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(54) **Lever arrangement for the safety mechanism of the rear door lock of automobile vehicles**

(57) The locking lever (1) is a basic structure shaped as a one-piece casting (2); the locking lever (1) presents a clipping projection (3), which is incorporated into one

of its sides (4) and presents a nucleus (5), which determines the condition of rotating assembly with respect to the assembly orifice provided on the specific plate (6) of the locking mechanism.

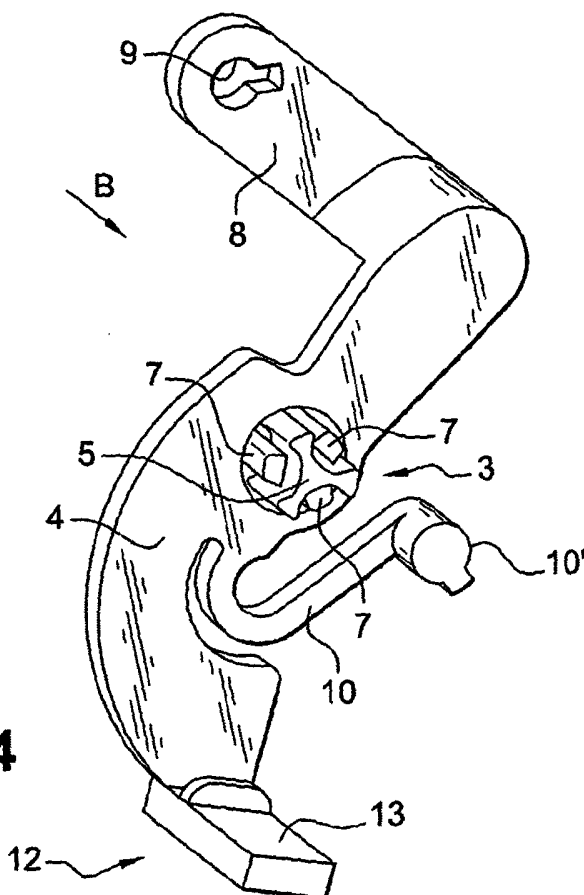


Fig. 4

Description

[0001] This invention relates to a Utility Model patent dealing with a constructive lever arrangement that incorporates the lock safety mechanism used on the rear door of an automotive vehicle. Consequently, the referred lever is differentiated from analogous components belonging to the state of the technique because its constructiveness is more efficient and a simpler assembly is required.

[0002] As is generally known, four-door automotive vehicles, especially those designed for the eventual transport of children, rely on a safety device which on being incorporated into the respective locking mechanisms of the two rear doors, inhibits them from being opened from the inside of the vehicle when the internal handle is activated. This inhibits the above-mentioned doors from accidentally being able to be opened.

[0003] This type of safety mechanism is normally operated by a lever positioned on the side of the internal panel of the rear perimeter of each of the doors. Furthermore, it can easily be operated between two basic positions, which determine whether the respective locks of the rear doors either can or cannot be opened from the inside of the vehicle.

[0004] The conventional lever is a swaged metal part anchored in a pivoting manner against an incorporated structural plate of the locking mechanism by a riveted metal pin. Furthermore, a bistable spring is provided, which when linked between the lever and the above-mentioned plate, permits the two positioning stages, which the lever can be in to be exactly determined.

[0005] Furthermore, conventional locking levers have a plastic cover that is placed on the spot where the user must effectively handle it and whose purpose is to permit more comfortable handling as well as improve the aesthetics of the above-mentioned component.

[0006] Locking levers belonging to the state of the technique, present some inconveniences due to their conventional constructiveness. The noise produced is included among these. This is due to the resonance generated by the extent of the vibrations to which the vehicle is exposed overall throughout its normal use.

[0007] Added to the effect caused by the resonance is also the issue of the metal-to-metal contact, that is, the metal of the locking lever rubbing against the structural metal on which it is pivoted. This negative aspect becomes worse when the above-mentioned components are assembled in such a way that slack is generated between them.

[0008] Another inconvenience observed in the conventional constructiveness is associated with the excessive complexity characterising the process of assembly of the locking lever belonging to the state of this technique since equipment such as radial or orbital type riveting machines must be used to execute this process of assembly, specifically to secure the metal pin to the structural plate.

[0009] The complexity of the conventional process of assembly causes further inconveniences. These are associated with the time required to assemble the components as well as with the relatively high number of components that have to be assembled, namely, the actual lever, the metal pin and the bistable spring.

[0010] The number of components involved in the conventional system seems problematic even when the factor concerning the level of greases concentrated on the centre of gravity of the shape and specifically on the locking lever is considered. Consequently, this generates an inadequate inertial moment to the system because of the spontaneous movement of the component. This factor is aggravated when materials are used with greater specific weight.

[0011] In view of what has been pointed out above, one of the aims of this utility model patent is characterised as providing a new constructiveness for the type of locking lever at issue, which is preferentially manufactured in injected plastic.

[0012] Another aim of this utility model patent rests on providing a locking lever whose system of attachment is by clipping. As a result, the metal pin used in the respective assembly is eradicated.

[0013] Furthermore, another aim of this utility model patent is to provide a new constructiveness to a different locking lever from the conventional ones belonging to the state of the technique in view of the fact that it incorporates an integrated bistable spring system in its structure, which makes use of the flexibility of the material employed to manufacture it.

[0014] Finally, one of the aims of this utility model patent is characterised as providing a locking lever that incorporates a projection for manipulation that substitutes the normal cover used in conventional components.

[0015] By virtue of the inconveniences observed in the state of the technique and with a view to the proposed aims, a constructiveness object of this utility model patent was proposed. It respectively proposes a locking lever that can be observed from the drawings listed below, of which:

Figure 1 illustrates a schematic view of a locking mechanism where the locking lever hereby dealt with is assembled. The referred lever is in its non-operating position;

Figure 2 illustrates a view of a similar locking mechanism to that presented in figure 1, where the locking lever hereby dealt with is shown in its operating position;

Figures 3 and 4 illustrate isolated views in perspective of the lever hereby dealt with;

Figure 5 illustrates a frontal view of the proposed lever, as indicated by arrow A of figure 3;

Figure 6 illustrates a view of the lever at issue, as indicated by arrow B of figure 4; and

Figure 7 illustrates a cross sectional view of the lever at issue. This is indicated by the A-A section of

figure 6.

[0016] According to what the figures listed above show, the locking lever object of this utility model patent, which is indicated as reference number 1, consists of a basic structure formed by one-piece casting 2. Such a locking lever is used in a locking mechanism of a door latch for a car and is preferentially manufactured in injected plastic, but can also be made of metal.

[0017] Locking lever 1 hereby dealt with can present physical configurations or contours that may vary according to the constructive particularities of the locking mechanism for which it is intended. For this reason, the respective configuration depicted in the figures illustrating this utility model patent, must be considered in a non-limiting way.

[0018] Regardless of the physical configuration which locking lever 1 may eventually present, the fundamental point of the present patent is that it enjoys basic constructiveness. This constructiveness, as far as the one-piece casting 2 is concerned, provides that the above-mentioned locking lever 1 will rely on clipping projection 3, which is incorporated into one of its sides 4. Clipping projection 3 presents nucleus 5, which determines the condition of rotating assembly with respect to the assembly orifice provided on specific plate 6 of the locking mechanism.

[0019] Clipping projection 3 also incorporates resilient retention flaps 7, which facilitate the anchoring of locking lever 1 to its assembly orifice on specific plate 6.

[0020] By virtue of the constructiveness of clipping projection 3, locking lever 1 can be assembled on specific plate 6 without any tools whatsoever being required to carry out this operation.

[0021] Furthermore, one-piece casting 2 presents at least one angular arm 8 with orifice 9, which is mechanically connected to the device(s) of the locking mechanism that must be activated.

[0022] Moreover, one-piece casting 2 presents a projection in the shape of resilient link arm 10 and this relies on terminal 10', which comes into contact with reference hole 11 on specific plate 6. Resilient link arm 10 acts as a bistable spring and it incorporates one-piece casting 2. These are therefore manufactured together.

[0023] One-piece casting 2 also incorporates projection 12, which is configured to present extremity 13. This extremity serves as a location from which the operator manoeuvres lever 1. For this reason, extremity 13 cited above, enjoys an ergonomic design that makes the task of handling lever 1 more comfortable.

[0024] The general constructiveness of lever 1 eradicates all the inconveniences observed in the state of the technique, that is, a) tools are not required to assemble it on specific plate 6; b) a metal pin is not required in this assembly; c) the bistable spring is not required as a separate component; d) the inconveniences regarding the contact of metal against metal are eliminated; e) it has less specific weight; and f) it incorporates

an ergonomically planned manoeuvring point and the use of separate parts is not required.

5 Claims

1. Lever arrangement for the safety mechanism of the rear door lock of automobile vehicles, where the locking lever (1) is **characterised by** the fact that it is a basic structure shaped as a one-piece casting (2); the locking lever (1) presents a clipping projection (3), which is incorporated into one of its sides (4) and presents a nucleus (5), which determines the condition of rotating assembly with respect to the assembly orifice provided on the specific plate (6) of the locking mechanism.
2. Lever arrangement as to claim 1, **characterized by** the fact that said locking lever (1) is preferentially manufactured in injected plastic.
3. Lever arrangement as to claim 1 or 2, **characterized in that** the clipping projection (3) also incorporates resilient retention flaps (7), which facilitate the anchoring of the locking lever (1) to its assembly orifice on the specific plate (6).
4. Lever arrangement as to any one of claims 1 to 3, **characterized in that** the one-piece casting (2) presents at least one angular arm (8) with an orifice (9) which is mechanically connected to the device (s) of the locking mechanism that must be activated.
5. Lever arrangement as to any one of claims 1 to 4, **characterized in that** the one-piece casting (2) also presents a projection in the shape of a resilient link arm (9) and this relies on the terminal (10), which comes into contact with the reference hole (11) on the specific plate (6) and **in that** the resilient link arm (9) is realized in order to act as a bistable spring and it incorporates the one-piece casting (2).
6. Lever arrangement as to any one of claims 1 to 5, **characterized in that** the one-piece casting (2) also incorporates a projection (12), which is configured to present an extremity (13), that serves as a location from which the operator manoeuvres lever 1 since the extremity (13) enjoys an ergonomic design.

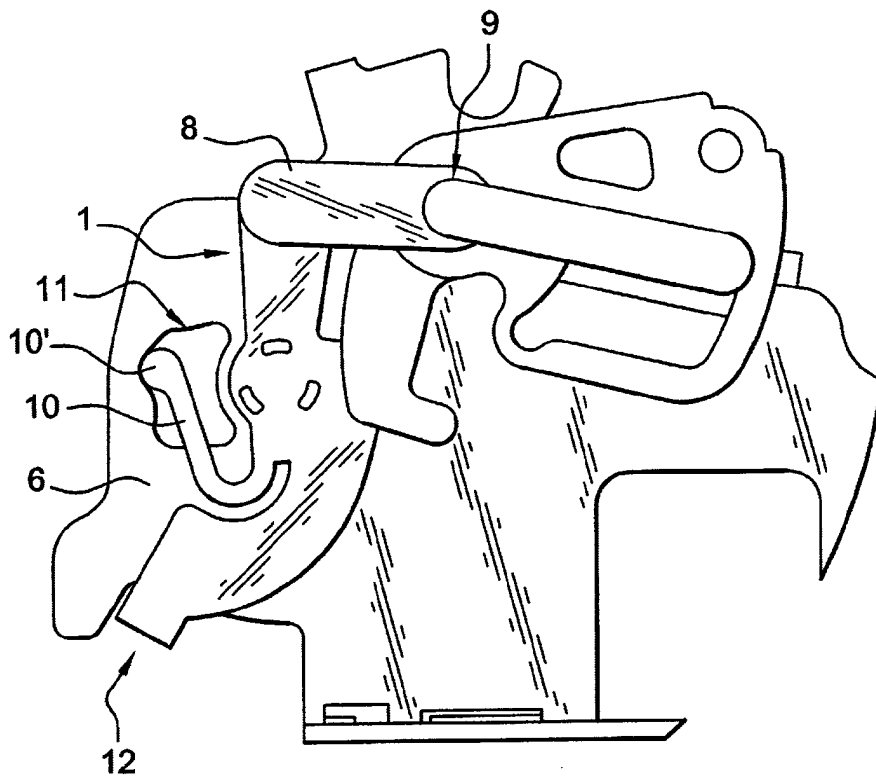


Fig. 1

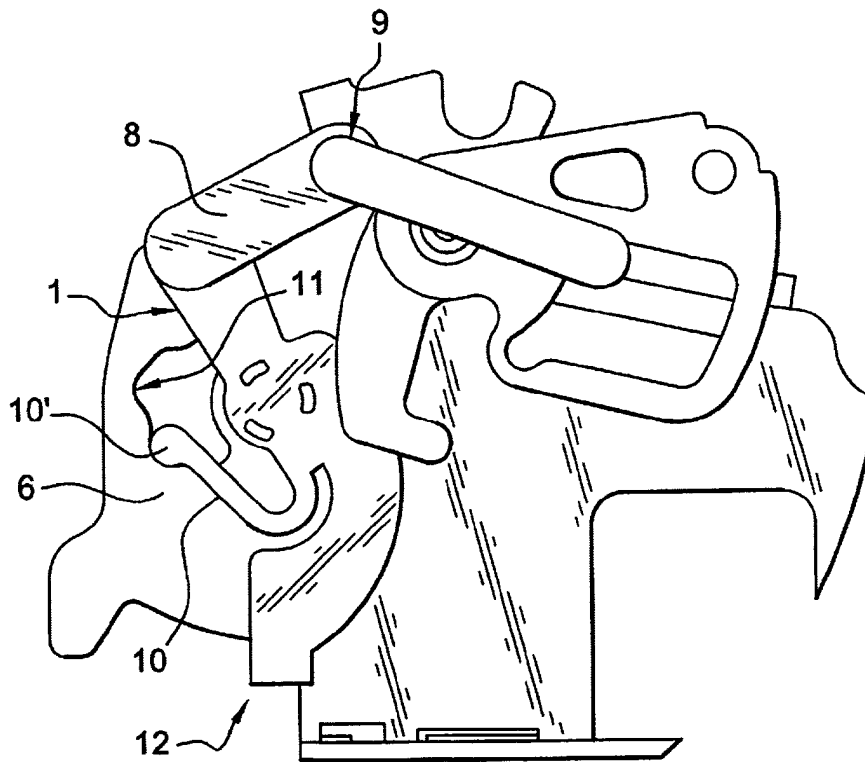


Fig. 2

