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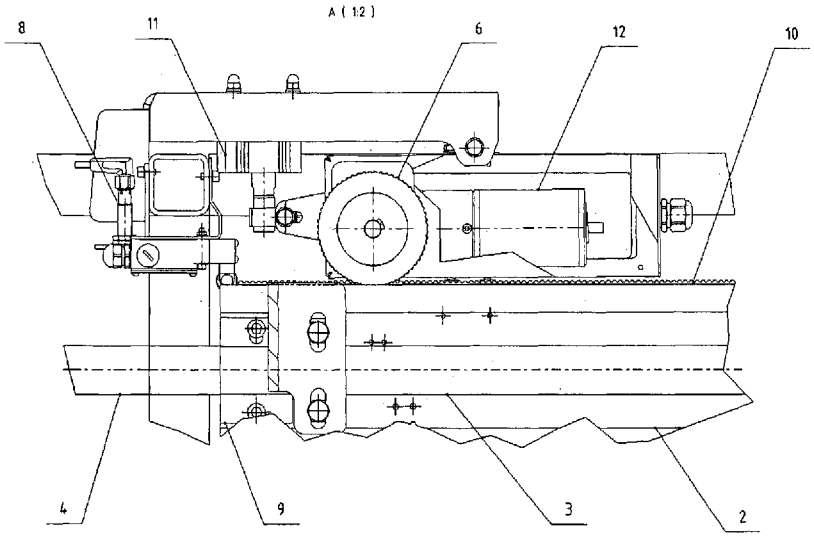


Fig. 4
A (1 : 2)

(57) Abstract: The object of the invention is a driving mechanism for moving a sliding door, in particular a heavy glass door for industrial rinsing machines. The driving mechanism for moving a sliding door of the invention consists of a grip, a driven cogwheel (6) fastened to a shaft of a motor (12), and a toothed belt (10) fastened to the upper surface of a mounted C-profile (2) of a holder of the sliding door (1).

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A DRIVE MECHANISM FOR MOVING A SLIDING DOOR

The object of the invention is a driving mechanism for moving a sliding door, in particular a heavy glass door for industrial rinsing machines. The driving mechanism for moving a sliding door of the invention consists of a grip, a driven cogwheel fastened to a motor shaft, and a toothed belt fastened to the upper surface of a mounted C-profile of a sliding door holder.

The technical problem which is efficiently solved by the proposed construction is construction and configuration of a driving mechanism for moving a sliding door, in particular a heavy sliding door suspended on a holder.

Known driving mechanisms for moving a sliding door, in particular driving mechanisms for a heavy sliding door suspended on a holder, are known for instance from patent document EP 1 639 220. Here, the sliding door is suspended on a mounted holder that allows movement in direction of door opening and closing. The support is driven by an electric motor. The transfer of force needed for door opening and closing is provided for by a driven wheel on a shaft of the electric motor via frictional transmission to a flat, smooth metallic upper surface of the door holder. An elastic O-ring is embedded in the wheel to provide for a better torque. The rotational movement of the wheel on the electric motor shaft is transferred via the force of friction to the horizontal movement of the door. The electric motor is biased in a direction towards the holder by a spring and provides for adequate force of friction. The force of friction was set by way of a test, such that the horizontal movement of the door stops at a force of 150 N for safety

reasons, because there is a risk of damages when the door moves towards the support frame.

The configuration of the door drive described above has several drawbacks. It is suitable only for small (light-weight) door. When a large (heavy) door is in question, it is difficult to set the force of friction. Moreover, dirt keeps accumulating on the holder and the conditions for the force of friction get changed. The door tends to stop or to glide off.

The driving mechanism for moving a sliding door of the invention consists of a grip, of a driven cogwheel mounted on a motor shaft, and of a cogged belt fastened to the upper surface of a mounted C-profile of a sliding door holder.

The invention will be explained in more detail by way of an embodiment and the enclosed drawings, in which:

Figure 1 shows a side view of a sliding door with a driving mechanism for movement of the invention;

Figure 2 shows a top view of a sliding door with a driving mechanism for movement of the invention;

Figure 3 shows a front view in section B-B and in partial cross-section of a detail of a driving mechanism for moving a sliding door of the invention;

Figure 4 shows a detail A of a driving mechanism for moving a sliding door of the invention, a side view, in a position, where the door is moved by an motor;

Figure 5 shows a detail A of a driving mechanism for moving a sliding door of the invention, a side view, in a position, where the door is moved manually.

The driving mechanism for moving a sliding door of the invention is represented by a motor-driven cogwheel 6 that engages with a cogged belt 10 fastened to a C-profile 2, to which a sliding door 1 is fastened.

The sliding door 1 is fastened to the C-profile 2 mounted on a guiding bearing bushing 9 and allows the sliding door 1 to move in horizontal direction on a shaft 3 and 4. The movement of the C-profile 2 with the sliding door 1 along the guiding bearing bushing 9 is provided for by a motor drive represented by an electric motor 12. Transmission of the force needed to move the sliding door 1 is carried out via motor-driven cogwheel 6 fastened on the shaft of the electric motor 12. The cogged belt 10 made from a PTFE material for instance is fastened to the upper surface of the C-profile 2. The rotational movement of the cogwheel 6 is transferred to the fastened cogged belt 10 and the sliding door 1 moves horizontally. The electric motor 12 with the cogwheel 6 is fastened on a holder 5 and positioned towards the C-profile 2 with the cogged belt 10 by means of a one-way pneumatic cylinder 11. A safety strip is arranged on both vertical edges of the sliding door 1. If the sliding door 1 encounters an obstacle while moving, the safety stip is activated and a signal is transmitted to a controller which withdraws air from the pneumatic cylinder 11 and as a result a spring in the pneumatic cylinder 11 pushes the piston rod upwards and spaces the cogwheel 6 and the

cogged belt 10 apart. The same happens if any of safety circuit breakers arranged all over the machine is activated.

Switches 7 and 8 are used to indicate the position of the sliding door 1.

In the event that any of the safety or limit switches are activated or if a switch for the manual opening of the sliding door 1 was activated by a user, the pneumatic cylinder 11 separates the cogwheel 6 from the cogged belt 10, such that the C-profile 2 and consequently the sliding door 1 can be manually moved. The position of the cogwheel 6 being separated from the cogged belt 10 is shown in Figure 3. The sliding door 1 can freely move and can be moved to a desired position manually.

Due to transmission of the torque from the motor to the door through the combination of a cogwheel, a rack and a pneumatic cylinder in the construction of the drive of the sliding door of the invention, gliding off and consequently unreliable door closing is not possible.

Moreover there are the following advantages over known variants of sliding door drives:

- the solution allows for reliable continuous movement and stop when the limit switches are switched off;
- protection of movement of the door by a safety electric sensor strip that prevents persons and devices from getting damaged in the event the door encounters an obstacle while moving;
- 100 % interruption of movement upon shortage of compressed air, which occurs when the safety switches are pushed (if a person remains closed within a chamber of a rinsing mashine, the chamber

is provided by two safety switches) because a spring moves the cogwheel away and the door can be moved manually.

CLAIMS

1. A driving mechanism for moving a sliding door,

   characterized in that

   a driven cogwheel (6) fastened to a shaft of a motor (12) engages with a cogged belt (10) fastened to an upper surface on a guiding bearing bushing (9) of a mounted C-profile (2) of a holder of the sliding door (1).

2. Driving mechanism according to claim 1,

   characterized in that

   the electric motor (12) is fastened in a holder (5) and positioned towards the C-profile (2) by the cogged belt (10) by means of a one-way pneumatic cylinder (11).

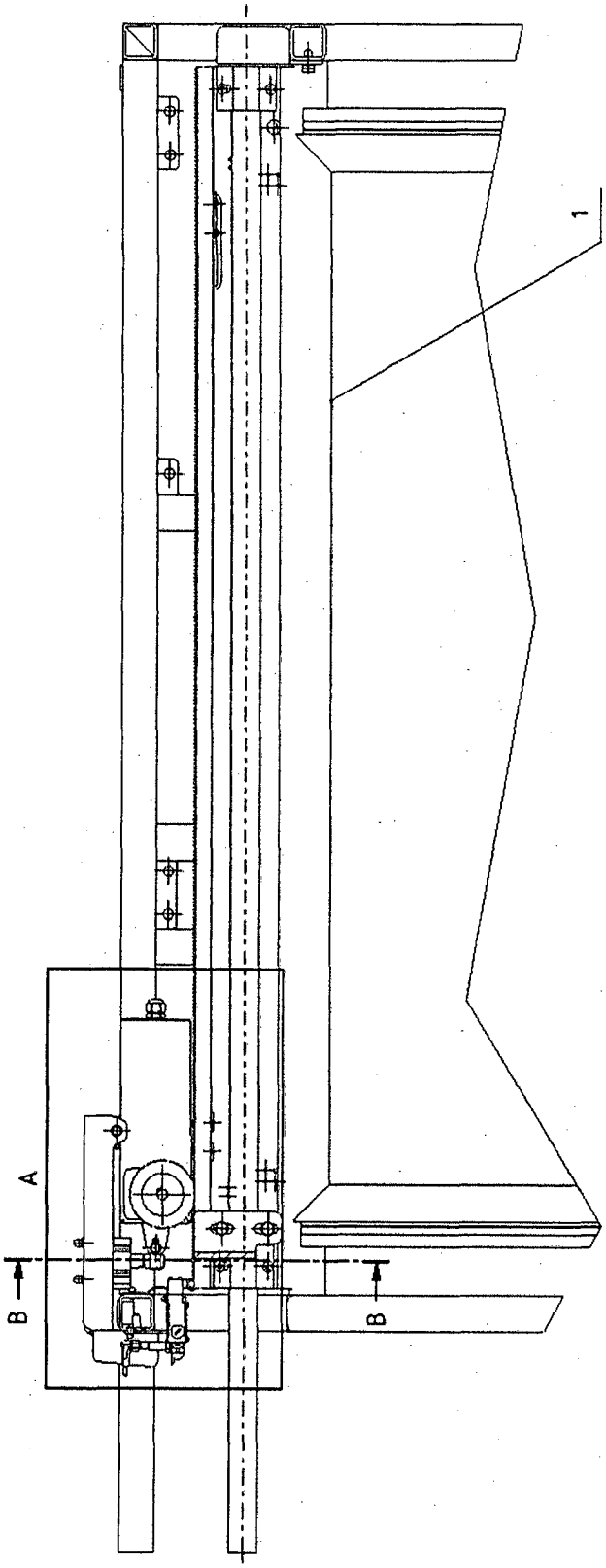


Fig. 1

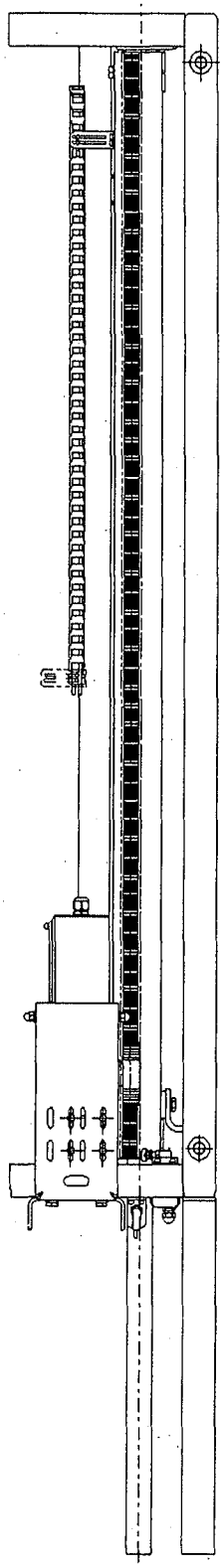


Fig. 2

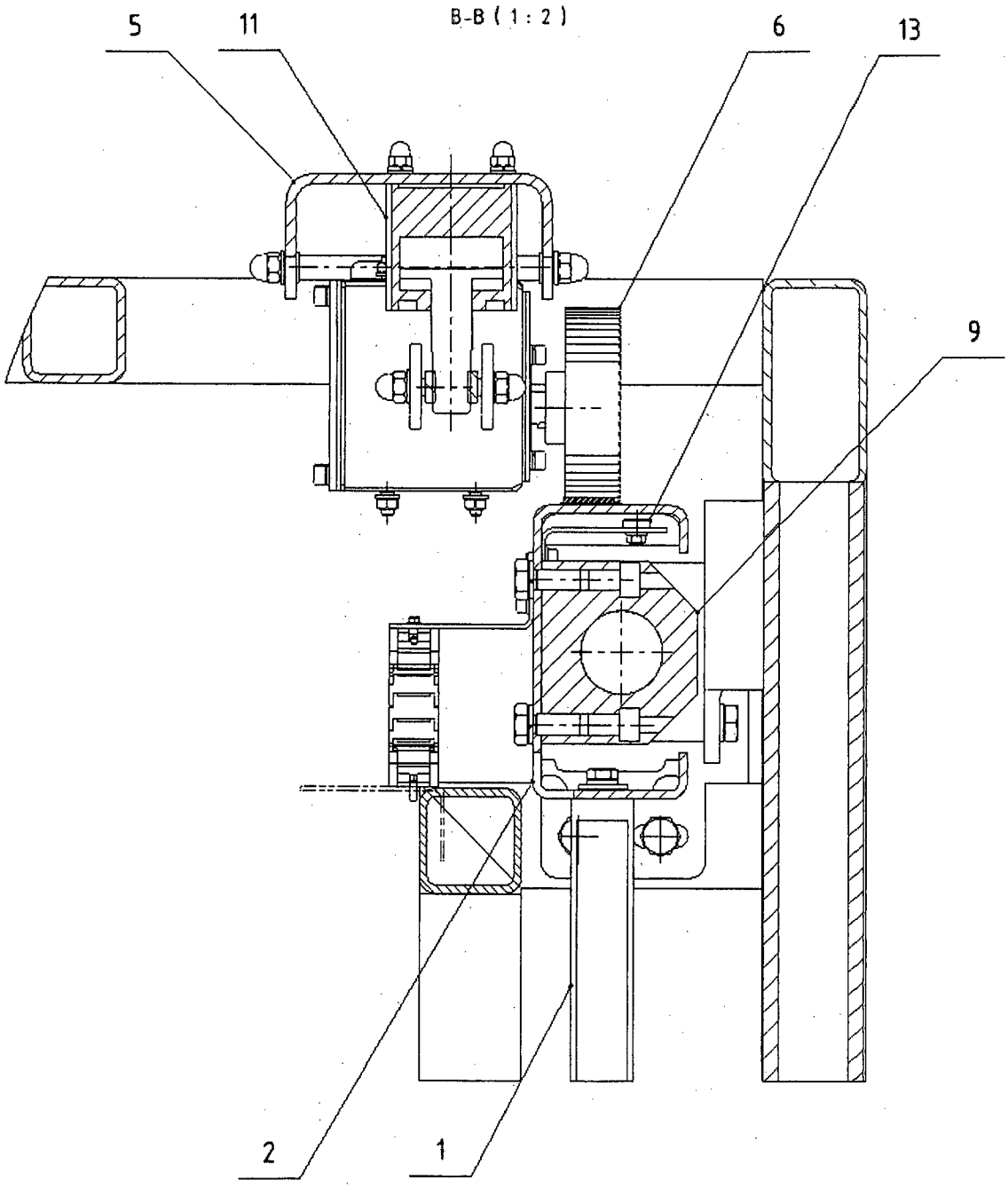


Fig. 3

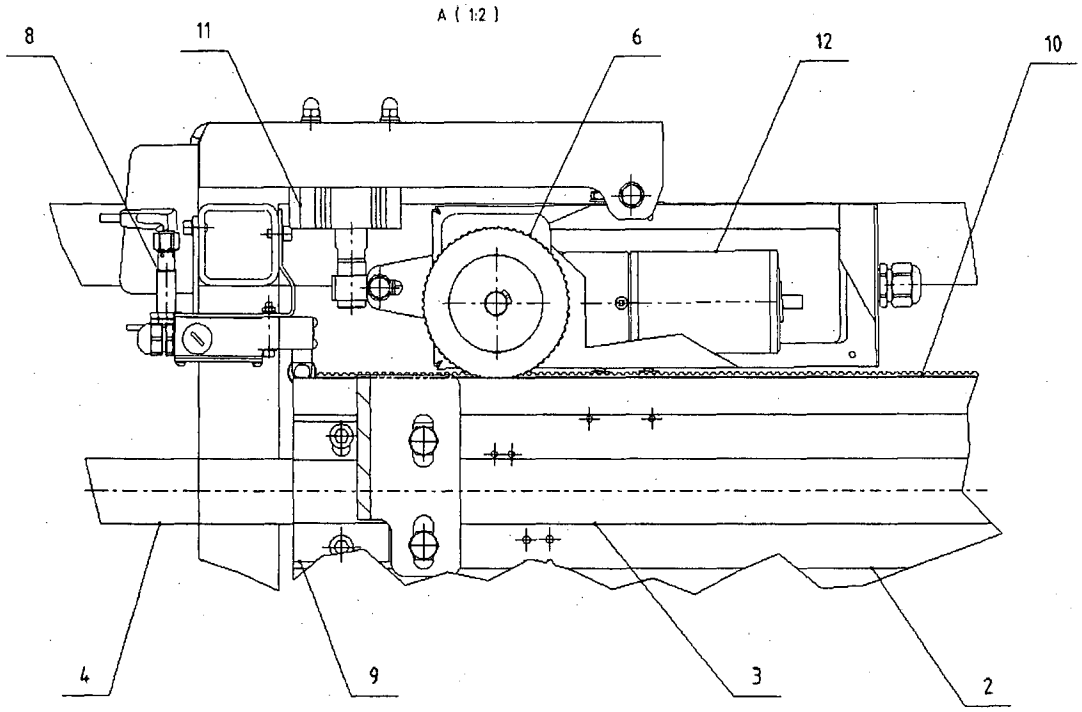


Fig. 4

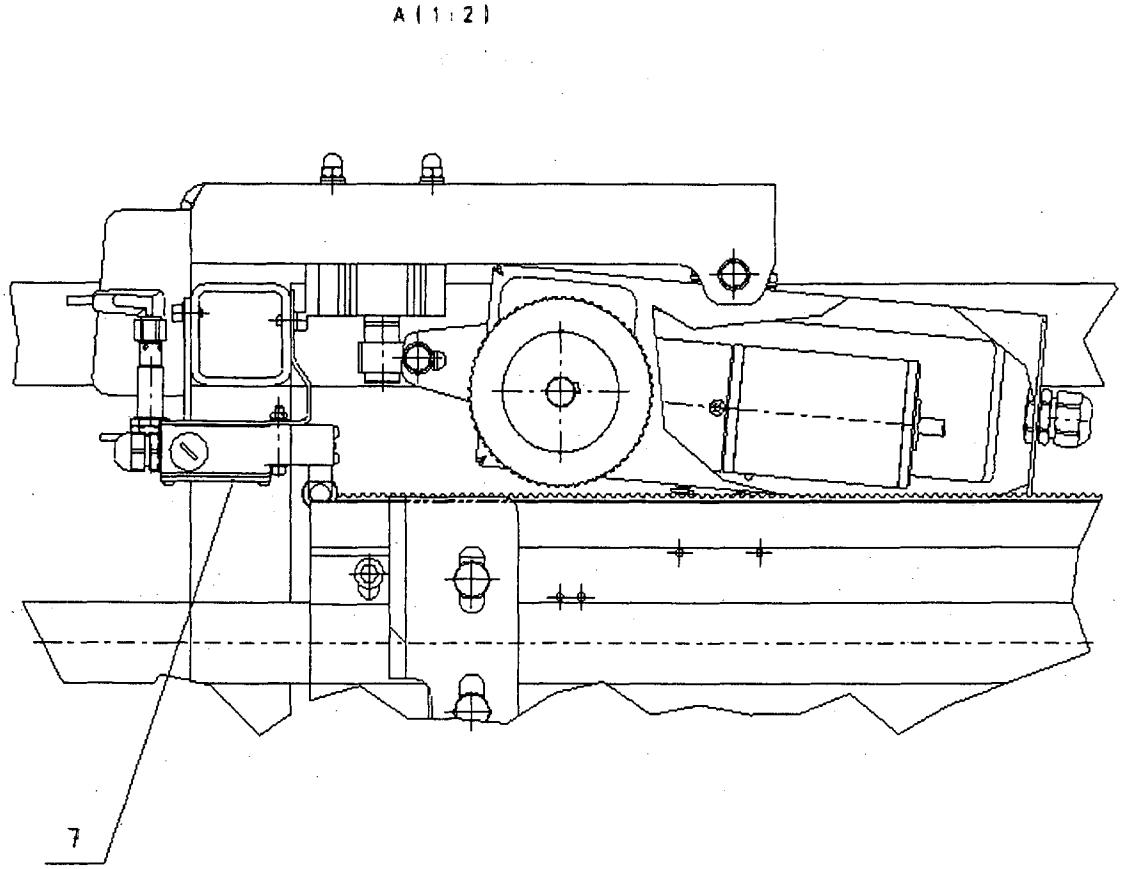


Fig. 5

INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. E05F15/635
ADD.

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)
E05F

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)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 1 639 220 A1 (ALTHAMMER JUERGEN [DE]; BELIMED GMBH [DE]) 29 March 2006 (2006-03-29) pages 15-20; figures 1,2	1,2
Y	CN 201 206 388 Y (ZIBO HUALIAN MINING INDUSTRY C [CN]) 11 March 2009 (2009-03-11) figure 1	1,2
A	WO 2012/012847 A1 (AUTOSLIDE PTY LTD [AU]; HANCOCK MARK STEVEN [AU]) 2 February 2012 (2012-02-02) page 6, lines 6-21; figures 2-8	1,2

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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"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

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/SI2017/000017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1639220 A1	29-03-2006	AT 458116 T	15-03-2010
		DE 10321037 A1	02-12-2004
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WO 2012012847 A1	02-02-2012	NONE	