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(54) **RELEASABLE COUPLING**

LÖSBARE VERBINDUNG

ACCOUPLEMENT DÉTACHABLE

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Description

[0001] The present invention relates to a releasable coupling for connecting an electrical operator device with a window, comprising a male part and a female part, said male part having a head portion, and said female part having a base part with a recess for said head portion, said female part further having a yielding closure member biased in a direction to at least partially cover the recess.

[0002] Actuators and operators have found widespread use in recent years to provide automation and increased user friendliness of different devices. To allow manual operation of the devices, it is often advantageous to provide a releasable coupling to enable release of the operator. This is of particular importance in respect to operators for windows, as in case of emergency, it may be necessary to manually open the window to escape the building, e.g. in case of a fire.

[0003] An example of a releasable coupling can be found in EP-B1-079299 to the applicant. This document discloses a coupling device having a male part and a female part. The male part comprises a head, whereas the female part comprises a recess and a closure member in the form of a hook-shaped arm, which is biased in the closing direction to retain the head in the recess. The hook-shaped arm is connected to a lip, so the hook-shaped arm may be tilted away from the closing direction by manipulating the lip in an opening direction of the arm. This manipulation may be a result of cooperation between a tiltable flap of a roof window and a sash or frame part of the window. Although this coupling has a number of advantages and has gained widespread use, it is relatively demanding when it comes to installation thereof. This is due to the fact that the release is the result of interaction between the coupling and a sash or frame part, so the female part of the coupling must be positioned and mounted very precisely to ensure reliable functioning thereof. If there is a mismatch, the coupling may not be operating properly, and there is a risk that it will not engage, or that it will not disengage correctly. This need for precision increases the time consumed to install the coupling device and renders the coupling device less suited for retrofitting.

[0004] The related art further includes EP-B1-0711376 to the applicant. This document discloses a coupling device for connecting an electrical operator device with an operating member. The male part of the coupling device is a ball head, whereas the female part is a bore. This coupling is, however, relatively demanding when it comes to installation thereof, as the parts must be precisely arranged and mounted in order to function reliably, and there is a risk of unintentional release of the coupling.

[0005] The object of the invention is to provide a releasable coupling according to the introduction, which coupling is less demanding with regard to precise mutual positioning of the coupling parts at installation thereof.

[0006] To achieve this object, the releasable coupling device is characterised in that the closure member is adapted for cooperation with said male part in a first mutual angular position of the male and female parts, in which the male and female parts are in non-positive engagement to allow release of the head portion of the male part from the recess, and a second mutual angular position in which the male and female parts are held in positive engagement by the closure member to hinder release of the head portion of the male part from the recess.

[0007] Hereby the release of the coupling parts is independent of cooperation with other parts. This means that the requirements with regard to precision at installation are less strict, so retrofitting of coupling parts to a construction can be performed relatively quick and even by a handyman.

[0008] By non-positive engagement is meant that the parts can be released by exerting a certain amount of force to overcome a frictional and/or elastic resistance. By positive engagement is understood that the parts cannot be released without breaking.

[0009] According to the invention, the coupling comprises a release mechanism having a first release element at the male part arranged to cooperate with a second release element at the female part to release the coupling. The first release element is a shank of the male part and the second release element is a cross member interconnecting a first closure part and a second closure part of the closure member, said cross member being adapted to cooperate with a face of the shank of the male part in said first mutual angular position of the male and female parts. This will allow the parts of the coupling to cooperate in a particularly simple manner, and the provision of two closure parts will ensure a secure retaining of the male part in the female part.

[0010] The base part may comprise a cut-out arranged to at least partly accommodate the shank portion of the male part in a second mutual angular position of the male and female parts. Hereby a large angular range is allowed, and a secure retaining is ensured.

[0011] According to a further development, the male part and the female part are designed to allow the parts to be off-set in a direction at right angles to the plane set out by the first and second mutual angular position, said off-set having a dimension of 5 mm or more. Hereby the need for precision during mounting is further reduced, so the time and thereby cost associated with retrofitting a coupling to a product is lowered.

[0012] In an embodiment, an abutment edge of the closure member is rounded with a radius of curvature of at about 0.6 mm, whereby entry and exit of the head of the male part from the recess is facilitated during engagement and release of the coupling.

[0013] To facilitate engagement of the male part with the female part, the base part may comprise an inclined ramp portion.

[0014] The releasable coupling is particularly advantageous for an operator, so the present invention further relates to an operator with a drive means, such as an electrical motor, and an extendable push element, said

operator comprising such a releasable coupling, whereby an operator with coupling having automatic release and engagement is provided, which will enhance the functionality of the operator.

[0015] The operator may be any kind of actuator or operator capable of being extended and retracted. According to an embodiment, however, the operator is a chain operator, which is found to be of particular use because of the very limited size and versatility. Further the end of a chain operator does not rotate, so it is relatively simple to engage a head of a male part in a corresponding female part.

[0016] The present invention further relates to a window provided with an operator of the above type, said window comprising a stationary frame and a sash arranged to be pivotable or tiltable in relation to the frame, where the operator is arranged to operate the window sash in relation to the window frame.

[0017] In an embodiment, the window further comprises a separate operating device, such as a handle, for moving the male part or the female part from said first mutual angular position of the male and female parts to said second mutual angular position of the male and female parts.

[0018] In an alternative embodiment, the window is a pivot-hung roof window operated by a tiltable flap, the operator being connected to the frame thereof and having the male part at its remote end to cooperate with the female part arranged at said flap. This specific embodiment has a number of advantages as will be further discussed in the following.

[0019] In the following the invention will be described in more detail by way of example and with reference to the drawing, in which:

Fig. 1 is a partial view of a roof window,
Fig. 2 is a perspective view of a coupling according to the invention,
Fig. 3 is a perspective view of the coupling according to the invention in a position of engagement/disengagement,
Fig. 4 is a side view of the coupling of Fig. 2 and 3 mounted on a flap of a window, and
Fig. 5 is a perspective view of the coupling corresponding to the side view in Fig. 4.

[0020] An upper right part of a roof window can be seen in Fig. 1. The window shown is of the pivot-type having a sash 12 with a horizontal pivot axis at a central part of the window frame 13. The window is operated by a tiltable flap 11 mounted on the sash 12 by hinges 16. The flap 11 can be tilted to a first position to allow ventilation, and a second position to operate a window lock in that the lock is disengaged to release the sash 12 from the frame 13 when the flap 11 is tilted away from the sash 12 to an extreme position of the flap 11 as shown. The window shown further comprises a chain operator 14 driven by a motor unit 15. The chain operator 14 is connected to the flap 11 and arranged to push the sash 12 from a closed position of the window to an open position of the window or pull the window from an open position to a closed position. The connection between the chain operator 14 and the flap 11 is schematically illustrated and comprises a male part 2 on the chain 14 and a female part 3 mounted on the flap 11.

[0021] A releasable coupling 1 according to the invention is seen in a perspective view in Fig. 2. The coupling 1 comprises a male part 2 having a shank portion 5 and a head 4. As can be seen, the male part 2 has a T-shaped head 4 with a circular cross-section. In this particular example, the length of the head 4 is approximately 42 mm and the diameter approximately 8 mm, whereas the shank 5 has a length of approximately 11 mm and a width of approximately 10 mm. The coupling 1 further comprises a female part 3 with a base part 30 having a recess 6 for accommodation of the head 4. In this particular example, the dimensions of the base part 30 are approximately 50 mm by 30 mm. The female part 3 further comprises a yielding closure member 7. The closure member 7 is in the shown embodiment pivotally connected to the base part 30 as illustrated by the arrow 18. The closure member 7 is biased in a closing direction to cover the recess 6 by a spring element (not shown) or the like. The position shown corresponds to a first mutual angular position denoted by the angle α between the plane of the back face of the female part 3 and the plane of travel of the male part 2. In the embodiment shown, the angle α is chosen at a value of approximately 90°, but other values can be used as will be appreciated by the skilled person. In this position the male part 2 is introduced in the female part 3, and a cross member 9 of the closure member 7 rest on an upper face 10 of the shank 5 of the male part 2. As illustrated the closure member 7 only partly encloses the head 4 of the male part in the recess 6, and a rounded abutment edge 17 of the closure member 7 abuts on the head 4. The radius of curvature is chosen as a compromise between ease of engagement/disengagement, and a reliable and secure engagement, and good results have been achieved with a radius of curvature of about 0.6 mm, but a radius in the interval of 0.2 mm to 1.5 mm is conceivable. Further the degree of closure in this position can be chosen by adjusting the dimensions of the cross member 9 and the shank 5, so that a fair compromise between ease of engagement/disengagement, and a reliable and secure retention. Because the closure member 7 is only partly closed and the edge 17 abuts the head 4 in this first mutual angular position of the coupling, the male part 2 is in non-positive engagement and may be disengaged from the female part 3 by simply pulling the male part 2 away from the female part as illustrated in Fig. 3 and described below. Introduction of the head 4 in the recess 6 of the base part 30 is facilitated by the inclined ramp portion 8, which will direct the head 4 towards the closure member 7 and the recess 6.

[0022] In Fig. 3 the head 4 of the male part 4 is in a

position of disengagement or engagement in the recess. That is, if the male part is advanced or retracted in the direction of the arrow 20, the head 4 of the male part is engaged in or disengaged from, respectively, the recess 6 of the base part 30 of the female part 3, when said female part 3 is kept stationary.

[0023] Fig. 4 illustrates the coupling device of which the base part 30 of the female part is connected to a tiltable flap 11 of a window as illustrated in Fig. 1. For the sake of clarity other elements are omitted, but of course the tiltable flap 11 is connected to a window sash 12 as illustrated in Fig. 1, and the male part 2 is connected to an operator, such as the chain operator 14 illustrated in Fig. 1. In Fig. 4 the flap 11 is tilted, and male part 2 and female part 3 is in a second mutual angular position having an angle β of the male part 2 in relation to the female part 3. The value of β deviates considerably from the value of α, and in the embodiment shown in the position shown, the value of β is approximately 40-45°. In this second mutual angular position, the closure member 7 encloses the head 4 in the recess 6, so the head 4 is in positive engagement and cannot be pulled out of the recess 6 of the female part 3. This means that the operator to which the male part 2 is connected can manipulate the tiltable flap 11 and the entire window sash 12 in a direction of closing or a direction of opening of the window by extending or retracting the operator as indicated by the arrow 20.

[0024] This principle will be more readily understood by reference to Fig. 5, which is a perspective view of the coupling device in the second mutual angular position. In this position the cross member 9 between the closure parts 7a and 7b does not touch the face 10 of the shank 5 of the male part 2, so the closure parts 7a and 7b enclose the head 4 in the recess 6, whereas the shank 5 is at least partly accommodated in the cut-out 19 provided in the base part 30. In this position an extension or retraction of an operator (not shown) as indicated by the arrow 20 will exert a push or pull force, respectively, from the male part 2 to the female part 3, as the head 4 of the male part 2 is held in positive engagement by being securely enclosed in the recess 6 of the base part 30 by the closure member 7. The closure parts 7a and 7b are spaced apart to provide a space 21 and further the cut-out 19 has a width exceeding the width of the shank 5, so the male part 2 may be off-set in a direction indicated by the arrow 22, i.e. at right angles to the plane set out by the first and second mutual angular position, said off-set having a dimension of 5 mm or more. In this particular embodiment the off-set may be up to 10 mm. The recess 6 may be open ended as shown to allow the head 4 to extend beyond the side of the base part 30.

[0025] The releasable coupling according to the invention is particularly advantageous when used with a roof window operated by a tiltable flap as in Fig. 1. The mode of operation of the operator and coupling will now be described for such a window as shown in Fig. 1 with reference also to the other Figures. In a closed and locked position of the window in which the flap 11 is closed, the head 4 of the male part 2 of the coupling is disengaged from the recess 6 of the female part 3 as illustrated in Fig. 3. In this position the coupling is disengaged, so the flap 11 may be operated manually, but the head 4 need only be advanced a little bit to engage with the recess 6 and be ready for operation of the flap 11 and sash 12 of the window. Alternatively the head 4 may be withdrawn fully from the female part 3 to be out of sight if the window is operated manually. In this alternative, when the operator is activated, the male part 2 will be extended toward the female part 3, and the head 4 will pass the yielding closure member 7 to enter the recess 6.

[0026] The flap 11 is kept closed by a locking mechanism, so a considerable force must be used to tilt the flap 11. The flap 11 further has two other stabile positions, namely a partly open ventilation position and a fully open release position. As the cross member 9 between the two closure parts 7a and 7b abuts the face 10 of the shank 5 of the male part 2 in this closed position of the window and flap 11, corresponding to the first mutual angular position of the male and female part, the head 4 may be retracted from the recess 6 past the closure member 7, which will resiliently deflect. If instead the operator is extended further, the head 4 will exert a force on the flap 11 to tilt the flap 11 against the closing force of the locking mechanism to a ventilation position thereof in which the window is still locked, so the sash is locked and stationary. In this position of the flap, the mutual angular position of the male and female parts is changed, so that the cross member 9 does not abut the face 10 of the shank 5, which means that the closure member 7, which is biased in the closing direction, close fully to enclose the recess 6 and retain the head 4 therein. This means that if the operator is retracted, the head 4 enclosed in the recess will exert a force on the female part 3 and pull the flap 11 in the closing direction thereof. If instead the operator is extended further, the head 4 will push the female part 3 and thereby push the flap 11 further to a release position in which the window lock is released, so the sash 12 is free to be tilted in relation to the frame 13. Further extension of the operator will hence result in the head 4 pushing on the female part 3 mounted on the flap 11, which in turn is connected to the sash, to thereby move the sash 12.

[0027] Although described in relation to a roof window it will be clear to the skilled person that the coupling can be used in a different context, e.g. a vertical window, in industry or relating to furniture.

[0028] In a prototype of the coupling, the male part and the female part were both made of POM (polyoxymethylene) and showed promising results, but any suitable material could be used, such as metal or plastics, if necessary fibre reinforced plastics, depending on the forces acting on the coupling and the environment in which the coupling is used.

Claims

1. A releasable coupling (1) for connecting an electrical operator device with a window, comprising a male part (2) and a female part (3), said male part (2) having a head portion (4), and said female part (3) having a base part (30) with a recess (6) for said head portion (4), said female part further having a yielding closure member (7) biased in a direction to at least partially cover the recess (6), the closure member (7) being adapted for cooperation with said male part (2) in a first mutual angular position of the male and female parts (2, 3), in which the male and female parts (2, 3) are in non-positive engagement to allow release of the head portion (4) of the male part (2) from the recess (6), and a second mutual angular position in which the male and female parts (2, 3) are held in positive engagement by the closure member (7) to hinder release of the head portion (4) of the male part (2) from the recess (6), the coupling (1) comprising a release mechanism, **characterized in that** the release mechanism has a first release element at the male part (2) arranged to cooperate with a second release element at the female part (3) to release the coupling (1), and that the first release element is a shank (5) of the male part (2) and the second release element is a cross member (9) interconnecting a first closure part (7a) and a second closure part (7b) of the closure member (7), said cross member (9) being adapted to cooperate with a face (10) of the shank (5) of the male part (2) in said first mutual angular position of the male and female parts (2, 3) where said closure member (7) only partly encloses the head portion (4) of the male part (2) in the recess (6).

2. A releasable coupling (1) according to claim 1, wherein the base part (30) comprises a cut-out (19) arranged to at least partly accommodate the shank (5) of the male part (2) in the second mutual angular position of the male and female parts (2, 3).

3. A releasable coupling (1) according to any of the claims above, wherein the male part (2) and the female part (3) are designed to allow the parts to be off-set in a direction at right angles to the plane set out by the first and second mutual angular position, said off-set having a dimension of 5 mm or more.

4. A releasable coupling (1) according to any of the claims above, wherein an abutment edge (17) of the closure member (7) is rounded with a radius of curvature of about 0.6 mm.

5. A releasable coupling (1) according to any of the claims above, wherein the base part (30) comprises an inclined ramp portion (8).

6. An operator with a drive means, such as an electrical motor, and an extendable push element, said operator comprising a releasable coupling according to any of the claims above.

7. An operator according to claim 6, wherein the operator is a chain operator (15).

8. A window provided with an operator according to claim 6 or 7, said window comprising a stationary frame (13) and a sash (12) arranged to be pivotable or tiltable in relation to the frame (13), where the operator is arranged to operate the window sash (12) in relation to the window frame (13).

9. A window according to claim 8, further comprising a separate operating device, such as a handle, for moving the male part (2) or the female part (3) from said first mutual angular position of the male and female parts (2, 3) to said second mutual angular position of the male and female parts (2, 3).

10. A window according to claim 9, wherein the window is a pivot-hung roof window operated by a tiltable flap, the operator being connected to the frame (13) thereof and having the male part (2) at its remote end to cooperate with the female part (3) arranged at said flap.

Patentansprüche

1. Lösbare Verbindung (1) zum Verbinden einer elektrischen Antriebsvorrichtung mit einem Fenster, umfassend einen Steckteil (2) und einen Aufnahmeteil (3), wobei der Steckteil (2) einen Kopfabschnitt (4) hat und der Aufnahmeteil (3) einen Basisteil (30) mit einer Ausnahme (6) für diesen Kopfabschnitt (4), wobei der Aufnahmeteil ferner ein nachgebendes Verschlusselement (7) hat, das in einer Richtung vorgespannt ist, um zumindest teilweise die Ausnahme (6) zu überdecken, wobei das Verschlusselement (7) für das Zusammenwirken mit dem Steckteil (2) in einer ersten gegenseitigen Winkelposition des Steckteils (2) und des Aufnahmeteils (3), in welcher der Steckteil (2) und der Aufnahmeteil (3) in einer nicht positiven Kopplung sind, geeignet ist, um die Freigabe des Kopfabschnittes (4) des Steckteils (2) aus der Ausnahme (6) zu erlauben, und in einer zweiten gegenseitigen Winkelposition, in welcher der Steckteil (2) und der Aufnahmeteil (3) durch das Verschlusselement (7) in einer positiven Kopplung gehalten werden, geeignet ist, um die Freigabe des Kopfabschnittes (4) des Steckteils (2) aus der Ausnahme (6) zu verhindern, wobei die Verbindung (1) einen Freigabemechanismus umfasst, **dadurch gekennzeichnet, dass** der Freigabemechanismus ein erstes Freigabeelement am Steckteil (2) hat, das an-

geordnet ist, um mit einem zweiten Freigabeelement am Aufnahmeteil (3) zusammenzuwirken, um die Verbindung zu lösen, und dass das erste Freigabeelement ein Schenkel (5) des Steckteils (2) ist und das zweite Freigabeelement eine Querstrebe (9), die einen ersten Verschlussteil (7a) und einen zweiten Verschlussteil (7b) des Verschlusselementes (7) miteinander verbindet, wobei die Querstrebe (9) geeignet ist, mit einer Fläche (10) des Schenkels (5) des Steckteils (2) in einer ersten gegenseitigen Winkelposition des Steckteils (2) und des Aufnahmeteils (3) zusammenzuwirken, in welcher das Verschlusselement (7) den Kopfabschnitt (4) des Steckteils (2) in der Ausnahme (6) nur teilweise umschließt.

2. Lösbare Verbindung (1) gemäß Anspruch 1, wobei der Basisteil (30) einen Ausschnitt (19) umfasst, der geeignet ist, um zumindest teilweise den Schenkel (5) des Steckteils (2) in der zweiten gegenseitigen Winkelposition des Steckteils (2) und des Aufnahmeteils (3) aufzunehmen.

3. Lösbare Verbindung (1) gemäß irgendeinem der obigen Ansprüche, wobei der Steckteil (2) und der Aufnahmeteil (3) ausgebildet sind, um den Teilen zu erlauben, in einer Richtung, in rechten Winkeln zur Ebene, versetzt zu werden, die durch die erste und die zweite gegenseitige Winkelposition festgelegt ist, wobei die Versetzung eine Dimension von 5 mm oder mehr hat.

4. Lösbare Verbindung (1) gemäß irgendeinem der obigen Ansprüche, wobei eine Auflagerkante (17) des Verschlusselementes (7) mit einem Krümmungsradius von etwa 0,6 mm abgerundet ist.

5. Lösbare Verbindung (1) gemäß irgendeinem der obigen Ansprüche, wobei der Basisteil (30) einen abgeschrägten Rampenabschnitt (8) enthält.

6. Antrieb mit Antriebsmittel wie einem elektrischen Motor und einem ausfahrbaren Schubelement, wobei der Antrieb eine lösbare Verbindung gemäß irgendeinem der obigen Ansprüche umfasst.

7. Antrieb gemäß Anspruch 6, wobei der Antrieb ein Kettenantrieb (15) ist.

8. Fenster, versehen mit einem Antrieb gemäß Anspruch 6 oder 7, wobei das Fenster einen stationären Rahmen (13) und ein Schwingfenster (12) umfasst, das geeignet ist, in Bezug auf den Rahmen (13) geschwenkt oder gekippt zu werden, wobei der Antrieb angeordnet ist, um das Schwingfenster (12) in Bezug auf den Fensterrahmen (13) zu betätigen.

9. Fenster gemäß Anspruch 8, ferner umfassend eine getrennte Betätigungsvorrichtung, wie einem Handgriff, um den Steckteil (2) oder den Aufnahmeteil (3) von der ersten gegenseitigen Winkelposition des Steckteils (2) und des Aufnahmeteils (3) in die zweite gegenseitige Winkelposition des Steckteils (2) und des Aufnahmeteils (3) zu bewegen.

10. Fenster gemäß Anspruch 9, wobei das Fenster ein Schwenk-Hänge-Dachfenster ist, das durch eine kippbare Klappe betätigt wird, wobei der Antrieb mit dem Rahmen (13) davon verbunden ist und einen Steckteil (2) an seinem entfernten Ende hat, um mit dem Aufnahmeteil (3), der an dieser Klappe angeordnet ist, zusammenzuwirken.

Revendications

1. Accouplement détachable (1) permettant de connecter un dispositif électrique de commande avec une fenêtre, comportant une pièce mâle (2) et une pièce femelle(3), ladite pièce mâle (2) présentant une partie de tête (4), et ladite pièce femelle (3) présentant une partie de base (30) dotée d'un évidement (6) destiné à ladite partie de tête (4), ladite pièce femelle comportant, de plus, un élément de fermeture élastique (7) incliné suivant une direction visant à recouvrir, au moins partiellement, l'évidement (6), l'élément de fermeture (7) étant adapté pour coopérer avec ladite pièce mâle (2) dans une première position d'inclinaison mutuelle des pièces mâle et femelle (2, 3), dans laquelle les pièces mâle et femelle (2, 3) se trouvent dans un engagement non asservi afin de permettre une libération de la partie de tête (4) de la pièce mâle (2) à partir de l'évidement (6), et, dans une seconde position d'inclinaison mutuelle dans laquelle les pièces mâle et femelle (2, 3) sont maintenues dans un engagement asservi par l'élément de fermeture, afin d'empêcher une libération de la partie de tête (4) de la pièce mâle (2) à partir de l'évidement (6), l'accouplement (1) comportant un mécanisme de libération, **caractérisé en ce que** le mécanisme de libération comporte un premier élément de libération au niveau de la pièce mâle (2) agencé en vue de coopérer avec un second élément de libération présent au niveau de la pièce femelle (3) afin de détacher l'accouplement (1), et **en ce que** le premier élément de libération est une tige (5) de la pièce mâle (2) et le second élément de libération est un élément de traverse (9) interconnectant une première pièce de fermeture (7a) et une seconde pièce de fermeture (7b) de l'élément de fermeture (7), ledit élément de traverse (9) étant adapté pour coopérer avec une face (10) de la tige (5) de la pièce mâle (2) dans ladite première position d'inclinaison mutuelle des pièces mâle et femelle (2, 3), dans lequel ledit élément de fermeture (7) enferme seulement de façon partielle la partie de tête (4) de la pièce mâle (2) dans l'évidement (6).

2. Accouplement détachable (1) selon la revendication 1, dans lequel la partie de base (30) comporte une découpe (19) agencée de façon à recevoir, au moins partiellement, la tige (5) de la pièce mâle (2) dans la seconde position d'inclinaison mutuelle des pièces mâle et femelle (2, 3).

3. Accouplement détachable (1) selon l'une quelconque des revendications précédentes, dans lequel la pièce mâle (2) et la pièce femelle (3) sont conçues pour permettre aux pièces d'être décalées dans une direction perpendiculaire au plan défini par les première et seconde positions d'inclinaison mutuelle, ledit décalage ayant une dimension de 5 mm ou davantage.

4. Accouplement détachable (1) selon l'une quelconque des revendications précédentes, dans lequel un bord de butée (17) de l'élément de fermeture (7) est arrondi en présentant un rayon de courbure de 0,6 mm environ.

5. Accouplement détachable (1) selon l'une quelconque des revendications précédentes, dans lequel la partie de base (30) comporte une partie en forme de rampe inclinée (8).

6. Actionneur doté de moyens de commande, tels qu'un moteur électrique, et d'un élément de poussée extensible, ledit actionneur comprenant un accouplement détachable selon l'une quelconque des revendications précédentes.

7. Actionneur selon la revendication 6, dans lequel l'actionneur est un actionneur à chaîne (15).

8. Fenêtre dotée d'un actionneur selon la revendication 6 ou 7, ladite fenêtre comportant un bâti fixe (13) et un châssis (12) agencé en vue de pouvoir pivoter ou basculer par rapport au bâti (13), dans laquelle l'actionneur est agencé en vue d'actionner le cadre de fenêtre (12) en liaison avec le bâti de la fenêtre (13).

9. Fenêtre selon la revendication 8 comprenant, de plus, un dispositif d'actionnement distinct, tel qu'une poignée, permettant de faire passer la pièce mâle (2) ou la pièce femelle (3) de ladite première position d'inclinaison mutuelle des pièces mâle et femelle (2,3) à ladite seconde position d'inclinaison mutuelle des pièces mâle et femelle (2, 3).

10. Fenêtre selon la revendication 9, dans laquelle la fenêtre est une fenêtre de toit à charnière inférieure actionnée par un volet pouvant être basculé, l'actionneur étant connecté au bâti (13)de celle-ci et présentant la pièce mâle (2) au niveau de son extrémité distale pour coopérer avec la partie femelle (3) disposée au niveau dudit volet.

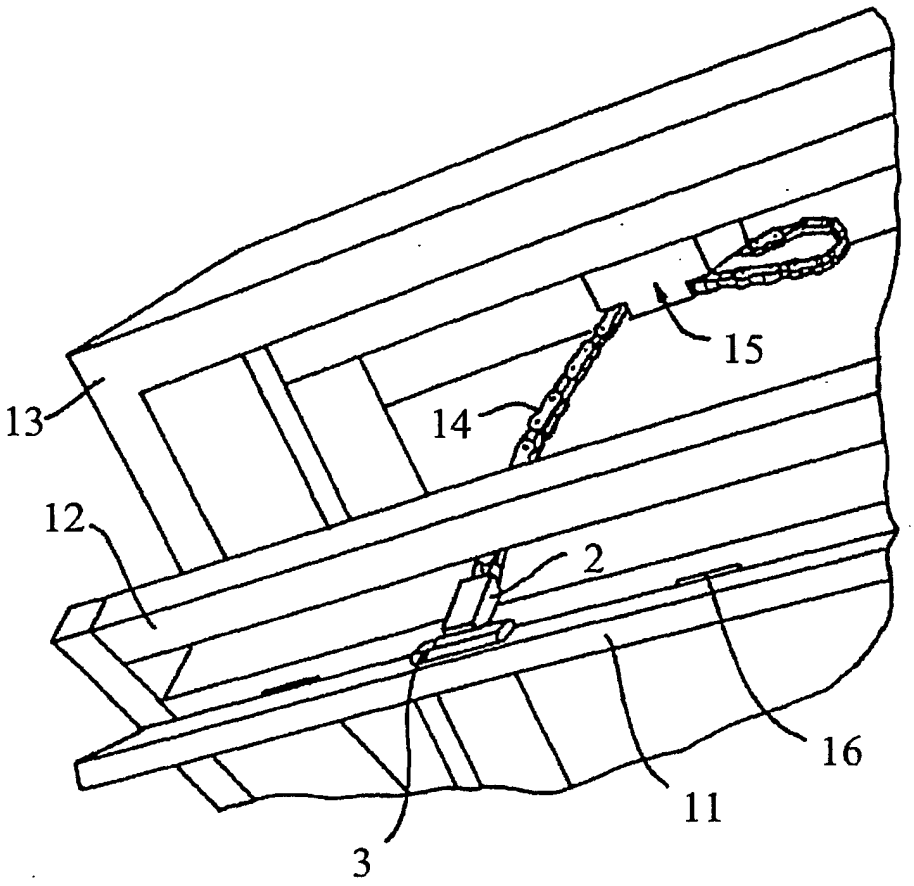

Fig. 1

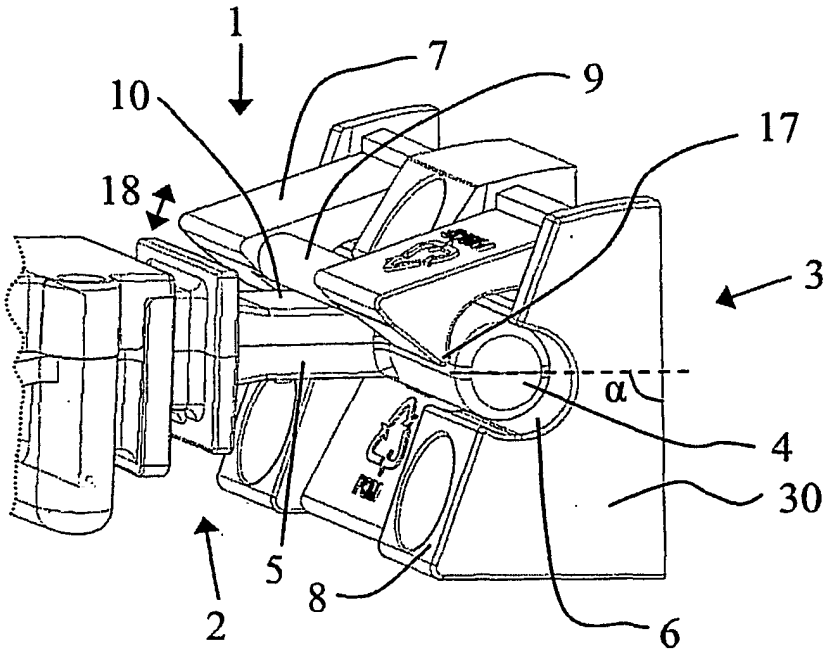

Fig. 2

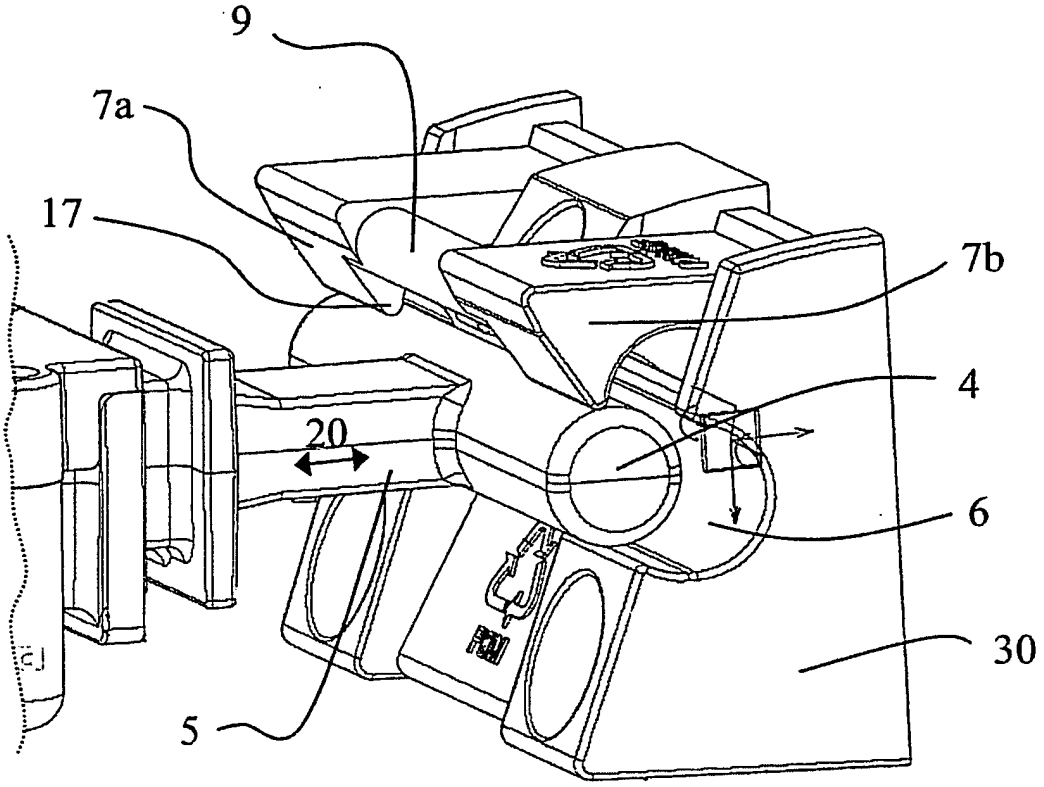

Fig. 3

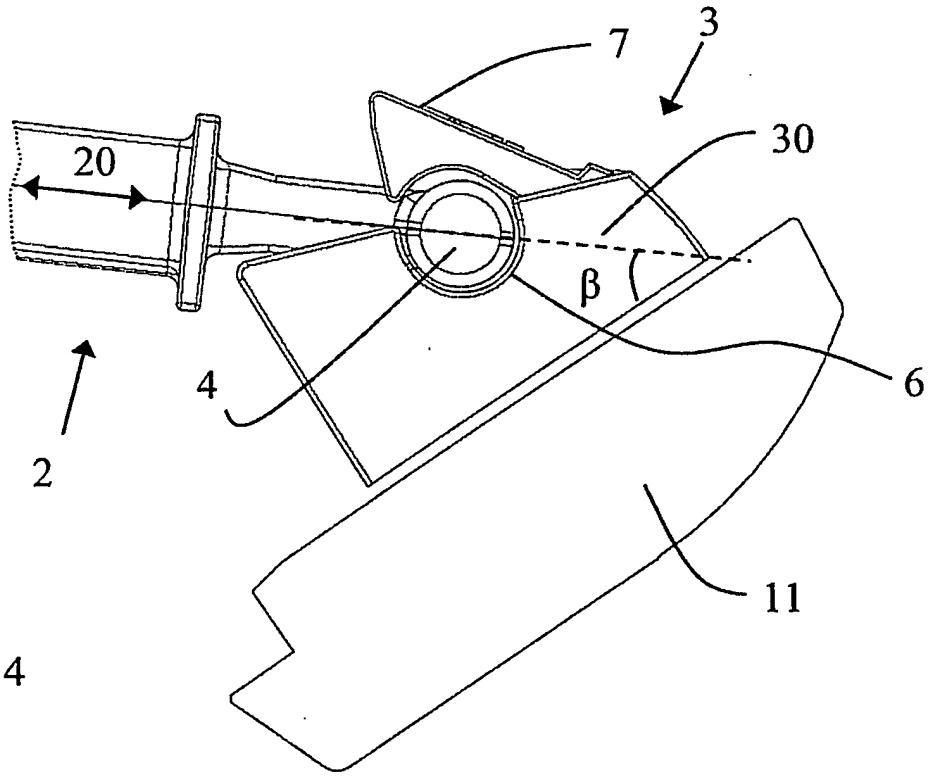

Fig. 4

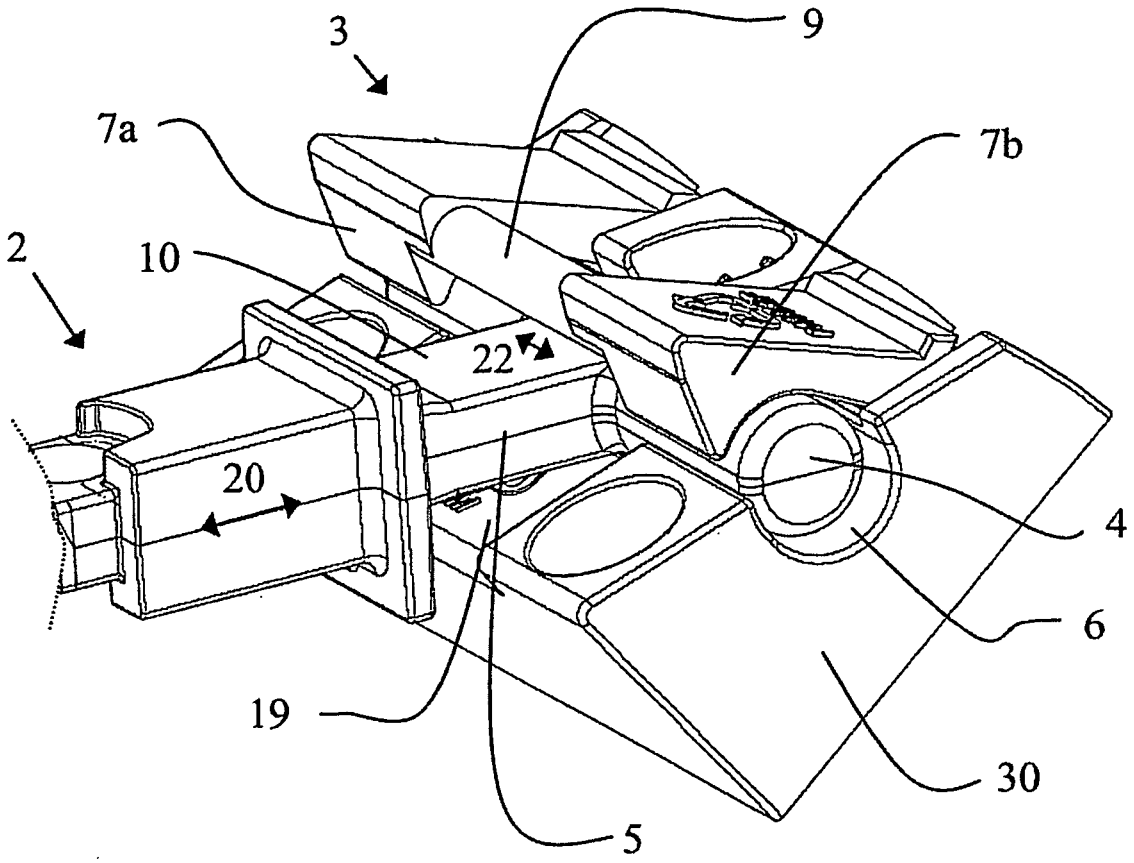

Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 079299 B1 **[0003]**
- EP 0711376 B1 **[0004]**