

Description**Field:**

[0001] The present disclosure relates to a hold back latch for the attachment of two wings, for example the window panes of a construction vehicle.

Background:

[0002] The use of magnetic latches for holding back or holding shut doors or windows is known. The use of paired magnets arrangable in an attraction position to hold a latch closed and a repulsion position for detachment is also known.

[0003] An example of a holdback latch making use of paired magnets is disclosed in US 2009/273194 A1, published on 5 November 2009, entitled "Magnetic Gate Latch", in which magnetic forces are used to brake and close a gate or door.

[0004] The described latch described in US 2009/273194 has certain disadvantages. It is a complex mechanism comprising a large number of components. In addition, the latch can be opened from one side only. This is undesirable in many circumstances, for example in construction vehicles, where it is desirable to be able to open a latch from inside or outside the cab. Further, the latch is dependent on exact alignment of the magnets to function properly. Over time, doors and windows can become misaligned (for example, due to wear on hinges), affecting the alignment of the latch. In addition, existing latch systems for use in construction vehicles are known to suffer from water ingress.

[0005] There remains a need for a hold back latch which addresses at least some of the aforementioned concerns.

Summary of the Invention:

[0006] According to the present disclosure there is provided a hold back latch comprising:

- a first latch body mountable to a first wing;
- a first magnet device rotatably mounted to the first latch body; and
- a second magnet device mountable to a second wing;

wherein the first magnet device is rotatable relative to the second magnet device, and in addition the first magnet device is sprung mounted so as to be attractable towards and repulsable away from the second magnet device due to magnetic field interactions between the first and second magnet devices;

wherein the hold back latch further comprises a retention mechanism for retaining a rotational orientation of the first magnet device when the magnetic fields of the first and second magnet devices are not interacting;

wherein the retention mechanism is disengagable by repulsion of the first magnet device away from the second magnet device when the first and second magnet devices interact.

[0007] There is also provided a method of unlatching and latching a first wing and a second wing by means of a hold back latch comprising:

- a first latch body mountable to a first wing;
 - a first magnet device rotatably mounted to the first latch body;
 - a second magnet device mountable to a second wing; and
 - a retention mechanism;
- said method comprising the steps of:

arranging the first magnet device and the second magnet device in an repulsion orientation such that the first wing and second wings unlatch;

retaining the first magnet device and the second magnet device in a repulsion orientation; disengaging the retention mechanism by interaction of the first magnet device and the second magnet device; and thereafter arranging the first magnet device and the second magnet device in an attraction orientation such that the first wing and second wing latch together.

Brief Description:

[0008] The hold back latch of the present disclosure will now be described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 is a schematic side elevation of the hold back latch in which the first magnet device and second magnet device are magnetically engaged.

Figure 2 is a schematic side elevation of the hold back latch in which the first magnet device and second magnet device are separated.

Figure 3 is a schematic side elevation of the hold back latch in which the first magnet device and second magnet device are repulsing each other resulting in the disengagement of the retention mechanism.

Detailed Description:

[0009] The hold back latch 1 of the present disclosure, shown in Figure 1, may comprise a first magnet device 30 mounted to a first latch body 10. The first latch body 10 may be mounted to a first wing 20. The hold back latch 1 may further comprise a second magnet device 40 mounted to a second wing 50. The first and second wings

20, 50 may be window panes (or frames of window panes) of a construction vehicle. One or both of the first and second wings 20, 50 may be movable.

[0010] The hold back latch 1 may further comprise a first shaft 80, a first retention mechanism 70 and a first resilient member 60. The first shaft 80 may be rotatably mounted to the first latch body 10. The first shaft 80 may be provided with a first handle 81. The first magnet device 30 may be mounted to a flexible component 82, said flexible component 82 being mounted to the first shaft 80 such that the connection between the first magnet device 30 with respect to the first wing 20 may be pliant. The hold back latch 1 may further comprise a gaiter 11 covering the first resilient member 60 and a portion of the first shaft 80 to provide environmental sealing. Alternatively, the gaiter 11 may cover the first resilient member 60, a portion of the first shaft 80 and the first magnet device 30, fully enclosing the portion of the latch 1 on the same side of the wing as the first magnet device 30. The first magnet device 30 may be sufficiently strong to interact with the second magnet device 40 through the gaiter.

[0011] The first and second magnet devices 30, 40 may each comprise a plurality of magnets in a housing. For example, in one possible arrangement the first and second magnet devices 30, 40 may each comprise four Neodymium magnets in two diagonal pairs of opposite polarity. Similarly, the first and second magnet devices 30, 40 may each comprise a single magnet with multiple magnetic poles.

[0012] The first retention mechanism 70 may comprise a first detent 71 and first ratchet 72, one of which may be provided on the first shaft 80 and the other of which may be provided on the first latch body 10. The first ratchet 72 may comprise a series of flat surfaces 73 and ramped surfaces 74 forming indents 75 arranged at intervals around the first shaft 80 corresponding to the angular separation of the magnetic poles of the first magnet device 40. For example, in one possible arrangement the indents 75 may be arranged at intervals of ninety degrees around the shaft. The first retention mechanism 70 may serve to retain a rotational orientation of the first magnet device 30 when the first and second magnet devices are not interacting.

[0013] The first resilient member 60 may be arranged to allow axial movement of the first magnet device 30 relative to the first latch body 10 such that the first retention mechanism 70 may be disengageable by repulsion of the first magnet device 30 from the second magnet device 40.

[0014] The hold back latch of the present disclosure may further comprise a second latch body 90, a second shaft 100, a second retention mechanism 110 comprising a second detent 111 and second ratchet 112 and a second resilient member 120. The second latch body 90 may be mounted to the second wing 50 and the second magnet device 40 may be rotationally mounted to the second latch body 90.

[0015] The second latch body 90, the second shaft

100, the second retention mechanism 110 and the second resilient member 120 may be duplicates of the first latch body 10, first shaft 80, first retention mechanism 70 and first resilient member 60 respectively.

[0016] In use, when the first wing 20 and the second wing 50 are distant from each other the magnetic fields of the first magnet device 30 and the second magnet device 40 do not interact with each other. In the following it is assumed that the first and second magnet devices 30, 40 are initially orientated relative to one another, as shown in Figure 2, so as to repulse each other when brought towards each other. In this separated configuration the first retention mechanism 70 and second retention mechanism 110 may retain the first magnet device 30 and second magnet device 40 in this 'repulsion' orientation by engagement of the first and second detents 71, 111 with their respective first and second ratchets 72, 112. When the first wing 20 is brought close to the second wing 50, the first magnet device 30 and the second magnet device 40 may interact to repulse each other. The repulsion force may cause disengagement of the first retention mechanism 70 or the second retention mechanism 110 by axially moving the respective detent relative to its indent such that the detent clears the latch body as shown in Figure 3, allowing the first magnet device 30 or the second magnet device 40 to rotate relative to the other magnet device into an attraction orientation so that the first and second magnet devices 30, 40 magnetically engage one another as shown in Figure 1.

[0017] On manual rotation of the first handle 81 and first shaft 80, the first magnet device 30 may be rotated into the repulsion orientation, disengaging the first magnet device 30 and the second magnet device 40, said rotation being accommodated by the detent moving up the ramped surface 74 and by a slight inward movement of the wings. Equally, disengagement may be achieved by manual rotation of the second handle 101 to rotate the second magnet device 40.

[0018] Alternatives to the above include the use of a single latch body 10, with the second magnet device 40 being directly mountable to the second wing 50. The second magnet device 40 may be fixedly or rotatably mounted to the second wing 50.

Industrial applicability:

[0019] The present disclosure has industrial applicability, for example, in latching the doors or window panes (or frames of window panes) of a construction vehicle. The present disclosure may equally be applicable to latching wings of other items including, but not limited to, other types of vehicles, machinery or items of furniture.

[0020] The hold back latch of the present disclosure may improve ease of use compared to known hold back latches through being operable from either inside or outside the vehicle or by compensating for misalignment of the magnet devices.

Claims**1.** A hold back latch comprising:

a first latch body mountable to a first wing;
a first magnet device rotatably mounted to the first latch body; and
a second magnet device mountable to a second wing;

wherein the first magnet device is rotatable relative to the second magnet device, and in addition the first magnet device is sprung mounted so as to be attractable towards and repulsable away from the second magnet device due to magnetic field interactions between the first and second magnet devices;
wherein the hold back latch further comprises a retention mechanism for retaining a rotational orientation of the first magnet device when the magnetic fields of the first and second magnet devices are not interacting;
wherein the retention mechanism is disengagable by repulsion of the first magnet device away from the second magnet device when the first and second magnet devices interact.

2. A hold back latch as claimed in claim 1 further comprising a first shaft rotatably mounted to the first latch body wherein the first magnet device is mounted to the first shaft.**3.** A hold back latch as claimed in claim 2 wherein the first shaft further comprises a handle.**4.** A hold back latch as claimed in claim 2 or claim 3 wherein the first shaft is biased axially with respect to the first latch body.**5.** A hold back latch as claimed in any preceding claim wherein the first latch body further comprises at least a part of the retention mechanism.**6.** A hold back latch as claimed in claim 5 wherein the retention mechanism comprises a detent and a ratchet, one of the detent and ratchet being provided on the first shaft and the other of the detent and ratchet being provided on the first latch body.**7.** A hold back latch as claimed in claim 6 wherein the detent and ratchet are disengageable by repulsion of the first magnet device from the second magnet device.**8.** A hold back latch as claimed in any preceding claim wherein the first magnet device is flexibly mounted to the first shaft.**9.** A hold back latch as claimed in any preceding claim

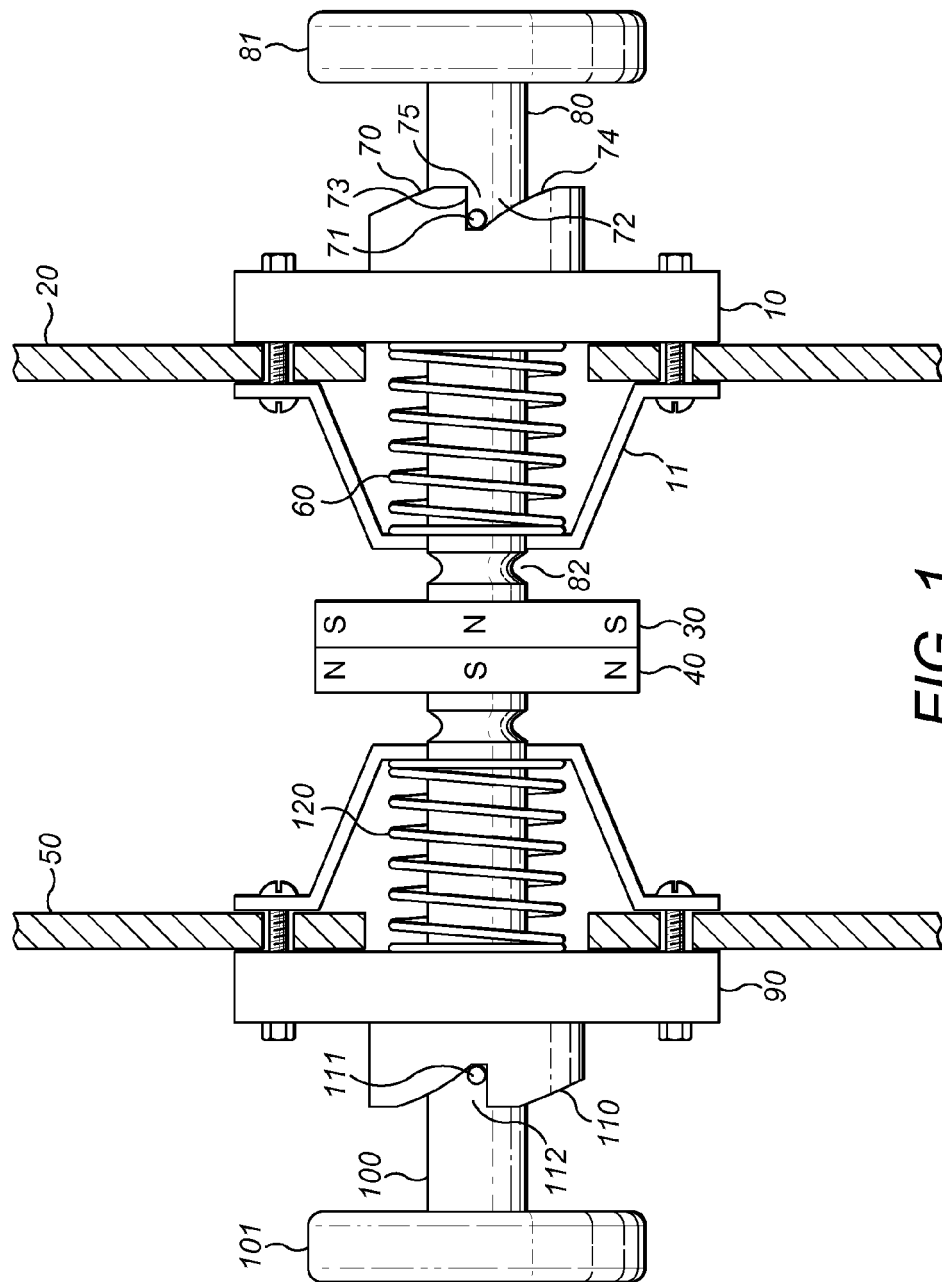
wherein each of the first and second magnetic devices comprise one or more magnets.

10. A hold back latch as claimed in claim 9 wherein the first magnetic device comprises multiple magnetic poles, said poles being rotationally offset from each other about the longitudinal axis of the first shaft.**11.** A hold back latch as claimed in any preceding claim wherein the second magnet device is mounted to a second latch body by means of a second rotatable shaft.**12.** A hold back latch as claimed in claim 11 wherein the second magnetic device comprises multiple magnetic poles, said poles being rotationally offset from each other about the longitudinal axis of the second shaft.**13.** A hold back latch as claimed in any preceding claim wherein the latch is operable from behind either of the first and second wings.**14.** A hold back latch as claimed in any preceding claim wherein the latch further comprises at least one gaiter for environmental sealing.**15.** A method of unlatching and latching a first wing and a second wing by means of a hold back latch comprising:

a first latch body mountable to a first wing;
a first magnet device rotatably mounted to the first latch body;
a second magnet device mountable to a second wing; and
a retention mechanism;

said method comprising the steps of:

arranging the first magnet device and the second magnet device in an repulsion orientation such that the first wing and second wing unlatch;
retaining the first magnet device and the second magnet device in a repulsion orientation;
disengaging the retention mechanism by interaction of the first magnet device and the second magnet device; and thereafter
arranging the first magnet device and the second magnet device in an attraction orientation such that the first wing and second wing latch together.



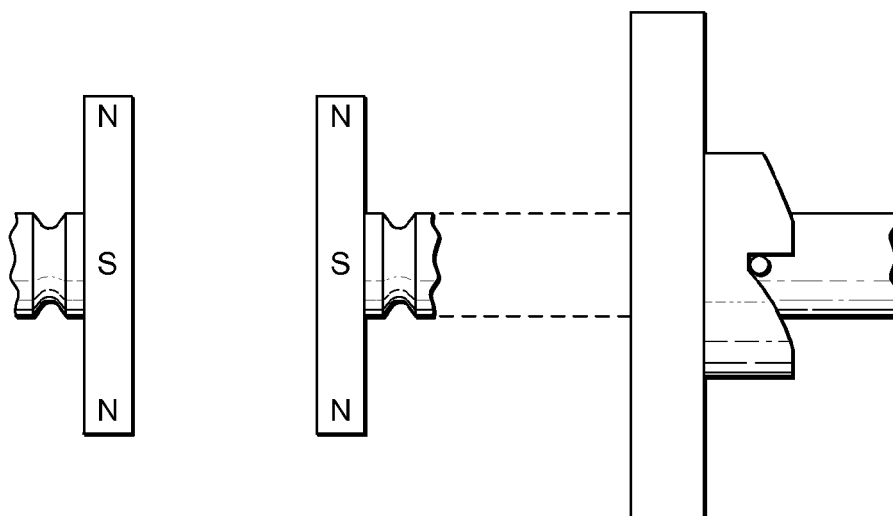


FIG. 2

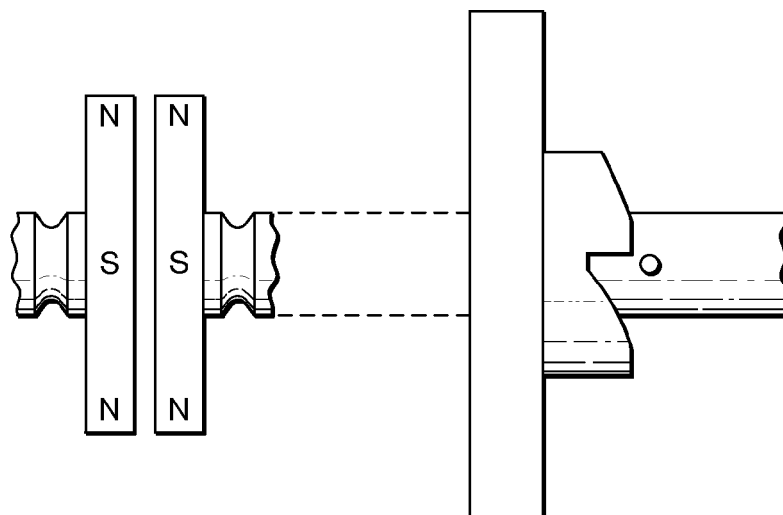


FIG. 3



EUROPEAN SEARCH REPORT

Application Number
EP 11 16 7302

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2009/273194 A1 (PATTERSON WAYNE ALBERT [US]) 5 November 2009 (2009-11-05) * the whole document *	1-15	INV. E05C17/56 E05C19/16
A	FR 1 383 073 A (PIERRE VILLEPLE) 24 December 1964 (1964-12-24) * the whole document *	1-15	
A	US 4 099 755 A (ANDERSON KEITH J) 11 July 1978 (1978-07-11) * column 3, line 10 - column 4, line 38; figures 1-3 *	1-15	
A	EP 2 154 320 A2 (FISCHERWERKE GMBH & CO KG [DE]) 17 February 2010 (2010-02-17) * paragraph [0023] - paragraph [0028]; figures 3-4 *	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			E05C H01F
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 29 November 2011	Examiner Cruyplant, Lieve
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 16 7302

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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29-11-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 2009273194 A1 [0003]
- US 2009273194 A [0004]