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(54) **Spring pusher**

(57) A spring pusher for packages queued over a shelf with front stopper much simpler to be used and with a greatly enhanced tolerance to hurried and/or careless use, always ensuring a secure end of travel retention and an outstandingly easy and reliable release once the new packages have been properly arranged in the relative sector or division of the shelf.

The device has a guide (1) along which a slider (2) may run recalled by spring (3) toward a rest position at the front edge of the guide.

A novel arrangement of retention of the slider (2) in its rearmost travel position along the guide comprises a pin feeler (5) sustained by an arm (4) capable of elasti-

cally flexing sideways. The feeler, after sliding along the outer flank of at least an upright protrusion (6) of the guide (1), near the rearmost end of travel of the slider, engages itself into a catching loop of the protrusion.

In plan view, the protrusion (6) has the shape of a two branch fork slanted at an angle in respect to a longitudinal axis of the guide, defining a semicircular catch between the two branches of the fork and has an "inlet" branch, over the outer flank surface of which slides the pin feeler (5) upon pushing toward the rearmost end of travel the slider (2) to block it, that is shorter than the "outlet" branch, on the inner flank surface of which slides the feeler (5) when releasing it.

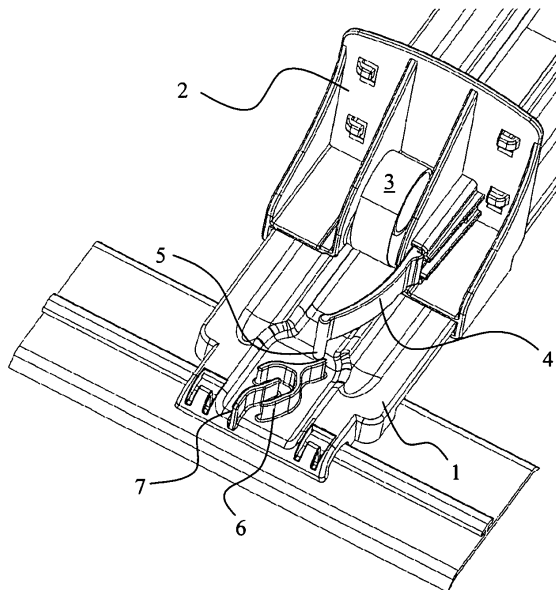


FIG. 2

Description

[0001] The present invention relates in general to devices for orderly placing packed goods on a shelf and for orderly advance the goods toward the front edge of the shelves at every pick-up of the package in sight at the front and in particular to a spring pusher of the queued packages so disposed on the shelves.

[0002] In self serve retail shops, the goods are exposed on shelves, the surface of which is generally divided in sectors or partitions of a certain width, each destined to contain packages of a certain good.

[0003] In order for the packaged goods to be easily lifted off the shelf by shoppers at the front edge of the shelf without having to reach inside the shelf, the latter may be inclined such that the packages may freely slide by gravity on the inclined surface until the front package is arrested in its slide by a stop railing that may be simply mounted in holes of the shelves at regular intervals, aligned along the front edge of the shelf.

[0004] With this arrangement though, the packages may not slide to the front if the surface is not sufficiently inclined, or they may assume awkward orientations. More in general, an inclination of the shelves has numerous drawbacks, that may be incompatible with other requirements and it is generally difficult that a given inclination be optimal for packages and/or goods of markedly different weight and staticity characteristics.

[0005] In order to overcome the drawbacks of inclined shelves, have been developed and are being deployed more and more often special devices that are commonly referred to as pusher of packaged goods aligned along the depth of a substantially horizontal shelf. The pushers are generally installed in the defined sectors in which the shelf is divided and commonly a spring biased pusher or slider, free of sliding in a guide, pushes from behind the queued packages disposed in the sector of the shelf toward a stopper installed along the front edge of the shelf.

[0006] In order to facilitate the replenishing of the sector with a new packages in front of the spring pusher without the latter being of encumbrance, it is desirable to push it backward by stretching the biasing spring and to block the slider at a rearmost position of its travel for nitely arrange the new packages in front of it. Thereafter, the slider is released from its rearmost position and slides forward until elastically pushing onto the rear of the last package of the queue. For this reason, the travelling slider or known spring device is provided with at least a pin stopper that when reaching the rearmost travel position engages a hole, from which it may be disengaged by slightly lifting the slider after completing the replenishment of the shelf sector with new packages.

[0007] These spring pushers are often of annoyance for the shop workers because the arrest of the spring biased slider in its rearmost position (end of travel) is not very stable and/or is not always established at the first attempt because of an excessive sensitiveness to disalignments when hurryingly pushing back the slider to-

ward its rearmost position. These inconveniences are irritating and time consuming.

[0008] It has now been devised a spring pusher for packages queued over a shelf with front stopper much simpler to be used and with a greatly enhanced tolerance to hurried and/or careless use, always ensuring a secure end of travel retention and an outstandingly easy and reliable release once the new packages have been properly arranged in the relative sector or division of the shelf.

[0009] As the known spring pushers, the device of this invention has a guide along which a slider may run recalled by spring toward a rest position at the front edge of the guide.

[0010] The novel arrangement of retention of the slider in its rearmost travel position along the guide comprises a pin feeler sustained by an arm capable of elastically flexing sideways. The feeler, after sliding along the outer flank of at least a protrusion of the guide near the rearmost end of travel of the slider, engages itself into a catching loop of the protrusion.

[0011] In plan view, the protrusion has the shape of a two branch fork slanted at an angle in respect to a longitudinal axis of the guide, defining a semicircular catch between the two branches of the fork and has an "inlet" branch, over the outer flank surface of which slides the pin feeler upon pushing toward the rearmost end of travel the slider to block it, that is shorter than the "outlet" branch, on the inner flank surface of which slides the feeler when releasing the spring biased slider from its catch.

[0012] The two branches of different length of the fork join to form a semicircular loop or catch in which the feeler is securely retained, thus preventing the biasing spring to recall the slider to the front end position of the guide.

[0013] The flexibility of the arm that sustains the pin feeler permits to the pin feeler, normally held at a certain position over the guide, to track the diverging outer flank surface of the inlet branch of the slanted fork-shaped catch until, upon reaching the end of the branch, the so flexed sustaining arm snaps back to its unyielded position bringing the pin feeler into the semicircular catching loop.

[0014] Thereafter, by simply pushing further rearwise the slider against the contrasting force of the spring, the elastically held pin feeler slides along the inner flank of the longest "outlet" branch of the inclined fork until it reaches the end of the outlet branch of the fork when the elastic suspension arm of the feeler may elastically snap back to its unyielded position, thus releasing the slider that can then be recalled toward the front of the shelf by the biasing spring of the device.

[0015] The invention is defined in the annexed claims.

[0016] Embodiments of the invention will be described by referring to the attached drawings, in which:

Figure 1 is a spring pusher according to a preferred embodiment of this invention;
Figures 2 to 6 show how the spring slider of this invention hooks in a retaining catch;

Figures 7 to 10 show how the spring slider can be released from the catch by pushing it further rearward.

[0017] A spring pusher according to the present invention is commonly mounted in a compartment of a shelf 5, in which packages of a certain good are to be placed as shown in Figure 1.

[0018] The device is basically composed of a guide 1 along which a slider 2 may slide, biased by a coiled tape spring 3. The guide may be commonly provided with snap-action clips 6a, 6b for fastening onto mounting profiles present along the front and rear of the shelf.

[0019] At its rear, the slider 2 has a projecting arm 4 that may elastically flex sideways, sustaining a feeler pin 5 at a certain height above the guide 1.

[0020] At the rearmost end of travel of the slider 2, the guide 1 has at least a upright protrusion 6 having, in plan view, the shape of an inclined fork that defines a catching loop for the pin feeler 5 in order to catch/uncatch the slider 2 when it is pushed back, by pulling out (unwinding) the biasing coiled tape spring 3.

[0021] Preferably, though not necessarily, the guide may have a second protrusion 7, bisecting the catching loop of the fork and shaped in a way to prevent the pin feeler 5 from being unduly led to exit from the catching loop of the fork-like protrusion upon pushing the slider 2 rearward to block it.

[0022] The slider 2 of the spring pusher of this invention is caught and released as illustrated in the series of Figures from 2 to 10.

[0023] By pushing back the slider 2 thus distending the coiled tape spring 3 (i.e. unwinding it), the pin feeler 5 is eventually forced to slide along the outer flank of the shorter branch of the inclined fork protrusion 6 of the guide 1 while the arm 4 that sustains the pin 5 elastically yields sideways (Figures 3 and 4).

[0024] By backing the slider 2 (Figure 5) to the point the pin feeler 5 oversteps the end of the shorter or inlet branch of the inclined fork protrusion 6, the elastic arm 4 snaps back to its unyielded position, thus bringing feeler 5 into the catching loop of the fork shaped protrusion 6.

[0025] Thus, the pin feeler 5 hooks in the semicircular catching loop of the fork protrusion 6, securely preventing the slider 2 from being recalled toward the front of the shelf by the stretched-out coiled tape spring.

[0026] Once the new packages are orderly placed in the compartment of the shelf, above the guide 1, the spring biased slider 2, may be easily released, as illustrated in Figures 7 to 10.

[0027] In practice, it is just necessary to push back the packages and the slider 2 (Figure 7) that much required for the pin feeler 5 to overcome the end of the longer or outlet branch of the inclined fork protrusion 6, being forced this time to slide along the inner flank of the longer or outlet branch of the fork protrusion 6, by virtue of the yielding of the elastic suspension arm 4. Upon reaching the end of the outlet branch of the fork the elastic arm 4

snaps back to its unyielded position freeing the pin feeler 5 out of the catch. The slider 2 thus released may slide on the guide 1, recalled by the spring 3 (Figures 9 and 10), bearing on the back of the packages.

[0028] The biasing coiled tape spring 3 may be a common steel tape coil spring, having the its distendable end fastened to the front end of the guide, the steel tape passing underneath the slider upon unwinding from its coiled portion that is carried in a containment space at the rear of the slider. All other parts of the device may be of molded plastic material fabricated by injection molding or, alternatively, they may be fabricated with a metal alloy by casting and/or by press molding.

Claims

1. A spring pusher for packaged goods placed in a compartment of a shelf with front stopper, comprising a channeled base guide with means at opposite ends for fastening onto mounting profiles present along the front and rear of the shelf, a slider engagedly travelling over said guide, a coiled tape spring having one end fastened to the front end of the guide, the tape passing underneath said slider upon unwinding from its coil carried in a containment space at the rear of said slider for biasing the slider toward a front end stop of the guide, means for blocking the slider at the rear end of the guide against the force exerted by the distended coiled tape spring, **characterized in that** said means for blocking the slider in said rear position consists of a pin feeler sustained at a certain height above said guide by an arm capable of elastically yielding sideways; at least an upright protrusion on said guide, near the rearmost travel end of the slider, having, in plan view, the shape of a two branch fork slanted at an angle in respect to a longitudinal axis of the guide, defining a semicircular catch between the two branches of the fork, forcing said pin feeler to slide along the outer flank of a shorter inlet branch of said slanted fork-like protrusion upon backing the slider as far as the end of said inlet shorter branch of the fork-like catch, when the elastically yielding suspension arm of said pin feeler snaps back to its unyielded position thus engaging the pin in said fork-like catch, and forcing said pin feeler to slide against the inner flank of a longer outlet branch of the fork-like catch upon pushing further back the slider as far as the end of said longer outlet branch of the fork-like catch, when the elastically yielding suspension arm snaps back to its unyielded position.
2. The spring pusher of claim 1, wherein said pin feeler has the shape of a vertical cylindrical pin.
3. The spring pusher of claim 1, **characterized in that**

there is a second upright protrusion on said guide having, in plan view, the shape of a not rectilinear segment, partially bisecting said semicircular catch.

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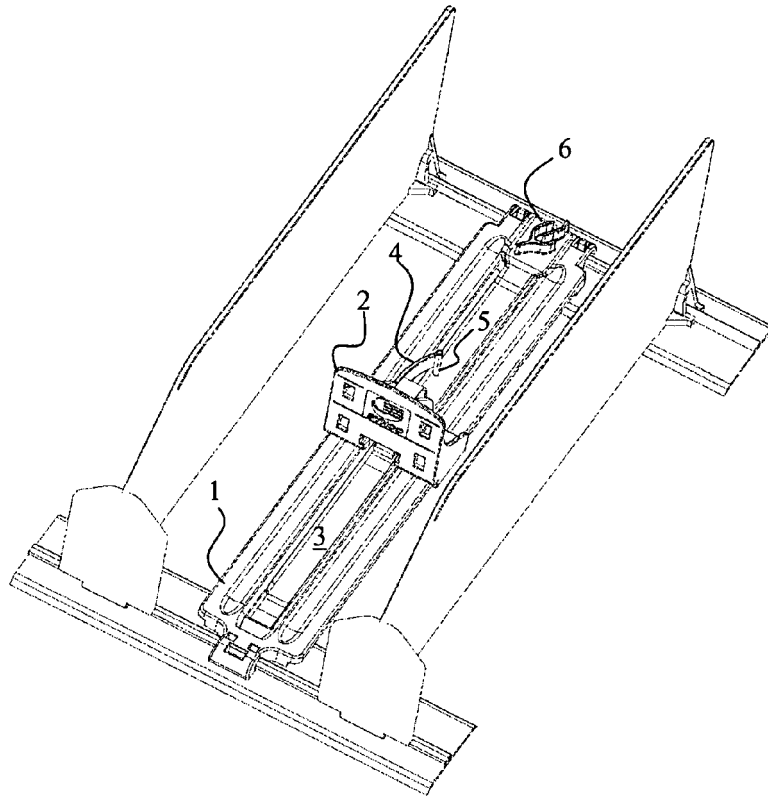


FIG. 1

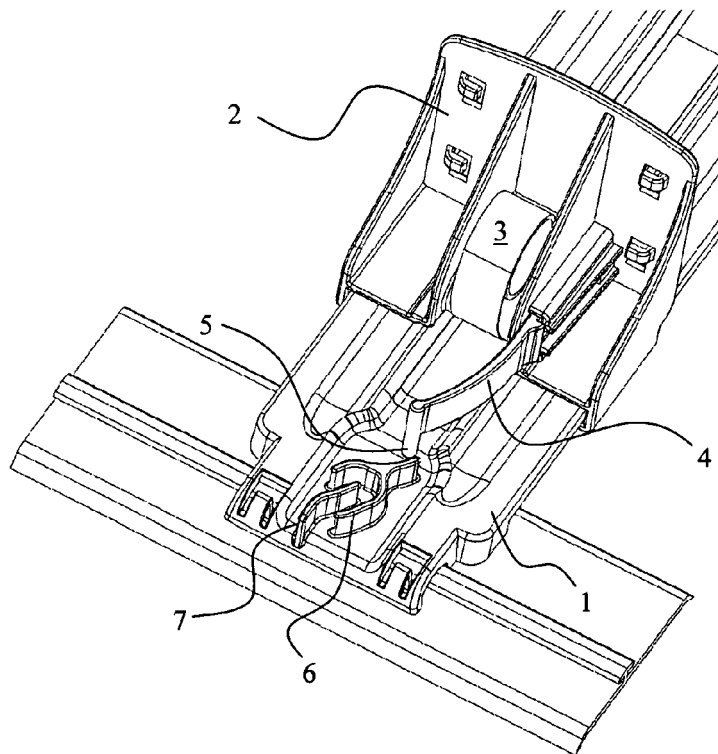


FIG. 2

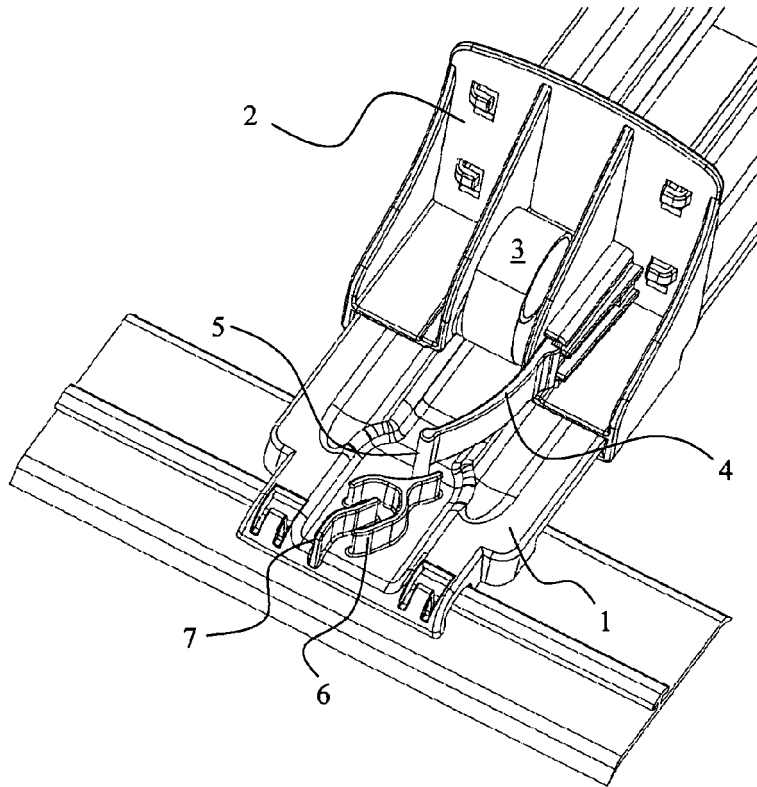


FIG. 3

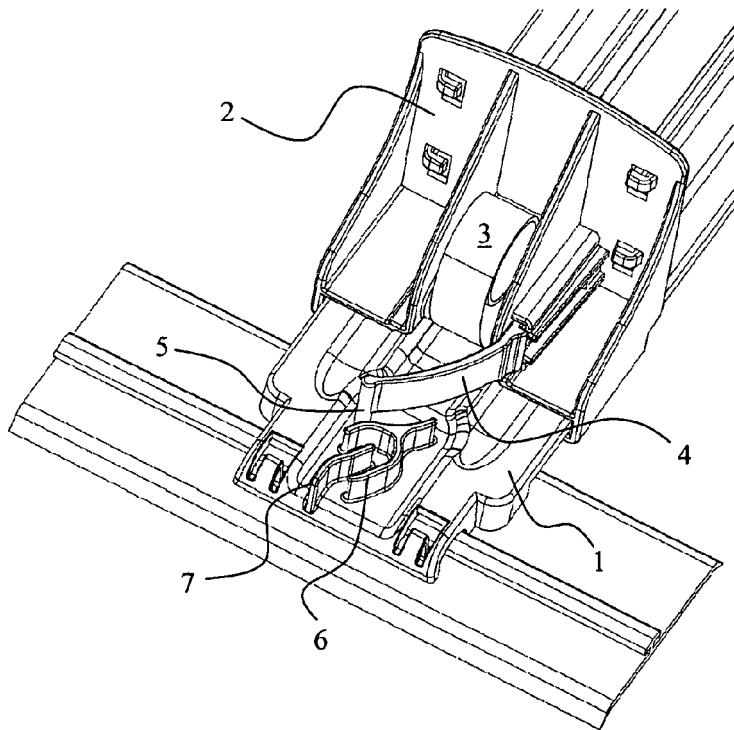


FIG. 4

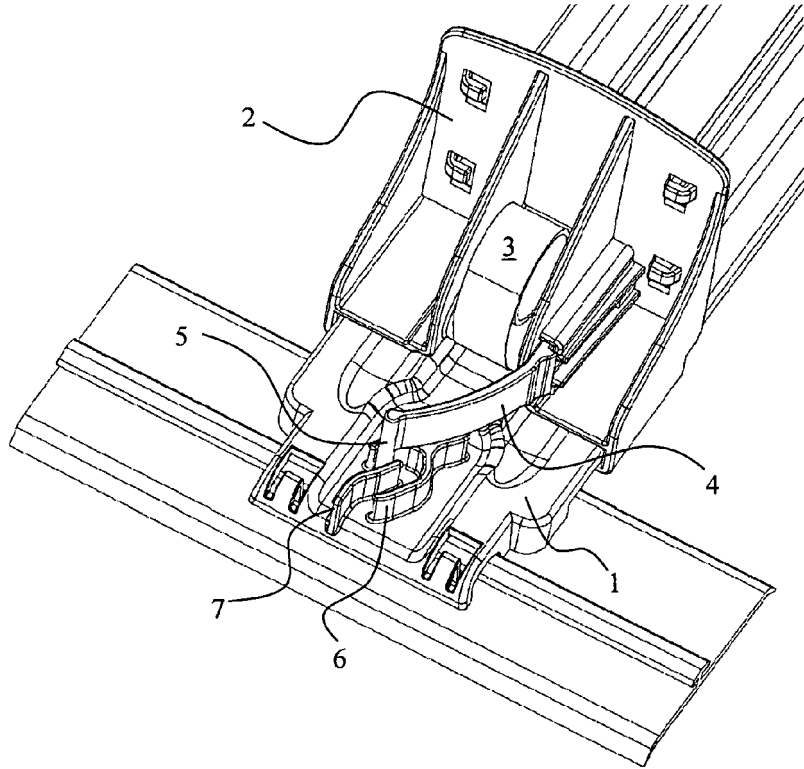


FIG. 5

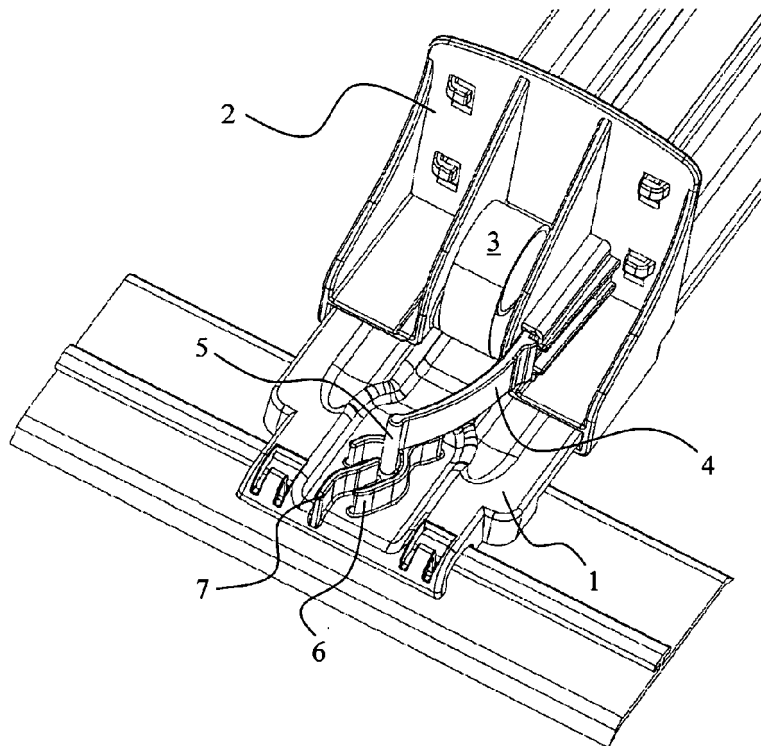


FIG. 6

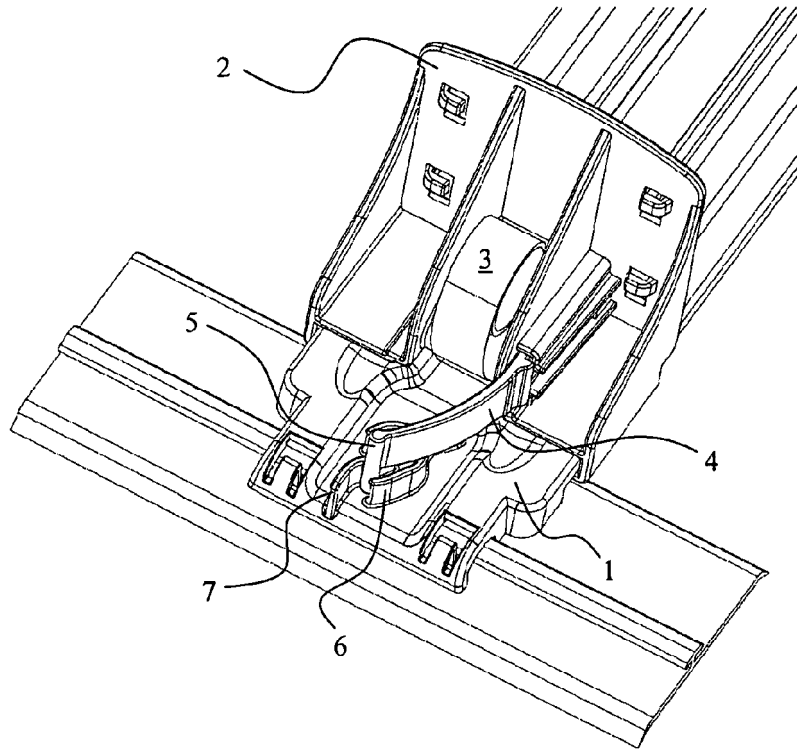


FIG. 7

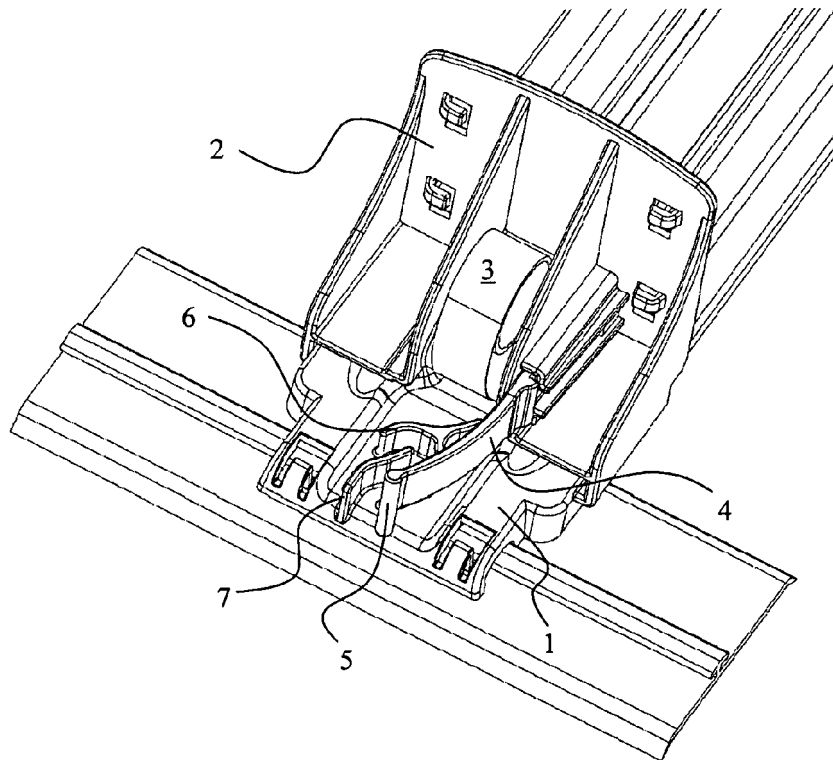


FIG. 8

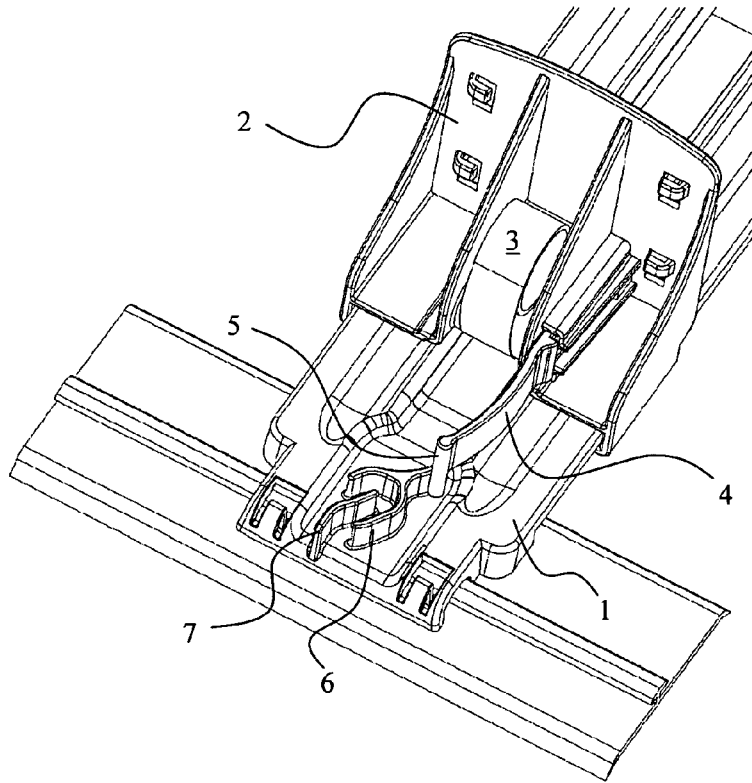


FIG. 9

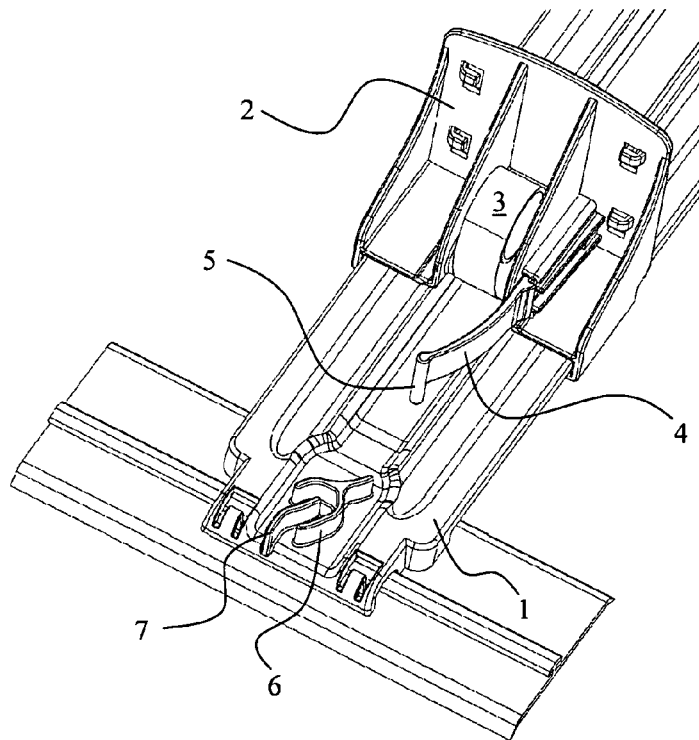


FIG. 10



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	GB 2 290 077 A (PPE LTD [GB]) 13 December 1995 (1995-12-13) * the whole document *	1	INV. A47F1/12
A	----- US 2003/057167 A1 (JOHNSON ALLEN E [US] ET AL) 27 March 2003 (2003-03-27) * figures 7-12 *	1	
E	----- US 2006/186065 A1 (CIESICK JAMES M [US]) 24 August 2006 (2006-08-24) * paragraph [0022]; figure 7 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47F
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		9 November 2006	Alff, Robert
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	

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EPC FORM 1503 03.82 (P04/001)

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

EP 06 42 5392

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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09-11-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2290077	A	13-12-1995	NONE
US 2003057167	A1	27-03-2003	NONE
US 2006186065	A1	24-08-2006	NONE

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