PUSHING MECHANISM, BATCH FEEDING APPARATUS AND DOCUMENT MANAGEMENT TERMINAL

TECHNICAL FIELD

The present disclosure relates generally to a technical field of document management device, and more particularly, to a pushing mechanism, a batch feeding apparatus and a document management terminal.

BACKGROUND

With the development of science and technology, intelligent devices are widely used in daily life, such as the field of document management.

When documents need to be stored, after transporting to the document management terminal, the documents enter a feeding apparatus of the document management terminal. The common feeding apparatus employs a manner of feeding at a fixed point, that is, the document is fed into a specific document inlet and then stored by cooperating with the manipulator. This manner of feeding at a fixed point, results in that a pushing structure of the feeding apparatus should be reset for each pushing operation, thus resulting in low efficiency of document storage.

The above discussion is only used to assist in understanding the technical solution of this disclosure, and does not mean that the above content is recognized as a prior art.

SUMMARY

The object of the present disclosure is to provide a pushing mechanism, a batch feeding apparatus and a document management terminal, aiming at the technical problem of how to improve the efficiency of document storage.

In a first aspect, a pushing mechanism is provided, including:

a bedplate, which is arranged with a guide groove;

a drive module, which is arranged at the bedplate;

a pushing block, which is slidably arranged at the guide groove, and connected with the drive module;

two first in-position detection switches, which are arranged at the bedplate, wherein the two first in-position detection switches are respectively arranged adjacent to both ends of the guide groove.

In an embodiment of this disclosure, the drive module includes:

a power component, which is arranged at the bedplate;

two rollers, which are rotationally connected with the bedplate, wherein one of the two rollers is arranged adjacent to one end of the guide groove, the other one of the two rollers is arranged adjacent to the other end of the guide groove; wherein at least one of the two rollers is connected with the power component; and

a first driving belt, which is sleeved at the two rollers, wherein the pushing block is connected with the first driving belt;

wherein, the power component drives at least one of the two rollers to rotate so that the first driving belt drives the pushing block to slide along the guide groove.

In an embodiment of this disclosure, the power component includes:

a motor, which is arranged at the bedplate;

a driving wheel, which is rotatably arranged at the bedplate and connected with the motor;

a driven wheel which is connected with either of the two rollers; and

a second driving belt, which is sleeved at the driving wheel and the driven wheel.

In an embodiment of this disclosure, the power component further includes an adjustment base which is arranged with a waist-type hole, and a locking piece passes through the waist-type hole and is connected with an installation hole of the bedplate, wherein the motor is arranged at the adjustment base.

In an embodiment of this disclosure, the drive module includes two first driving belts which are arranged at intervals;

the pushing mechanism further includes a second in-position detection switch, which is arranged at the bedplate corresponding to an area between the two first driving belts.

In an embodiment of this disclosure, the pushing block includes:

a first base body, which is connected with the first driving belt, and an end of the first base body extends to the guide groove;

a bearing, which is arranged inside the guide groove and connected with an end of the guide groove which is sleeved at the first base body; and

a second base body, which is connected with the first base body and protrudes from a surface of the bedplate.

In an embodiment of this disclosure, the pushing block includes two first base bodies which are matched with an inner wall of the guide groove through the bearing, and the two first base bodies are connected with the second base body.

In an embodiment of this disclosure, the first base body is arranged as a rod body.

In an embodiment of this disclosure, the bedplate includes:

two installation bases; and

a connecting rod, one end of the connecting rod is connected with one installation base, the other end of the connecting rod is connected with the other installation base, the two installation bases are arranged at intervals and form a channel, at least one of the installation bases is arranged with the guide groove, wherein the guide groove is arranged facing the channel, and the pushing block is located at the channel;

the drive module is arranged at either of the two installation bases.

In an embodiment of this disclosure, the bedplate includes two connecting rods, one end of each connecting rod is connected with one installation base, and the other end of each connecting rod is connected with the other one installation base.

In an embodiment of this disclosure, at least one installation base is arranged with an avoidance groove, which is configured for routing of the drive module and the first in-position detection switch.

In an embodiment of this disclosure, the drive module is located between the two installation bases.

In an embodiment of this disclosure, the guide groove is arranged as an elliptical groove.

In an embodiment of this disclosure, the roller is arranged inside an inner ring of the guide groove.

In an embodiment of this disclosure, the guide groove is arranged as a straight groove.

In a second aspect, a batch feeding apparatus is provided, including a storage bin and the pushing mechanism discussed above, wherein the storage bin is arranged with a material groove, and the bedplate of the pushing mechanism is connected with the storage bin and is located at one end of the material groove,

two feeding gaps are formed between the bedplate and the storage bin and the feeding gap is connected with the material groove;

both ends of the guide groove of the bedplate are respectively corresponding to one feeding gap;

the drive module of the pushing mechanism drives the pushing block to move along the guide groove, so that the pushing block pushes material in the material groove to slide out of the feeding gap.

In an embodiment of this disclosure, the batch feeding apparatus further includes two third in-position detection switches, which are arranged inside the storage bin, and one third in-position detection switch corresponds to one feeding gap.

In a third aspect, a document management terminal is provided, including a manipulator and the batch feeding apparatus, discussed above, wherein the manipulator is arranged adjacent to the batch feeding apparatus.

The technical scheme of this disclosure arranges the drive module, the pushing block and two first in-position detection switches at the bedplate, wherein the drive module is connected with the pushing block. The drive module drives the pushing block to move along the guide groove of the bedplate, and cooperates with the first in-position detection switch at both ends of the guide groove, so that the pushing block can slide back and forth along the guide groove. In this way, materials can be pushed out from both sides of the bedplate through the pushing block, such that materials can be pushed out in batches. The pushing mechanism of this disclosure can effectively output materials and improve the efficiency of material storage.

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 present 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 a structural diagram of a pushing mechanism according to an embodiment of this disclosure.

Fig. 2 is a sectional diagram of the pushing mechanism in Fig. 1.

Fig. 3 is an assembly structure diagram of a batch feeding apparatus according to an embodiment of this disclosure.

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

Reference number	Name	Reference number	Name
1	Pushing mechanism	1216	Waist-type hole
11	Bedplate	122	Roller
111	Guide groove	123	First driving belt
112	Installation base	13	Pushing block
113	Connecting rod	131	First base body
114	Channel	132	Bearing
115	Avoidance groove	133	Second base body
12	Drive module	14	First in-position detection switch
121	Power component	15	Second in-position detection switch
1211	Motor	2	storage bin
1212	Driving wheel	21	Material groove
1213	Driven wheel	22	Feeding gap

1214	Second driving belt	23	Third in-position detection switch
1215	Adjustment base		

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In order to make the object, technical scheme and advantages of the present disclosure clearer, the present 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 present disclosure and are not used to limit the present 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 at 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 present 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 present disclosure, “several” or “a plurality of” means two or more, unless otherwise is specifically defined. In addition, the meaning of "and/or" in this disclosure includes three parallel schemes. Take "A and/or B as an example", which includes scheme A, or scheme B, or a scheme that both A and B satisfy. In addition, the technical solutions of various embodiments can be combined with each other, however, such combination should base on the realization of common technical personnel in the art. When the combination of technical solutions is contradictory or impossible to achieve, it should be considered that the combination of such technical solutions does not exist and never falls into the scope of protection required by this disclosure.

This disclosure provides a pushing mechanism. Please refer to Fig.1, which is a structural diagram of a pushing mechanism according to an embodiment of this disclosure. please refer to Fig.2, which is a sectional diagram of the pushing mechanism in Fig. 1. please refer to Fig.3, which is an assembly structure diagram of a batch feeding apparatus according to an embodiment of this disclosure.

In the embodiment of this disclosure, as shown in Fig. 1, and in combination with Fig. 2 and Fig. 3, the pushing mechanism 1 includes a bedplate 11, a drive module 12, a pushing block 13, and two first in-position detection switches 14. The bedplate 11 is arranged with a guide groove 111. The drive module 12 is arranged at the bedplate 11. The pushing block 13 is slidably arranged at the guide groove 111, and connected with the drive module 12. The two first in-position detection switches 14 are arranged at the bedplate 11, and respectively arranged adjacent to both ends of the guide groove 111.

In this embodiment, this disclosure arranges the drive module 12, the pushing block 13 13 and two first in-position detection switches 14 at the bedplate 11. The drive module 12 is connected with the pushing block 13 13. The drive module 12 drives the pushing block 13 to move along the guide groove 111 of the bedplate 11, and cooperates with the first in-position detection switch 14 at both ends of the guide groove 111, so that the pushing block 13 can slide back and forth along the guide groove 111. In this way, materials can be pushed out from both sides of the bedplate 11 through the pushing block 13, such that materials can be pushed out in batches. The pushing mechanism 1 of this disclosure can effectively output materials and improve the efficiency of material storage.

In an optional embodiment of this disclosure, the drive module 12 and the two first in-position detection switches 14 are electrically connected with a control circuit to facilitate an adjustment of an operation of the drive module 12, as well as an adjustment of a movement direction of the pushing block 13, through the control circuit.

In an optional embodiment of this disclosure, the first in-position detection switch 14 can be arranged as any sensor, such as a photoelectric sensor, an electromagnetic sensor, or even a mechanical stroke switch. It can be understood that the specific model of the first in-position detection switch 14 is not limited on the premise that the first in-position detection switch 14 can obtain the relative position with respect to the pushing block 13 after the pushing block 13 moves to the corresponding first in-position detection switch 14.

In an optional embodiment of this disclosure, the bedplate 11 can be arranged in any shape, such as a frame shape, a plate shape or other specific shapes. The bedplate 11 is not limited to a specific shape on the premise that the guide groove 111 can guide the movement of the pushing block 13 and be arranged at the bedplate 11.

In an optional embodiment of this disclosure, the guide groove 111 can be arranged at any one surface of the bedplate 11.

In an optional embodiment of this disclosure, as shown in Fig.1 and 2, the pushing block 13 can move along the guide groove 111 to push materials at the bedplate 11 to move, the guide groove 111 can be arranged in parallel to a plane at which the surface of the bedplate 11 places the materials. The guide groove 111 can be arranged as a linear grove, or a closed-loop groove, or an arc groove.

Based on the above discussion, the guide groove 111 can be arranged as a straight groove, and the guide groove 111 is arranged in parallel with the plane at which the surface of the bedplate 11 places the materials. It can be understood that two first in-position detection switches 14 are located adjacent to both ends of the straight groove respectively. After the drive module 12 drives the pushing block 13 to one end of the guide groove 111, the first in-position detection switch 14 corresponding to this end of the guide groove 111 is triggered to generate an electrical signal, which is transmitted to the corresponding control circuit, to adjust the drive module 12 to stop working or to adjust the drive module 12 to drive the pushing block 13 to move in the opposite direction along the guide groove 111 relative to the previous moving direction.

In additional, as shown in Fig. 1 and Fig. 2, the guide groove 111 can be arranged as a closed-loop groove. It can be understood that, in order to facilitate the movement of the pushing block 13 for pushing the material out, at least one section of the closed-loop groove is straight, and the straight section of the closed-loop groove is in parallel with the plane at which the surface of the bedplate 11 places the materials. That is to say, two first in-position detection switches 14 are respectively located an inner ring or outer ring of adjacent guide groove 111, and the two first in-position detection switches 14 are relatively adjacent to both ends of the straight section of the closed-loop groove. In the application, two first

in-position detection switches 14 can be respectively located in an arc section of the guide groove 111. After the drive module 12 drives the pushing block 13 to move to one end of the guide groove 111, the arc section of the guide groove 111 can be used as a buffer area of the pushing block 13. The first in-position detection switch 14 corresponding to this end of the guide groove 111 is triggered. At this time, the first in-position detection switch 14 generates an electrical signal, which is transmitted to the corresponding control circuit, to adjust the drive module 12 to stop working or adjust the drive module 12 to drive the pushing block 13 to move in the opposite direction along the guide groove 111 relative to the previous moving direction.

In additional, the guide groove 111 can be arranged as an arc groove. It can be understood that, in order to facilitate the movement of the pushing block 13 for pushing the material out, at least one section of the arc groove is straight, and the straight section of the arc groove is in parallel with the plane at which the surface of the bedplate 11 places the materials. That is to say, two first in-position detection switches 14 are respectively arranged adjacent to both ends of the straight section of the arc groove. It can be understood that the arc section of the arc groove can be a surface with both ends away from the bedplate 11. That is to say, when the pushing block 13 moves to the end of the guide groove 111, the guide groove 111 partially retracts toward the bedplate 11, so as to reduce the protruded part of the pushing block 13 from the bedplate 11 and avoid the contact between the pushing block 13 and the manipulator for gripping the material.

In an optional embodiment of this disclosure, the drive module 12 can be arranged as any form of power component 121, such as a combination of a motor 1211, a linear module, and a gear transmission structure. On the premise that the drive module 12 can drive the pushing block 13 to move along the guide groove 111, the specific type of the drive module 12 is not limited.

In an embodiment of this disclosure, in combination with Fig. 1 and Fig. 2, the drive module 12 includes a power component 121, two rollers 122 and a first driving belt 123, wherein the power component 121 is arranged at the bedplate 11, the two rollers 122 are rotatably connected with the bedplate 11. One roller 122 is arranged adjacent to one end of the guide groove 111, the other one roller 122 is arranged adjacent to the other end of the guide groove 111, and at least one roller 122 is connected with the power component 121. The first driving belt 123 is sleeved at the two rollers 122, and the pushing block 13 is connected with the first driving belt 123. The power component 121 drives the rollers 122 to rotate so that the first driving belt 123 drives the pushing block 13 to slide along the guide groove 111.

That is to say, the power component 121 drives at least one of the two rollers 122 to rotate, so that the two rollers 122 drive the first driving belt 123 to rotate around the two rollers 122, thus enabling the first driving belt 123 to move with the pushing block 13 for pushing the materials to move. Among them, the first driving belt 123 is engaged and connected with two rollers 122. That is, the first driving belt 123 is provided with engagement teeth, and the surfaces of the two rollers 122 are arranged with engagement grooves, such that, the first driving belt 123 is engaged and connected with two rollers 122 are engaged and connected through the matching of the engagement teeth and engagement grooves.

In this embodiment, the power component 121 is configured to drive the roller 122 to rotate, and then the first driving belt 123 drives the pushing block 13 to move, so as to realize the movement of the pushing block 13 through transmission, and improve the drive stability for the movement of the pushing block 13. In additional, the split-type structures of the power component 121 and the transmission structure can effectively improve the maintainability of the drive module 12.

In an optional embodiment of this disclosure, the power component 121 can be arranged as the motor 1211, which is directly or indirectly connected with at least one roller 122.

In an optional embodiment of this disclosure, the power component 121 can be arranged as a gas cylinder, and an output shaft of the gas cylinder is connected with the roller 122 through a rack.

In an optional embodiment of this disclosure, the power component 121 can be arranged as a linear motor 1211, and an output shaft of the linear motor 1211 is connected with the roller 122 through a rack.

In an optional embodiment of this disclosure, the power component 121 can be arranged as a linear module, and an output shaft of the linear module is connected with the roller 122 through a rack.

In an embodiment of this disclosure, in combination with Fig. 1 and Fig. 2, the drive module 12 includes two first driving belts 123, which are arranged at intervals to form a hole therebetween.

The pushing mechanism 1 further includes a second in-position detection switch 15, which is arranged at the bedplate 11, and the second in-position detection switch 15 corresponds to an area between the two first driving belts 123.

In this embodiment, the second in-position detection switch 15 is installed at the bedplate 11. The second in-position detection switch 15 corresponds to the hole formed between the two driving belts, so that the second in-position detection switch 15 can be configured to sense the material above. In the application, when the material falls into an upper part of the bedplate 11, the second in-position detection switch 15 drives the drive module 12 to work in coordination with the control circuit for driving the pushing block 13 to move along the guide groove 111, after sensing the material. It is understandable that the second in-position detection switch 15 is arranged at the bedplate 11. By integrating the second

in-position detection switch 15 for detecting materials at the pushing mechanism 1, the integration of the pushing mechanism 1 is effectively improved.

In an optional embodiment of this disclosure, the second in-position detection switch 15 can be arranged as any sensor, such as a photoelectric sensor, an electromagnetic sensor, or even a mechanical stroke switch.

In an embodiment of this disclosure, the power component 121 includes a motor 1211, a driving wheel 1212, a driven wheel 1213 and a second driving belt 1214, wherein the motor 1211 is arranged at the bedplate 11. The driving wheel 1212 is rotatably arranged at the bedplate 11, and connected with the motor 1211. The driven wheel 1213 is connected with either of the two rollers 122. The second driving belt 1214 is sleeved at the driving wheel 1212 and the driven wheel 1213.

In this embodiment, the motor 1211 is configured to drive the driving wheel 1212, the driven wheel 1213 and the second driving belt 1214 are connected with either of the two rollers 122, so that the motor 1211 drives the roller 122 to rotate. It can be understood that the driving wheel 1212, the driven wheel 1213 and the second driving belt 1214 are used as the transmission structure to avoid the direct connection between the motor 1211 and the roller 122 and the projection of the motor 1211 from the bedplate 11, so as to realize the miniaturization of the pushing mechanism 1. In additional, the motor 1211 is arranged longitudinally with the roller 122 and the first driving belt 123, so that the transverse occupied area of the pushing mechanism 1 is reduced. When installing the power component 121, the motor 1211 can be disassembled separately to facilitate the replacement of the motor 1211.

In an optional embodiment of this disclosure, as shown in Fig. 1, the power component 121 further includes an adjustment base 1215, the motor 1211 is arranged at the adjustment base 1215 which is arranged with a waist-type hole 1216, and a locking piece passes through the waist-type hole 1216 and is

connected with an installation hole of the bedplate 11. The installation hole can be arranged as a threaded hole, so as to realize quick adjustment of the relative position of the motor 1211 relative to the driving wheel 1212, and facilitate the disassembly and assembly of the second driving belt 1214. That is, the motor 1211 is arranged at the bedplate 11 through the adjustment base 1215.

In an embodiment of this disclosure, in combination with Fig. 1 and Fig. 2, the pushing block 13 includes a first base body 131, a bearing 132 and a second base body 133. The first base body 131 is connected with the first driving belt 123, and an end of the first base body 131 extends to the guide groove 111. The bearing 132 is arranged inside the guide groove 111 and connected with an end of the guide groove 111 which is sleeved at the first base body 131. The second base body 133 is connected with the first base body 131 and protrudes from the surface of the bedplate 11.

In this embodiment, the pushing block 13 includes the first base body 131, the bearing 132 and the second base body 133. The first base body 131 is connected with the first driving belt 123, the end of the first base body 131 extends to the guide groove 111, and the second base body 133 is connected with the first base body 131. When the second base body 133 is damaged, it can be replaced by removing the second base body 133 separately, thus guaranteeing that the connections between the first base body 131 and the bedplate 11 and between the first base body 131 and the first driving belt 123 remain unchanged, thus avoiding the problem that the first base body 131 should be adjusted repeatedly, and effectively improving the maintenance efficiency of the pushing mechanism 1. In additional, the bearing 132 is arranged inside the guide groove 111 and connected with the end of the guide groove 111 which is sleeved at the first base body 131 to avoid the direct connection between the first base body 131 and the guide groove 111. The friction between the first base body 131 and the guide groove 111 is

reduced through the bearing 132, so that the first base body 131 can slide smoothly.

In an embodiment of this disclosure, the first base body 131 is arranged as a rod body.

In an embodiment of this disclosure, the pushing block 13 includes two first base bodies 131, which are matched with an inner wall of the guide groove 111 through the bearing 132, and the two first base bodies 131 are connected with the second base body 133 to increase a connection area between the second base body 133 and the first driving belt 123 through the two first base bodies 131. In additional, when the guide groove 111 adopts the structure scheme with arc section and straight section, the two first base bodies 131 are arranged at intervals to form a certain spacing distance between the two first base bodies 131, so that the two first base bodies 131 can pass through the arc section sequentially, and the spacing distance before the two first base bodies 131 can be configured to realize the position avoidance of the first driving belt 123 corresponding to the arc section, so as to avoid friction between the first driving belt 123 and the first base body 131 when passing through the arc section of the guide groove 111.

In an embodiment of this disclosure, as shown in Fig. 1 and Fig. 2, the bedplate 11 includes two installation bases 112 and a connecting rod 113. One end of the connecting rod 113 is connected with one installation base 112, and the other end of the connecting rod 113 is connected with the other installation base 112. The two installation bases 112 are arranged at intervals and form a channel 114. At least one installation base 112 is arranged with a guide groove 111, which is arranged facing the channel 114, and the pushing block 13 is located at the channel 114.

The drive module 12 is arranged at either of the two installation bases.

In this embodiment, one end of the connecting rod 113 is connected with one installation base 112, and the other end of the connecting rod 113 is connected with the other installation base 112. The two installation bases 112 are arranged at intervals and form the channel 114. The pushing block 13 can be located between the two installation bases 112, thus reducing the impact of external components on the pushing block 13, and effectively improving the working stability of the pushing mechanism 1.

In an optional embodiment of this disclosure, the drive module 12 can be arranged at either of the two installation bases 112 to prevent the drive module 12 from protruding out of the bedplate 11 and effectively improve the working stability of the pushing mechanism 1.

In an optional embodiment of this disclosure, the bedplate 11 includes two connecting rods 113, one end of each connecting rod 113 is connected with one installation base 112, and the other end of each connecting rod 113 is connected with the other one installation base 112 to improve the connection stability of the two installation bases 112.

In an optional embodiment of this disclosure, at least one installation base 112 is arranged with an avoidance groove 115, which is configured for routing of the drive module 12 and the first in-position detection switch 14. It can be understood that the avoidance groove 115 is located at a side of the installation base 112 away from the guide groove 111, and the avoidance groove 115 is a through groove connecting two opposite surfaces of the installation base 112.

In an embodiment of this disclosure, the drive module 12 is located between two installation bases 112, so as to prevent the drive module 12 from protruding out of the installation base 112 and optimize the structural layout of the pushing mechanism 1.

In an embodiment of this disclosure, as shown in Fig. 1 and Fig. 2, the motor 1211 is connected with one of the installation bases 112, the motor 1211 is separated from the guide groove 111, and forms an installation space. The two first in-position detection switches 14 are located inside the installation space. It can be understood that the first in-position detection switch 14 can be arranged as any type of sensor, and the damage probability of common sensors is small. In order to ensure the accuracy of the sensor, the first in-position detection switch 14 is arranged between two installation bases 112 to reduce external interference. In additional, the motor 1211 is located under the two first in-position detection switches 14 to facilitate the disassembly and assembly of the motor 1211.

In an embodiment of this disclosure, the guide groove 111 is arranged as an elliptical groove. Optionally, the guide groove 111 is arranged along the extension direction of the channel 114.

In an optional embodiment of the application, the guide groove 111 is arranged as a raceway-shaped groove, and two first in-position detection switches 14 are located at an outer ring of the guide groove 111.

In an optional embodiment of this disclosure, the roller 122 is located inside an inner ring of the guide groove 111.

In an optional embodiment of this disclosure, the roller 122 is arranged corresponding to a first in-position detection switch 14 which is arranged below the roller 122, that is, the first in-position detection switch 14 is located at the outer ring of the guide groove 111 corresponding to the roller 122 which is located above.

In an optional embodiment of this disclosure, the two installation bases 112 are both arranged with a guide groove 111, and two opposite ends of the pushing block 13 which are symmetrically arranged at the guide groove, are slidably arranged inside the guide groove. That is to say, the opposite sides of the pushing

block 13 are matched with the guide groove 111, so that the pushing block 13 can slide smoothly.

This disclosure also proposes a batch feeding apparatus. As shown in Fig. 3, the batch feeding apparatus includes a storage bin 2 and the pushing mechanism 1. The specific structure of the pushing mechanism 1 refers to the above embodiments. Since this batch feeding apparatus adopts all the technical solutions of the pushing mechanism of all the above embodiments, it has at least all the beneficial effects brought by the technical solutions of the above embodiments, and is not repeated here for concise. The storage bin 2 is arranged with a material groove 21, and the bedplate 11 of the pushing mechanism 1 is connected with the storage bin 2 and is located at one end of the material groove 21. Two feeding gaps 22 are formed between the bedplate 11 and the storage bin 2. The feeding gap 22 is located at both sides of the material groove 21, and connected with the material groove 21.

Both ends of the guide groove 111 of the bedplate 11 correspond to one feeding gap 22, respectively.

The drive module 12 of the pushing mechanism 1 drives the pushing block 13 to move along the guide groove 111, so that the pushing block 13 pushes the material in the material groove 21 to slide out of the feeding gap 22.

In an optional embodiment of this disclosure, the batch feeding apparatus includes two third in-position detection switches 23, which are arranged inside the storage bin 2, and one third in-position detection switch 23 corresponds to one feeding gap 22. It can be understood that the third in-position detection switch 23 is electrically connected with the control circuit.

This disclosure also proposes a document management terminal. The document management terminal includes a manipulator and a batch feeding apparatus. The specific design of the necessary components of the document

management terminal and the manipulator can refer to any known prior art and is not repeated here for concise. The specific structure of the batch feeding apparatus is referred to the above embodiments. Since the document management terminal uses all the technical solutions of the batch feeding apparatus of all the above embodiments, it has at least all the beneficial effects brought by the technical solutions of the above embodiments, and is not repeated here for concise. The manipulator and the batch feeding apparatus are adjacent to each other.

The above is only an optional embodiment of this disclosure, and does not limit the protection scope of this disclosure. Under the creative concept of this disclosure, the equivalent structure transformation made by using the description and attached drawings of this disclosure, or the direct/indirect application in other relevant technical fields, are included in the protection scope of this disclosure.

CLAIMS

1. A pushing mechanism, comprising:

a bedplate, which is arranged with a guide groove;

a drive module, which is arranged at the bedplate;

a pushing block, which is slidably arranged at the guide groove, and connected with the drive module;

two first in-position detection switches, which are arranged at the bedplate, wherein the two first in-position detection switches are respectively arranged adjacent to both ends of the guide groove.

2. The pushing mechanism according to claim 1, wherein the drive module comprises:

a power component, which is arranged at the bedplate;

two rollers, which are rotationally connected with the bedplate, wherein one of the two rollers is arranged adjacent to one end of the guide groove, the other one of the two rollers is arranged adjacent to the other end of the guide groove; wherein at least one of the two rollers is connected with the power component; and

a first driving belt, which is sleeved at the two rollers, wherein the pushing block is connected with the first driving belt;

wherein, the power component drives at least one of the two rollers to rotate so that the first driving belt drives the pushing block to slide along the guide groove.

3. The pushing mechanism according to claim 2, wherein the power component comprises:

a motor, which is arranged at the bedplate;

a driving wheel, which is rotatably arranged at the bedplate and connected with the motor;

a driven wheel which is connected with either of the two rollers; and

a second driving belt, which is sleeved at the driving wheel and the driven wheel.

4. The pushing mechanism according to claim 3, wherein the power component further comprises an adjustment base which is arranged with a

waist-type hole, and a locking piece passes through the waist-type hole and is connected with an installation hole of the bedplate, wherein the motor is arranged at the adjustment base.

5. The pushing mechanism according to claim 2, wherein the drive module comprises two first driving belts which are arranged at intervals;

the pushing mechanism further comprises a second in-position detection switch, which is arranged at the bedplate corresponding to an area between the two first driving belts.

6. The pushing mechanism according to claim 2, wherein the pushing block comprises:

a first base body, which is connected with the first driving belt, and an end of the first base body extends to the guide groove;

a bearing, which is arranged inside the guide groove and connected with an end of the guide groove which is sleeved at the first base body; and

a second base body, which is connected with the first base body and protrudes from a surface of the bedplate.

7. The pushing mechanism according to claim 6, wherein the pushing block comprises two first base bodies which are matched with an inner wall of the guide groove through the bearing, and the two first base bodies are connected with the second base body.

8. The pushing mechanism according to claim 6, wherein the first base body is arranged as a rod body.

9. The pushing mechanism according to claim 1, wherein the bedplate comprises:

two installation bases; and

a connecting rod, one end of the connecting rod is connected with one installation base, the other end of the connecting rod is connected with the other

installation base, the two installation bases are arranged at intervals and form a channel, at least one of the installation bases is arranged with the guide groove, wherein the guide groove is arranged facing the channel, and the pushing block is located at the channel;

the drive module is arranged at either of the two installation bases.

10. The pushing mechanism according to claim 9, wherein the bedplate comprises two connecting rods, one end of each connecting rod is connected with one installation base, and the other end of each connecting rod is connected with the other one installation base.

11. The pushing mechanism according to claim 9, wherein at least one installation base is arranged with an avoidance groove, which is configured for routing of the drive module and the first in-position detection switch.

12. The pushing mechanism according to claim 9, wherein the drive module is located between the two installation bases.

13. The pushing mechanism according to claim 1, wherein the guide groove is arranged as an elliptical groove.

14. The pushing mechanism according to claim 13, wherein the roller is arranged inside an inner ring of the guide groove.

15. The pushing mechanism according to claim 1, wherein the guide groove is arranged as a straight groove.

16. A batch feeding apparatus comprising a storage bin and the pushing mechanism according to any one of claims 1-15, wherein the storage bin is arranged with a material groove, and the bedplate of the pushing mechanism is connected with the storage bin and is located at one end of the material groove, two feeding gaps are formed between the bedplate and the storage bin, wherein the feeding gap is connected with the material groove;

both ends of the guide groove of the bedplate are respectively corresponding to one feeding gap;

the drive module of the pushing mechanism drives the pushing block to move along the guide groove, so that the pushing block pushes material in the material groove to slide out of the feeding gap.

17. The batch feeding apparatus according to claim 16, wherein the batch feeding apparatus further comprises two third in-position detection switches, which are arranged inside the storage bin, and one third in-position detection switch corresponds to one feeding gap.

18. A document management terminal comprising a manipulator and the batch feeding apparatus according to claim 16, wherein the manipulator is arranged adjacent to the batch feeding apparatus.