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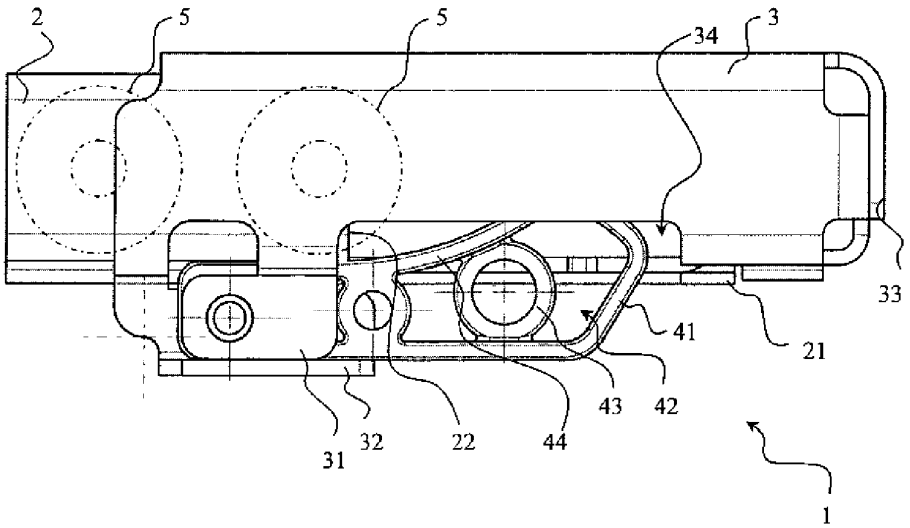
(54) Improved stop mechanism for sliding doors

(57) The present invention relates to a mechanism that enables the sliding doors used especially in vehicles to be held open at a certain position and reduces the variability in the force that is to be applied during the stop and release of the sliding door and that provides a good holding with fewer components, comprising; at least one track (2) with at least one track end (21) on which the door desired to be held in a certain position moves by means of at least one guiding roller (5); at least one door stop bracket (3) allowing the insertion of the parts forming the mechanism to the track end (21); at least one compression member (4) provided with a compression member hole (42) allowing the minimization of force variability therein, and with a compression arm(41) going between two consecutive guiding rollers (5) and compressing them, thereby preventing undesired movement of the door; at least one connection member used for connecting the door stop bracket (3) with the compression member (4).

Fig 2



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Description

Technical Field

[0001] The present invention relates mechanisms enabling the sliding doors, used especially in vehicles, to be kept open in a certain position.

Prior Art

[0002] Today, various stop mechanisms are provided in sliding door systems in order to the sliding door to be held in an open position. In general, spring systems (passive door stop) are used in sliding door stop mechanisms. In such systems, a flexible part compresses guide rolls of the movable sliding door, thereby enabling the door to be stopped. As a result of process inputs and part tolerances (INOX-AISI 302, SH, DH, SM, DM, SL, or spring made of spring steel, bracket holding spring lugs, etc.), high variability occurs in closing force of the sliding door in such mechanisms. This variability is about 60N and causes difficulties in releasing the door after having been fixed, or in being fixed while it is free.

[0003] Today, in mechanisms holding sliding door, generally only a wheel or roller is held and compressed by flexible part. This, in turn, necessitates forming complicated bevels in order to the wheel to be fixed thereto; moreover, variances in forces during locking/releasing of the wheel are high due to the increased tolerance importance. In such wheeled systems, a good door holding cannot be achieved despite the above mentioned disadvantages; thus, additional parts are used in order to prevent the door from slamming. Known holding/locking mechanisms cause inconveniences during use with their variable holding forces, do not operate stably, and are difficult to mount due to the excess number of the parts used.

[0004] In Korean Patent Document numbered KR 20090038754, a stop mechanism, wherein the door is stopped by compressing the wheel of the sliding door by means of the flexible attachment fixed to a frame with lower and upper rails, and wherein the impact is reduced by means of a pad, is disclosed. In Japanese Patent Document numbered JP 2005307498, a mechanism comprising a flexible member and a magnet for holding a sliding door in open position and for preventing the wheel from bouncing is disclosed.

Brief Description of the Invention

[0005] The object of the present invention is to introduce an improved sliding door stop mechanism that will reduce the variability in the force that is to be applied during the stop and release of the sliding door.

[0006] Another object of the invention is to introduce an improved sliding door stop mechanism allowing a good holding with fewer components, thereby requiring less mounting time and providing lower cost.

Detailed Description of the Invention

[0007] An improved sliding door stop mechanism developed for achieving the objects of the present invention is shown in the attached drawings, in which;

Fig. 1 is the perspective view of the improved sliding door stop mechanism according to the invention.
Fig. 2 is the top view of the improved sliding door stop mechanism according to the invention, with the sliding door guiding rollers in free position.
Fig. 3 is the top view of indication of the guiding rollers of the improved sliding door stop mechanism when the door is stopped according to the invention.

[0008] The parts in the figures are numbered individually and the corresponding numbers of these parts are given below.

1. Improved sliding door stop mechanism
2. Track
21. Track end
22. Track recession
23. Track hole
3. Door Stop Bracket
31. Door Stop Bracket Fixing Flange
32. Door Stop Bracket Supporting Flange
33. Door Stop Bracket End
34. Door Stop Bracket Hole
4. Compression member
41. Compression arm
42. Compression member hole
43. Compression member filling
44. Inclined contact surface
5. Guiding roller

[0009] An improved sliding door stop mechanism (1) that provides the reduced variability of the force which is applied during the stop and the release of the sliding door and also provides a good holding with fewer components, comprising the following;

- at least one track (2) with at least one track end (21), on which the door desired to be held in a certain position, moves by means of at least one guiding roller (5),
- at least one door stop bracket (3) allowing the insertion of the parts forming the mechanism to the track end (21),
- at least one compression member (4) provided with at least one compression member hole (42) allowing the minimization of force variability, and with at least one compression arm (41) going between two consecutive guiding rollers (5) and compressing them, thereby preventing undesired movement of the door.

[0010] In a preferred embodiment of the invention, a track hole (23) is provided in track end (21) side where

the track (2), on which the door moves, terminates such that the compression member (4) will extend in the inner hole of the track (2) where the guiding rollers (5) move. This track hole (23) is limited to a track recession (22) provided in one side of the track (2) with a fixed hole, the said recession not changing the section, and preferably, it extends till the track end (21) point. (Fig. 1,2)

[0011] A door stop bracket (3) preferably produced of sheet metal by being bent is inserted into track end (21) such that it will seize the track (2) from the outside and prevents the guiding roller (5) from removing off the end of the rail/track (2) by means of the door stop bracket end (33). In a preferred embodiment of the invention, a door stop bracket hole (34) is provided again such that the compression member (4) will extend into the track (2) inner hole where the guiding rollers (5) move. In a preferred embodiment of the invention, the door stop bracket (3) is fixed to the end of the track (2) by welding. (Fig. 1)

[0012] In a preferred embodiment of the invention, the compression member (4) has smooth surface edges along the periphery thereof in parallel with the rotating axes of the guiding rollers (5) and it is provided with a compression arm (41) formed by raising this surface such that it will be fitted between the guiding rollers. Provided in one side of this compression arm (41) is an inclined contact surface (44) to which the guiding roller (5) will contact first during the opening of the door, the said inclined contact surface enabling the compression member (4) to be easily pushed outward. In a preferred embodiment of the invention, the compression member hole (42), minimizing the variability in guiding roller (5) insertion force, is preferably formed by completely emptying it in parallel with the outer surfaces such that it will form a wall thickness along the periphery of compression member (4). In another preferred embodiment of the invention, at least one filling compression member (43) which contacts the walls forming the compression member hole (42) and which enables the compression member (4) to be elastically deformed without being subject to plastic deformation; and the said compression member filling (43) preferably has a ring section and extends in the rotational axis of the guiding roller (5). (Fig. 1,2)

[0013] In another preferred embodiment of the invention, the fixing process of the compression member (4) to the mechanism (1) is performed by means of the door stop bracket support flange (32) and door stop bracket fixing flange (31) again formed by bending and provided on the door stop bracket (3). For example, the compression member (4) can be fixed by passing at least one connection member through reciprocal holes in the Door stop bracket fixing flange (31) and door stop bracket support flange (32). The connection member is made pass through a hole formed in compression member (4) as well and fixed, as known. This connection member is preferably a rivet. In a preferred embodiment of the invention, Door stop bracket support flange (32) is a bit more elongated and is bent such that the compression member (4) will not be able to rotate by attaching the door to the mechanism (1) and applying pressure on the guiding rollers (5), and it is leaned on the outer surface of the compression member (4). (Fig. 1)

[0014] In a preferred embodiment of the invention, a compression member (4) made of plastic material is used so as to minimize the variability in force.

[0015] When the door is given the position in which it is to be held open, of the two guiding rollers (5) in the track, preferably the one that is further with respect to opening direction contacts the compression arm (41) in the mechanism located in the end of the lower, middle, or upper rail/Track of the door vehicle. The guiding roller (5) contacting the inclined contact surface (44) of the compression arm (41) elastically deforms the compression member (4) and pushes outward. When the guiding roller (5) contacting the compression member (4) contacts the highest point of the compression arm (41) and pushes the compression member (4) to the outermost section, the critical point is achieved and, with a little more pushing, the compression arm (41) fits between the two guiding rollers (5) and hold the door in place. Likewise, when the door is pushed otherwise, the door becomes free by pushing the compression member (4) by another inclined contact surface (44) provided in the other side of the compression arm (41).

[0016] The door is enabled to be held in open or closed position in a stable manner by the help of the compression member holes (42) and compression member fillings (43) in the form of ring, , without breaking or plastically deforming the compression member (4); at the same time, the variability in opening/closing force of the sliding door is reduced. Thanks to the compression member (4) attached by a rivet and to the simple and single-piece door stop bracket (3) engaged in one end of the track (2), a good hold is achieved with fewer components, and thus reducing the mounting time and cost of the mechanism.

[0017] It is possible to develop various applications of the improved sliding door stop mechanism (1) according to the invention without drifting away from this main concept, and the invention cannot be limited to the examples explained herein, but it is mainly as in the claims below.

Claims

1. An improved sliding door stop mechanism (1) reducing the variability in the force that is to be applied during the stop and release of the sliding door and providing a good holding with fewer components; comprising at least one track (2) with at least one track end (21), on which the door desired to be held in a certain position moves by means of at least one guiding roller (5), and
characterized in that it comprises;

    - at least one door stop bracket (3) allowing the insertion of the parts forming the mechanism to

the track end (21),
- at least one compression member (4) provided with at least one compression member hole (42) allowing the minimization of force variability, and with at least one compression arm (41) going between two consecutive guiding rollers (5) and compressing them, thereby preventing undesired movement of the door;
- and at least one connection member used for connecting the door stop bracket (3) with the compression member (4).

2. An improved sliding door stop mechanism (1) according to Claim 1; **characterized in** comprising a track hole(23) provided in track end (21) side where the track (2), on which the door moves, terminates such that the compression member (4) will extend in the inner hole of the track (2) where the guiding rollers (5) move.

3. An improved sliding door stop mechanism (1) according to Claim 1 or Claim 2; **characterized in** comprising a track hole(23) extending till the track end (21) point.

4. An improved sliding door stop mechanism (1) according to any one of the preceding Claims; **characterized in** comprising a track recession (22) limiting the track hole(23) such that the section of the track (2), the said section being a fixed section, from a direction.

5. An improved sliding door stop mechanism (1) according to any one of the preceding Claims; **characterized in** comprising a door stop bracket (3) produced of sheet metal by being bent and fixed to the track end (21) such that it will seize the track (2) from the outside.

6. An improved sliding door stop mechanism (1) according to any one of the preceding Claims; **characterized in** comprising at least one door stop bracket end (33) preventing the guiding roller (5) from removing off the end of the track (2).

7. An improved sliding door stop mechanism (1) according to any one of the preceding Claims; **characterized in** comprising a door stop bracket hole (34) formed such that the compression member (4) will extend in the inner hole of the track (2) where the guiding rollers (5) move.

8. An improved sliding door stop mechanism (1) according to any one of the preceding Claims; **characterized in** comprising a compression member (4) with smooth surface edges along the periphery thereof, in parallel with the rotating axes of the guiding rollers (5).

9. An improved sliding door stop mechanism (1) according to any one of the preceding Claims; **characterized in** comprising a compression arm (41) formed by raising at least one side of the compression member (4) such that it will be fitted between the consecutive guiding rollers, when the door is given the position in which it is desired to be stopped.

10. An improved sliding door stop mechanism (1) according to any one of the preceding Claims; **characterized in** comprising at least one inclined contact surface (44) provided in at least one side of the compression arm (41) and to which the guiding roller (5) will contact while the door is taken to and from the position in which it will be stopped and which will enable the compression member (4) to be easily pushed outward.

11. An improved sliding door stop mechanism (1) according to any one of the preceding Claims; **characterized in** comprising a compression member hole (42) formed by completely emptying it in parallel with the outer surfaces such that it will form a wall thickness along the periphery of the compression member (4).

12. An improved sliding door stop mechanism (1) according to any one of the preceding Claims; **characterized in** comprising a plastic compression member (4).

13. An improved sliding door stop mechanism (1) according to any one of the preceding Claims; **characterized in** comprising at least one compression member filling (43) which contacts the walls forming the compression member hole (42) and which enables the compression member (4) to be elastically deformed without being subject to plastic deformation.

14. An improved sliding door stop mechanism (1) according to any one of the preceding Claims; **characterized in** comprising at least one door stop bracket fixing flange (31) and door stop bracket supporting flange (32), which are provided on the door stop bracket (3), and formed by being bent, provide the fixation of the compression member (4) to the mechanism (1) by means of at least one connection member and reciprocal holes where in at least one connection member passing through with door stop bracket fixing flange (31).

15. An improved sliding door stop mechanism (1) according to any one of the preceding Claims; **characterized in** comprising a door stop bracket supporting flange (32) leaned on the outer surface of the compression member (4) by being bent such that the compression member (4) cannot rotate, by en-

gaging the guiding rollers (2) to the mechanism (1) and applying pressure thereon.

Fig 1

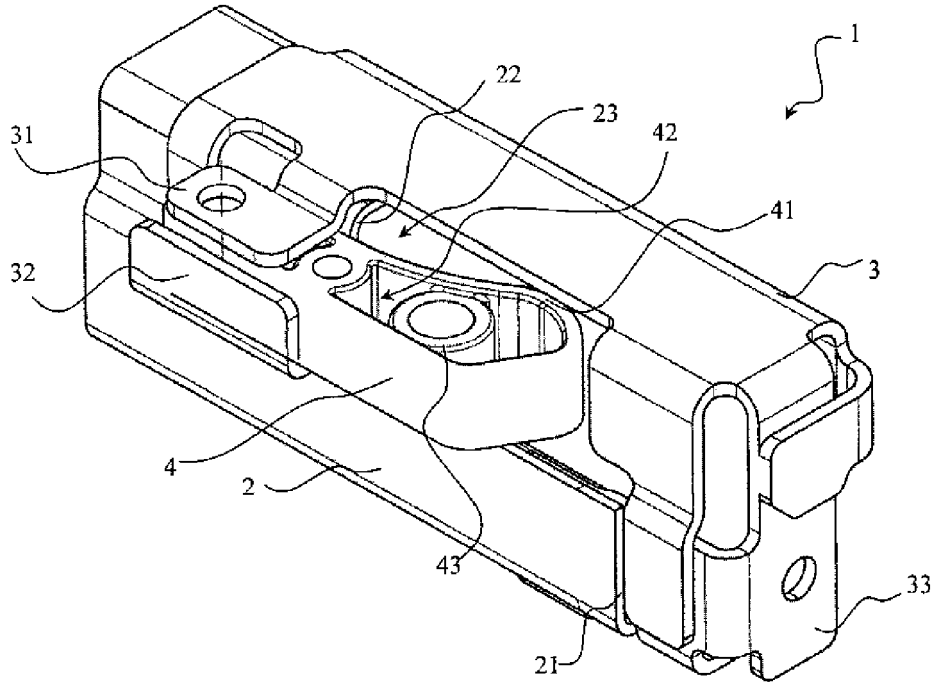


Fig 2

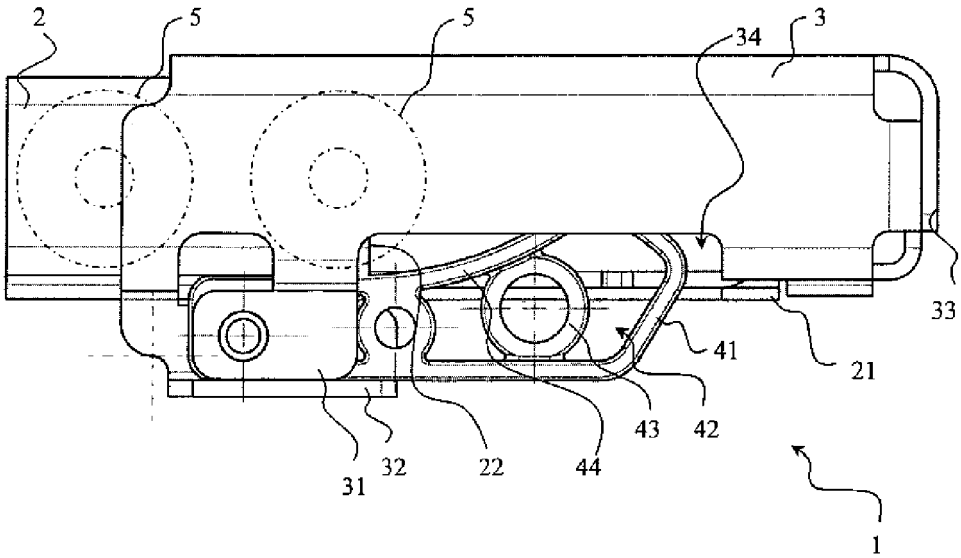
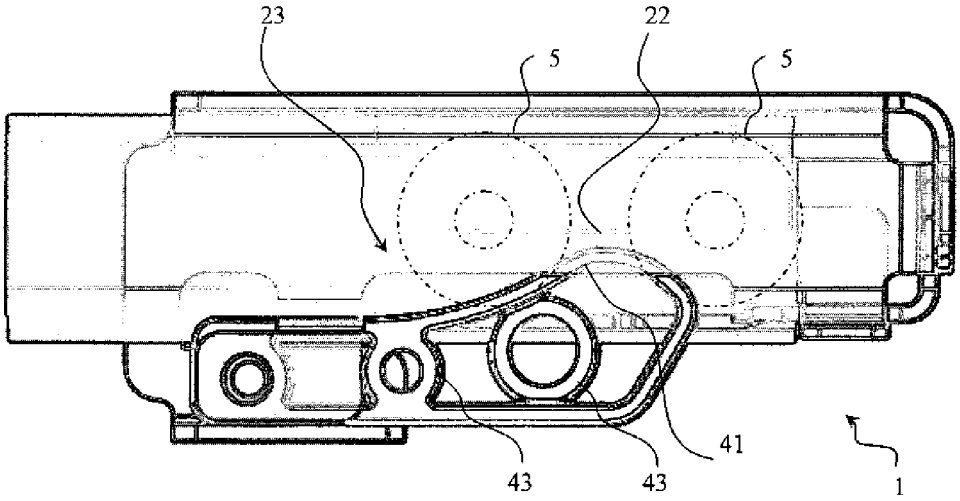


Fig 3



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- KR 20090038754 **[0004]**
- JP 2005307498 B **[0004]**