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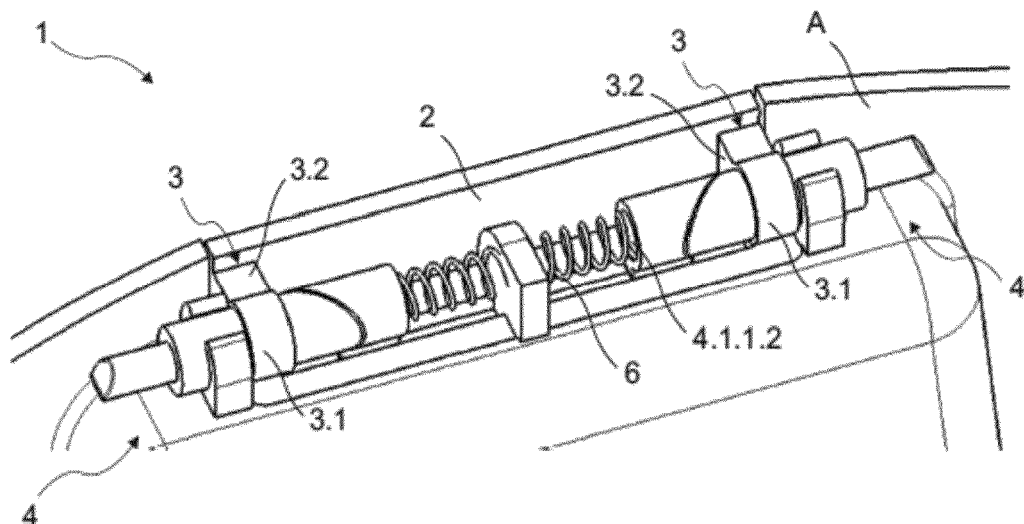
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(54) **A LOCKING MECHANISM**

(57) The present invention relates to a locking mechanism (1), which provides opening or closing of a lid (A) by means of a release mechanism (4), wherein the pusher (4.2) provides a linear motion of the lock pin (4.1) by

pushing it and this locking mechanism reduces the maintenance costs for components and the production costs by having a small number of parts.

Figure 1



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Description

Technical Field

[0001] The present invention relates a locking mechanism which is used to close or open the lids of the interior compartments of a vehicle and which has a small number of components such that it reduces the cost of components.

Background Art

[0002] Nowadays, a wide production variety of latches and locks performed, which are intended for the lids of compartments of the vehicles. The lock manufacturing becomes important in order to prevent the opening of the compartment lids. The most needed item for opening and closing in vehicles is the glove box. The locks of the glove box lid must be easy to open and close. For this reason, too many parts are used to mount the glove box lids. The locks of the glove box can be mounted to the body or to the lid. For locks mounted onto the body, extra material costs arise. On the other hand, latching systems are used in the lid-mounted locks. Latching systems include separate parts for the part of latching inserted into the spring, the part of latching connected to the pins, or the part mounted on the cover. In this case, the cost of parts is increasing. Thus, when the need for service for the glove box lid arises, it is difficult to mount the parts.

[0003] In the known state of the art, DE10351980A1, a German patent document with a priority date of 07.11.2002, discloses a locking arrangement. This locking assembly is used for the glove boxes in vehicles and is axially rotationally supported by the front panel of the vehicle. The present invention comprises a handle, a pair of springs which are supported movably by the housing member, a pair of sliding pins loaded by springs in the direction of the locking holes defined in the supporting member, and a pair of cams to which the rear end portions of the sliding pins are connected in order to move the each sliding pin in and out. When the handle is rotated, the front-end portion of each sliding pin is retracted from the corresponding locking hole against the spring force. The connection holes of the cam element which have a cylindrical form are defined on opposite sides of each front-end portion. Each back-end part of the sliding pins has a fork-like structure with elastic parts. Each of the elastic portions of the slide pins has a removable mounted projection corresponding to the connection hole. The said invention transmits the motion of the lid handle to the body of the glove box and the transmission of this motion is performed by means of sliding pins. In the invention according to the application, the motion of the lid handle is transmitted to the lock pins. Transmission of the motion is performed through pins with angled response surface.

[0004] In the known state of the art, in the Chinese utility model document with number CN205894943U and

priority date of 09.08.2016 is a self-locking device disclosed which is provided for a glove box in an automobile. This invention comprises a motion panel, a support element, a compression spring, a sliding guide element, a rotating coupling element and a movable locking block. The back surface of the handle has a pair of cylindrical portions, each of which is provided with a sliding support post and between which is a guiding plate. The compression spring is disposed between the guide plate and the sliding guide post. The compression spring applies a force on the sliding guide post to move the slide guide post backwards. The guide block prevents the sliding guide post from being relatively rotated in the cylindrical portion. In the said utility model, the number of the components that generate solutions is quite large. In the invention according to the application, by means of the single axial motion of the lock response surface with respect to the angular force, the angular surface provides a back and forth motion.

[0005] In the known state of the art, by the United States patent document with number US4781407A and priority date 13.05.1986, a sliding mechanism for a glove box eyelid in a vehicle is disclosed. In the said invention, each said locking element has, at its inner end, a substantially triangular, grooved cylindrical surface which is perpendicular to one another and which is arranged parallel and perpendicular to the longitudinal axis of the locking bar, respectively. The wall which is perpendicular to the longitudinal axis of the locking bar is positioned towards the outer end of the locking bar. The handle is arranged to be able to rotate about a bearing axis which is located on the lid and which is parallel to the shaft axis of the lid. The handle has a pair of transmission elements which are extending to the triangular grooves of the holding elements respectively. In this way, the rotary motion of the arm causes the transmission elements to move in a direction perpendicular to the axis of the locking elements. In the said invention, there is no angular response surface which exists in the invention according to the application. In this invention the springs are not compressed but expanded during the opening of the lock. In the invention according to the application, the lock is rotated and the springs are compressed when the handle is gripped.

[0006] The most significant technical problem encountered in the locking mechanisms used in the present technique is that the locking and unlocking structures are complicated and have multiple parts. The multi-part locking mechanisms can make easily a breakdown and the production cost can be high. In the present case there is no disclosure about the pins having angular surfaces among the locking mechanisms used for the compartments in a vehicle and about the use of the handle whereby the motion transmitted angularly is transformed to a single axis movement.

Objectives of the Invention

[0007] The object of the present invention is to achieve a locking mechanism that reduces the production and assembly cost due to the small number of parts contained.

[0008] Another object of the present invention is to realize a locking mechanism which reduces the part maintenance cost in case a need of service for parts due to the reduced number of parts.

Brief Description of the Invention

[0009] A locking mechanism realized to achieve the object of this invention and defined in the first claim and in the dependent claims comprises lid handle, handle leg, release mechanism, housing and resilient element. In order to open the lid, a force is applied in an upright position along an axis to the handle of the lid. The handle of the lid performs a rotational movement about the centre axis of the handle leg in a clockwise direction. By rotational motion of the handle leg, also the pusher, which is fixed to the handle, starts to rotate at the centre axis. Before the pusher performs a rotational motion at the centre axis, the response surface of the lock pin and the impulse surface of the pusher are contacting in a manner such that their surfaces facing each other. As the pusher rotates it becomes tangential to the lock pin. With the impact body and the reaction body being tangential to the corner points, the impact body starts to push the lock pin that rests on the bearing body via the stabilizing body. The reaction body performs a linear motion on the guide channel through the channel extension with which the reaction body interacts. The resilient member, its two ends are put in to the gap, is compressed under the effect of pushing force as a result of the coaxial motion of lock pins. At the end position where the resilient member can be compressed, the lock pin is released from the lock slot located on the lid. Thus, the locking mechanism on the lid is opened and the lid is separated from the body. Accordingly, the lid handle, which is not subjected to a vertical force, starts to rotate counter clockwise around the centre axis of the handle leg. When the force applied to the lid handle is over, the resilient member is left idle and the pushing force is applied on it in the reverse direction. Under effect of said force, the lock pin moves in a direction of passing through the lock pin channel extension along the central axis on the guide channel to the lock slot. Then, the lock pin and pusher come again into contact in such a manner that their surfaces facing each other. In this case, the locking mechanism comes to the closing position.

Detailed Description of the Invention

[0010] The locking mechanism for achieving the object of the present invention is shown in the attached figures, in which;

Figure 1. Perspective view of the locking mechanism in an assembled state.

Figure 2. Perspective view of locking mechanism.

Figure 3. Perspective view of housing.

Figure 4. Perspective view of locking mechanism in which the lid handle is in a turned state.

Figure 5. Perspective view of the closed state of locking mechanism.

[0011] The parts in the figures are numbered one by one and the correspondences of these numbers are given below:

1. Locking mechanism
2. Lid handle
3. Lid leg
 - 3.1. Rotating body
 - 3.2. Coupling extension
4. Release mechanism
 - 4.1. Lock pin
 - 4.1.1. Reaction body
 - 4.1.1.1. Reaction surface
 - 4.1.1.2. Gap
 - 4.1.1.3 Channel extension
 - 4.1.2. Coupling body
 - 4.1.2.1. Impact surface
 - 4.1.2.2. Cam
 - 4.2. Pusher
 - 4.2.1. Impact body
 - 4.2.1.1. Impulse surface
 - 4.2.1.2 Connection surface
 - 4.2.2. Stabilizing body
 - 4.2.3. Connection gap
5. Housing

5.1. Bearer

5.1.1. Bearing hole

5.1.2. Pass-through gap

5.2. Guide channel

5.3. Centring member

5.3.1. Extension

6. Resilient member

A. Lid

[0012] The locking mechanism (1) used to close or open the lids of the interior compartments of a vehicle comprises basically,

- at least a lid handle (2) which can perform a rotary motion by applying a force,
- at least a handle leg (3) which is connected to the lid handle (2) and can perform a rotary motion around the central axis by rotating the lid handle (2).
- at least a release mechanism (4) which has at least a lock pin (4.1) and at least a pusher (4.2) and which provides,
 - interacting of the lid handle (2) with the lock pin (4.1) by rotating the pusher (4.2) around the central axis, whereby the lid handle rotates,
 - the linear movement of the lock pin (4.1) along the central axis by pushing the lock pin (4.1) by means of the pusher (4.2) which interacts with the lock pin (4.1),
 - releasing the lid (A) as a result of the linear movement of the lock pin (4.1) along the central axis.

[0013] The lock mechanism (1) in this embodiment of the invention comprises a lid handle (2), a handle leg (3), a release mechanism (4), a housing (5) and a resilient member (6). The locking mechanism (1) is located on the lid (A). The lid handle (2) preferably has a rectangular geometry. The lid handle (2) performs a rotary motion whereby a force is applied thereon. The lid handle (2), on which is applied a momentum force perpendicularly along an axis, makes a rotational movement in the central axis of the handle leg (3). The handle leg (3) may preferably be associated with or independent of the lid handle (2). In this embodiment of the invention the handle leg (3) is associated with the lid handle (2) (Figure 1). By rotation of the lid handle (2), the lid leg (3) also rotates about the central axis. The handle leg (3) is connected to the lock pin (4.1). The handle leg (3) is consist of ro-

tating body (3.1) and a coupling extension (3.2). The rotating body (3.1) allows the lid handle (2) to be connected to the lock pin (4.1). The rotating body is preferably in an annular geometric form. The rotating body (3.1) is preferably connected to the lock pin (4.1) so that the lock pin (4.1) passes through the centre of the rotating body (3.1) (Figure 1). The coupling extension (3.2) allows the handle leg (3) to be secured to the lid handle (2). The coupling extension (3.2) and the rotating body (3.1) are preferably in a combined form. When the lid handle (2) is independent of the lid leg (3), the lid leg (3) can be fixed to the lid handle (2) by a connection method by means of a coupling extension (3.2). The handle leg (3) is preferably located on either edge of the lid handle (2) (Figure 1).

[0014] In this embodiment of the invention, the release mechanism (4) consists of a lock pin (4.1) and a pusher (4.2). The release mechanism (4) has a connection with the lid handle (2) and the housing (5). In the case that the lock pin (4.1) interacts with the pusher (4.2), the lock pin performs a linear motion. The lock pin (4.1) allows the lid (A) to be opened and closed with the help of the linear motion it performs.

[0015] In this embodiment of the invention, the lock pin (4.1) consists of the reaction body (4.1.1) and the coupling body (4.1.2) (Figure 2). The reaction body (4.1.1) and the coupling body (4.1.2) are preferably connected to each other. The connection body (4.1.2) is passed through the pusher (4.2). The connection body (4.1.2) is preferably in a cylindrical geometric form. The diameter of the connection body (4.1.2) is preferably adjustable relative to the lid (A) on which the locking mechanism (1) is to be mounted. On one of the two side surfaces of the connection body (4.1.2) the reaction body (4.1.1) is located and on the other one the impact surface (4.1.2.1) and the cam (4.1.2.2) is located (Figure 2). The surface of the connection body (4.1.2), which is connected to the reaction body (4.1.1) is preferably inclined. The impact surface (4.1.2.1), which is located on the other side surface of the connecting body (4.1.2), has a function to lock the lid (A). When the locking mechanism (1) is preferred to be closed after opening, the lock pin (4.1) performs locking by contacting the impact surface (4.1.2.1) to the lock slot. The impact surface (4.1.2.1) has preferably an inclined form. Adjacent to the impact surface, there is a cam (4.1.2.2). The cam (4.1.2.2) allows the lock pin (4.1) to stand in the lock slot when it enters the lock slot. The cam (4.1.2.2) extends from the surface where the connection surface (4.1.2) is located. The depth of the cam (4.1.2.2) can be adjusted preferably to suit the dimensions of the lock slot. The reaction body (4.1.1) located on the inclined end of the connection body (4.1.2) can interact with the pusher (4.2). The reaction body (4.1.1) has preferably a cylindrical geometry and is larger in diameter than the diameter of the connection body (4.1.2). The reaction body (4.1.1) consists of the reaction surface (4.1.1.1), gap (4.1.1.2) and channel extension (4.1.1.3) (Figure 2). The reaction surface (4.1.1.1) is preferably an inclined surface. The reaction body (4.1.1) is connected

to the connection body (4.1.2) through the reaction surface (4.1.1.1). The lock pin (4.1) interacts with the pusher (4.2) via reaction surface (4.1.1.1). There is a gap (4.1.1.2) on the side surface located opposite the reaction surface (4.1.1.1). The resilient member (6), which applies force to the reaction body (4.1.1) of the lock pin (4.1), is placed in this gap (4.1.1.2). The diameter of the gap (4.1.1.2) is preferably somewhat larger than the diameter of the resilient member (6). One end of the resilient member (6) is placed into the gap (4.1.1.2). On the cylindrical surface of the reaction body (4.1.1), there is a channel extension (4.1.1.3). The channel extension (4.1.1.3) is preferably in a rectangular geometric form and can be adjusted so that its dimensions will be dependent of the reaction body (4.1.1) and the housing (5). In this embodiment of the invention, the length of the channel extension (4.1.1.3) is equal to the length of the cylindrical surface of the reaction body (4.1.1). The channel extension (4.1.1.3) is a component which helps the lock pin (4.1) to move in a single axis. This channel extension (4.1.1.3) also prevents the lock pin (4.1) to rotate around the central axis.

[0016] In this embodiment of the invention, the pusher (4.2) consists of the impact body (4.2.1), stabilizing body (4.2.2) and the connection gap (4.2.3) (Figure 4). The impact body (4.2.1) and the stabilizing body (4.2.2) are fixed to each other such that their central axes become coincident. The connection gap passes preferably through the centre of the impact body (4.2.1) and the stabilizing body (4.2.2). The stabilizing body (4.2.2) preferably has a cylindrical geometry. Diameter of the stabilizing body (4.2.2) is somewhat smaller than the diameter of the hole located at the centre of the rotating body (3.1). The stabilizing body (4.2.2) is inserted into the rotating body (3.1) of the handle leg (3) by a connection method. In this embodiment of the invention, the stabilizing body (4.2.2) passes by means of tight fitting method into the rotating body (3.1). As a result, the stabilizing body (4.2.2) can move together with the rotating body (3.1). The stabilizing body (4.2.2) guides the lock pin (4.1). While the rotating body (3.1) performs a rotational motion about the central axis, the stabilizing body (4.2.2) also makes a rotational motion. The connection gap (4.2.3) extends through the centre of the stabilizing body (4.2.2). The connection body (4.1.2) of the lock pin (4.1) is passed through the connection gap (4.2.3). The diameter of the connection gap (4.2.3) is preferably somewhat less than the diameter of the connection body (4.1.2) so that the connection body (4.1.2) can move frictionless within the connection gap (4.2.3). The impact body (4.2.1) can be independent of the stabilizing body (4.2.2) or can be dependent of the stabilizing body (4.2.2). Also the impact body (4.2.1) is in a cylindrical geometric form like the stabilizing body (4.2.2). On the impact body (4.2.1), there are impulse surface (4.2.1.1) and the connection surface (4.2.1.2) (Figure 4). The impulse surface (4.2.1.1) and the connection surface (4.2.1.2) are on the surfaces perpendicular to the cylindrical surface of the impact body

(4.2.1). The impulse surface (4.2.1.1) and the connection surface (4.2.1.2) are located opposite to each other. The impulse surface (4.2.1.1) preferably has a sloped structure. The angle of inclination of the impulse surface (4.2.1.1) is preferably adjustable so that the reaction surface (4.1.1.1) and the impulse surface (4.2.1.1) touch in such a manner that their surfaces facing each other. The connection surface (4.2.1.2) is located opposite to impulse surface (4.2.1.1). The connection surface (4.2.1.2) is located preferably perpendicular to the cylindrical surface of the impact body (4.2.1). The impact body (4.2.1) is coupled to the stabilizing body (4.2.2) via the connection surface (4.2.1.2). Also, at the centre point of the impact body (4.2.1), there is connection gap (4.2.3). The connection body (4.1.2) is passed through the connection gap (4.2.3) in the impact body (4.2.1) and in the stabilizing body (4.2.2). The connection body (4.1.2) can move in the connection gap (4.2.3), which is located in the impact body (4.2.1) and in the stabilizing body (4.2.2). The connection body (4.1.2) can perform a linear motion along the central axis in the connection gap (4.2.3). Also, the impact body (4.2.1) is fixed to the rotating body (3.1) like the stabilizing body (4.2.2). The impact body (4.2.1) is fixed to the rotating body (3.1) preferably by a tight-fitting method. Thus, the impact body (4.2.1) and the stabilizing body (4.2.2), which are placed in the rotating body (3.1), can move together with the handle leg (3). The impact body (4.2.1) and the stabilizing body (4.2.2) can also perform a rotational movement in the central axes as a result of a rotational movement of the handle leg (3) on the central axis under the action of a force.

[0017] In this embodiment of the invention, the lock pin (4.1) is passed through the connection gap (4.2.3) of the pusher (4.2). The lock pin (4.1) is passed into the connection gap (4.2.3) such that the reaction surface (4.1.1.1) and impulse surface (4.2.1.1) touch in such a manner that their surfaces facing each other. Lock pin (4.1) and pusher (4.2) are connected to each other via connection gap (4.2.3). Lock pin (4.1) and pusher (4.2) which are connected to each other, are placed in the housing (5). Further, the pusher (4.2) connected with the handle leg (3) rotates with the handle leg (3) together as a result of the force applied to the lid handle (2). By rotating of the pusher (4.2) the reaction body (4.1.1) interacts with the impact body (4.2.1). The reaction surface (4.1.1.1) and the impact surface, their surfaces touching each other before the pusher (4.2) rotates, became tangential to each other (Figure 4). The pusher (4.2) pushes the lock pin (4.1) from the reaction body (4.1.1) as the impulse surface (4.2.1.1) turns to the reaction surface (4.1.1.1) and comes in a tangential position. The lock pin (4.1) starts to move linearly along the central axis when the pusher (4.2) pushes the lock pin (4.1).

[0018] In this embodiment of the invention, the housing (5) serves as a guide and bearing for the release mechanism (4). Housing (5) is used by being mounted on the lid (A) without the necessity of using a body. Housing (5) is fixed to the lid (A). The housing (5) is preferably placed

in a position which is on the cover (A) and in the dimensions of the housing (5). The housing (5) comprises of bearer (5.1), guiding channel (5.2) and centring member (5.3). The bearer (5.1) can consist of a single piece or two separate pieces. In the case where the bearer (5.1) is a single piece, its geometry is preferably a quadrilateral form with one side being circular and the other side being planar. In the case where the bearer (5.1) consists of two separate pieces, these pieces are in form of two mutual symmetrical pieces. When these pieces are placed mutually such that there is somewhat aperture between them, there is a bearing hole (5.1.1) at their centre points. In one embodiment of the invention, the bearer (5.1) consists of a single piece (Figure 3). Preferably in the centre of the bearer (5.1), there is the bearing hole (5.1.1). The pusher (4.2) is supported by the bearing hole (5.1.1) together with the lock pin (4.1). The diameter of the bearing hole (5.1.1) is of such a dimension that it will allow the pusher (4.2) to rotate at the central axis. The bearer (5.1) is secured preferably by its planar side to housing (5) or to lid (A). In this case the circular side of bearer (5.1) is faced to outside of the lid (A). There is pass-through gap (5.1.2) on the circular side of the bearer (5.1). The pass-through gap (5.1.2) is preferably in form of an aperture. The pusher (4.2) is passed through the pass-through gap (5.1.2) in order to be fitted in the bearing hole (5.1.1). The pass-through gap (5.1.2) is large enough for the pusher (4.2) to pass into the bearing hole (5.1.1) but it is so narrow that it cannot escape from the bearing hole (5.1.1) without any force being applied. Two bearers (5.1) are positioned in the housing (5). These two bearers (5.1) are arranged so that there is a distance between them.

[0019] In the present embodiment of the invention, the guide channel (5.2) in the housing (5) allows the lock pin (4.1) to move linear along the central axis. In addition, the guide channel (5.2) prevents rotation of the lock pin (4.1) in the central axis while the pusher (4.2) is rotating in the central axis. Guide channel (5.2) is preferably located at the centre point of the housing (5) (Figure 3). Guide channel (5.2) is located between two bearers (5.1) secured to the housing (5). The depth of the guide channel (5.2) is preferably such that the channel extension (4.1.1.3) in the lock pin (4.1) cannot escape from the interior of guide channel (5.2). The length of the guide channel (5.2) is such that the pusher (4.2) can bring out the lock pin (4.1) from the lock slot at the lid (A) by pushing the lock pin (4.1). The centring member (5.3) located in the housing (5) is used by fitting in the guide channel (5.2). Centring member (5.3) is preferably in a rectangular geometric form. The centring member (5.3) has an extension (5.3.1) that it can rest on the guide channel (5.2). The centring member (5.3) is used by inserting its extension (5.3.1) into the guide channel (5.2). This centring member (5.3) provides the centring of the resilient member (6). The centring member (5.3) can be of a flat structure so that it can touch two side surfaces of two resilient member (6) or it can be in such a configuration so that one resilient member (6) can pass through the

centre thereof. In this embodiment of the invention, there is a clearance at the centre point of the centring member (5.3) in such a dimension that the resilient member (6) can pass through there. Thus, the centring member (5.3) can hold the resilient member (6) together with lock pin (4.1) on the common axis and centre it (Figures 3-4). In the present embodiment of the invention, locking mechanism (1) has a resilient member (6). The resilient member (6) ensures that the lock pin (4.1) performs a linear motion on the guide channel (5.2) by applying a force thereon (Figures 4-5). Resilient member (6) is preferably a spring. In the locking mechanism (1) are two resilient members which are mutually standing or there is only one resilient member (6) which extends to two locking pins (4.1). In the present embodiment of the invention, a single resilient member (6) is provided. The resilient member (6) is positioned into the gap (4.1.1.2) of the lock pin (4.1), which is disposed to two mutually standing bearers (5.1) so that its reaction bodies (4.1.1) facing inwards (Figure 4). Resilient member (6) is disposed such that its one end fits into the gap (4.1.1.2) on one side and its other end fits into the gap (4.1.1.2) on the other side. Resilient member (6) is compressed between the lock pins (4.1), which move on the guide channel (5.2) as a result of rotating of the pusher (4.2). After being compressed, the resilient member (6) applies a pushing force on the reaction body (4.1.1). Thanks to the pushing force applied by resilient member (6) to the reaction body (4.1.1), the lock pin (4.1) moves on the guide channel (5.2) and return to its former position. The locking mechanism (1) is opened when the resilient member (6) is compressed between the lock pins (4.1), but the locking mechanism (1) is closed when the resilient member (6) returns the lock pins (4.1) to their former positions by applying pushing force to the lock pins (4.1). By means of the force applied by the resilient member (6), it is possible for the lid (A) to be opened or closed depending on the direction in which the lock pin (4.1) is moved.

[0020] In this embodiment of the invention, the operation of the locking mechanism (1) during the opening is performed as follows: Force is applied in an upright position along an axis to the lid handle (2) to open the glove box eyelid (A) in the vehicle. The lid handle (2), on which a force is applied, performs a clockwise rotary motion around the central axis of handle leg (3). By the rotational movement of the handle leg (3), the pusher (4.2), which is fixed to the handle leg (3), also begins to rotate in the central axis. The reaction surface (4.1.1.1) at the lock pin (4.1) and the impulse surface (4.2.1.1) at the pusher (4.2) touch each other frontally before the pusher (4.2) rotates in the central axis. As the pusher (4.2) starts to rotate, the impact body (4.2.1) also begins to rotate. Since the channel extension (4.1.1.3) of the lock pin (4.1) is passed into the guide channel (5.2), the rotation of the lock pin (4.1) is blocked when the pusher (4.2) rotates. Impact body (4.2.1) becomes tangential to the reaction body (4.1.1) as it rotates. Thus, the impulse surface (4.2.1.1) and the reaction surface (4.1.1.1), which are inclined,

become tangent to each other at the corner points surrounding the surfaces. By being tangential of the impact body (4.2.1) to reaction body (4.1.1) at the corner points, the impact body (4.2.1) begins to push the lock pin (4.1), which is supported in the bearer (5.1) by means of stabilizing body (4.2.2). The reaction body (4.1.1), which interacts with impact body (4.2.1), performs a linear motion on the guide channel (5.2) by means of channel extension (4.1.1.3). The lock pin (4.1) is pushed by the pusher (4.2) and moves linearly in the central axis (Figure 4). The lock pins (4.1) in the two bearings (5.1) facing each other begin to approach each other along their central axes as a result of pushing by the pusher (Figure 4). The resilient member (6), its two ends passed through the gap (4.1.1.2), is compressed by the effect of the pushing force as a result of coaxial motion performed by lock pins (4.1). The centring member (5.3) centres the resilient element (6) between the two lock pins (4.1) to provide a single axial compression of the resilient member (6). In the end position where the resilient member (6) can be compressed, the lock pin (4.1) is released from the lock slot on the lid (A) (Figure 4). Thus, the locking mechanism (1) on the lid (A) is opened and separated from the body.

[0021] In this embodiment of the invention, the operation of the locking mechanism (1) during the closing is performed as follows: After the opening of the locking mechanism (1), the application of a vertical force on the lid handle (2) is finished. In this case, the lid handle (2), which is no more subjected to a vertical force, begins to rotate about the central axis of the handle leg (3) in the counter clockwise direction. By terminating of the force applied to the lid handle (2), the resilient member (6), which is compressed between the lock pins (4.1), remains in an idle state and a pushing force is applied thereon in opposite direction (Figure 5). Pushing force in opposite direction acts to the lock pin (4.1) via the gap (4.1.1.2). Under effect of said force, the lock pin (4.1) moves along the central axis on the guide channel (5.2) by means of the channel extension (4.1.1.3) in a direction to pass into lock slot. Then, as a result of the force in reverse direction applied to the resilient member (6) the surfaces of the lock pin (4.1) and the pusher (4.2) contact again. As soon as the reaction surface (4.1) in the lock pin (4.1.1.1) and the impulse surface (4.2.1.1) of the pusher (4.2) come into contact with their surfaces, the lock pins (4.1) pass into the lock slot in the lid (A) (Figure 5). Thus, the locking mechanism (1) comes to the closing position.

[0022] Thanks to the locking mechanism (1) of the present invention, it is possible to reduce the part maintenance cost and the production cost by having a small number of parts.

Claims

1. Locking mechanism (1) used to close or open the lids of the interior compartments of a vehicle basi-

cally comprising,

- at least a lid handle (2) which can perform a rotary motion by applying a force,
- at least a handle leg (3) which is connected to the lid handle (2) and can perform a rotary motion around the central axis by rotating the lid handle (2).
- **characterized by** at least a release mechanism (4) which has at least a lock pin (4.1) and at least a pusher (4.2) and which provides,

- interacting of the lid handle (2) with the lock pin (4.1) by rotating the pusher (4.2) around the central axis, whereby the lid handle rotates,
- the linear movement of the lock pin (4.1) along the central axis by pushing the lock pin (4.1) by means of the pusher (4.2) which interacts with the lock pin (4.1),
- releasing the lid (A) as a result of the linear movement of the lock pin (4.1) along the central axis.

2. Locking mechanism (1) as in claim 1, **characterized by** the lock pin (4.1), which comprises the reaction body (4.1.1) on one of its two sides and the impact surface (4.1.2.1) on the other side, wherein the impact surface contacts the lock slot such that the lock pin (4.1) performs locking and **by** having a connection body (4.1.2), which comprises the cam (4.1.2.2) ensuring the lock pin (4.1) to rest in the lock slot when it passed into there.
3. Locking mechanism (1) as in claim 2, **characterized by** the reaction body (4.1.1), which comprises reaction surface (4.1.1.1), gap (4.1.1.2) and channel extension (4.1.1.3) and which is coupled to the connection body (4.1.2) from the reaction surface (4.1.1.1) and interacts with pusher (4.2) via the inclined reaction surface (4.1.1.1).
4. Locking mechanism (1) as in claim 3, **characterized by** the channel extension (4.1.1.3), which is located on the cylindrical surface of the reaction body (4.1.1) and which helps the lock pin (4.1) to move on the guide channel (5.2) in a single axis and further preventing the lock pin (4.1) to rotate around its central axis as a result of fitting in the guide channel (5.2).
5. Locking mechanism (1) as in claim 1, **characterized by** the release mechanism (4) having a pusher (4.2), which comprises an impact body (4.2.1) and a stabilizing body (4.2.2) fixed to each other such that their central axes are coincident and a connection gap (4.2.3) passing through the centre of the impact body (4.2.1) and the stabilizing body (4.2.2).

6. Locking mechanism (1) as in claim 5, **characterized by** the stabilizing body (4.2.2), which is fitted into the rotating body (3.1) by tight fitting method and can perform a pivoting motion together with the rotary body (3.1) around the central axis of the rotating body (3.1) and which also guides the lock pin (4.1). 5
7. Locking mechanism (1) as in claim 5, **characterized by** the connection gap (4.2.3), which is passed through the stabilizing body (4.2.2) and through which the connection body (4.1.2) is passed and in which the connection body (4.1.2) can move without being exposed to friction. 10
8. Locking mechanism (1) as in claim 5, **characterized by** the impact body (4.2.1), which comprises an impulse surface (4.2.1.1) in an inclined form and can contact the reaction surface (4.1.1.1) frontal and which also comprises a connection surface (4.2.1.2) allowing the coupling to the stabilizing body (4.2.2). 15 20
9. Locking mechanism (1) as in claim 5, **characterized by** the impact body (4.2.1), which is fixed to the rotating body (3.1) by means of a tight-fitting method and which can perform a pivotal motion together with stabilizing body (4.2.2) around the central axes when the handle leg (3) rotates around the central axis by acting of a force. 25
10. Locking mechanism (1) as in claim 1, **characterized by** the release mechanism (4) comprising a pusher (4.2), which is connected to handle leg (3) and can rotate together with the handle leg (3) because of the force applied to lid handle (2) and which also provides the interacting of the reaction body (4.1.1) with the impact body (4.2.1) by being rotated. 30 35
11. Locking mechanism (1) as in claim 1, **characterized by** the release mechanism (4) comprising a pusher (4.2), which ensures that the reaction surface (4.1.1.1) and the impulse surface (4.2.1.1) are tangential to each other in such a manner that their surfaces facing each other before performing a rotary motion and which also allows the lock pin (4.1) to move linearly in direction of the central axis by pushing the lock pin (4.1) as the impulse surface (4.2.1.1) becomes tangential to reaction surface (4.1.1.1). 40 45
12. Locking mechanism (1) as in claim 1, **characterized by** the housing (5) which is a guide for the release mechanism (4) and acts as a bearing and can also be used by being mounted on the lid (A) without a necessity to use a body and which comprises a bearer (5.1), a guide channel (5.2) and a centring member (5.3). 50 55
13. Locking mechanism (1) as in claim 12, **characterized by** the guide channel (5.2) which allows the lock pin (4.1) to move linearly in the direction of the central axis and which prevents that also the locking pin (4.1) rotates around the central axis while the pusher (4.2) is pivoted around central axis.
14. Locking mechanism (1) as in claim 12, **characterized by** the resilient member (6) which is located in the gap (4.1.1.2) at the lock pin (4.2) and which allows the lock pin (4.1) to move linearly on the guide channel (5.2) by applying a force thereon and which ensures that the lock pin (4.1) moving in a direction by the applied force, opens or closes the lid (A) depending on the direction.

Figure 1

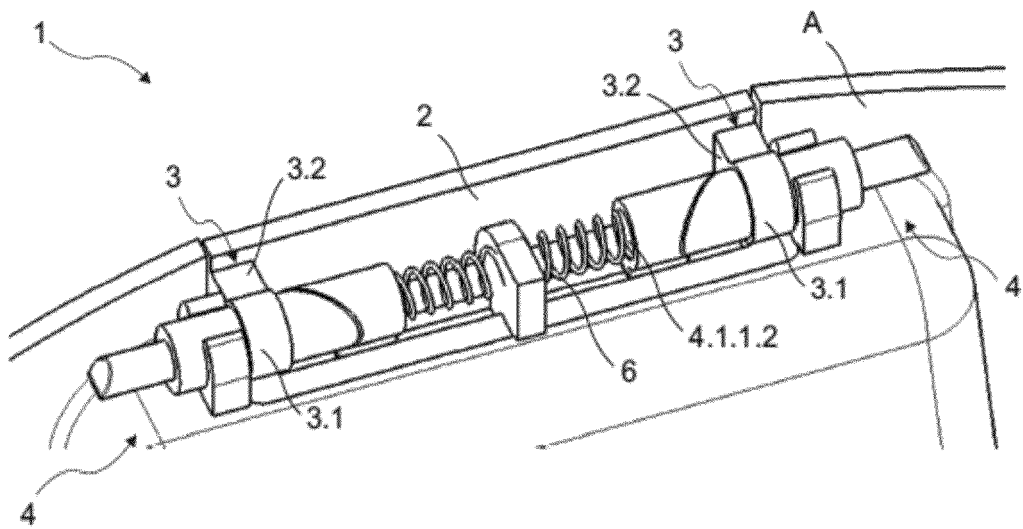


Figure 2

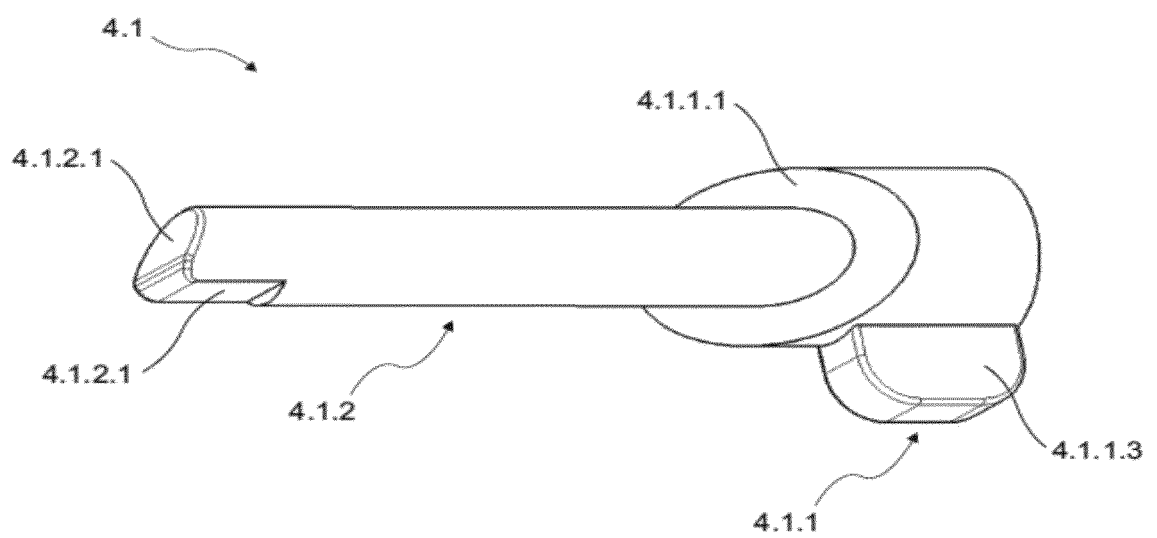


Figure 3

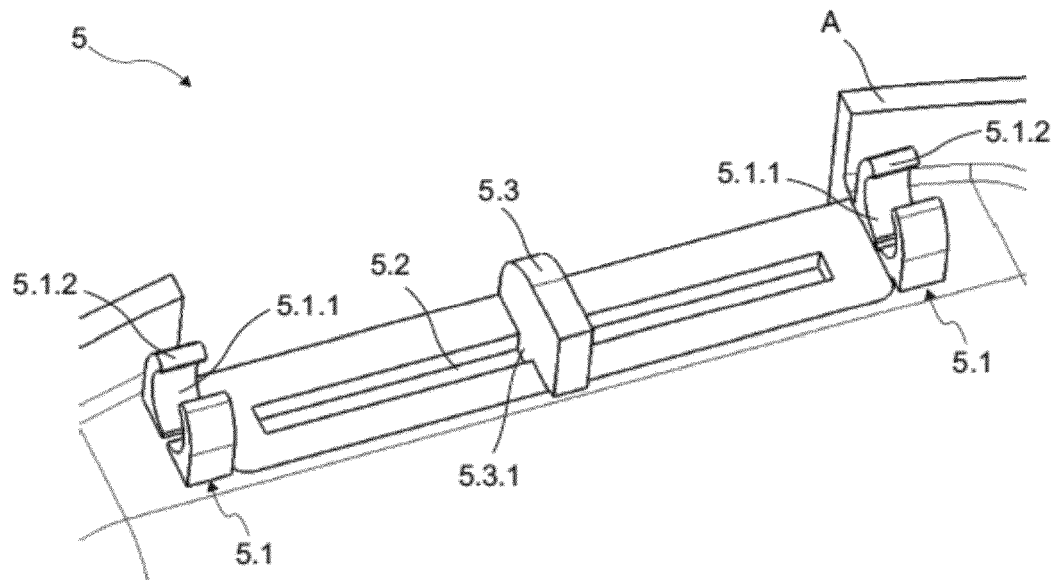


Figure 4

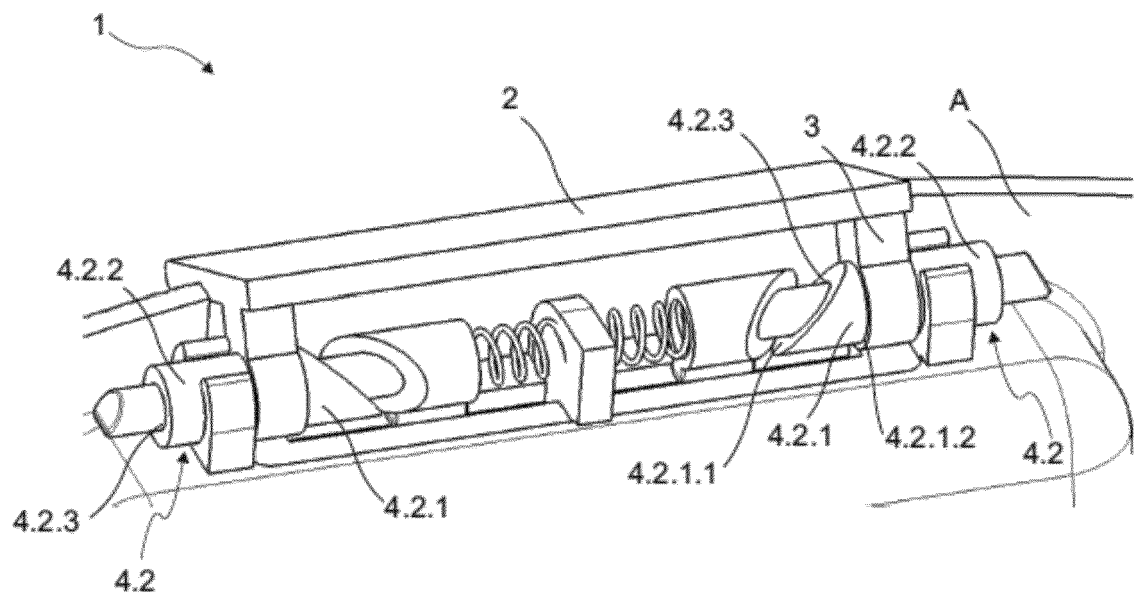
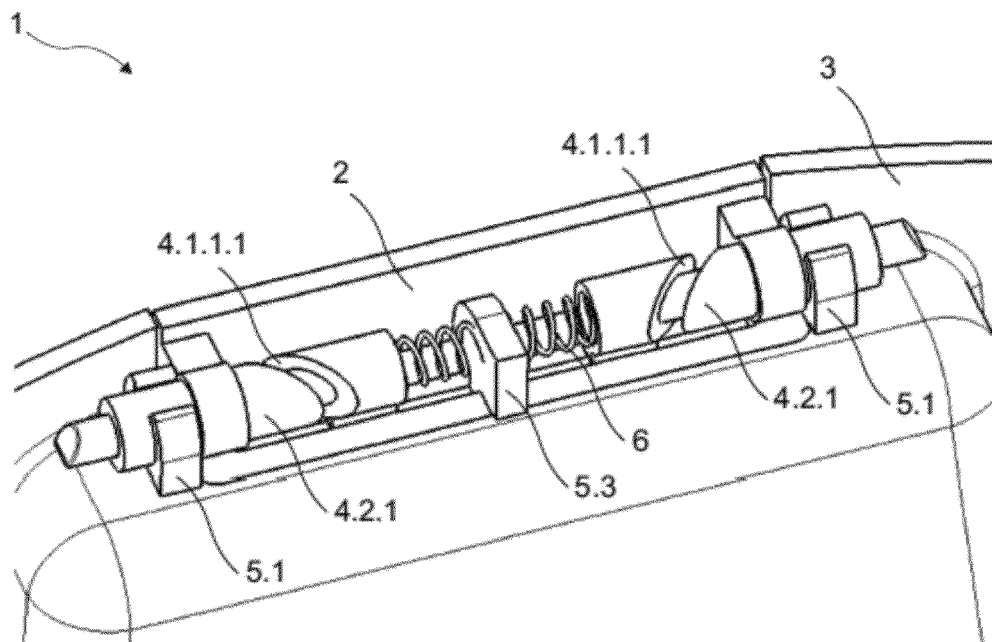


Figure 5





EUROPEAN SEARCH REPORT

Application Number
EP 18 18 9196

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 273 746 A1 (PIOLAX INC [JP]; KANTO JIDOSHA KOGYO KK [JP]) 8 January 2003 (2003-01-08)	1,2,10	INV. E05B83/30 E05C9/04
A	* paragraph [0040] - paragraph [0050]; figures 7-11 *	5-9, 11-14	
X,D	DE 103 51 980 A1 (PIOLAX INC [JP]; KANTO JIDOSHA KOGYO KK [JP]) 27 May 2004 (2004-05-27)	1-3,10, 12-14	
A	* paragraph [0046] - paragraph [0057]; figures 1-10 *	4	
A	GB 2 126 275 A (FORD MOTOR CO) 21 March 1984 (1984-03-21) * page 1, line 72 - line 99; figures 1-3 *	1	
A	US 3 298 728 A (DYE CLYDE V) 17 January 1967 (1967-01-17) * column 4, line 29 - column 5, line 24; figures 1-10 *	1,8	TECHNICAL FIELDS SEARCHED (IPC)
			E05B E05C
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 8 January 2019	Examiner Pérez Méndez, José F
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	

EPO FORM 1503 03/82 (P04C01)

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

EP 18 18 9196

5 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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08-01-2019

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1273746 A1	08-01-2003	DE 60222211 T2	29-05-2008
		EP 1273746 A1	08-01-2003
		EP 1842995 A1	10-10-2007
		US 2003006616 A1	09-01-2003

DE 10351980 A1	27-05-2004	CN 1498791 A	26-05-2004
		DE 10351980 A1	27-05-2004
		DE 10362275 B4	31-10-2012
		KR 20040041075 A	13-05-2004
		US 2004189012 A1	30-09-2004

GB 2126275 A	21-03-1984	DE 3232607 A1	15-03-1984
		FR 2532678 A1	09-03-1984
		GB 2126275 A	21-03-1984

US 3298728 A	17-01-1967	NONE	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 10351980 A1 [0003]
- CN 205894943 U [0004]
- US 4781407 A [0005]