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(54) AUTOMATIC DEVICE FOR DISPENSING ADHESIVE TAPE

(57) An automatic adhesive tape dispenser includes a housing (5, 12), an adhesive tape mount bracket provided in the housing, a drive mechanism (1, 2, 3, 4), a transportation mechanism (6, 7, 9, 10, 11), a cutting control mechanism (8), and a cutting mechanism (13, 14, 16). A movable button (1) is provided on the housing, and an elastic return member (2) is provided between the button and the housing. The transportation mechanism is located between an adhesive tape discharge opening of the housing and the adhesive tape mount bracket. The cutting mechanism is located between the transportation mechanism and the adhesive tape discharge opening. The cutting control mechanism is located between the drive mechanism and the cutting mechanism. An external force applied on the button may be transmitted to the transportation mechanism by the drive mechanism, so that the transportation mechanism is rotated and transports an adhesive tape towards the adhesive tape discharge opening. When the external force is removed from the button, the drive mechanism transmits a return force of the elastic return member to the cutting mechanism by the cutting control mechanism, so that the cutting mechanism is rotated and cuts off the adhesive tape. The above automatic adhesive tape dispenser has some advantageous effects such as a reasonable structure, a stable performance and an easy operation.

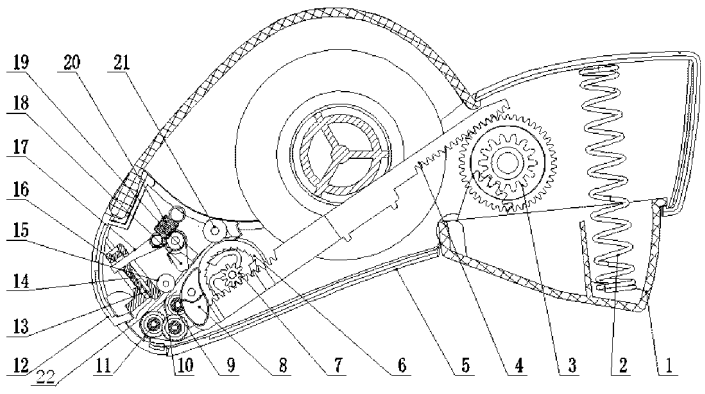

Fig.1

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Description

[0001] The present application claims the benefit of priority to Chinese patent application No. 201010100011.9 titled "AUTOMATIC ADHESIVE TAPE DISPENSER", filed with the Chinese State Intellectual Property Office on January 22, 2010. The entire disclosures thereof are incorporated herein by reference.

FIELD OF THE INVENTION

[0002] The invention relates to an adhesive tape dispenser, in particular to an automatic adhesive tape dispenser.

BACKGROUND OF THE INVENTION

[0003] The adhesive tape dispenser is an office supplies, and mainly used with adhesive tape rolls. At present, there are various adhesive tape dispensers, such as a double-side adhesive tape dispenser disclosed in Chinese patent publication CN2635632. The double-side adhesive tape dispenser includes a cabinet having an opening, adhesive tape wheels and an adhesive tape roll disposed in the cabinet. The adhesive tape wheels include a tightening wheel, a rolling-belt wheel and a rolling-paper wheel, which are all flat-belt wheels with gears offset along the axial line; the rolling-belt wheel is installed at the opening of the cabinet; the tightening wheel is arranged between the rolling-belt wheel and the adhesive tape roll; the rolling-paper wheel and the rolling-belt wheel mesh with each other via the offset gears; the diameter of the offset gears of the rolling-belt wheel is less than the diameter of the rolling-belt wheel. The adhesive tape dispenser neither has the function of automatically transporting an adhesive tape, nor has the function of automatically cutting, thereby it is inconvenient to use.

[0004] Also as disclosed in Chinese patent application CN02226860.X, an electric adhesive tape dispenser includes a frame, an adhesive tape ring, a paper feed mechanism, a paper cutting device and a trigger switch, wherein the adhesive tape ring is supported on the frame, the paper feed mechanism comprises a motor, a primary paper feed wheel, a secondary paper feed wheel and a paper pressing rod, the motor drives the primary paper feed wheel and the secondary paper feed wheel after being decelerated through a speed reduction gear, and the rotatable paper pressing rod is arranged above the secondary paper feed wheel, the paper cutting device comprises a blade and a blade holder, the blade has a peak-like oblique double-blade structure which is staggered and is fixed on the blade holder, the detachable blade holder is arranged above an outlet of the paper pressing rod, the trigger switch for triggering the motor to preset the paper feed length is fixed on the blade holder, the shell of the frame is provided with a manual paper feed switch and a paper discharging length delaying adjustor, a power source is connected with the motor through the manual paper feed switch, and the delaying adjustor is connected with the trigger switch in series and then is connected with two ends of the manual paper feed switch in parallel. The adhesive tape dispenser has a complex structure, a large volume, a great weight and high manufacture costs, though it has the functions of paper automatic transportation and cutting.

SUMMARY OF THE INVENTION

[0005] In view of the above disadvantages of the prior art, the object of the present invention is to provide a mechanical automatic adhesive tape dispenser having the functions of automatic transportation and cutting.

[0006] The automatic adhesive tape dispenser according to the present invention includes n housing, an adhesive tape mount bracket provided in the housing, a transportation mechanism provided between an adhesive tape discharge opening of the housing and the adhesive tape mount bracket, and a cutting mechanism provided between the transportation mechanism and the adhesive tape discharge opening. A movable button is provided on the housing, and an elastic return member is provided between the button and the housing. The button transmits an external force applied thereon to the transportation mechanism by a drive mechanism, so that the transportation mechanism is rotated and transports an adhesive tape towards the adhesive tape discharge opening. A cutting control mechanism is provided between the drive mechanism and the cutting mechanism. When the external force is removed from the button, the drive mechanism transmits a return force of the elastic return member to the cutting mechanism by the cutting control mechanism, so that the cutting mechanism is rotated and cuts off the adhesive tape.

[0007] Preferably, the drive mechanism includes a connecting member which is provided on the button and has teeth, a double linked gear and a rack. A small gear of the double linked gear is engaged with the connecting member with teeth, and a big gear of the double linked gear is engaged with a rear end of the rack. A guide groove for the rack and support shafts for respectively fixing the double linked gear and the button are provided on an inner wall of a lower portion of the housing.

[0008] Preferably, the elastic return member is a spring or an elastic belt.

[0009] Preferably, the transportation mechanism comprises a one-way pawl, a big roller, a rubber ring, a small roller

and a transportation wheel. The one-way pawl and pawl of an inner side of the big roller form a ratchet wheel assembly. Teeth of the one-way pawl are engaged with straight teeth of the rack. The big roller, the small roller and the transportation wheel are connected by the rubber ring. The small roller is disposed on a small roller bracket. Two raised ribs protruding above a top surface of the small roller bracket are respectively provided at two sides of the small roller bracket. A support shaft for tightening a rubber belt along with ratchet wheel assembly is provided in the lower portion of the housing, and a support shaft for fixing the one-way pawl is provided on the inner wall of the lower portion of the housing.

[0010] Preferably, the cutting control mechanism comprises a swaying wheel rotatably installed in the lower portion of the housing. A column on one end of the swaying wheel stretches into a slide groove of a front end of the rack to form a movable connection. A support shaft for fixing the swaying wheel is provided on the inner wall of the lower portion of the housing.

[0011] Preferably, the drive conversion mechanism comprises a swaying rod, a torsion spring, a pressing rod and a tension spring. The swaying rod and the pressing rod are connected via the torsion spring, and an upper portion of the housing is connected with the pressing rod via the tension spring.

[0012] Preferably, the cutting mechanism includes a cutting seat, a cutting blade seat and a cutting blade. The cutting blade is assembled on the cutting blade seat so as to form a cutting blade assembly. The cutting blade assembly is integrally installed in an inner groove of the cutting seat. A guide groove for the cutting seat is provided on an inner wall of the upper portion of the housing.

[0013] Preferably, the cutting blade is perpendicular to the adhesive tape.

[0014] Preferably, the drive conversion mechanism and the cutting mechanism are located at an upper side and a lower side of the adhesive tape, respectively.

[0015] Preferably, a driven wheel and a pressing wheel are rotatably installed in the upper portion of the housing. The big roller, the rubber ring, the small roller and the transportation wheel form a lower passage for transporting the adhesive tape. The driven wheel and the pressing wheel form an upper passage for transporting the adhesive tape. The adhesive tape is transported between the upper passage and the lower passage.

[0016] Preferably, a tooth surface orientation of one end of the rack is opposite to a tooth surface orientation of the other end thereof.

[0017] Preferably, the adhesive tape discharge opening of the lower portion of the housing is provided with a serrate rib along a direction in which the adhesive tape goes out.

[0018] Preferably, the material of the rubber ring is silicon rubber.

[0019] In the present invention, the double linked gear is driven by the spring and the button of the drive mechanism. Then, the double linked gear drives the rack, which in turn drives the transportation mechanism, the cutting control mechanism, the drive conversion mechanism and the cutting blade mechanism to perform their corresponding operation in sequence. Finally, the adhesive tape is automatically transported out and is cut off. The automatic adhesive tape dispenser according to the present invention has the following functions: a. if the button is pushed down, a certain length of the adhesive tape may be automatically transported out; b. if the button is kept being pushed down, the adhesive tape may be draw out infinitely; c. if the button is released, the adhesive tape may be automatically cut off by the cutting blade. The automatic adhesive tape dispenser of the present invention has some advantageous effects such as a reasonable structure, a stable performance and an easy operation.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] Fig. 1 is an internal structural view of the automatic adhesive tape dispenser according to the present invention;

[0021] Reference numerals in Figure 1:

1-	button,	2-	spring,
3-	double linked gear,	4-	rack,
5-	lower housing,	6-	big roller,
7-	one-way pawl,	8-	swaying wheel,
9-	small roller,	10-	rubber ring,
11-	transportation wheel,	12-	upper housing,
13-	cutting blade,	14-	cutting blade seat,
15-	driven wheel,	16-	cutting seat,
17-	pressing rod,	18-	swaying rod,
19-	torsion spring,	20-	tension spring,
21-	pressing wheel,	22-	small roller bracket.

DETAILED DESCRIPTION

[0022] Hereinafter, the automatic adhesive tape dispenser according to the present invention will be further described in detail with reference to the drawing and the specific embodiments.

[0023] As shown in Fig. 1, the automatic adhesive tape dispenser includes a drive conversion mechanism, a cutting mechanism, a drive mechanism, a transportation mechanism and a cutting control mechanism. The drive conversion mechanism and the cutting mechanism are disposed inside the upper housing 12. The drive mechanism, the transportation mechanism and the cutting control mechanism are disposed inside the lower housing 5. The drive mechanism includes a button 1, a spring 2, a double linked gear 3 and a rack 4. One end of the button 1 is rotatably connected with the lower housing 5, and the other end thereof is supported by the spring 2. A sector gear on the button 1 is engaged with a small gear of the double linked gear 3, and a big gear of the double linked gear 3 is engaged with straight teeth of the rack 4. A guiding groove for the rack 4 and support shafts for respectively fixing the double linked gear 3 and the button 1 are provided on the inner wall of the lower housing 5. The transportation mechanism includes a one-way pawl 7, a big roller 6, a rubber ring 10, a small roller 9 and a transportation wheel 11. The one-way pawl 7 and the big roller 6 form a ratchet wheel assembly. Teeth of the one-way pawl 7 are engaged with the straight teeth of the rack 4. The big roller 6, the small roller 9 and the transportation wheel 11 are connected by the rubber ring 10. A support shaft for fixing the one-way pawl is provided on the inner wall of the lower housing 5. The big roller 6 drives the transportation wheel 11 via the rubber ring 10 to transport the adhesive tape in the same direction. The small roller 9 is disposed on a small roller bracket 22. Two raised ribs protruding above the top surface of the small roller bracket are respectively provided at two sides of the small roller bracket 22 in order to limit the swing of the adhesive tape towards the two sides. A support shaft for tightening a rubber belt along with the ratchet wheel assembly is provided in the lower housing 5. The cutting control mechanism includes a swaying wheel 8 rotatably installed in the lower housing 5. A column on one end of the swaying wheel 8 is stretched into a slide groove of the front end of the rack 4 so as to achieve a movable connection. A support shaft for fixing the swaying wheel 8 is provided on the inner wall of the lower housing 5. The drive conversion mechanism includes a swaying rod 18, a torsion spring 19, a pressing rod 17 and a tension spring 20. The swaying rod 18 and the pressing rod 17 are connected via the torsion spring 19, and the upper housing 12 and the pressing rod 17 are connected via the tension spring 20. Support shafts for respectively fixing the swaying rod 18 and the tension spring 20 are provided on the inner wall of the upper housing 12. The cutting mechanism includes a cutting seat 16, a cutting blade seat 14 and a cutting blade 13. The cutting blade 13 is assembled on the cutting blade seat 14 to form a cutting blade assembly. The cutting blade assembly is integrally installed in an inner groove of the cutting seat 16. A guide groove for the cutting seat is provided in the inner wall of the upper housing 12. The cutting seat 16 presses the adhesive tape against the transportation wheel before the cutting blade 13 cuts the adhesive tape. The cutting blade 13 cuts off the adhesive tape in a direction perpendicular to the adhesive tape. The pressing rod 17 presses the cutting seat 16 and the cutting blade assembly downwardly when rotating downwardly. The cutting seat 16 and the transportation wheel 11 are firstly press the adhesive tape, and then the cutting blade 13 cuts off the adhesive tape. A support shaft for fixing the upper housing 12 is provided on the inner wall of the lower housing 5, so that the upper housing 12 is assembled in the lower housing 5 and is rotatable around the support shaft. Support shafts for respectively fixing the driven wheel 15 and the pressing wheel 21 are provided on the inner wall of the upper housing 12, so that the driven wheel 15 and the pressing wheel 21 are rotatably installed in the upper housing 12. When the upper housing 12 is closed on the lower housing 5, the adhesive tape is tightly pressed by the pressing wheel 21 and the driven wheel 15 together with the big roller 6, the small roller 9 and the rubber ring 10. The big roller 6, the rubber ring 10, the small roller 9 and the transportation wheel 11 form a lower passage for transporting the adhesive tape, and the driven wheel 15 and the pressing wheel 21 form an upper passage for transporting the adhesive tape. The adhesive tape is transported between the upper passage and the lower passage. An adhesive tape discharge opening of the lower housing 5 is provided with a serrate rib along a direction in which the adhesive tape goes out. The material of the rubber ring 10 is silicon rubber.

[0024] The operation principle of the present invention is given as follows. The upper housing 12 is opened, the adhesive tape is installed between the rubber ring 10 and the pressing wheel 21, and then the upper housing 12 is closed, so that the adhesive tape is tightly pressed by the pressing wheel 21, the driven wheel 15, the big roller 6, the small roller 9 and the rubber ring 10. The button 1 is pressed down, and the double linked gear 3 is rotated in the counterclockwise direction to move the rack 4 forwardly, and then the forward moving rack 4 drives the one-way pawl 7 to rotate in the clockwise direction, so that the ratchet wheel assembly is rotated in one way, i.e. the clockwise direction. When the ratchet wheel assembly is rotated clockwise in one way, the rubber ring 10 is moved forwardly in one way, so that the adhesive tape pressed on the surface of the rubber ring 10 is automatically forwardly transported by a certain distance. During the forward moving of the rack 4, the swaying wheel 8 is rotated forwardly, and drives the swaying rod 18 to rotate forwardly. When the swaying wheel 8 is rotated to a certain position, the swaying rod 18 is disengaged from the swaying wheel 8 and then is automatically returned by the torsion spring. During this process, the pressing rod 17 doesn't move because it is in the limit position. The button 1 is released, and then returned by the spring 2. When the button 1 is returned, the double linked gear 3 is rotated in clockwise direction, and the double linked gear 3 drives the

rack 4 to move backwardly, and the backward moving rack 4 drives the swaying wheel 8 to swing backwardly, so as to push the swaying rod 18 to rotate backwardly, so that the pressing rod 17 is rotated downwardly. During the downward rotation of the pressing rod 17, the cutting seat 16 and the cutting blade assembly are pressed downwardly. The cutting seat 16 and the transportation wheel 11 firstly press the adhesive tape, and the cutting blade 13 cuts off the adhesive tape subsequently. When the swaying wheel 8 is moved to a certain position, the swaying wheel 8 is disengaged from the swaying rod 18, and under the action of the tension spring 20, the pressing rod 17 brings the cutting blade assembly, the cutting seat 16 and the swaying rod 18 to return. One operation of the adhesive tape dispenser is finished.

[0025] The present invention is not limited by the above preferred embodiment, and products in other forms may be made according to the enlightening given by the present invention. Any variation in shape or structure, which is the same as or similar to the technical solution of the present invention, falls into the protection scope of the present invention.

[0026] The preferred embodiment of the present invention has been described above. However, it is noted that the above preferred embodiment shouldn't be deemed to limit the present invention and the protection scope of the present invention is defined by claims. Therefore, for those skilled in the art, various modifications and improvements may be made without depart from the spirit of the present invention, and these modifications and improvements should be deemed to fall into the protection scope of the present invention.

Claims

1. An automatic adhesive tape dispenser, comprising a housing, an adhesive tape mount bracket provided in the housing, a transportation mechanism provided between an adhesive tape discharge opening of the housing and the adhesive tape mount bracket, and a cutting mechanism provided between the transportation mechanism and the adhesive tape discharge opening, wherein
a movable button is provided on the housing, an elastic return member is provided between the button and the housing, the button transmits an external force applied thereon to the transportation mechanism by a drive mechanism, so that the transportation mechanism is rotated and transports an adhesive tape towards the adhesive tape discharge opening, a cutting control mechanism is provided between the drive mechanism and the cutting mechanism, when the external force is removed from the button, the drive mechanism transmits a return force of the elastic return member to the cutting mechanism by the cutting control mechanism, so that the cutting mechanism is rotated and cuts off the adhesive tape.

2. The automatic adhesive tape dispenser according to claim 1, wherein the drive mechanism comprises a connecting member which is provided on the button and has teeth, a double linked gear and a rack, a small gear of the double linked gear is engaged with the connecting member with teeth, a big gear of the double linked gear is engaged with a rear end of the rack, a guide groove for the rack and support shafts for respectively fixing the double linked gear and the button are provided on an inner wall of a lower portion of the housing.

3. The automatic adhesive tape dispenser according to claim 1, wherein the elastic return member is a spring or an elastic belt.

4. The automatic adhesive tape dispenser according to claim 2, wherein the transportation mechanism comprises a one-way pawl, a big roller, a rubber ring, a small roller and a transportation wheel, the one-way pawl and pawl of an inner side of the big roller form a ratchet wheel assembly, teeth of the one-way pawl is engaged with straight teeth of the rack; the big roller, the small roller and the transportation wheel are connected by the rubber ring, the small roller is disposed on a small roller bracket, two raised ribs protruding above a top surface of the small roller bracket are respectively provided at two sides of the small roller bracket, a support shaft for tightening a rubber belt along with ratchet wheel assembly is provided in the lower portion of the housing, and a support shaft for fixing the one-way pawl is provided on the inner wall of the lower portion of the housing.

5. The automatic adhesive tape dispenser according to claim 4, wherein the cutting control mechanism comprises a swaying wheel rotatably installed in the lower portion of the housing, a column on one end of the swaying wheel stretches into a slide groove of a front end of the rack to form a movable connection, a support shaft for fixing the swaying wheel is provided on the inner wall of the lower portion of the housing.

6. The automatic adhesive tape dispenser according to claim 5, wherein the drive conversion mechanism comprises a swaying rod, a torsion spring, a pressing rod and a tension spring, the swaying rod and the pressing rod are connected via the torsion spring, and an upper portion of the housing is connected with the pressing rod via the tension spring.

7. The automatic adhesive tape dispenser according to claim 6, wherein the cutting mechanism comprises a cutting seat, a cutting blade seat and a cutting blade, the cutting blade is assembled on the cutting blade seat so as to form a cutting blade assembly, the cutting blade assembly is integrally installed in an inner groove of the cutting seat, a guide groove for the cutting seat is provided on an inner wall of the upper portion of the housing.

8. The automatic adhesive tape dispenser according to claim 7, wherein the cutting blade is perpendicular to the adhesive tape.

9. The automatic adhesive tape dispenser according to claim 7 or 8, wherein the drive conversion mechanism and the cutting mechanism are located at an upper side and a lower side of the adhesive tape, respectively.

10. The automatic adhesive tape dispenser according to claim 1, wherein a driven wheel and a pressing wheel are rotatably installed in the upper portion of the housing; the big roller, the rubber ring, the small roller and the transportation wheel form a lower passage for transporting the adhesive tape; the driven wheel and the pressing wheel form an upper passage for transporting the adhesive tape; and the adhesive tape is transported between the upper passage and the lower passage.

11. The automatic adhesive tape dispenser according to claim 2, wherein a tooth surface orientation of one end of the rack is opposite to a tooth surface orientation of the other end thereof.

12. The automatic adhesive tape dispenser according to claim 1, wherein the adhesive tape discharge opening of the lower portion of the housing is provided with a serrate rib along a direction in which the adhesive tape goes out.

13. The automatic adhesive tape dispenser according to claim 1, wherein the material of the rubber ring is silicon rubber.

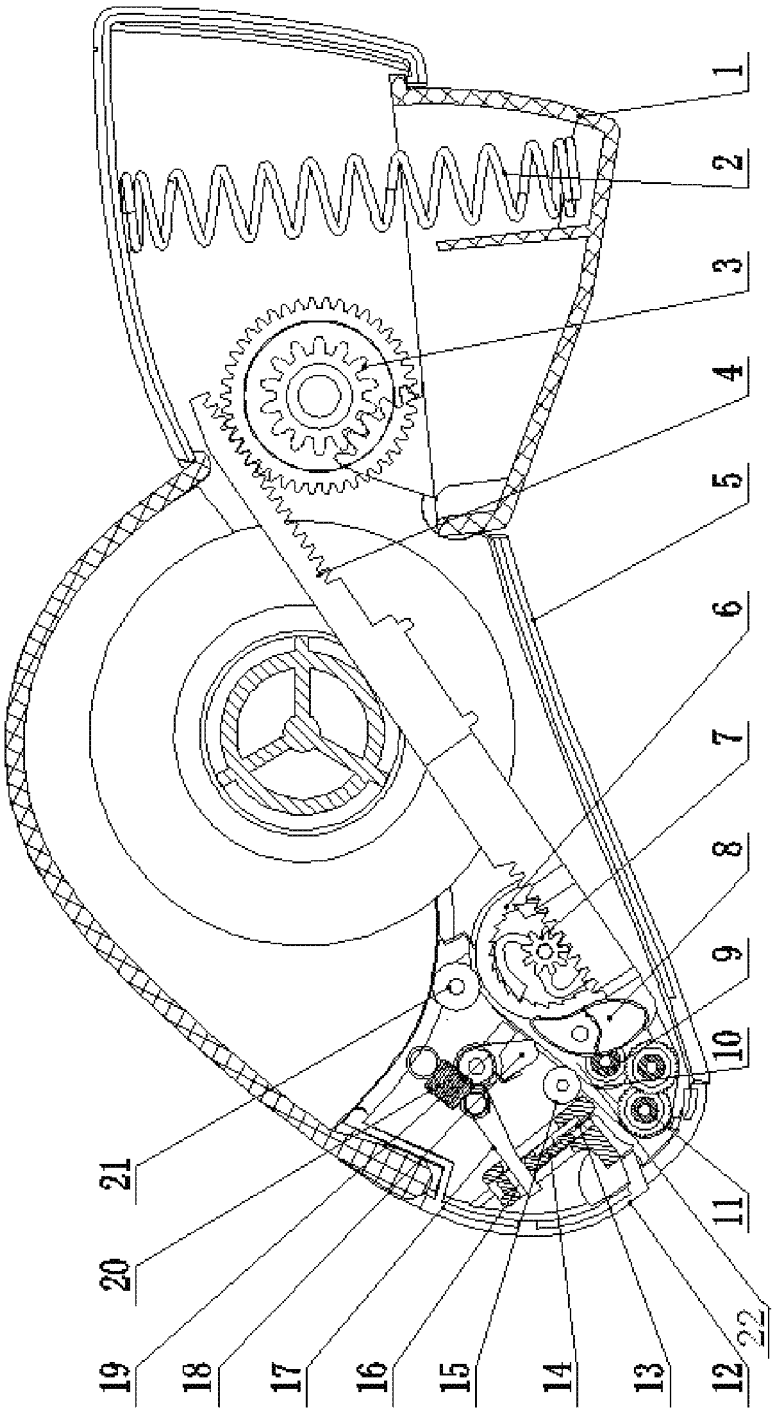

Fig.1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2010/072554

A. CLASSIFICATION OF SUBJECT MATTER

B65H35/07 (2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: B65H35/-

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI,EPODOC,CNPAT adhesive tape,gum+ paper, cut+, control+,button?, key+,dispens+,B65H35/ic/ec/fi

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 201169464 Y(PANYU UNIVERSAL STATIONERY ARTICLE FACTORY CO LTD) 24 Dec. 2008（24.12.2008）page 3 line 7 to page 4 line 4 of the description and fig.1	1-3,11-12
A		4-10,13
A	WO 01/34507 A1(PEGGION FERNANDO)17 May 2001（17.05.2001）the whole document	1-13
A	WO 92/07785 A1(ITEM PRODUCTS NPD LIMITED)14 May 1992（14.05.1992）the whole document	1-13
A	US 3850779 A(MINNESOTA MINING & MFG CO) 26 Nov. 1974（26.11.1974）the whole document	1-13

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
31 Aug. 2010（31.08.2010）	**28 Oct. 2010 (28.10.2010)**
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451	Authorized officer SUN, Lanxiang Telephone No. (86-10)62085064

Form PCT/ISA /210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2010/072554

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 201169464 Y	24.12.2008	NONE	
WO 01/34507 A1	17.05.2001	AU 1883201 A	06.06.2001
		EP 1233922 A1	28.08.2002
		IT 1313064 B	30.05.2002
		US 6712113 B1	30.03.2004
		DE 60018099 E	17.03.2005
WO 92/07785 A1	14.05.1992	AU 8761891 A	26.05.1992
		EP 0509076 A1	21.10.1992
		GB 2255549 A	11.11.1992
		JP 5-503278 T	03.06.1993
		US 5326421 A	05.07.1994
		DE 69120932 E	22.08.1996
		CA 2072873 C	06.08.1996
US 3850779 A	26.11.1974	NONE	

Form PCT/ISA /210 (patent family annex) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 201010100011 **[0001]**
- CN 2635632 **[0003]**
- CN 02226860X **[0004]**