PATENT SPECIFICATION (11) 1 591 005

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(21) Application No. 10405/78 (32) Filed 16 March 1978 (19)
(31) Convention Application No. 52/050 200U
(32) Filed 20 April 1977 in
(33) Japan (JP)
(44) Complete Specification published 10 June 1981
(51) INT. CL.³ E05B 63/00
(52) Index at acceptance
E2A 106 401 PA

(54) DOOR LOCKING MECHANISM

(71) We, AISIN SEIKI KABUSHIKI KAISHA, a corporation organised and existing under the laws of Japan, of 1 Asahi-Machi, 2-chome, Kariya city, Aichi Pref., Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to door locking mechanisms, particular to such mechanisms adapted for use in motor vehicles.

In general, the noise produced upon door closing is offensive to the ear, and it is desirable that a door locking mechanism should be as quiet as possible in use. The noise arises basically because in a mechanism with a latch, a pawl detent and a striker, those members are made of metal and the metal-to-metal contact during door closure produces the undesirable impact noise. We have found that the noise of the pawl detent contacting the latch member is far larger than the noise of the striker member contacting the latch member.

The invention comprises a door locking mechanism for a motor vehicle, comprising a rotary latch member for receiving a striker and a pawl detent assembly which comprises a first surface for contacting and following a cam face of the latch member and a second surface for engaging behind one or more latch teeth of the latch member to retain the latch member in a latching condition, wherein the first surface of the pawl detent assembly is formed on a shock absorbing member secured in a recess in a body portion of the pawl detent assembly. The shock absorbing member serves to reduce the noise of door closure considerably. Preferably the shock absorbing member is made of a flexible material, for example a plastics material. The recess may be reentrant to secure the shock absorbing member therein.

The invention is hereinafter particularly described, by way of example only, with reference to the drawings, of which:

Figure 1 is a side elevation of a door locking mechanism according to the invention, with a side plate removed, being in the unlocked condition.

Figure 2 is an elevation similar to that of Figure 1, but with the mechanism in a partially locked condition; and

Figure 3 is an exploded view, on an enlarged scale, of the pawl detent of Figure 1.

In Figures 1 and 2, the door lock comprising a main body 10 made of a plastics material, provided with a recess 11. A rotary latch member 12 engages a striker member 13 and a pawl detent assembly 14. The latch member 12 and pawl detent assembly 14 are rotatably mounted within the recess 11 by shafts 15 and 16 respectively.

The main body 10 is clamped between side plates, of which one is removed from Figures 1 and 2 to show the internal parts of the mechanism. The mechanism is in use secured to a door through mounting holes 17. A groove 18 is formed within the recess 11 of the main body 10 and is accessible through a slot in the side plate that is not shown in Figures 1 and 2, to allow the striker member 13 to engage the rotary latch member 12 on door closure. The latch member 12 is provided with a slot 19 for receiving a leading limb of the striker member 13, and with latching teeth 20 and 21, engageable by the pawl detent 14. Engagement of the pawl detent assembly 14 with the tooth 20, as in Figure 2, represents a half latched condition and engagement with the tooth 21 represents a fully latched condition. The pawl detent assembly 14 is urged by a spring 22 anticlockwise as viewed in the drawings into engagement with the teeth. A pin 43 operatively connects the pawl detent assembly 14 with an opening lever (not shown) and is displaceable with an elongated hole 24 of the recess 11.

A shock absorbing member 25 is inserted into a shaped groove 26 which is formed through the entire width of a body portion of the pawl detent assembly in the zone of its engagement with the latch member 12.

The shock absorbing member 25 is made of a flexible plastics material, and comprises an initially flat plate portion 27 which is deformed into an arcuate shape as indicated in chain-dotted lines in Figure 3 when the member 25 is inserted into the groove 26. The deformation of the plate portion 27 causes its end portions to press closely into contact with faces 28 and 29 of the groove 26, the central portion of the shock absorbing member 25 being retained in an inwardly divergent portion of the groove 26.

The operation of the door locking mechanism is as follows.

When the striker member 13 moves to the right into the groove 18, the leading limb of the striker member enters the slot 19 of the latch member 12. The latch member 12 is rotated anticlockwise about the shaft 15 by a further rightward displacement of the striker member 13 until the leading edge of the tooth 20 of the latch member 12 contacts a first surface of the pawl detent 14 as shown in Figure 1. However, the shock absorbing member 25 is provided where the latch member 12 contacts the pawl detent 14, so that the impact is absorbed by the flexibility of the shock absorbing member 25, reducing or eliminating the noise of impact.

When the striker member 13 is further rightwardly displaced in the groove 18, the latch member 12 is rotated further anticlockwise about the shaft 15, until the tooth 20 passes behind the pawl detent 14 against the bias of the spring 22, to obtain the half latching condition of Figure 2. At this stage the pawl detent 14 moves vigorously into contact with the latch member 12, but the noise of impact is reduced or eliminated by the cushioning effect of the shock absorbing member 25.

When the striker member 13 reaches the right end of the groove 18, the tooth 21 passes behind a second surface 14^1 of the pawl detent 14, which enters the mouth of the recess to establish the full latching condition of the mechanism.

WHAT WE CLAIM IS:—

1. A door locking mechanism for a motor vehicle, comprising a rotary latch member for receiving a striker and a pawl detent assembly which comprises a first surface for contacting and following a cam face of the latch member and a second surface for engaging behind one or more latch teeth of the latch member to retain the latch member in a latching condition, wherein the first surface of the pawl detent assembly is formed on a shock absorbing member secured in a recess in a body portion of the pawl detent assembly.

2. A door locking mechanism according to claim 1, wherein the shock absorbing member is made of a flexible material.

3. A door locking mechanism according to claim 2, wherein the shock absorbing member is made of a plastics material.

4. A door locking mechanism according to claim 2 or claim 3, wherein the shock absorbing member is secured in the recess in a deformed condition such that its ends are resiliently urged into contact with the body portion of the pawl detent assembly.

5. A door locking mechanism according to claim 4, wherein the recess is reentrant to secure the shock absorbing member therein.

6. A door locking mechanism for a motor vehicle, substantially as particularly described herein with reference to the drawings.

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Printed for Her Majesty's Stationery Office by Burgess & Son (Abingdon), Ltd.—1981
Published at The Patent Office, 25 Southampton Buildings, London, WC2A 1AY,
from which copies may be obtained.

1591005 COMPLETE SPECIFICATION

1 SHEET *This drawing is a reproduction of the Original on a reduced scale*

FIG.1

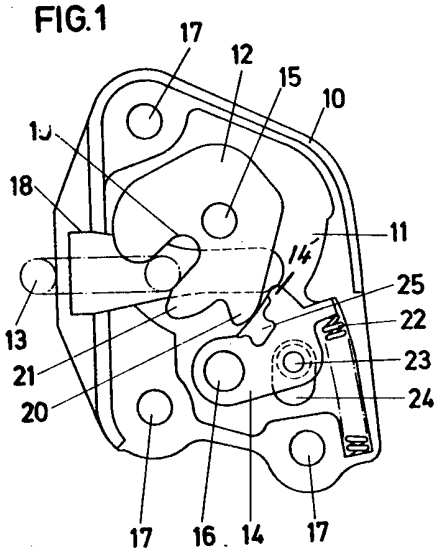

FIG. 2

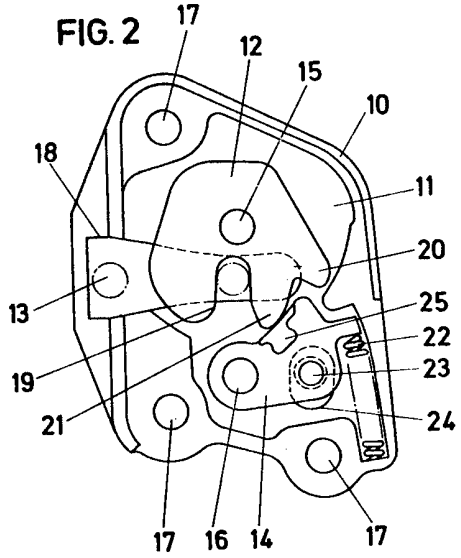

FIG.3