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(54) **Csillapított zárású vasalattal felszerelt tolószárny záró mozgásának vezérlése**

Control of a closing movement of a sliding sash having a soft-close fitting

The invention relates to a soft-close fitting according to the preamble of claim 1.

The starting point for damping a closing movement is a solution for the simplification of a closing movement, as was described in DE 10 2010 061 174.3 of 11 December 2010. It is briefly explained here that the mentioned reference uses an energy storage unit, which is arranged in the longitudinal direction of the fitting and takes up energy when the fitting is pivoted outwardly (according to the outward pivoting movement of the wing), wherein said energy storage unit stores said energy during the movement of the fitting (and during the movement of the associated sliding sash) in order to supply said stored energy again in form of an actuating force. The time of delivery or, more precisely, the start of the delivery of the stored energy as a pivoting or closing force, is the one of releasing a deployment lock. While the fitting (and the sliding sash together said fitting) moves, the deployment arms of the fitting are in a locked position in order to secure the parallel guidance of the sash. Said locked (or latched) position is released by reaching the end of the path of displacement (in the closing direction), so that a pivoting movement of the arms follows, which leads to the inward pivoting of the sash into the blind frame and to reaching the closing position. The start of the pivoting movement is substantially the one at which unlatching occurs. At this point of time, the energy storage unit also starts to release its stored energy as a force and to release said force via an auxiliary arm onto the deployment arm as a torque for inward pivoting. The user is thus supported in the inward pivoting of the sliding sash, since an additional force from the energy storage unit helps to bring the heavy sash to a pivoting movement and supports the user in guiding/pressing the sash into the blind frame.

Express reference is made to the aforementioned reference for the closer explanation of the formation of said inward pivoting aid via the energy storage unit, which is thus expressly included here.

In another reference of the prior art, DE 538 417 (Everdy Company) of August 1928, the person skilled in the art finds a pneumatic plunger brake as a door or window closer. An adjusting screw is conically there (cf. Fig. 3, reference numeral 15). The damping effect of the plunger brake is thereby adjusted to the weight of the door, which in the example is a swing door (bearing 3 there) and is braked by a single arm (i.e. the cylindrical plunger brake). The adjustment of the conical screw at the cylinder end changes the air passage (vol/time) and thus the braking effect.

EP 1 959 080 discloses a fitting for a sliding sash with bottom displaceable carriages and upper sliding elements. A grip element comprises two switching positions in order to move the sash, by avoiding a tilted position, from a closing position directly to the sliding position and/or back to its closing position. The sliding sash can be latched onto the carriages in a deployment position.

The inward pivoting of the sliding sash or tilt-and-slide sash shall be refined with the invention that is disclosed and claimed here. The improvement does not occur in relation to the aforementioned references, which are included here, but the improvement occurs generally in relation to the accessible prior art, so that the object of the invention is the following.

The pivoting-in movement of an especially heavy tilt-and-slide sash or sliding sash shall be provided to the user in a more convenient and simple way. It shall occur easily and at the same time reliably. Special emphauniformly, so that the user is given the impression the heavy sliding sash would move to the closed position in a virtually automatic manner.

The aforementioned object is achieved by a soft-close fitting with the features of claim 1.

The structure or fundamental solutions are explained as follows.

If the sash is heavy, an energy storage unit arranged on the fitting cannot immediately convert its released force (from a stored potential energy via a force and then into a torque, converted into kinetic energy of the sash), but can ensure within the scope of a time interval that the heavy sash is provided with a velocity in form of a rotational movement. If the sash is accelerated too strongly in its rotational movement, it impacts the blind frame too strongly upon impingement and springs back (in form of a rebound). This can also be observed in light sashes. In the case of light sashes, the occurring force is already so high at the beginning that the sash will accelerate too rapidly or suddenly. An intervention is therefore made on at least two points of the closing movement within the terms of inward pivoting by damping, for which purpose a damping element is provided which acts against the released force of the elongated energy storage unit.

The damping element is involved in the pivoting movement via an auxiliary arm which is rotatably linked to one of the main push-out arms. It is coupled on the one hand to the longitudinally displaceable end of the auxiliary arm and arranged in a non-displaceable manner on a connecting rod on the other hand. Said connecting rod holds the two movement elements of the fitting at a fixed distance from each other.

The unlocking of the deployment latching leads to a release of the stored energy. This energy is converted as a force and torque into a closing movement, but it at least supports the closing movement which is initiated or carried out by the user on the sash. Following the release of the stored energy, the damping element also becomes active and gains influence on the movement of the pivoting. The damping element is arranged in the longitudinal direction of the fitting in such a way that the released force is provided with a dampening effect, i.e. it is therefore directed against the released force of the energy storage unit.

The damping preferably acts immediately after the start of the release of the force from the energy storage unit. Said damping also preferably acts for a longer period of time, e.g. until reaching the closed position. Once the closed position has been reached, the push-out arms are completely pivoted inwardly. It has been recognised that even a temporarily limited influence of the damping effect can be advantageous. In this case, the damping acts on the released energy of the energy storage unit during at least 50% of a pivoting-in movement. This explanation shall mean that at least 50% of the push-out angle of the push-out arms has occurred when the damping effect ends, which cannot occur suddenly, but in a dropping curve of a decreasing damping.

As a result, the closing velocity is reduced by this influence. Other influences are such that the closing velocity does not become too high at the beginning of the inward pivoting. There is also another effect in that the closing velocity is not too high at the end of the deployment movement. At the same time, the damping effect by the damping element allows counteracting the closing force from the energy storage unit, as a result of which it supports the user during closure of the sash and provides the user, together with the storage unit, with the feeling that the sash was guided smoothly and uniformly to the closed position, without applying virtually any additional closing force by the user, who merely starts the process by releasing the latching in order to trigger the closing movement and to follow said closing movement on an optionally provided control lever or to take part with marginal control or guiding forces on the closing movement. The damping element preferably comprises a filling made of a compressible media such as air or another gas. Such a damper usually comprises a piston rod, which is arranged at a position of the fitting in such a way that it can be moved in the longitudinal direction and simultaneously counteracts the released closing force of the energy storage unit. The damper and the energy storage unit are attached to a common coupling member that can be an adjusting ring.

The effect of the damping element is preferably such that a substantially constant force is developed. Said force is produced during the pivoting-in movement and counteracts the closing force of the energy storage unit, in so far as it is present.

The occurring force is lower however than that of the provided energy storage unit. The force developed by the damping element can preferably also be speed-dependent. If the speed becomes too high, a stronger force is produced than would occur if the speed (the pivoting movement) were low.

The described damping system with the damping element on a soft-close fitting is applied in accordance with claim 1 to at least one push-out arm which is provided for the sliding sash or tilt-and-slide sash. The aforementioned arms can also generally be scissors-type push-out mechanisms.

Claim 1 must also be understood with respect to the movement elements that they can be carriages, i.e. they are not arranged at the top on a sash, but at the bottom in the height region of the carriages which support the sashes and also control its movements with scissors-type push-out mechanisms or arms. The two movement elements are carriages in this case, which are connected via a connecting rod. The carriages as movement elements comprise push-out arms which support and guide the movement of the sash, and at least one auxiliary arm is provided which is involved in the pivoting-in movement.

The damping element is provided in conjunction with an energy storage unit and counteracts the occurring force in the direction of the closed position, preferably in a speed-dependent manner or/and at the beginning of the closing movement (after the unlatching from the parallel deployment position). In so far as the fitting is claimed as a soft-close fitting, the claim must be read in such a way that the sliding sash or tilt-and-slide sash is not the subject matter of the claim, but rather that the fitting is capable to be arranged thereon. The closed position or open position respectively relates to the fitting which also has a closed position and an open position.

The claimed invention is explained and supplemented by the embodiments.

Fig. 1 shows a view of a first embodiment of a fitting in accordance with the invention in the outwardly pivoted position of the arms a, b and with two sliders A, B as the movement elements;

Fig. 1a shows a sectional view of Fig. 1;

Fig. 2 shows the fitting of Fig. 1 in the installed position in a view in the longitudinal direction (from the right-hand side in Fig. 1), so that the first slider A and the first push-out arm a can be seen; the illustration shows the sash 2 and the blind frame 3, which are coupled via the fitting; Fig. 2 shows the extended (in parallel) and latched position, as in Fig. 1;

Figs. 3a to 3c show three views of an embodiment not in accordance with the invention of a fitting with an energy storage unit 11a, two sliders as the movement elements A', B' and a push-out arm b' in the outwardly pivoted position; this example also comprises a damping arrangement 10', which is arranged close to the second slider B' on the connecting rod z';

Fig. 4 shows the fitting of Figs. 3 in an inwardly pivoted or closed position (according to an inwardly pivoted sash); this view corresponds to that of Fig. 3c;

Fig. 5 shows an example of a fitting not in accordance with the invention with a damping unit 10, but without the energy storage unit.

The fitting according to Fig. 1 comprises a first connecting rod v, on which the two push-out arms a, b are rotatably linked via a respective joint a_3, b_3 (which is also known as bearing or bearing point). The connecting rod v is preferably formed as a flat bar and is arranged in an angular housing U. This is shown in Fig. 2, in conjunction with the illustrated bearing a_3. The sash 2 is retained and guided via said two bearings a_3, b_3 and the connection v. It is shown in Fig. 2 in the open position because the respective position of the fitting of Fig. 1 is shown in the outwardly pivoted position of the arms a, b.

Angular housing U is fixed at the upper end of the sash 2 with a tab element u and protrudes inwardly (towards the room) from the front side of the sash 2.

The illustration does not show the pane insert of the sash 2 and the remaining blind frame, beneath the horizontal spar 3.

The fitting of Fig. 1 further comprises two sliding elements A, B whose bearing points a_1, b_1 have the same or at least approximately the same distance as the bearings a_3/b_3. The sliders are held via a connecting rod z in an aforementioned, fixed distance, wherein the connecting rod z is preferably formed as a flat bar. The "upper carriage" with the two sliders A, B and the connecting rod z is accommodated in the guide profile Z and is slidingly movable therein. The sash 2 is displaced relative to the blind frame in the longitudinal direction with said sliding movement in the guide profile Z.

The further elements of the fitting according to Fig. 1 are structured as follows, and the first outwardly pivoting arm a with the outer bearing a_3 on the connecting rod v (which is arranged on the sash) comprises a further bearing a_2 on which an auxiliary arm h is pivotably arranged. The auxiliary arm h has a further linkage h_1, which is arranged on a coupling element 12 which is movable in the longitudinal direction and is formed in this case as an adjusting ring. The end of the energy storage device 11 which is disposed on the left in Fig. 1 also acts on the coupling element 12, which energy storage device is arranged at its other end with the connecting rod z close to the first sliding element A. The energy storage unit, which is formed in this case as a spiral spring 11, is visible because the connecting rod z comprises a longitudinal slot and it is shown in a tensioned position because the fitting is shown in the outwardly pivoted position, so that the energy storage unit potentially stores energy as spring energy. The energy storage unit 11 can also be formed in a different way, e.g. as a gas pressure spring or other spring elements which take up and are able to store energy via a change in length and which are capable of releasing said energy again under relaxation. The illustrated cylindrical spring 11 merely represents an example.

The geometric configuration shows how the arrangement will operate when it approaches the closed position during longitudinal movement (initiated by the sliders A, B). Once it reaches position x, in which the unlatching occurs (to be explained on the left sliding element B), a pivoting movement S is produced (the grip side GS is on the left), which is manifested by inward pivoting of the two main arms a and b, supported by a relaxing energy storage unit 11 with action of force on the adjusting ring 12, which draws the main arm a with torque to the closed position by the auxiliary arm h and the joint a_2.

The position of the various arms and connecting rods shown in Fig. 1 is the push-out position. The fitting is "push-out latched" in said position, which allows it during the sliding movement to keep the blind frame 3 parallel to the sash frame 2. The push-out latching is associated in this case by way of example to the left slider B. They operate in such a way as can be explained in closer detail on the basis of Fig. 1a in the enlarged view of the section. It shows an enlarged view of a section of Fig. 1 in the region of the second auxiliary link arm c, the latching tab r and the leading control apparatus F; the auxiliary link arm c has been broken away in order to illustrate the push-out latching.

Fig. 1 shows the outwardly pivoted position, as also in the enlargement of the sectional view of Fig. 1a. The second auxiliary link arm c is provided with a cuboid control pin r which protrudes into the control apparatus F (sword) or its respective control guide f. It latches into an undercut f', which forms the end of the control track f in the leading control apparatus F, which control track is disposed at the right-hand end in Fig. 1a. This is the push-out latching in which the deployed position is "latched" via the second main arm b and its pivot coupling b_2 to the second auxiliary link arm c.

From this latched position at the illustrated position x, the latching pin r enters an obliquely disposed receiver k_1 of a control block K, which is also shown in Fig. 1 and Fig. 1a. The latching pin r, which forms in Fig. 1 the bottom end of a volumetric larger latching base r_1 on the second auxiliary link am c, is removed from the undercut f' of the track guide and travels along the straight section f of the track guide under simultaneous entrainment of the second main link arm b. The control apparatus F as a so-called "leading sword" is accommodated in a longitudinal receiver of the control block K and no longer moves to the left shortly after the position of Fig. 1 when the latching pin r is accommodated in the obliquely positioned depression k_1 and is also retained there, so that the apparatus of Fig. 1 can move to the right again with its connecting rod z (under entrainment of the leading sword F), but under inward pivoting of the two push-out arms a, b.

The point in time of releasing the latching pin r from the undercut f' is the point in time at which the deployment latching is released and the energy storage device 11 begins to exert its stored force on the intermediate element 12.

During the pivoting-in movement, the energy storage unit 11 thus supports the pivoting-in movement of the arms a, b and c, h, and the damping element 10, which is non-displaceably connected to the connecting rod z at one end 10a, which is shown as w, simultaneously shows its effect. On the other side, the damping unit 10 is provided with a piston rod 10b which is arranged as an adjusting ring on the intermediate element 12.

The damping unit 10 is then in the position to resist the occurring spring force 11 of the energy storage device or to build up a force respectively, which is preferably speed-dependent.

The force counteracting the force of the spring 11 commences at the time of the unlatching, as described above. It ends at the very latest at the point in time of the inward pivoting of all arms, i.e. when the sash 2 is accommodated in the blind frame 3 and has reached its closed position.

The piston rod 10b travels into the damping element 10, and the energy storage unit, in the form of the cylindrical spring 11, lengthens along the longitudinal direction of the connecting rod z.

Of the two ends 10a, 10b of the damping element 10, the one end 10a is non-displaceably anchored at w relative to the connecting rod z, and the other end 10b, as the head of the piston rod, is displaceable in the longitudinal direction, according to the longitudinal position of the adjusting ring 12 at the bearing point h_1.

The damping of the damping element 10 can continue until the inward pivoting of the arms a, b in the closed position. It can also terminate before, especially in a continuous or slowly trailing manner. It is present at least up to 50% of the pivoting-in movement, wherein this corresponds to half the illustrated pivoting-in angle of the push-out arms a, b.

Damping has a positive effect at the time when the force of the energy storage unit 11 is released in order to mitigate, intercept or weaken the initial effect of the action on the sash.

At the end of the pivoting-in movement the damping element can act in such a way that the pivoting-in speed is reduced and the impact is dampened or prevented entirely. A rebound of the sash can thus be prevented.

It is an embodiment to fill the damping element c in its body region with a compressible medium and to allow the piston rod 10b to compress said medium. Special embodiments are speed-dependent in order to dampen a high speed more strongly than a low speed.

The adjusting ring 12, which is longitudinally displaceable as a coupling, can be guided in an expanded slot which is arranged in the connecting rod.

If the damping element develops a constant force during the inward pivoting which is at least substantially constant, it is lower than the initially released force of the energy storage unit 11.

The person skilled in the art would select the settings of the two forces in such a way that they can be dependent on the weight of the sash. Different settings are advantageous in the case of a low weight of the sash, and other settings are advantageous at a high weight of the sash. The setting of the various forces dependent on the user is ultimately also possible, e.g. for older people in a retirement home, where it is relevant that the lowest possible forces are necessary for closing the sash, but to thus accept slight rebound at the point of closing. The case is different in applications with normal sliding sashes, in which the user is certainly capable of applying a low level of own force, but where the closing process should occur smoothly, uniformly and without any rebound.

The structure which was described with reference to Figs. 1 and 1a can also be applied functionally to carriages at the bottom end of a sash/blind frame. This example is not shown separately, but the movement elements A, B, which are sliders in Figs. 1, 2, can accordingly also be carriages which rest with rollers on a track which is arranged at the bottom edge of the blind frame. The push-out arms are then supporting push-out arms, which not only guide the sash but also carry its weight. The concrete arm geometry can be the same or slightly modified because the connecting rod v can be omitted at the bottom and the arrangement of the pivot bearings a_3, b_3 is made directly at the bottom edge of the sash 2 via profile elements to be arranged there (as supporting profiles). The object of the connecting rod v is then fulfilled by the sash frame with its bottom spar.

If the arrangement is selected for top and bottom, the assignment of latching can be assigned to the upper or the bottom fitting part. The assignment of the energy storage unit 11 can also be assigned to the upper or bottom fitting part. Similarly, the damping units 10 can be assigned to the upper or bottom fitting part. The latching itself, which was explained by reference to the second auxiliary link arm c and the guide track f, its undercut f' and the non-round engagement pin r, must then accordingly be made on the bottom or upper fitting part.

In various variants, latching can occur at the top for example, but the damping unit 10 and the energy storage unit 11 are situated at the bottom. Deployment latching can also be selected at the top or bottom, as shown in Figs. 1, 1a. The possibility is further provided to position a combination of latching, damping and energy storage unit at the top and bottom, so that high symmetry and high synchronous running of the parallel movement are achieved. This is not mandatory however. It is possible to assign or distribute individual functions of the three described partial functions to the upper fitting part and the bottom fitting part. This can also be provided under the consideration that sliders A, B are provided at the top and carriages at the bottom, which respectively operate as movement elements.

The embodiment of Figs. 3, which is not in accordance with the invention, comprises a damping unit and an energy storage unit, but only one main push-out arm b'.

Figs. 3a, 3b and 3c show three sides of a fitting, which from a functional standpoint corresponds to the one which was explained with reference to the preceding drawings. There are a number of differences which will be explained here, wherein the push-out latching according to Fig. 1a is realised in a virtually identical manner in the left region of Fig. 3a (without the illustrated control block K, which must also be provided here).

In the region of the second sliding element B', three arms are connected to each other via joints. The common joint b_2' serves the first auxiliary arm h' and the short latching link arm c' as a linkage point on the second main arm b'.

The illustration shows that the first auxiliary arm h' is oriented differently than the first auxiliary arm h of Fig. 1. The energy storage unit 11' is still arranged at the same location and is coupled in an articulated manner h_1' to the auxiliary arm h' via a sliding element 12', which is displaceable in the longitudinal direction on the connecting rod z'.

The cylindrical spring of the energy storage unit 11', which is used as an example, is guided on a round rod 11", which round rod is arranged on the left on the coupling element 12' and is fixed on the right to the connecting rod z'.

The piston rod 10b' of the damping element 10' is arranged on the coupling element 12' on the other side (relating to the energy storage unit 11'). The other end 10a' of the damper is fixedly arranged at the end of the rod z'.

No additional push-out arm is provided on the sliding element A', so that the unlocking of the parking lock and the additional force during inward pivoting of the main arm b' can be assigned jointly to the movement element B'. The end of the main arm b' can be pivotably linked to a rod v' mounted on the sash with the bearing point b_3'. The rod v' can also be a short piece of rod or be omitted entirely. The bearing point b_3' is maintained and can be screwed onto the face end of the sash.

According to an embodiment that is not arranged in accordance with the invention and is shown in Fig. 5, the energy storage unit 11' can also be omitted, so that only one damping unit 10 is present which acts with its piston rod 10b on the end h_1 of the auxiliary arm h, namely in a damping manner, so that it is dampened during a pivoting-in movement, corresponding to the pivoting-in movement of the sash.

The damping can relate to excessive speed, but can also be initial damping or end damping, relating to the pivoting-in angle □.

The function of Figs. 3 is as explained by reference to Figs. 1, 1a and 2. At the beginning of the unlatching of the non-round latching pin r_1 from the undercut f' (as shown in Fig. 1a or in Fig. 3c on the left), the pivoting-in movement commences and the supporting effect of the energy storage unit 11' commences. The damping unit 10' acts on the opposite direction with its piston rod 10b'. The pivoting-in movement is terminated when the closed state according to Fig. 4 has been reached (closing position). All link arms have been pivoted inwardly here, which inwardly pivoted position relates to the fitting, and with a mounted sash on the fitting it is the closed position of the sash in the blind frame. The latching pin r_1 reaches the end of the guide track f of the guide sword F as a control element and the push-out arm b' is visibly inwardly pivoted. The auxiliary arm h' is also shown in the inwardly pivoted position. The energy storage unit 11' is relaxed and has its longest extension, and the damping effect of the damping element 10' is extinguished.

During the push-out, the damping apparatus preferably does not exert any counterforce, so that during the push-out the energy storage unit 11' is capable of storing potential energy, e.g. in form of spring force or a compressible medium.

A transfer to the carriage side is also possible in the example of Fig. 3. The implementation of the transferability of Figs. 1 and 2 applies similarly to Figs. 3 and 4.

Similarly, the individual functions can be distributed in embodiments not in accordance with the invention to a fitting part situated at the top and a fitting part situated at the bottom, and the energy storage unit 11' and the damping unit 10' need not act on the same displaceable coupling element 12', but can be distributed among the upper or bottom side. It is also possible that the damping element and the energy storage unit are located both at the top and the bottom, i.e. close to the sliders and the carriages.

Concerning the possibilities of forming the damping unit 10', reference is made to the aforementioned information as was provided with respect to the damping unit 10 of Fig. 1.

Fig. 5 has already been mentioned and is based with respect to its function on Fig. 1 and all elements functions described there also apply to this example, with the exception of the energy storage unit.

Csillapított zárású vasalattal felszerelt tolószárny záró mozgásának vezérlése

Szabadalmi igénypontok

1. Csillapított zárású vasalat tolószárnyhoz vagy bukó-toló szárnyhoz az ablak- vagy ajtószárny vezérelt mozgatására egy kimozdított helyzetből zárt helyzetbe,

– két hosszirányban mozgatható mozgóelemmel (A, B) az ablak- vagy ajtószárny hosszirányú mozgatására, ahol a két mozgóelem (A, B) egy összekötő rúddal (z) van összekötve, amely azokat egy fix távolságra tartja egymástól és egymással mozgathatóvá teszi;

– egy kihajlítható kitámasztókarral (a, b; b') a két mozgóelem (A, B) mindegyikén;

– egy kimozdított helyzeti reteszeléssel (r, f) a kihajlítható kitámasztókarok (a, b) kihajlított kitámasztási helyzetének megtartásához a vasalat mozgóelemek (A, B) általi elmozdítása során;

– egy segédkarral (h, h'), amely az egyik végén a kitámasztókarok (a, b') egyikével elfordíthatóan van összekapcsolva (a_2, b_2') és a másik vége az összekötő rúd (z) mentén egy kapcsolótagon (12, 12') van hosszirányban megvezetve, ***azzal jellemezve***, hogy

– van egy csillapítótagja (10, 10'), amely az egyik végén a segédkar (h, h') elcsúsztatható végével van összekapcsolva, míg a másik végén nem elcsúsztathatóan van az összekötő rúdon (z, z') elrendezve (w, 10a');

– van egy hosszanti energiatároló egysége (11, 11'), ahol az energiatároló egység (11, 11') és a csillapítótag (10) együttesen a kapcsolótagra (12, 12') van felszerelve és a csillapítótag (10, 10') a csillapító hatását a hosszanti energiatároló egység (11, 11') szabaddá váló erejével szemben gyakorolja,

– ahol az energiatároló egység (11, 11') a kihajlítható kitámasztókar (a, b) kimozdított helyzeti reteszelés (r, f) általi megtartásának állapotában energiát tárol, és

– ahol a kimozdított helyzeti reteszelés kioldása a tárolt energia szabaddá válásához vezet, amely a zárt helyzet felé irányuló erőként válik szabaddá.

2. Az 1. igénypont szerinti vasalat, ahol a mozgóelemek (A, B) csúszkák, amelyek egy profilírozott vezetősínben (Z) való csúszó mozgásra alkalmasan vannak kialakítva.

3. Az előző igénypontok bármelyike szerinti vasalat, ahol a csillapítótag (10, 10') egy összenyomható közeggel van feltöltve.

4. Az 1. igénypont szerinti vasalat, ahol a csillapítótag (10, 10') ahhoz van kialakítva, hogy egy lényegében állandó erőt fejtsen ki a behajló mozgás során, amely erő főként kisebb, mint egy egyidejűleg az energiatároló egység által kifejtett erő.

5. Az 1. igénypont szerinti vasalat, ahol a kapcsolótag (12, 12') egy állítógyűrű, amely a rúdon (z) hosszanti irányban eltolhatóan van megvezetve.

6. Az elözö igénypontok bármelyike szerinti vasalat, ahol kimozdított helyzeti reteszelés (r, f) a kitámasztókarok (b, b') egyikéhez van hozzárendelve.

7. A 6. igénypont szerinti vasalat, ahol a kimozdított helyzeti reteszelés (r, f) egy további segédrúdon (c, c') keresztül van a kitámasztókarhoz (b, b') hozzárendelve, amelynek közelében a csillapítótag (10, 10') az összekötö rúdon (z) van rögzítve (w).

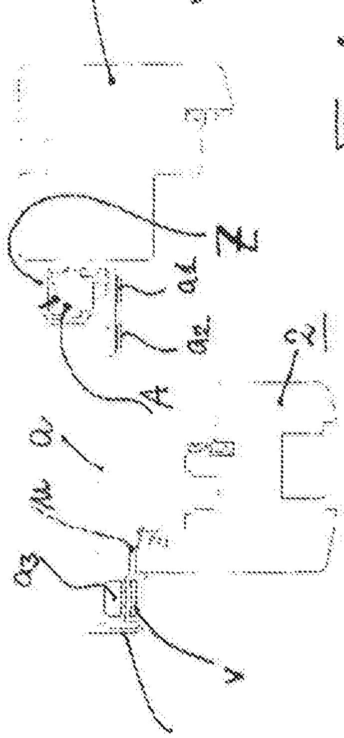


Fig. 2

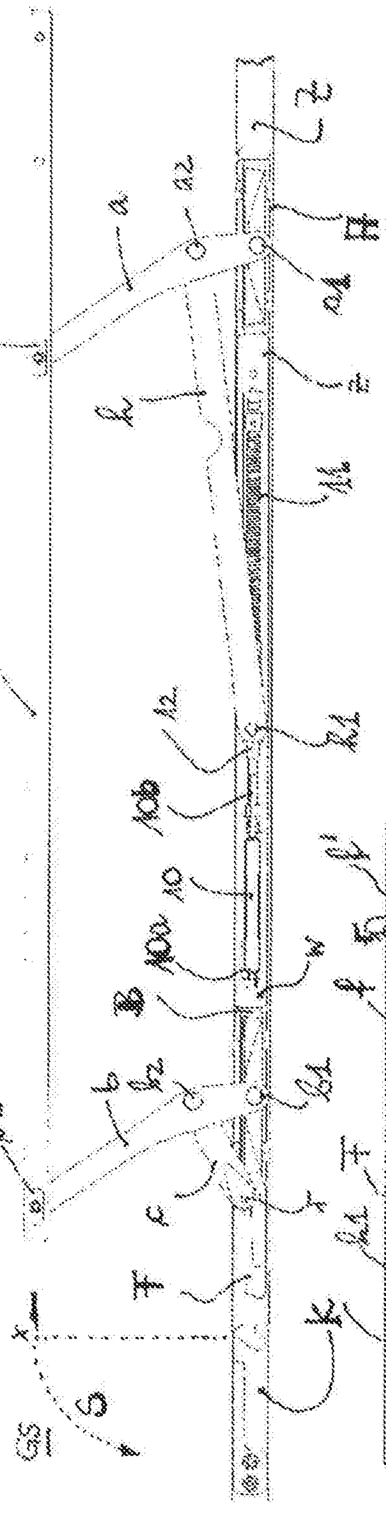


Fig. 1

Fig. 1a

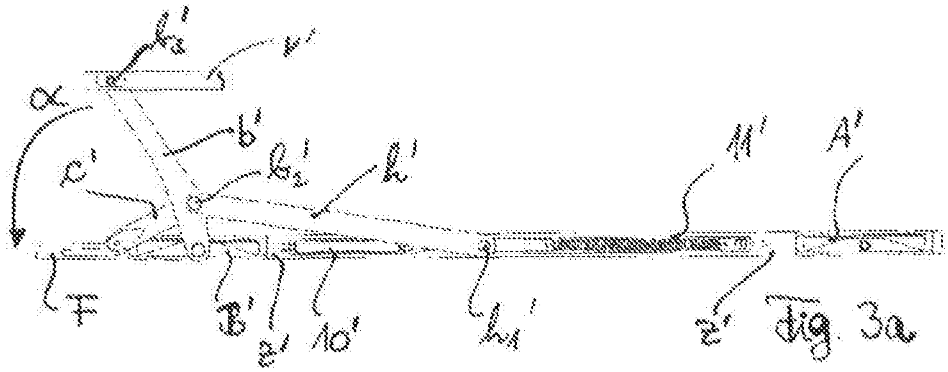


Fig. 3a

Fig. 3b

Fig. 3c

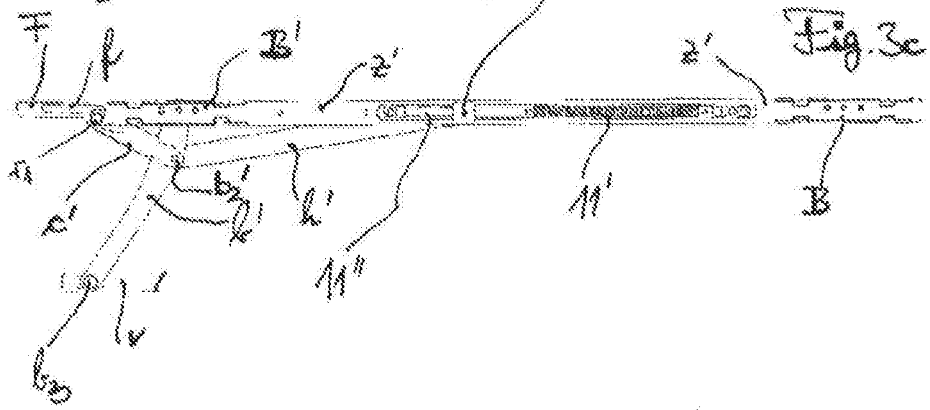
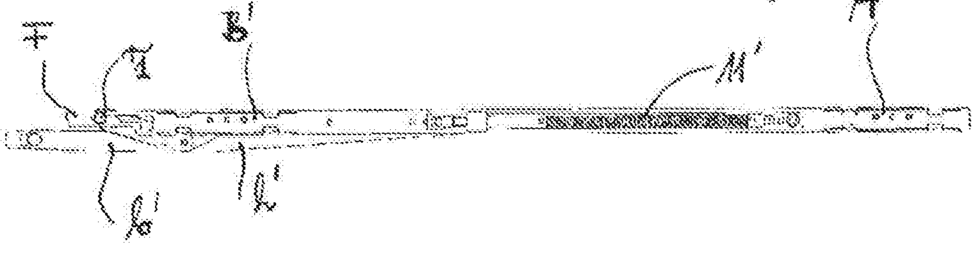


Fig. 4



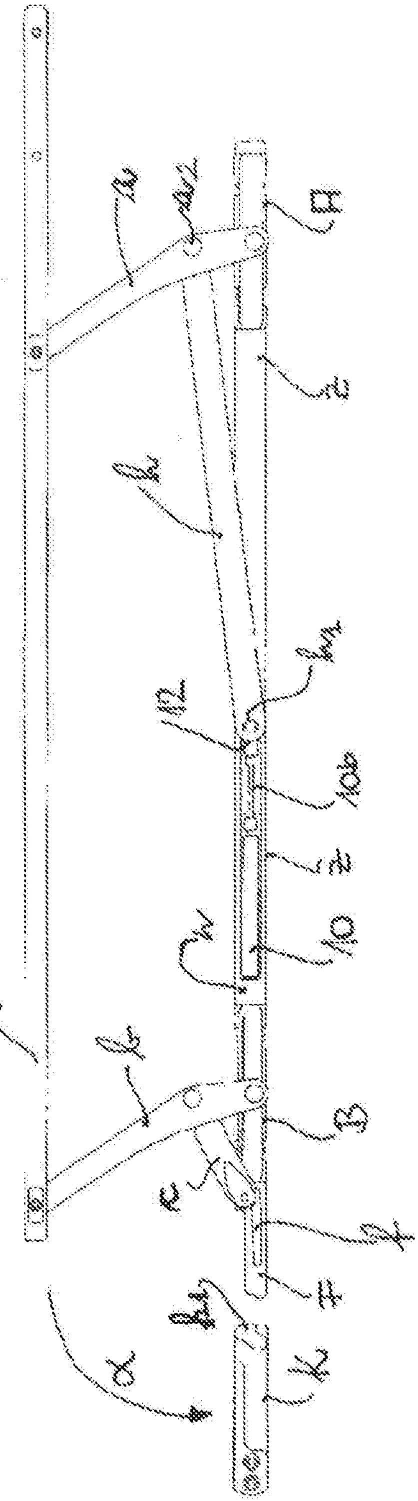


Fig. 5