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(54) **Spring pusher**

Federangetriebene Schubvorrichtung

Poussoir à ressort

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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, there 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 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 neatly 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] Document GB 2 290 077 A discloses a latch for a pusher on a merchandising shelf according to the preamble of claim 1.

[0008] 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 toward its rearmost position. These inconveniences are irritating and time consuming.

[0009] 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.

[0010] 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.

[0011] 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 sideway. 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.

[0012] 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.

[0013] 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.

[0014] The flexibility of the arm that sustains the pin feeler permits 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.

[0015] 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 longer "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.

[0016] The invention is defined in the annexed claims.

[0017] 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.

[0018] A spring pusher according to the present invention is commonly mounted in a compartment of a shelf, in which packages of a certain good are to be placed as shown in Figure 1.

[0019] 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.

[0020] 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.

[0021] At the rearmost end of travel of the slider 2, the guide 1 has at least an 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.

[0022] 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.

[0023] The slider 2 of the spring pusher of this invention is catched and released as illustrated in the series of Figures from 2 to 10.

[0024] 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 sideway (Figures 3 and 4).

[0025] 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.

[0026] 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.

[0027] 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.

[0028] 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.

[0029] The biasing coiled tape spring 3 may be a common steel tape coil spring, having 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 (1) with means (6a, 6b) at opposite ends for fastening onto mounting profiles present along the front and rear of the shelf, a slider (2) engagedly travelling over said guide, a coiled tape spring (3) 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 (5) sustained at a certain height above said guide by an arm (4) capable of elastically yielding sideway;

at least an upright protrusion (6) 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 (5) has the shape of a vertical cylindrical pin.

3. The spring pusher of claim 1, **characterized in that** there is a second upright protrusion (7) on said guide having, in plan view, the shape of a not rectilinear segment, partially bisecting said semicircular catch.

Patentansprüche

1. Ein Federschieber für verpackte Waren in einem Fach eines Regals mit einer vorderen Sperrvorrichtung, der eine gerillte Basisführung (1) mit Elementen (6a, 6b) an den entgegen gesetzten Enden zur Befestigung an Montageprofilen umfasst, die sich jeweils entlang der Vorder- und Rückseite des Regals befinden, ein Gleitstück (2), das im Eingriff über der genannten Führung verläuft, eine gewickelte Bandfeder (3), deren eines Ende am vorderen Ende der Führung befestigt ist, wobei das Band sich beim Abwickeln von seiner Spule unterhalb des genannten Gleitstücks bewegt, welche sich in einem Behälterraum an der Rückseite des genannten Gleitstücks befindet, um das Gleitstück jeweils in Richtung einer vorderen Endarretierung der Führung zu schieben, Elemente zur Arretierung des Gleitstücks am hinteren Ende der Führung gegen die von der ausgedehnten gewickelten Bandfeder ausgeübte Kraft, **dadurch gekennzeichnet, dass** die genannten Elemente zur Arretierung des Gleitstücks in der genannten hinteren Stellung aus folgendem bestehen:

   - einem Tasterstift (5), der in einer bestimmten Höhe oberhalb der genannten Führung von einem Arm (4) gehalten wird, welcher in der Lage ist, seitlich elastisch nachzugeben;
   - mindestens einer senkrechten Vorwölbung (6) auf der genannten Führung, in der Nähe des hintersten Hubendes des Gleitstücks, mit der Form, im Aufriss, einer zweiarmigen Gabel, die an einem Winkel im Verhältnis zu einer Längsachse der Führung abgeschrägt ist, wodurch eine halbkreisförmige Raste zwischen den beiden Armen der Gabel entsteht und der genannte Tasterstift gezwungen wird, entlang der Außenflanke eines kürzeren Einlassarms der genannten abgeschrägten gabelähnlichen Vorwölbung zu gleiten, wobei das Gleitstück bis zum Ende des genannten kürzeren Einlassarms der gabelähnlichen Raste gehalten wird, wenn der elastisch nachgebende Tragarm des genannten Tasterstifts in seine starre Stellung zurückschnappt, wodurch der Stift in die genannte gabelförmige Raste einrastet und der genannte Tasterstift gezwungen wird, gegen die innere Flanke eines längeren Auslassarms der gabelähnlichen Raste zu gleiten, wobei das Gleitstück weiter bis zum Ende des genannten längeren Auslassarms der gabelähnlichen Raste geschoben wird, wenn der elastisch nachgebende Tragarm in seine starre Stellung zurückschnappt.

2. Der Federschieber gemäß Anspruch 1, wobei der genannte Tasterstift (5) die Form eines senkrechten zylindrischen Stifts aufweist.

3. Der Federschieber gemäß Anspruch 1, **dadurch gekennzeichnet, dass** eine zweite senkrechte Vorwölbung (7) an der genannten Führung vorhanden ist, die im Aufriss die Form eines nicht geradlinigen Segments aufweist, das die genannte halbkreisförmige Raste in zwei Teile teilt.

Revendications

1. Dispositif d'avancement à ressort de paquets placés sur une zone d'une étagère présentant une butée frontale, comprenant une base cannelée (1) présentant des dispositifs (6a, 6b) aux extrémités opposées pour l'engagement sur des profils d'ancrage placés le long de la partie arrière et de la partie avant de l'étagère, un chariot (2) se déplaçant par engagement sur ladite base, un ressort hélicoïdal à bande (3) présentant une extrémité fixée à l'extrémité frontale de la base, la bande passant sous ledit chariot lors du déroulement de sa spirale placée dans un logement dans la partie arrière dudit chariot pour le pousser contre une butée frontale de la base, des dispositifs de blocage du chariot à l'extrémité arrière de la base contre la force de rappel exercée par ledit ressort hélicoïdal à bande dans la position détendue, **caractérisé en ce que** lesdits dispositifs de blocage du chariot dans ladite position rétractée se compose d'un palpeur à broche (5) suspendu à une hauteur donnée au-dessus de ladite base par un bras (4) en mesure de fléchir élastiquement de côté ;
   au moins une saillie verticale (6) sur ladite base, à proximité de la dernière extrémité de déplacement du chariot, présentant, dans une section plane, la forme d'une fourche à deux branches inclinées à un angle par rapport à un axe longitudinal de la base, définissant une prise semi-circulaire entre les deux branches de la fourche, forçant ledit palpeur à broche à coulisser le long du côté extérieur d'une plus petite branche d'entrée de ladite saillie en forme de fourche oblique en faisant reculer le chariot aussi loin que l'extrémité de ladite plus petite branche d'entrée de la prise en forme de fourche, quand le bras de suspension pouvant fléchir élastiquement dudit palpeur à broche revient brusquement dans sa position rigide engageant la broche dans ladite prise en forme de fourche, et forçant ledit palpeur à broche à coulisser contre le côté intérieur d'une plus longue branche de sortie de la prise en forme de fourche

poussant plus en arrière le chariot aussi loin que l'extrémité de ladite plus longue branche de sortie de la prise en forme de fourche, quand le bras de suspension pouvant fléchir élastiquement revient en arrière dans son position rigide.

2. Dispositif d'avancement à ressort selon la revendication 1, où ledit palpeur à broche (5) a une forme de broche cylindrique verticale.

3. Dispositif d'avancement à ressort selon la revendication 1, **caractérisé en ce qu'**il y a une deuxième saillie verticale (7) sur ladite base ayant, dans une section plane, la forme d'un segment non rectiligne, divisant partiellement en deux ladite prise semi-circulaire.

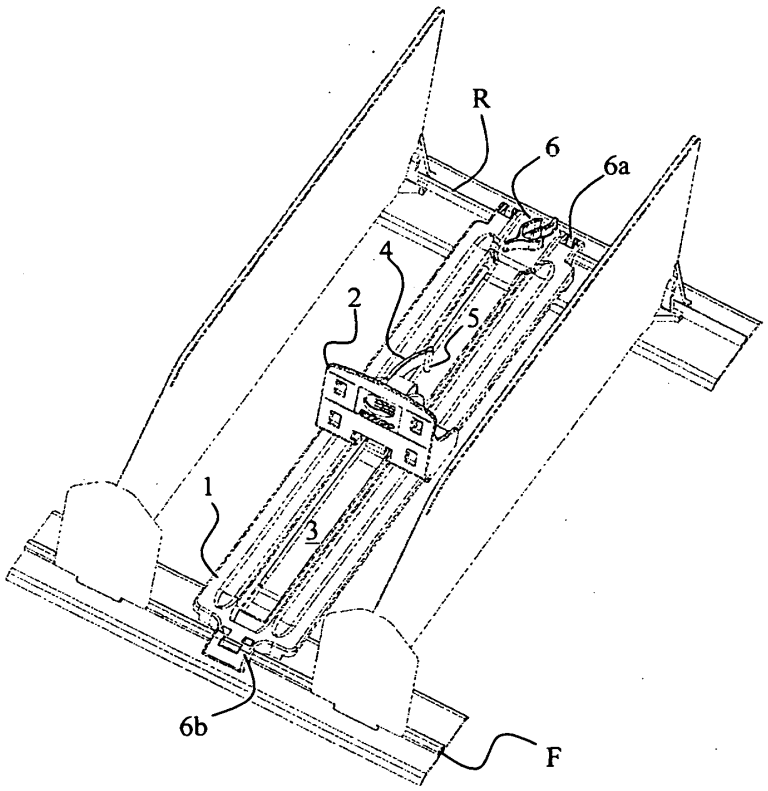

FIG. 1

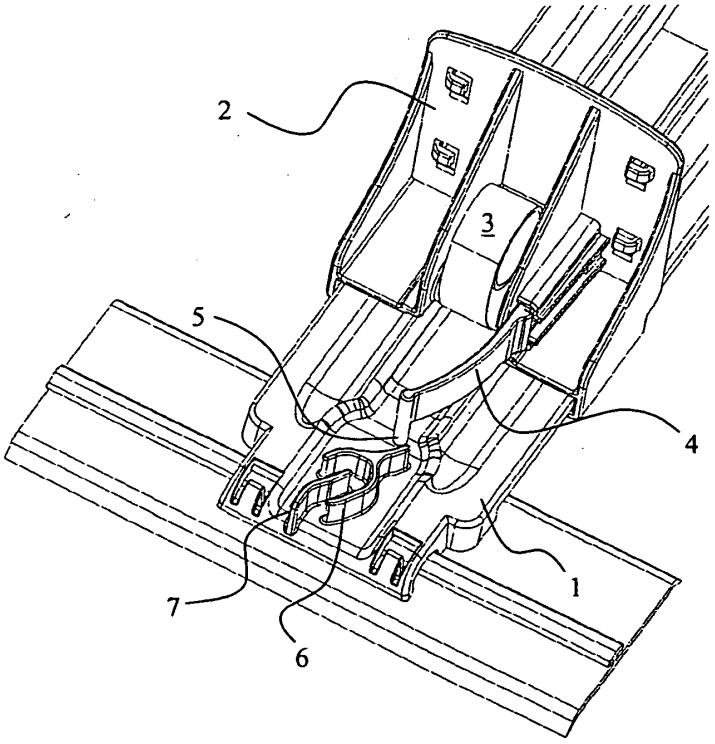

FIG. 2

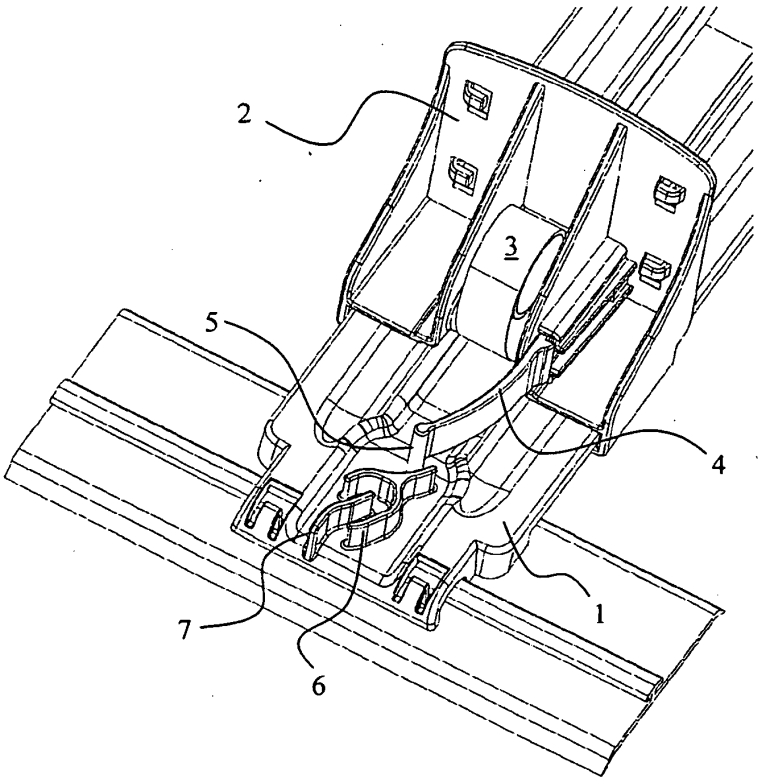

FIG. 3

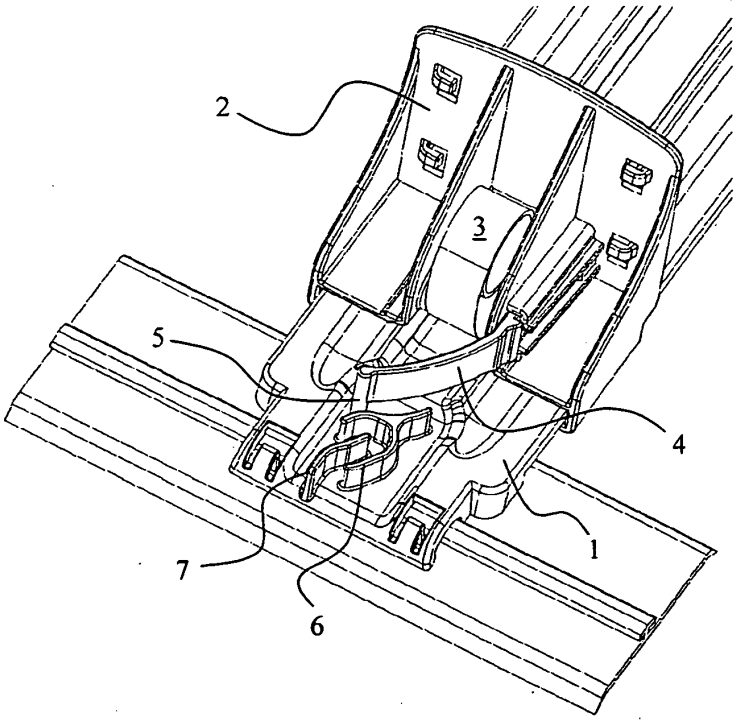

FIG. 4

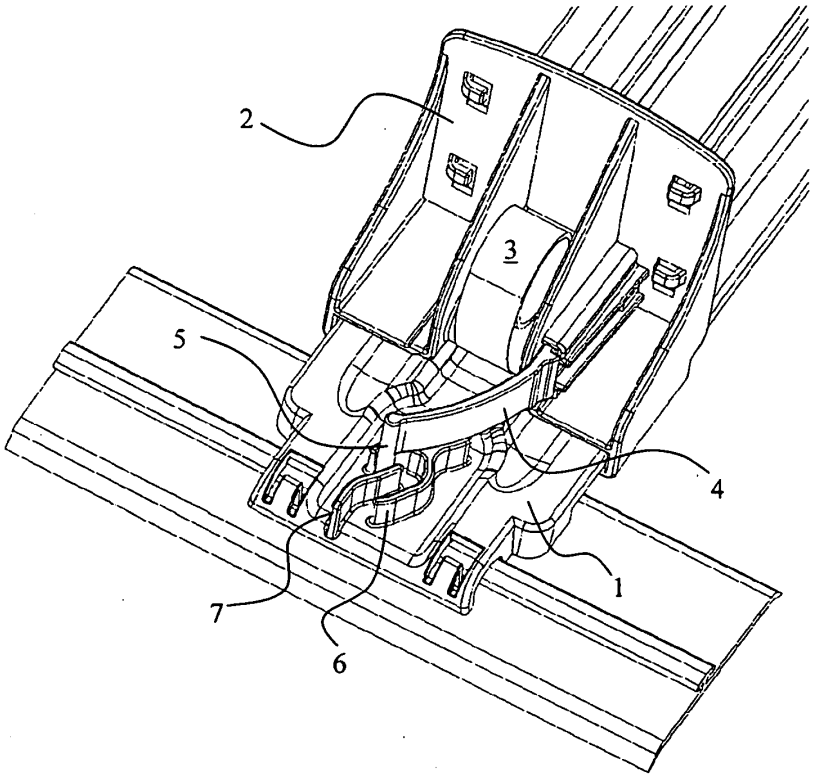

FIG. 5

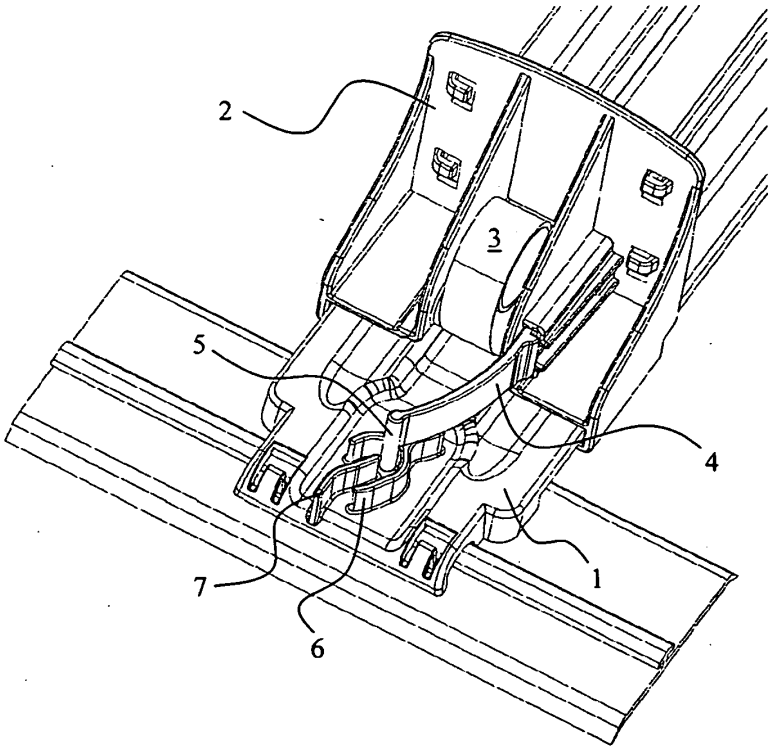

FIG. 6

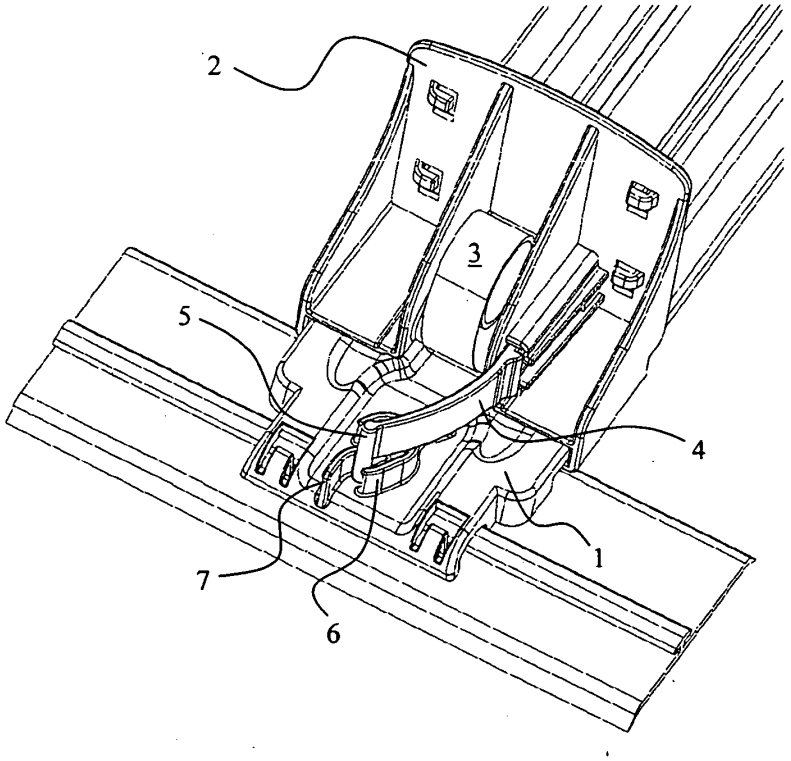

FIG. 7

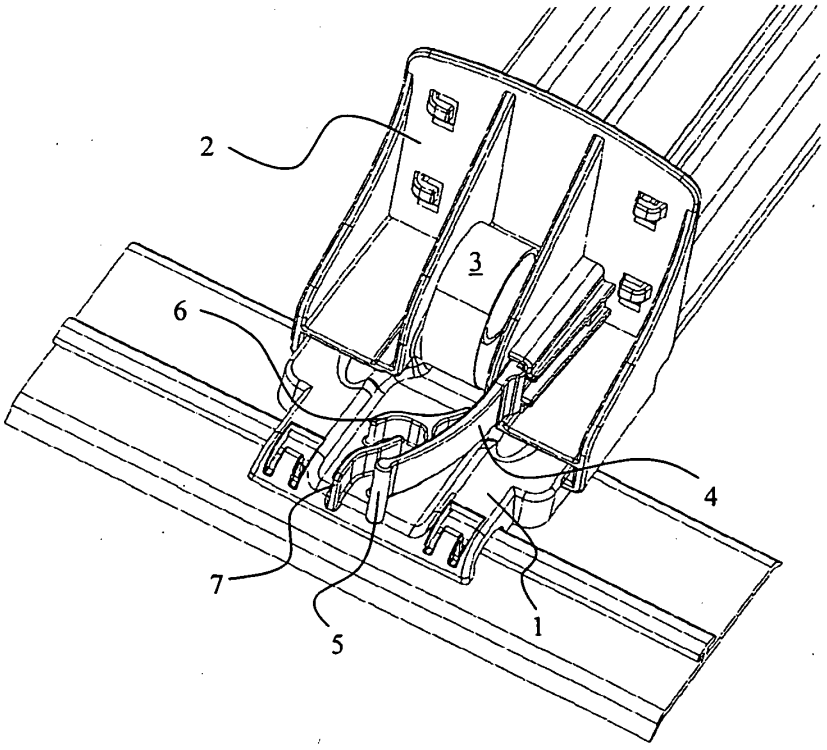

FIG. 8

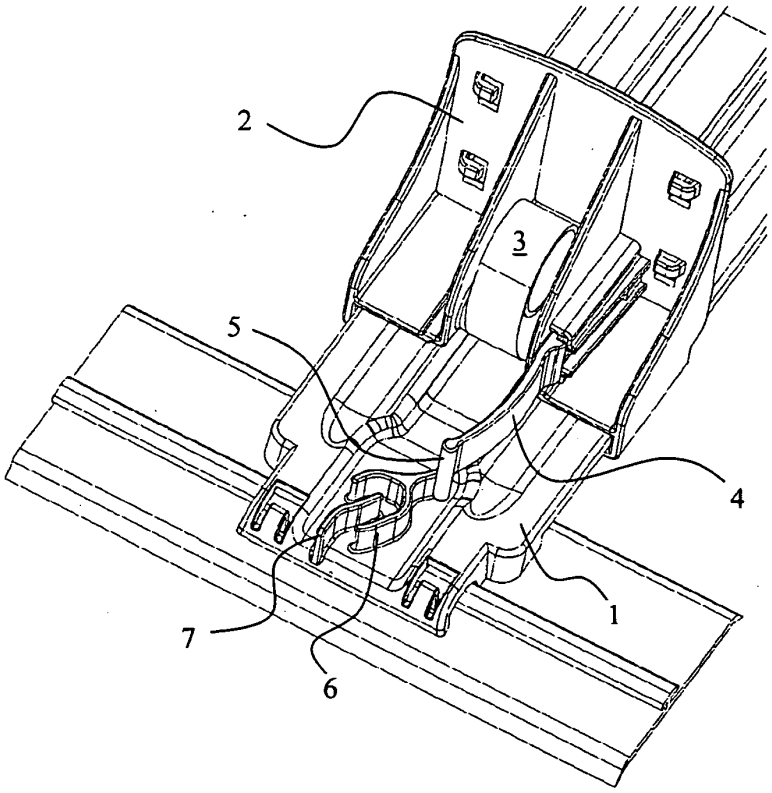

FIG. 9

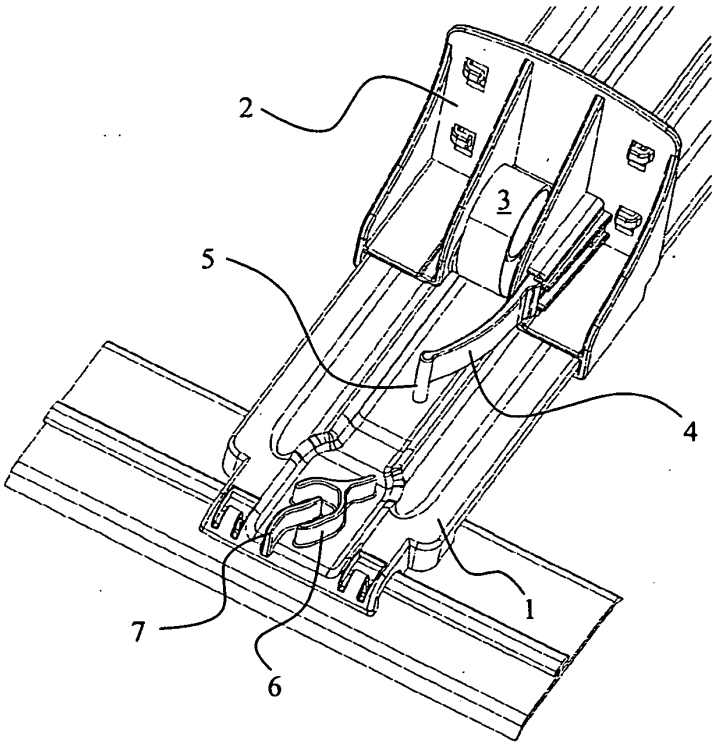

FIG. 10

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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