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(54) **FOLLOW-UP SEALING EQUIPMENT FOR PACKING BAGS USED IN A FILLING MACHINE**

(57) The present invention provides a follow-up sealing equipment for packing bags used in a filling machine comprising a rotary table (1) and a number of clamping components (2) uniformly distributed at the periphery of the rotary table (1); a track (3) is arranged outside the rotary table (1); a sliding seat (5) is slidably installed on the track (3); a number of sealing components corresponding to the clamping components (2) on the rotary table (1) are installed on the sliding seat (5); a positioning component fitted with a pusher dog (9) is arranged on the sliding seat (5), a stopper corresponding to the pusher dog (9) is arranged on the rotary table (1); a proximity switch (11) adjacent to the fore-end of the sliding seat (5) is fixed on the track (3); a first spring (10) is connected between the track (3) and the sliding seat (5). The follow-up sealing equipment for packing bags in a filling machine according to the present invention has a reasonable structure and reliable performance; respective sealing components of the sliding seat may finish the sealing of the packing bags in the course of following the rotation of the rotary table; it is possible for the equipment to avoid the work process of frequent start-stop-start of the rotary table and to ensure that the rotary table may run in a uniform speed stably throughout, so as to greatly improve the productivity of the filling machine; moreover, sealing components of the sliding seat are exactly coordinated with the clamping components of the rotary table respectively during the sealing operation, and hence a good sealing effect may be obtained.

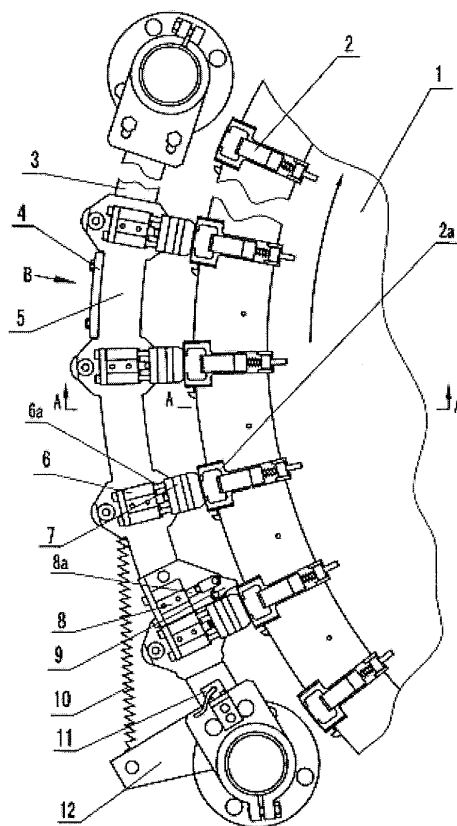


Fig. 1

Description

Field of the Invention

[0001] The present invention relates to product-packing machine fields, and more particularly, to a follow-up sealing equipment for packing bags used in a filling machine.

Background of the Invention

[0002] At present, the filling machines for shaping bags on the market are all in the form of multi-station rotary filling and packing by use of a round rotary table; the basic structure mode required for this form is that there are a number of clamping devices uniformly distributed at the periphery of the round rotary table; corresponding sealing equipments are arranged for respective clamping devices; a bag-supplying structure is arranged outside the round rotary table; packing bags are supplied to the respective clamping devices via the bag-supplying structure and then sealed by the sealing equipment after the packing bags clamped by the clamping device are filled completely. The sealing operation of the existing filling machine for shaping bags is performed by a sealing equipment when the rotary table is rotated to the next station after the filling is completed. It is decided by the structure of the sealing equipment that the rotary table operates in the form of stepping rotation, so that the sealing equipment can perform the sealing operation when the rotary table is halted and subsequently the next packing bag to be sealed is supplied to the clamping device by the bag-supplying structure after the previous packing bag finishes its free fall. The stepping rotary table consumes a large number of effective time in the ceaseless start-stop-start process and results in a low work efficiency of the filling machine, meanwhile the power consumption of the filling machine is relatively large because of the frequent start and stop of the rotary table.

Summary of the Invention

[0003] The objective of the present invention is to provide a follow-up sealing equipment for packing bags used in a filling machine which may implement the exact coordination between the clamping component and the sealing component during the continuous rotation of the rotary table, so as to implement the sealing of packing bags.

[0004] To achieve the above objective, a follow-up sealing equipment for packing bags used in a filling machine according to an embodiment of the present invention is provided, the equipment comprises: a rotary table and clamping components uniformly distributed at the periphery of the rotary table; a track is arranged outside the rotary table; a sliding seat may be slidably installed on the track; a number of sealing components and positioning components adjacent to the sealing components

are arranged on the sliding seat; the sealing components correspond with the clamping components respectively; a first spring is connected between the track and the sliding seat.

5 [0005] Preferably, the sealing component comprises a first cylinder and a seal head; the first cylinder is fixed on the sliding seat; the seal head is connected to the fore-end of the piston rod of the cylinder.

10 [0006] Preferably, the positioning component comprises a second cylinder and a pusher dog; the second cylinder is fixed on the sliding seat; the pusher dog is hinged to the sliding seat and to the fore-end of the piston rod of the second cylinder.

15 [0007] Preferably, a number of first rolling wheels located at both sides of the track respectively are installed at the bottom of the sliding seat; the sliding seat is matched with the track by the first rolling wheel in a rolling way.

20 [0008] Preferably, a damping bump is fixed at the edge of the sliding seat; a guide sleeve is fixed at the bottom of the track; a guide rod is installed inside the guide sleeve and protruding out of the upper end of the guide sleeve; a screw stem is protruding into the guide sleeve from the bottom of the guide sleeve.

25 [0009] Preferably, a second spring is connected between the guide rod and the screw stem.

[0010] Preferably, the screw stem is connected to the guide sleeve by screw thread.

30 [0011] Preferably, a second rolling wheel is installed at the upper end of the guide rod; the second rolling wheel is rested against the downside of the damping bump; wherein, the downside of the damping bump is an inclined plane.

35 [0012] Preferably, a proximity switch adjacent to the fore-end of the sliding seat is fixed on the track.

40 [0013] Preferably, the first spring is connected between the track and the sliding seat in such a manner that a bracket is fixed at the fore-end of the track and both ends of the first spring are connected to the bracket and the sliding seat respectively.

45 [0014] The follow-up sealing equipment for packing bags in a filling machine according to the present invention has a reasonable structure and reliable performance; respective sealing components of the sliding seat may finish the sealing of the packing bags in the course of following the rotation of the rotary table; it is possible for the equipment to avoid the work process of frequent start-stop-start of the rotary table and to ensure that the rotary table may run in a uniform speed stably throughout, so as to greatly improve the productivity of the filling machine; moreover, sealing components of the sliding seat are exactly coordinated with the clamping components of the rotary table respectively during the sealing operation and hence a good sealing effect may be obtained.

Mode of Carrying Out the Invention

55 [0015] Particular modes for carrying out the present

invention will be further described in detail with reference to accompanying drawings and embodiments. The following embodiments are used for explaining the present invention but not limiting the scope thereof.

Fig.1 is a structure diagram illustrating a follow-up sealing equipment for packing bags used in a filling machine according to an embodiment of the present invention;

Fig.2 is an A-A sectional view of fig.1;

Fig.3 is a B-directional view of fig.1.

[0016] Referring to fig.1 and fig.2, the follow-up sealing equipment for packing bags used in a filling machine comprises: a rotary table 1 and a number of clamping components 2; the clamping components 2 are uniformly distributed at the periphery of the rotary table 1. A track 3 is arranged outside the rotary table 1; a sliding seat 5 slidably matched with the track 3 is installed on the track 3; a number of sealing components corresponding to the clamping components 2 are installed on the sliding seat 5; the sealing component comprises a first cylinder 6 and a seal head 7; the first cylinder 6 is fixed on the sliding seat 5; the seal head 7 is connected to the fore-end of the piston rod 6a of the first cylinder 6.

[0017] The rotary table 1 uses the base 2a of the clamping component 2 as a stopper; a positioning component is located adjacent to the sealing component. The positioning component comprises a second cylinder 8 and a pusher dog 9; the second cylinder 8 is fixed on the sliding seat 5; the pusher dog 9 is hinged to the sliding seat 5 and to the fore-end of the piston rod 8a of the second cylinder 8; a proximity switch 11 adjacent to the fore-end of the sliding seat 5 is fixed on the track 3. A first spring 10 is connected between the track 3 and the sliding seat 5 in such a manner that a bracket 12 is fixed at the fore-end of the track 3 and both ends of the spring 10 are connected to the bracket 12 and the sliding seat 5 respectively.

[0018] Referring to fig.2, a number of first rolling wheels 13 respectively located at both sides of the track 3 are installed at the bottom of the sliding seat 5; the first rolling wheel 13 is matched with the track 3 in a rolling way. A guide sleeve 16 is fixed at the bottom of the track 3. Through a screw, the guide sleeve 16 is fixed on a support plate 22; the support plate 22 is connected to the track 3; a guide rod 15 is installed inside the guide sleeve 16 and protruding out of the upper end of the guide sleeve 16; a screw stem 19 is protruding into the guide sleeve 16 from the bottom of the guide sleeve 16 and is connected to the guide sleeve 16 by screw thread; a handle 20 is connected to the bottom of the screw stem 19; a second spring 18 is installed between the guide rod 15 and the screw stem 19; a second rolling wheel 14 is installed at the upper end of the guide rod 15. In addition, there is a through groove 16a slotted on the guide sleeve 16; a screw 17 is passing through the through groove 16a and coupling with the bottom of the guide rod 15.

[0019] Referring to fig.2 and fig.3, the downside of the damping bump 4 fixed at the edge of the sliding seat 5 is an inclined plane; the second rolling wheel 14 is rested against the downside of the damping bump 4.

[0020] A pusher dog 9 of the positioning component is protruding out by the second cylinder 8 and a base 2a of the clamping component 2 may rest against the pusher dog 9, when a group of clamping components are rotated to the side where the track 3 is located after packing bags clamped on the group of clamping components 2 are filled completely, during the rotation of the rotary table 1, thereby the respective sealing components of the sliding seat 5 may be aligned with the respective clamping components of this group one by one by means of the pusher dog 9 rested against the base 2a; afterwards, the base 2a of the clamping component 2 may push the pusher dog 9 to slide on the track 3 along with the sliding seat 5; when the fore-end of the sliding seat 5 and the proximity switch 11 is separated from each other at a certain distance, the proximity switch 11 may send a signal to allow the first cylinder 6 of each sealing component to push the seal head 7 out; in this way, a packing bag clamped by the group of clamping components 2 may be sealed during the rotation of the rotary table 1 by the seal heads 7 of respective sealing components cooperating with respective clamping components 2 one by one. The seal heads 7 of respective sealing components and the pusher dog 9 of the positioning component are retracted after the sealing is completed; the sliding seat 5 may return to its original position under the effect of the first spring 10, so as to seal the filled packing bags clamped on the next group of clamping components.

[0021] It can be seen in conjunction with fig.1, fig.2 and fig.3 that under the effect of the first spring 10, the downside of the damping bump 4 on the sliding seat 5 may slide along the second rolling wheel 14 in the course of the sliding seat returning to its original position; under the effects of the second rolling wheel 14, the guide rod 15 and the second spring 18, the sliding of the damping bump 4 may be damped, so as to provide a cushion effect for the returning of the sliding seat 5.

[0022] The foregoing descriptions are only preferred embodiments of the present invention. It should be noted that, it's possible for the person skilled in the art to acquire a number of modifications and improvements thereof without departing from the technical principles of the present invention, and all of such modifications and improvements shall be deemed as being included in the protection scope of the present invention.

Industrial applicability

[0023] The follow-up sealing equipment for packing bags used in a filling machine according to the present invention has a reasonable structure and reliable performance; respective sealing components of the sliding seat may finish the sealing of the packing bags in the course of following the rotation of the rotary table; it is

possible for the equipment to avoid the work process of frequent start-stop-start of the rotary table and to ensure that the rotary table may run in a uniform speed stably throughout, so as to greatly improve the productivity of the filling machine; moreover, sealing components of the sliding seat are exactly coordinated with the clamping components of the rotary table respectively during the sealing operation, and hence a good sealing effect may be obtained.

Claims

1. A follow-up sealing equipment for packing bags used in a filling machine comprising a rotary table (1) and clamping components (2) uniformly distributed at the periphery of the rotary table (1), **characterized in that**, a track (3) is arranged outside the rotary table (1); a sliding seat (5) is slidably installed on the track (3); a number of sealing components and positioning components located adjacent to the sealing components are arranged on the sliding seat (5); the sealing components correspond with the clamping components respectively; and a first spring (10) is connected between the track (3) and the sliding seat (5).
2. The follow-up sealing equipment for packing bags used in a filling machine of claim 1, **characterized in that**, the sealing component comprises a first cylinder (6) and a seal head (7); the first cylinder (6) is fixed on the sliding seat (5); and the seal head (7) is connected to the front end of the piston rod (6a) of the first cylinder (6).
3. The follow-up sealing equipment for packing bags used in a filling machine of claim 1, **characterized in that**, the positioning component comprises a second cylinder (8) and a pusher dog (9); the second cylinder (8) is fixed on the sliding seat (5); and the pusher dog (9) is hinged to the sliding seat (5) and to the front end of the piston rod (8a) of the second cylinder (8).
4. The follow-up sealing equipment for packing bags used in a filling machine of any of claims 1-3, **characterized in that**, a number of first rolling wheels (13) located at both sides of the track (3) respectively are installed at the bottom of the sliding seat (5); and the sliding seat (5) is matched with the track (3) by the first rolling wheel (13) in a rolling way.
5. The follow-up sealing equipment for packing bags used in a filling machine of claim 4, **characterized in that**, a damping bump (4) is fixed at the edge of the sliding seat (5); a guide sleeve (16) is fixed at the bottom of the track (3); a guide rod (15) is installed into the guide sleeve (16) from the bottom thereof.
6. The follow-up sealing equipment for packing bags used in a filling machine of claim 1, **characterized in that**, a second spring (18) is installed between the guide rod (15) and the screw stem (19).
7. The follow-up sealing equipment for packing bags used in a filling machine of claim 5 or 6, **characterized in that**, the screw stem (19) is connected to the guide sleeve (16) by screw thread.
8. The follow-up sealing equipment for packing bags used in a filling machine of claim 7, **characterized in that**, a second rolling wheel (14) is installed at the upper end of the guide rod (15); the second rolling wheel (14) is rested against the downside of the damping bump (4); wherein the downside of the damping bump (4) is an inclined plane.
9. The follow-up sealing equipment for packing bags used in a filling machine of claim 8, **characterized in that**, a proximity switch (11) adjacent to the front end of the sliding seat (5) is fixed on the track (3).
10. The follow-up sealing equipment for packing bags used in a filling machine of claim 9, **characterized in that**, the first spring (10) is connected between the track (3) and the sliding seat (5) in such a manner that a bracket (12) is fixed at the front end of the track (3) and both ends of the first spring (10) are connected to the bracket (12) and the sliding seat (5) respectively.

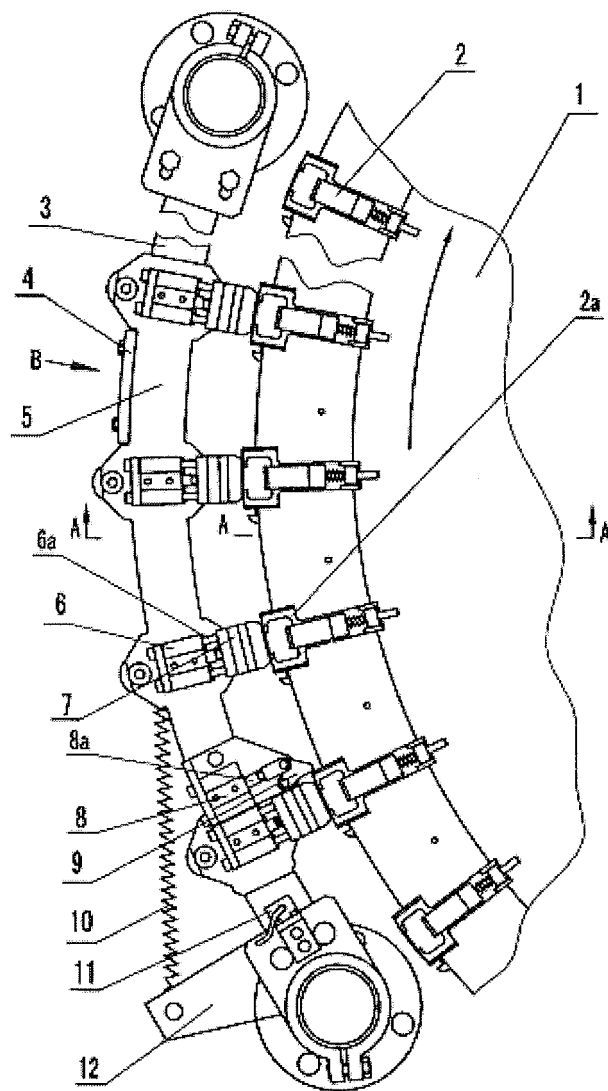


Fig. 1

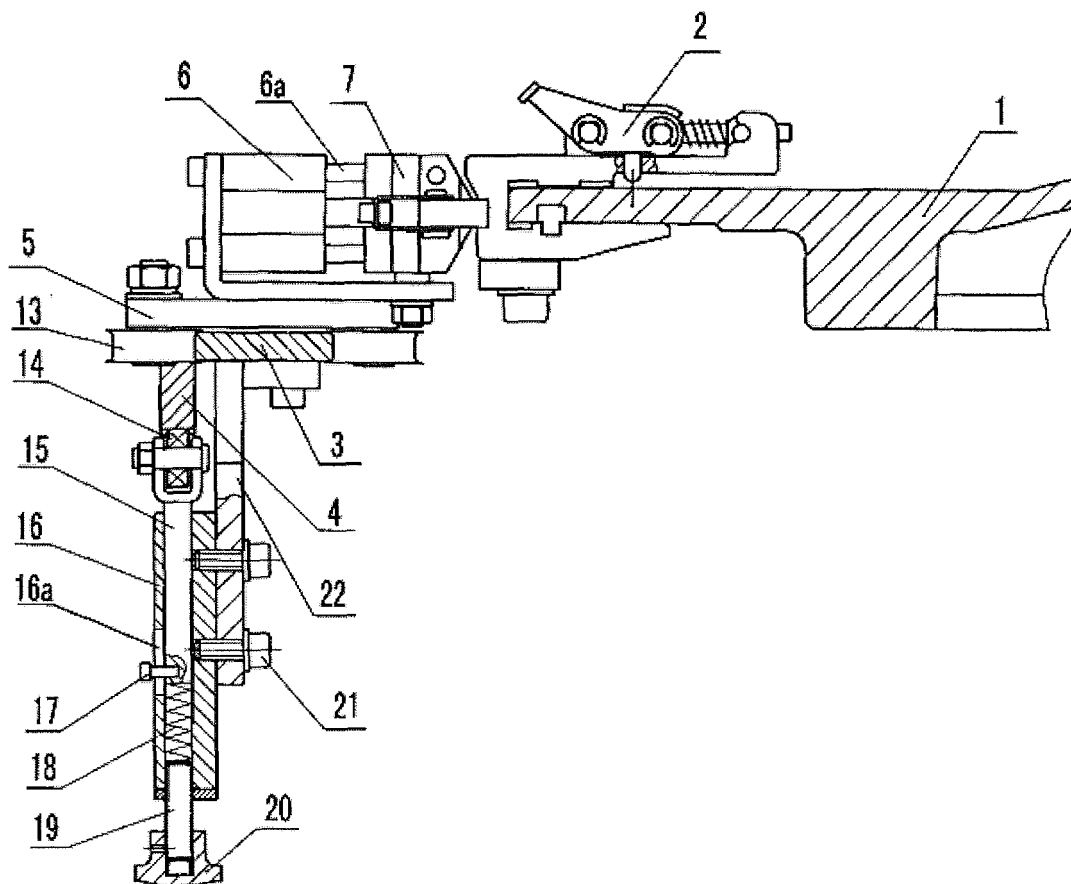


Fig. 2

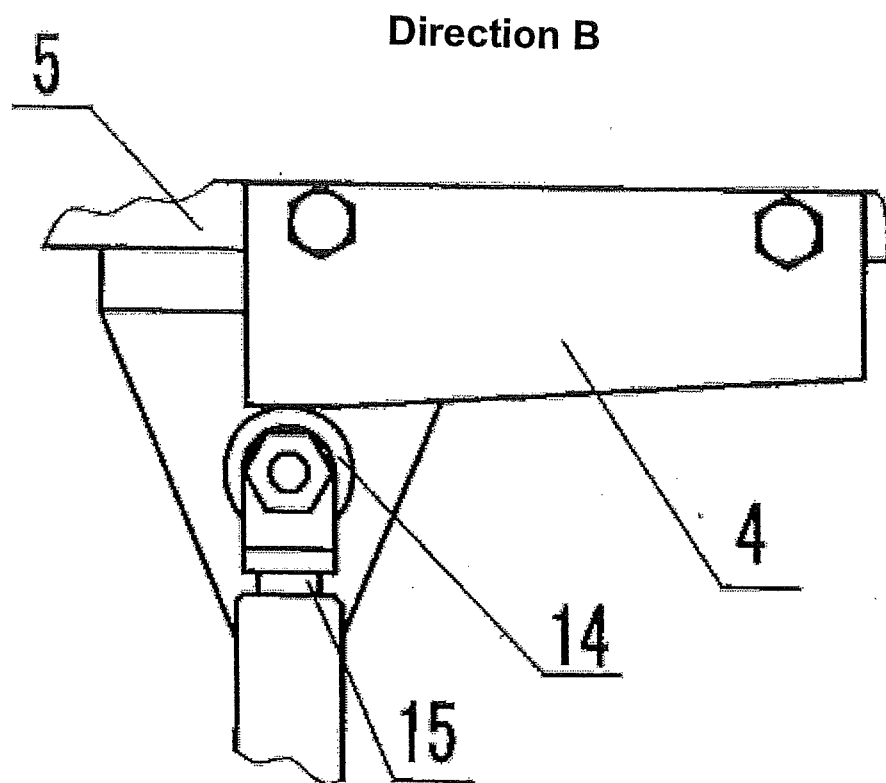


Fig. 3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2009/074671

A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

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: B65B

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)

CNPAT,EPODOC, WPI: pack+,fill+,follow,seal,spring,hold+,seat,slid+, rotary,claw,roll+,disc,bag

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN201296404Y (WEI, Hui) 26 Aug. 2009 (26. 08.2009) see the whole document	1-10
A	CN1715137A (YUEDONG MACHINERY FACTORY CO., LTD.) 04 Jan. 2006 (04. 01.2006) see the whole document	1-10
A	CN2728912Y (XIE, Jianfeng) 28 Sep. 2005 (28. 09.2005) see the whole document	1-10
A	CN201102894Y (LIU, Yaoyu) 20 Aug. 2008 (20. 08.2008) see the whole document	1-10
A	US6357211B1 (AVISO PACKAGING LLC) 19 Mar. 2002 (19. 03.2002) see the whole document	1-10

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

* Special categories of cited documents:	“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
“A” document defining the general state of the art which is not considered to be of particular relevance	“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
“E” earlier application or patent but published on or after the international filing date	“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
“L” document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified)	“&” document member of the same patent family
“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	

Date of the actual completion of the international search 12 Jan. 2010(12.01.2010)	Date of mailing of the international search report 04 Feb. 2010 (04.02.2010)
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 SHAO, Jitao Telephone No. (86-10)62085326

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2009/074671

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP2005029182A (OMORI MACHINERY) 03 Feb. 2005 (03. 02.2005) see the whole document	1-10

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

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2009/074671

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		MXPA00007247 A	10. 11.2004
JP2005029182A	03. 02.2005	NONE	

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2009/074671

CLASSIFICATION OF SUBJECT MATTER

B65B 51/04 (2006.01) i

B65B 3/00 (2006.01) i