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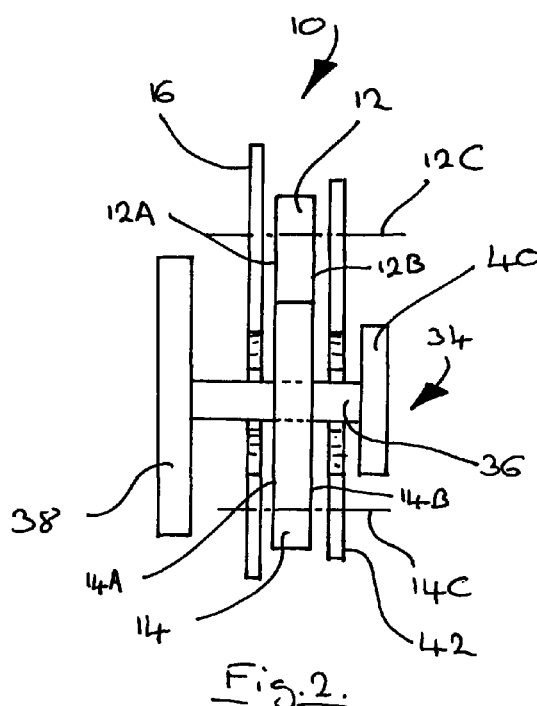
(71) Applicant:
Meritor Light Vehicle Systems (UK) Ltd
Birmingham B30 3BW (GB)

(72) Inventors:
• **Fisher, Sidney Edward**
Stirchley, Birmingham B30 8BW (GB)
• **Spurr, Nigel Victor**
Stirchley, Birmingham B30 8BW (GB)
• **Bland, Timothy**
Stirchley, Birmingham B30 8BW (GB)

(74) Representative:
Jones, John Bryn et al
Withers & Rogers,
Goldings House,
2 Hays Lane
London SE1 2HW (GB)

(54) **Latch mechanism**

(57) A latch mechanism(10) having a latch bolt(14) for releasably securing a striker(34) in a closed position, the latch bolt being movably mounted on a chassis(16) of the latch mechanism, and a pawl(12) movably mounted on the chassis and engageable with the latch bolt to releasably secure it in a closed position, the latch mechanism further including a limiting member mounted in the chassis, the limiting member being positioned adjacent the pawl and latch bolt so as to limit relative movement therebetween by co-operation with an engagement portion of the striker when the striker is secured in the closed position following the application of an abnormal load to the latch mechanism.



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Description

[0001] The present invention relates to latch assemblies and in particular to latch assemblies for releasably securing vehicle doors when such doors are in a closed position.

[0002] When known latch assemblies are used in car doors, and the car has subsequently been involved in a road accident where an impact has deformed the door, the very act of deforming the door has been known to cause the latch assembly to unlatch and allow the door to open.

[0003] It is generally recognised that occupants of a vehicle which is involved in an accident are safer if they remain inside the vehicle during the accident and immediately thereafter until, for example, the vehicle comes to a stop or is no longer in danger. The presence of an open door during an accident increases the chance of an occupant being injured. Furthermore, the structural rigidity of a vehicle passenger cell is enhanced if all doors remain shut.

[0004] A typical vehicle door latch mechanism essentially comprises a rotatable claw mounted on the vehicle door which co-operates with a striker pin mounted on the vehicle body. The action of closing the door causes the claw to rotate to a closed position whereupon it engages and retains the striker pin. The claw is maintained in the closed position by a sprung pawl which abuts an appropriately shaped portion of the claw. In the event of an accident, forces experienced by the latch mechanism can lead to relative movement between the claw and pawl, with the result that the two become misaligned and the pawl no longer maintains the claw in the closed position.

[0005] The present invention seeks to provide a latch mechanism which is less likely to unlatch during an accident.

[0006] According to the present invention there is provided a latch mechanism having a latch bolt for releasably securing a striker in a closed position, the latch bolt being movably mounted on a chassis of the latch mechanism, and a pawl movably mounted on the chassis and engageable with the latch bolt to releasably secure it in a closed position, the latch mechanism further including a limiting member mounted in the chassis, the limiting member being positioned adjacent the pawl and latch bolt so as to limit relative movement therebetween by co-operation with an engagement portion of the striker when the striker is secured in the closed position following the application of an abnormal load to the latch mechanism.

[0007] In a preferred embodiment the limiting member is configured so as to substantially surround a portion of the striker when the striker is secured in the closed position. The limiting member may be substantially planar and provided with a mouth adapted to receive said portion of the striker.

[0008] An embodiment of the invention will now be

described with reference to the accompanying drawings in which:

Figure 1 shows a diagrammatic side view of a latch mechanism according to the present invention; and Figure 2 shows the end view indicated by arrow A in figure 1.

[0009] Referring to the drawings there is shown a latch mechanism generally designated 10. The mechanism 10 includes a pawl 12, a latch bolt in the form of a claw 14, and a retention plate 16. The pawl 12 is pivotally mounted via a pawl pivot 20 which is connected to the retention plate 16. In the embodiment shown the pawl pivot 20 is defined by a pin extending from the retention plate 16. The pawl 12 includes a pawl engagement portion 22.

[0010] The retention plate 16, in conjunction with further components of the latch mechanism 10 (not shown) which do not move relative to the retention plate 16 during use, form a chassis of the latch mechanism.

[0011] The claw 14 is pivotally mounted on a claw pivot 24 which is secured to the retention plate 16. In the embodiment shown the claw pivot 24 is defined by a pin extending from the retention plate 16. The claw 14 includes a claw jaw 26 and a claw closed engagement portion 28 and a claw first safety engagement portion 30. The retention plate 16 includes a mouth 32.

[0012] In use, the claw jaw 26 releasably secures a striker 34 in the mouth 32 of the retention plate 16. The claw 14 can be secured in its closed position, as shown in figure 1, by the pawl 12, and in particular by abutment of the pawl engagement portion 22 with the claw closed engagement portion 28. The striker 34 comprises a pin 36 having at opposite ends thereof a base 38 and an end flange 40. In use, the base 38 of the striker 34 is secured at a location of a vehicle body.

[0013] Known release means allow the pawl 12 to be rotated anticlockwise when viewing figure 1 to disengage the pawl engagement portion 22 from the claw closed engagement portion 28, to allow the claw 14 to rotate in an anticlockwise direction and thus release the striker 34 from the mouth 32.

[0014] As can best be seen from figure 2, the pawl 12 and claw 14 are substantially planar having respective first planar sides 12A and 14A, and second planar sides 12B and 14B. The retention plate 16 is positioned on the respective first sides 12A, 14A of the pawl 12 and claw 14. The pawl 12 and claw 14 are pivotable about respective pivot axes 12C and 14C which, in the embodiment shown, are substantially parallel.

[0015] Under abnormal conditions, such as when the latch mechanism is secured in a door of a vehicle and the door receives a side impact during a road traffic accident, the retention plate 16 can be distorted with the result that the alignment pivot axes 12C and 14C changes. This can lead to the pawl engagement portion becoming misaligned with the claw closed engagement

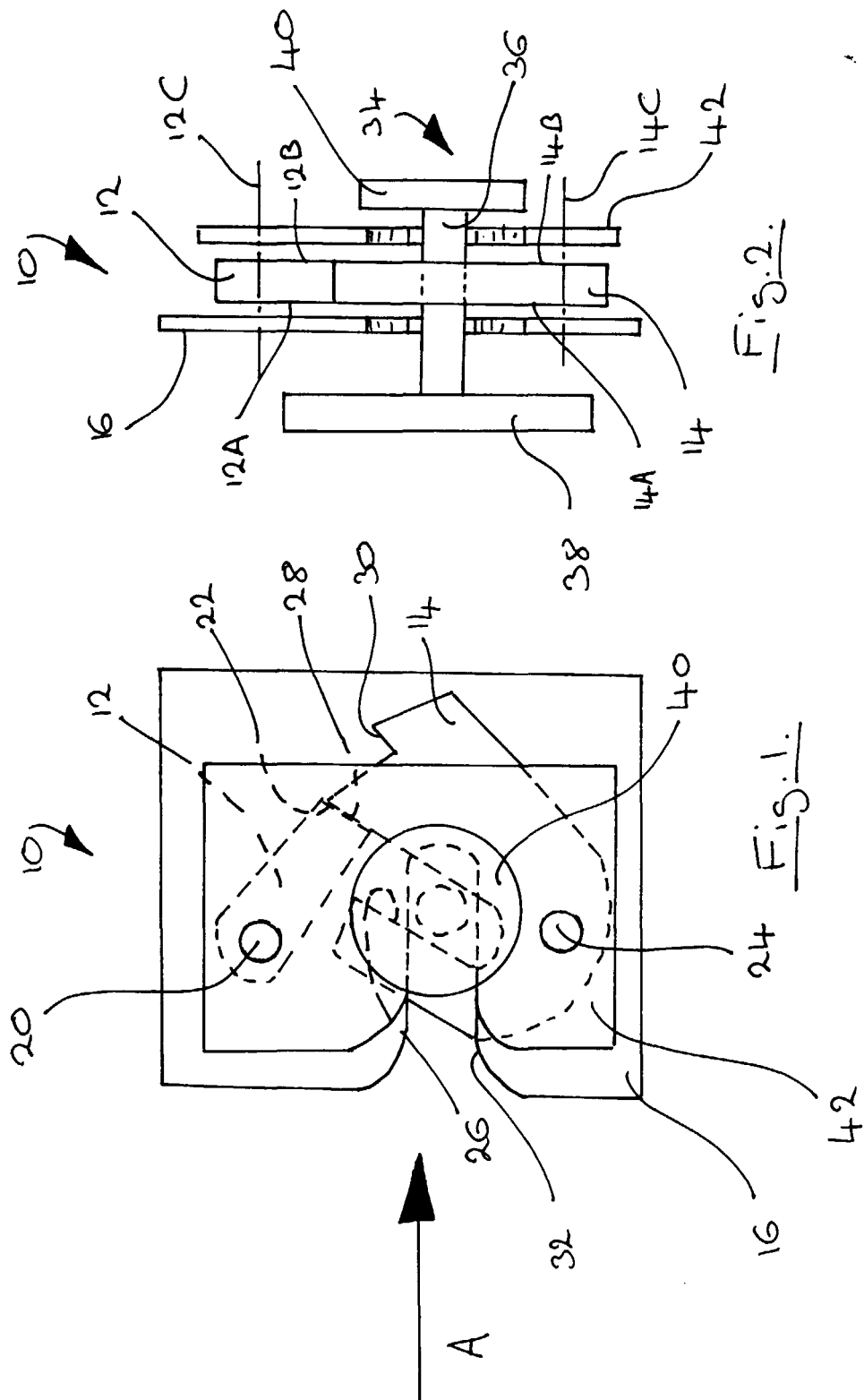
portion 28, and thereby allowing the door to open.

[0016] To counter this eventuality, the latch mechanism 10 is provided with a substantially planar striker engagement plate 42 within the chassis of the latch mechanism. The striker engagement plate 42 is positioned in the chassis such that it lies on the respective second sides 12B,14B of the pawl 12 and claw 14. In the embodiment shown striker engagement plate 42 is arranged substantially parallel to the retention plate 16 and may be carried by the pins defining the pawl and claw pivots 20,24.

[0017] In use, and as shown in the figures, the claw jaw 26 releasably secures the striker 34 both in the mouth 32 of the retention plate 16 and a corresponding mouth 44 of the striker engagement plate 42. As can be readily seen from figure 2, when the claw jaw 26 is secured to the striker 34, the striker engagement plate 42 is positioned between the claw 12 and pawl 14 and the end flange of the 40 of the striker 34. Under the abnormal conditions described above, the striker engagement plate 42 acts to resist misalignment of the pawl 12 and claw 14. Movement of the claw 12 and/or pawl 14 can result in each or either of them moving into contact with the retention plate 16 and/or the striker engagement plate 42, with the plates 16,42 then acting to constrain further movement of the claw 12 and/or pawl 14. The proximity of the striker engagement plate 42 to the striker end flange 40 (the spacing therebetween is exaggerated in figure 2), means that any distortion or flexing of the striker engagement plate 42 causes it to abut the end flange 40. Further distortion or flexing of the striker engagement plate 42 is resisted by the end flange 40.

Claims

1. A latch mechanism having a latch bolt for releasably securing a striker in a closed position, the latch bolt being movably mounted on a chassis of the latch mechanism, and a pawl movably mounted on the chassis and engageable with the latch bolt to releasably secure it in a closed position, the latch mechanism further including a limiting member mounted in the chassis, the limiting member being positioned adjacent the pawl and latch bolt so as to limit relative movement therebetween by co-operation with an engagement portion of the striker when the striker is secured in the closed position following the application of an abnormal load to the latch mechanism.
2. A latch mechanism as claimed in claim 1, the chassis including a retention plate situated on a first side of the pawl and latch bolt and having a mouth to receive the striker, wherein the limiting member is situated in the chassis on a second side of the pawl and latch bolt such that the pawl and latch bolt are between the retention plate and limiting member.
3. A latch mechanism as claimed in any preceding claim wherein the limiting member is provided with a mouth to receive the striker.
4. A latch mechanism as claimed in claim 3 wherein the engagement portion of the striker is larger than the mouth of the limiting member.
5. A latch mechanism as claimed in claim 4 wherein the engagement portion is defined by a flange of the striker.
6. A latch mechanism as claimed in claim 5 wherein the limiting member is positioned between the second sides of the pawl and latch bolt and the flange of the striker when the striker is secured in the closed position.
7. A latch mechanism as claimed in any preceding claim, the chassis including pins about which the pawl and lock bolt are movably mounted, wherein the limiting member is located on said pins.
8. A latch mechanism as claimed in any preceding claim wherein the limiting member is substantially planar.
9. A latch mechanism substantially as hereinbefore described with reference to or as shown in the accompanying drawings.





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EUROPEAN SEARCH REPORT

Application Number
EP 00 30 6055

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Place of search	Date of completion of the search	Examiner	
MUNICH	23 November 2000	Vacca, R	
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 00 30 6055

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