rectangular body, etc., and no specific restrictions are made here. In addition, since the guide column 311 can move relatively along each connection position 201, it is necessary to guarantee that the diameter of the connection through-hole adopted by the connection position 201 is greater than the diameter of the guide column 311. Optionally, the guide sleeve 312 is connected with the fixation support 40, and an end face of the guide sleeve 312 is provided with a through hole, and the guide column 311 can penetrate into the guide sleeve 312 along the through hole and move relatively along the guide sleeve 312. In order to guarantee that the guide column 311 can move relatively along the guide sleeve 312, the hole diameter of

the through-hole should be greater than the outer diameter of the guide column 311. In this way, the guide apparatus31 is arranged along the feeding frame 20 and plays a guidance role when the feeding frame 20 moves upward and downward, thus preventing the deviation, shake or slanting of the feeding frame 20, which affect the feeding of the card-type document or the book-type document.

Please refer to Figure 1 and Figure 4, simultaneously. Further, the fixation support 40 is composed of several fixation parts 41, which include a first fixation part 411 connected with the drive part 302, a second fixation part 412 connected with the guide sleeve 312 and a third fixation part 413 connected with the transport component 50. Preferably, the fixation support 40 is integrally molded by a plurality of fixation parts 41. This arrangement, on the one hand, guarantees the installation accuracy, on the other hand, facilitates modular production and assembly and improves the installation efficiency.

Please refer to Figure 1 and Figure 4, simultaneously. Specifically, as an optional embodiment of this disclosure, the first fixation part 411 at the fixation support 40 adopts an installation groove or installation opening that matches the shape and size of the drive part 302. The drive part 302 can be detachably installed at the fixation support 40 through the first fixation part 411. Herein, the connection between the drive part 302 and the fixation support 40 includes bolt and screw connection, location pin connection, mortise and tenon connection and other physical connection methods. This arrangement guarantees the installation stability of the drive part 302 and avoids the severe shaking of the drive part 302 during operation due to the installation accuracy, which affects the work efficiency.

Please refer to Figure 1 and Figure 4, simultaneously. Specifically, as an optional embodiment of this disclosure, the second fixation part 412 arranged at the fixation support 40 adopts an installation groove or installation opening that matches the shape and size of the guide sleeve 312. The guide sleeve 312 can be

detachably installed at the fixation support 40 through the second fixation part 412. The connection methods between the guide sleeve 312 and the fixation support 40 here include bolt connection, pin connection, mortise and tenon connection and other physical connection methods. In this way, the installation stability of the guide sleeve 312 is guaranteed, and the influences on the movement of the feeding frame 20 and the document feeding, which are generated by the direction deviation and dislocation shake of the guide column 311 caused by the low installation accuracy of the guide sleeve 312, when the guide column 311 moves up and down along the guide sleeve 312, can be avoided.

Please refer to Figure 4 and Fig. 5, simultaneously. As an optional embodiment of this disclosure, the transport component 50 includes a drive apparatus 51 which is fixed at the fixation support 40 and a movable support 52 which is in drive connection with the drive apparatus 51, a transmission apparatus 53 which is rotationally connected with the movable support 52 and a transmission structure 54 which is in drive connection with the transmission apparatus 53. Among them, the third fixation part 413 of the fixation support 40 includes an installation groove or installation opening that matches the shape and size of the drive apparatus 51. The drive apparatus 51 can be detachably installed at the fixation support 40 through the third fixation part 413. The connection method between the drive apparatus 51 and the fixation support 40 here includes bolt connection, pin connection, mortise and tenon connection and other physical connection methods. This arrangement guarantees the installation stability of the drive apparatus 51, avoids the influences on the normal drive process which are generated by the direction deviation and dislocation shake caused by the low installation accuracy of the drive apparatus 51 during the drive process. Preferably, the drive apparatus 51 can adopt one of an electric cylinder, an electric motor or a hydraulic cylinder, and no specific restrictions are made here.

Please refer to Figure 5 and Figure 6, simultaneously. Further, the movable support 52 has a connection rod 521 which is connected with the drive apparatus 51, through which the drive apparatus 51 drives the movable support 52 to move upward and downward in a vertical direction. In addition, the movable support 52 has a plurality of installation cavities, which are integrally formed to form the movable support 52.

Please refer to Figure 5 and Figure 6, simultaneously. Further, as an optional embodiment of this disclosure, the transmission apparatus 53 includes a drive source 531 which is installed inside one installation cavity, a driving part 532 and a driven part 533 which are installed inside another installation cavity and rotationally connected with the drive source 531. The driving part 532 and the driven part 533 can be connected by a synchronous belt. Preferably, the drive source 531 can use an electric cylinder, a motor, a hydraulic cylinder or an air cylinder, etc., without specific restrictions here. The driving part 532 includes a driving shaft which is connected with the drive source 531 and a driving wheel sleeved outside the driving shaft, and the driven part 533 includes a driven wheel opposite to the driving wheel. The driving wheel rotates synchronously with the driving shaft. The synchronous belt is sleeved at peripheries of the driving wheel and the driven wheel. The driven wheel rotates synchronously with the driving wheel under the driving of the synchronous belt. The transmission structure 54 is connected with the driven wheel and rotates with the driven wheel. In this embodiment, the synchronous belt uses a toothed belt, and the driving wheel and driven wheel both use a toothed wheel. In order to guarantee the stability of movement transport, the driving wheel and driven wheel are engaged with the synchronous belt, thus improving the transport efficiency. Of course, in other embodiments, the synchronous belt can also be replaced by a synchronous chain wheel. The driving wheel and the driven wheel can use the chain wheels which

engage with the synchronous belt respectively, thud improving the transport accuracy.

Please refer to Figure 5 and Figure 6, simultaneously. Furthermore, the transmission structure 54 includes a transmission shaft 541 which is rotationally connected with the driven wheel and at least one transmission roller 542 which is sleeved at the transmission shaft 541. Each transmission roller 542 is arranged inside one installation cavity. In this embodiment, each transmission roller 542 uses a rubber coated roller, which can be a ring roller, a round roller, etc., which is not further described herein for concise. In this way, the drive source 531 drives the driving wheel to rotate, the driven wheel rotates synchronously with the driving wheel under the driving of the synchronous belt, and each transmission roller 542 rotates with the driven wheel through the transmission shaft 541. In addition, in this embodiment, the surface of the transmission roller 542 contains colloidal material, so it can adhere the document to its outer wall to further complete the document transport.

Please also refer to Figure 5 to Figure 7. In this embodiment, in order to transport the document to the invalidation position along the feeding position of the feeding inlet 10 through the transmission structure 54, the hybrid document feeding mechanism 1 also includes a power source 70 which is fixed at the fixation support 40 and a transport apparatus 80 which is connected with the fixation support 40. The power source 70 drives the transmission structure 54 of the transport component 50 to move along the transport apparatus 80 through the fixation support 40. Preferably, the power source 70 uses a drive motor. Of course, it is not limited to the motor, an electric cylinder, a hydraulic cylinder, an air cylinder and other drive modes can also be employed in this disclosure. Further, the fixation support 40 is provided with a fixation groove for installing the power source 70. The fixation groove adopts a U-shaped slot. An installation block for

fixing the power source 70 is arranged along and protrudes from the fixation groove. An insertion hole is arranged along a middle of the installation block. A rotation shaft is inserted into the end of the power source 70 through the insertion hole. In addition, the transport apparatus 80 includes a sliding block 801 which is clamped at the top of the fixation support 40 and a sliding rail 802 which is arranged above the sliding block 801. Specifically, in this embodiment, the sliding rail 802 extends from the feeding position to the invalidation position, ensuring that the transmission structure 54 can reciprocate between the feeding position and the invalidation position along the sliding rail 802 to complete the document transport. It should be noted that an upper part of the fixation support 40 is provided with a clamping groove for clamping the sliding block 801. The clamping groove is preferably U-shaped, and provided with a fixation hole for detachable clamping the sliding block 801 above the fixation support 40. Preferably, the sliding block 801 is provided with a clamping part that can clamp and cooperate with the sliding rail 802, ensuring that the sliding block 801 can slide stably along the sliding rail 802 to drive the transmission structure 54 to carry out the document transport.

Please refer to Figure 7 and Figure 8, simultaneously. This disclosure further includes a document invalidation device 204, including an installation frame 204, the above hybrid document feeding mechanism 1 which is arranged inside the installation frame 204 and reciprocates between the feeding position and the target invalidation position, a document invalidation mechanism 202 which is arranged along the installation frame 204 and adjacent to the target invalidation position, and a waste recycling mechanism 203 which is arranged below the document invalidation mechanism 202. The hybrid document feeding mechanism 1 can employ the above embodiments. The installation frame 204, document invalidation

mechanism 202 and waste recycling mechanism 203 can employ any know technical solution of the prior art.

For those skilled in the art, any obvious changes made on the basis of not deviating from the technical principles of this disclosure belong to the protection scope of the concept and the appended claims of this disclosure. In addition, although exemplary embodiments have been described herein, the scope of this disclosure includes any and all embodiments based on this disclosure that have equivalent elements, modifications, ellipsis, combinations (for example, schemes that cross various embodiments), adaptations or changes.

The above description is intended to be illustrative rather than restrictive. For example, the above examples (or one or more of them) can be used in combination with each other. For example, those skilled in the art can use other embodiments when reading the above description.

The above descriptions are only better embodiments of the this disclosure, and not to limit the this disclosure. Any modification, equivalent replacement and improvement made within the spirit and principle of the this disclosure shall be included in the protection scope of the this disclosure.

CLAIMS

1. A hybrid document feeding mechanism, comprising a feeding frame with at least one feeding inlet, an adjustment mechanism for self-adaptive adjusting and switching of each feeding inlet, a fixation support which is connected with the adjustment mechanism, and a transport component which is connected with the fixation support, wherein each adjacent feeding inlets are arranged at intervals and have a feeding position difference.

2. The hybrid document feeding mechanism according to claim 1, wherein each feeding inlet comprises a first feeding inlet and a second feeding inlet which are arranged at intervals along a bottom of the feeding frame, and the first feeding inlet and the second feeding inlet are mutually embedded.

3. The hybrid document feeding mechanism according to claim 2, wherein a feeding end of the first feeding inlet is provided with a first guide bevel for inserting a document, and a feeding end of the second feeding inlet is provided with a second guide bevel for inserting a document.

4. The hybrid document feeding mechanism according to claim 3, wherein a distance between a top of the first guide bevel and a bottom of the feeding frame is greater than a distance between a top of the second guide bevel and the bottom of the feeding frame, so as to form a feeding height difference between the second guide bevel and the first guide bevel.

5. The hybrid document feeding mechanism according to claim 4, wherein the adjustment mechanism comprises an adjustment part which is connected with the feeding frame and a drive part which is in drive connection with the adjustment part;

wherein one end of the adjustment part is movably inserted into the drive part, and the other end of the adjustment part is connected with the feeding frame through an installation part.

6. The hybrid document feeding mechanism according to claim 5, wherein the drive part adopts one of an air cylinder, a hydraulic cylinder or an electric cylinder, and the adjustment part adopts a telescopic pushrod which is in drive connection with the drive part, a top of the adjustment part is movably inserted into an end of the drive part.

7. The hybrid document feeding mechanism according to claim 6, wherein the feeding frame is provided with an installation groove which is arranged with an installation hole matching with the installation part, wherein the adjustment part is connected with the feeding frame through the installation hole.

8. The hybrid document feeding mechanism according to claim 7, wherein a document detection sensor is arranged along a feeding position of the feeding frame and configured to determine a type of the document entering along the feeding frame.

9. The hybrid document feeding mechanism according to claim 8, wherein the adjustment mechanism further comprises a guide apparatus which is arranged along both sides of the feeding frame, and the guide apparatus comprises a guide column which penetrates through the feeding frame and a guide sleeve which is sleeved outside the guide column.

10. The hybrid document feeding mechanism according to claim 9, wherein the fixation support is composed of several fixation parts, which comprise a first fixation part connected with the drive part, a second fixation part connected with the guide sleeve and a third fixation part connected with the transport component.

11. The hybrid document feeding mechanism according to claim 10, wherein the transport component comprises a drive apparatus which is fixed at the fixation

support, a movable support which is in drive connection with the drive apparatus, a transmission apparatus which is rotationally connected with the movable support, and a transmission structure which is in drive connection with the transmission apparatus.

12. The hybrid document feeding mechanism according to claim 11, wherein the movable support has a connection rod which is connected with the drive apparatus, wherein the drive apparatus drives the movable support to move upward and downward along a vertical direction through the connection rod;

the movable support has several installation cavities, each of which is integrally formed to form the movable support.

13. The hybrid document feeding mechanism according to claim 12, wherein the transmission apparatus comprises a drive source which is installed inside one installation cavity, and a driving part and a driven part which are installed inside another installation cavity and rotationally connected with the drive source, wherein driving part and the driven part are connected through a synchronous belt.

14. The hybrid document feeding mechanism according to any one of claims 1-13, wherein the hybrid document feeding mechanism further comprises a power source which is fixed at the fixation support and a transport apparatus which is slidably connected with the fixation support; wherein the power source drives the transport component to move along the transport apparatus through the fixation support.

15. A document invalidation device comprising an installation frame, a hybrid document feeding mechanism which is arranged inside the installation frame and reciprocates between a feeding position and a target invalidation position, a document invalidation mechanism which is arranged along the installation frame and adjacent to the target invalidation position, and a waste recycling mechanism

which is arranged below the document invalidation mechanism; wherein the hybrid document feeding mechanism is according to any one of claims 1-14.