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(54) **Automatically activated cord lock**

Automatische Schnurklemme

Dispositif de blocage de corde automatique

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(73) Proprietor: **HUNTER DOUGLAS INDUSTRIES B.V.**
3008 AB Rotterdam (NL)

(72) Inventors:
• **Dekker, Nico**
2993 CN Barendrecht (NL)

• **Kieu, Hin**
5161 CE Sprang Capelle (NL)

(74) Representative: **Smith, Samuel Leonard**
J.A. Kemp & Co.
14 South Square
Gray's Inn
London WC1R 5JJ (GB)

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Description

[0001] The invention relates to an automatically activated cord lock for one or more lift cords of a window covering, particularly for pleated blinds.

[0002] Such a cord lock, which locks automatically when its lift cord is not being pulled downwardly to raise a window covering, is known from EP 0 690 199 B1. Although this cord lock has generally been satisfactory in normal use, the necessity for mounting it in a slanted head rail of a window covering has sometimes interfered with its operation.

[0003] US 2,010,286 describes a cord lock which is activated to the locking position by moving a lever, which causes a cross bar in the lever to act on a stack of dogs that are provided with cord gripping teeth. The dogs are moved into engagement with the cords and the teeth at once bite into the cords and they tend to be drawn into the cords by the weight of the blind. It is a significant problem of this cord lock that the lock has to be actively moved into engagement with the cords by a user manipulating the pull cord to move the lever arm to engage the dogs that engage the cord. Only after correctly activating the lock can the user let go of the operating cord. If a mistake has been made, the blind will drop.

[0004] NL-A-8 301 286 describes a cord lock having a pair of cylindrical bodies. One of the bodies is fixed and the other is movable, the lift cords pass between the bodies. Upon release the blind will drop and the lift cord pulls the movable body up and towards the fixed one. This action will clamp the cord and arrest the downward movement from the blind. Although very easy to use, the blind will always drop a certain distance before the cords are clamped between the two bodies.

[0005] In order to overcome the above problem and provide an automatically activated cord lock, especially for a window covering, particularly a pleated blind, which is easier to assemble and operate and which is less expensive, this invention provides a cord lock as defined in appended claim 1.

[0006] It is advantageous that the first and second walls and the locking lever extend horizontally, the cord-guiding passage extends laterally, and the pivot pin and the guiding surface extend vertically. It is especially advantageous that the pivot pin be located laterally between the guiding surface and the locking surface. It is particularly advantageous that an upper portion of any lift cord of the window covering extend slidably upwardly to the cord-guiding passage and then horizontally and laterally through the cord-guiding passage, then horizontally and laterally about the guiding surface, then horizontally and longitudinally about the cord-gripping formation and then horizontally and longitudinally between the cord-gripping formation and the locking surface. It is quite particularly advantageous that the guiding surface also extends between the first and second walls of the housing.

[0007] Further aspects of the invention will be apparent from the detailed description below of particular embod-

iments and the drawings thereof, in which:

- Figure 1 is a schematic plan view of the front of a pleated blind with a cord lock attached to its head rail;
- Figures 2 and 3 are schematic vertical-sectional views of conventional cord connectors which can be used with the blind of Figure 1;
- Figure 4 is a schematic perspective view of a portion of the front of the blind of Figure 1 with a first embodiment of a cord lock of this invention attached to its head rail;
- Figure 5 is an exploded view of the first embodiment of the cord lock of Figure 4;
- Figures 6 and 7 are horizontal-sectional views of the first embodiment of the cord lock of Figure 4, showing its locking lever pivotally mounted on its bottom wall and its automatic locking operation; in Figure 6, the cord lock is in its unlocked position, not gripping a lift cord, and in Figure 7, the cord lock is in its locked position, gripping a lift cord;
- Figure 8 is a schematic perspective view of the front of a pleated blind with a second embodiment of a cord lock of this invention provided within its head rail;
- Figure 9 is a schematic perspective view of the front of the head rail of the blind of Figure 8 with the second embodiment of a cord lock of this invention within the head rail;
- Figure 10 is an exploded view of the second embodiment of the cord lock;
- Figures 11 to 14 are horizontal-sectional views of the second embodiment of the cord lock, showing its automatic locking operation;
- Figures 15 and 16 are schematic perspective views of a third embodiment of a cord lock of this invention;
- Figure 17 is a schematic perspective view of the front of a fourth embodiment of a cord lock of this invention; and
- Figures 18 and 19 are horizontal-sectional views of the fourth embodiment of the cord lock of Figure 17, showing its automatic locking operation; in Figure 18, the cord lock is in its locked position, and in Figure 19, the cord lock is in its unlocked position.

[0008] Figure 1 shows a conventional pleated blind 1 with a cord lock 3 as a longitudinal extension on the left side of its longitudinally-extending head rail 5. A longitudinally-extending bottom rail 9 of the blind 1 can be raised and lowered to retract or to deploy a pleated blind fabric 7 by means of conventional lift cords 11, 13 (shown as a single line in Figure 1). Each lift cord 11, 13 is attached, at one end, to the bottom rail 9 and extends upwardly through the head rail 5 and then through the cord lock 3. The lift cords 11, 13 extend downwardly from the cord lock 3, are looped through a conventional cord connector 15 and then extend upwardly toward the cord lock. The free ends of the lift cords are then attached to a fixed cord end receptor 16 on the cord lock. The cord connector

15 can be pulled by means of a single manipulating cord 17, depending from the cord connector, or by means of a tassel 19, depending from the manipulating cord 17, to raise the bottom rail 9 by a distance that is twice the pulling stroke on the manipulating cord 17. This arrangement is particularly suitable for a large pleated blind 1 and prevents excessive lengths of lift cords 11, 13 dangling downwardly when the blind is raised. In this regard, excess lengths of lift cords can present a safety hazard for small children.

[0009] Figure 2 shows an alternative cord connector 15A which can guide the looped lift cords 11, 13 of the blind 1 over a curved guiding surface 21.

[0010] Figure 3 shows another alternative cord connector 15B which can guide the looped lift cords 11, 13 of the blind 1 over a rotatable guide pulley 23.

[0011] Figures 4-7 shows a first embodiment of a cord lock 103 of the invention which is similar to the cord lock 3 of Figure 1 and for which corresponding reference numerals (greater by 100) are used below for describing the same parts or corresponding parts.

[0012] Figure 4 shows a pleated blind 101 with its cord lock 103 attached to the left end of its head rail 105. The head rail 105 can be mounted on an overhead structure by means of conventional mounting brackets 106. The head rail 105 also holds an upper edge of a pleated blind fabric 107 which may be retracted by pulling lift cords 111, 113 and 114 together through the cord lock 103. The cord lock 103 has a housing 133, best seen in Figure 5. A right part of the housing 133 can be inserted in the left end of the head rail 105 as seen from Figures 4, 6 and 7.

[0013] Figure 4 also shows the lift cords 111 etc. exiting the cord lock 103 through a cord-guiding funnel 125 on the front of a generally laterally-extending cord-guiding passage 126 in a front portion 122 of a movable, generally laterally-extending locking lever 127 in the housing 133 of the cord lock. The funnel 125 and a front portion of the cord-guiding passage 126 extend outwardly from the front of the housing 133. The lift cords pass downwardly from the funnel 125 and through a connector (not shown) and are then attached to a fixed cord end receptor 116 on the front of a laterally-extending front wall 118 of the cord lock housing 133, located on its front at about its longitudinal middle. The housing's front wall 118 has a left-facing laterally-extending shoulder 120, against which the right side 122A of the front portion 122 of the locking lever 127 can abut to limit its rightward movement during counter-clockwise pivoting of the locking lever as shown in Figure 6.

[0014] Figure 5 best shows the cord lock's housing 133 and locking lever 127, including its funnel 125 at the front of its cord-guiding passage 126. The right side of the housing 133 has a longitudinally-(rightwardly-)extending profiled tongue 137 which is adapted to be inserted into, and snugly fit within, the contours of the left side of the head rail 105. The profiled tongue 137 has a longitudinally-extending channel 139, through which the lift cords

111 etc. can extend longitudinally from the cord lock housing 133 into the head rail 105. The housing 133 also includes a cover 141, and the cord end receptor 116 of the housing includes a recessed cavity 143 for holding a knot at the end of each lift cord.

[0015] As shown in Figures 6 and 7, the locking lever 127 extends horizontally- and rearwardly into the cord lock housing 133 and is pivotally connected to a vertically-extending cylindrical pivot pin 129. The cord-guiding passage 126 in the front portion 122 of the locking lever 127 extends laterally (rearwardly) from the funnel 125 toward the pivot pin 129. A rear portion 124 of the locking lever 127, rearwardly of the pivot pin, has a vertically- and longitudinally-extending rear surface with a cord-gripping formation 145. The cord-gripping formation 145 preferably includes a rearwardly- and rightwardly-facing abutment 146 with a cord-gripping surface

[0016] As also shown in Figures 6 and 7, a vertically- and longitudinally-extending front surface on the rear wall 147 of the cord lock housing 133 includes a locking surface 161. The locking surface 161 is located longitudinally closer to the housing's channel 139 than is the cord-gripping formation 145 in the rear surface of the locking lever 127. The locking surface 161 is preferably also a shoulder on the front surface of the rear wall 147 with a frontally- and leftwardly-facing cord-gripping surface. Thereby, the shoulder of the locking surface 161 can abut against the cord-gripping formation 145 of the locking lever in order to limit its clockwise (rightward) movement as shown in Figure 7.

[0017] As shown in Figure 4, each pull cord (only 111 is shown) extends upwardly and then rearwardly and horizontally into the cord lock housing 133. Then, as shown in Figures 6 and 7, each pull cord extends horizontally within the housing: rearwardly through the funnel 125 and cord-guiding passage 126 of the locking lever 127, rearwardly and to the left about a vertically-extending cylindrical cord-guiding pin 149, rearwardly and to the right between the cord-gripping formation 145 and the rear wall 147 and then rearwardly and to the right towards the channel 139 and the head rail 105.

[0018] The cord-gripping formation 145 preferably is adapted to significantly restrain longitudinal movement of the lift cords 111 etc. along its cord-gripping surface, particularly movement to the right, towards the channel 139, when the cord-gripping formation is moved clockwise (to the right) to actually engage the locking surface 161 (as in Figure 7). However, the cord-gripping formation 145 also is preferably adapted not to significantly restrain longitudinal movement of the lift cords along its cord-gripping surface when it is not actually engaging the locking surface 161 (as in Figure 6). Likewise, the locking surface 161 preferably is adapted to significantly restrain longitudinal movement of the lift cords 111 etc. along it only when the cord-gripping formation 145 is moved to the right to actually engage it (as in Figure 7).

[0019] As seen from Figure 5, the pivot pin 129 is received in a first pair of holes 135A, 135B (not shown in

Figure 5), respectively in a horizontally-extending top wall 155 and a horizontally-extending bottom wall 157 of the housing 133. The pivot pin 129 is located longitudinally between the cord-guiding pin 149 and the locking surface 161 on the rear wall 147 of the housing 133 and laterally between the front and rear portions 122, 124 of the locking lever. The locking lever 127 has a vertically-extending bore 131 that is located laterally between its cord-gripping formation 145 and its cord-guiding passage 126 and is pivotally positioned on the pivot pin 129. As a result, as shown in Figure 7, the locking lever 127 can pivot horizontally about the pivot pin 129, between the top and bottom walls 155, 157 of the housing, so that the rear portion 124 of the locking lever and its cord-gripping formation 145 move rearwardly and horizontally to the right (i.e., clockwise), towards the locking surface 161, when its front portion 122 and its cord-guiding passage 126 are moved horizontally to the left, away from the locking surface 161. Thereby, the cord-gripping formation 145 of the locking lever 127 can tightly hold the pull cords 111 etc. against the locking surface 161 on the rear wall 147 of the housing 137 when the cord-gripping formation is urged rightwardly against the locking surface 161.

[0020] The cord-guiding pin 149 in the housing 133 guides each lift cord 111 etc. at an appropriate angle between the cord-gripping formation 145 at the rear of the locking lever 127 and the rear wall 147 of the housing, so that the lift cords frictionally contact, and move longitudinally along, the cord-gripping formation 145 and move longitudinally along the channel 139 whenever the lift cords 111 etc. are being pulled from, or released towards, the cord lock 103 and the head rail 105 by a user of the blind 101. The cord-guiding pin 149 is mounted, in the housing, on the opposite longitudinal side of the locking lever 127 from the channel 139, laterally between the front and rear of the locking lever, and either rearwardly or frontwardly of the pivot pin 129. In this regard, the cord-guiding pin 149 can be mounted in either a second pair of vertically-aligned holes 151A and 151B, rearwardly of the pivot pin 129, or a third pair of vertically-aligned holes 153A and 153B, frontwardly of the pivot pin, in the top and bottom walls 155 and 157, respectively, of the housing. The location of the cord-guiding pin 149 will be selected depending upon which is better, in view of whether the cord lock is to be used with a head rail that is horizontal or is slanted. In this regard, the cord-guiding pin 149 is preferably located (in Figure 6) in the third pair of holes 153A and 153B, laterally farther from the rear wall 147, for a vertically-slanted head rail 105 and is preferably located (in Figure 7) in the second pair of holes 151A and 151B, laterally closer to the rear wall 147, for a horizontal head rail 105.

[0021] Sliding the cover 141 over the housing 133 of the cord lock 103 secures the pins 129 and 149 in their respective holes 135A, 135B, 151A, 151B, 153A, 153B. A longitudinally-extending slot 159 in the right side of the front of the cap 141 ensures that the funnel 125 of the locking lever 127 and the front wall 118 of the housing

133, with its cord end receptor 116, can properly extend outwardly of the cap 141.

[0022] In the unlocked position of the cord lock 103 as shown in Figure 6, the locking lever 127 has been pivoted in a counter-clockwise direction, so that its rear is moved longitudinally (to the left) away from the channel 139, by a user of the blind 101 pulling on the lift cords 111 etc. Thereby, the cord-gripping formation 145 on the rear portion 124 of the locking lever has been moved longitudinally away from the locking surface 161 on the rear wall 147 of the housing 133 and preferably also frontwardly away from the locking surface 161. This has disengaged the cord-gripping formation 145 from the locking surface 161. Thereby, the lift cords can move relatively freely longitudinally between the rear portion 124 of the locking lever and the rear wall 147 of the housing. However, the weight of the covering 107 on the lift cords 111 etc. causes the lift cords to continuously engage frictionally the rear portion 124 of the locking lever and its cord-gripping formation 145 and to continuously urge the rear portion of the locking lever to pivot back in a clockwise direction, longitudinally to the right toward the channel 139, from its counter-clockwise position in Figure 6, caused by the user's pull on the lift cords. Nevertheless while the user continues to pull on the lift cords, the rear of the locking lever remains pivoted to the left, in a counter-clockwise position, and the cord lock remains unlocked.

[0023] In the locked position of the cord lock 103 as shown in Figure 7, the locking lever 127 has been pivoted automatically in a clockwise direction. This automatic pivoting is a result of the weight of covering 107 on the lift cords 111 etc. which produces a continuous frictional engagement of the lift cords with the rear portion 124 of the locking lever and its cord-gripping formation 145 and which urges the rear portion of the locking lever to move longitudinally (to the right) once the user's pull on the front portion 122 of the locking lever (to keep the cord lock unlocked) has been released. In the locked position of the cord lock, the cord-gripping formation 145 on the rear portion 124 of the locking lever 127 is urged against, and engages, the cord-gripping surface of the locking surface 161 of the rear wall 147 of the housing 133. Thereby, the cord-gripping formation 145 and the locking surface 161 grip tightly the lift cords 111, etc. between them and prevent the lift cords from moving longitudinally between them.

[0024] In operation, the cord lock 103 automatically moves from its unlocked position in Figure 6 to its locked position in Figure 7. This occurs when the user of the blind 101 releases the lift cords 111 etc., which allows the weight of the pleated blind fabric 107 to pull the lift cords upwardly to the funnel 125 on the front of the locking lever, then rearwardly through its cord-guiding passage 126, then around the cord-guiding pin 149 and then longitudinally (to the right) between the rear wall 147 of the housing 133 and the rear of the locking lever 127, about and along its cord-gripping formation 145, toward the channel 139 as shown in Figure 6. The frictional contact

between the lift cords and the cord-gripping formation 145, as the fabric 107 pulls the lift cords to the right about and along the rear of the locking lever 127, causes the locking lever to pivot clockwise about the pivot pin 129, until its cord-gripping formation is urged against, and engages, the locking surface 161 on the rear wall 147 of the housing 133 as shown in Figure 7.

[0025] When the user of the blind 101 again pulls on the lift cords 111 etc., the lift cords are initially pulled longitudinally (to the left), about and along the cord-gripping formation 145 on the rear of the locking lever 127, away from the channel 139. The frictional contact between the lift cords and the cord-gripping formation 145, as the lift cords are pulled to the left, towards the cord-guiding pin 149, causes the locking lever 127 to pivot counter-clockwise about the pivot pin 129 until the cord-gripping formation no longer engages the locking surface 161 of the rear wall 147 of the housing 133 as shown in Figure 6. The user can then easily pull further on the lift cords to pull up the pleated blind fabric 107 and pull the lift cords longitudinally to the left within the channel 139 and then about and along the cord-gripping formation 145, then around the cord-guiding pin 149, then through the cord-guiding passage 126, and then downwardly from the funnel 125 as shown in Figure 6.

[0026] Figures 8-14 show a second embodiment of a cord lock 203 of the invention which is similar to the cord lock 103 of Figures 4-7 and for which corresponding reference numerals (greater by 100) are used below for describing the same parts or corresponding parts.

[0027] As seen from Figure 8, the cord lock 203 for one or more lift cords 211 etc. is accommodated in an opening 263 in the front of the head rail 205 of a pleated blind 201.

[0028] As seen from Figures 9-14, the cord lock 203 has a horizontally- and rearwardly-extending locking lever 227. A front portion 222 of the locking lever 227 contains a generally laterally-extending rear surface cord-guiding passage 226, and a rear portion 224 of the locking lever 227 has a vertically- and longitudinally-extending rear surface with a cord-gripping formation 245. The cord lock 203 also has a vertically- and frontally-extending locking surface 261 on the rear wall 247 of the housing 233. Preferably, a cord end receptor 216 is also provided in a front portion 222 of the locking lever 227 when the blind 201 includes a cord connector like those shown in Figure 2 or 3. The locking lever 227 has a bore 231, pivotally located on a pivot pin 229. The pivot pin 229 is mounted in a first pair of holes 235A and 235B in respectively the top wall 255 and bottom wall 257 of the housing 233. As a result, the locking lever 227 can pivot horizontally about the pivot pin, between the top and bottom walls 255, 257 of the housing 233, so that the rear portion 224 of the locking lever and its cord-gripping formation 245 automatically move rearwardly and horizontally to the right (clockwise), towards the locking surface 261, as shown in Figure 12, when a user of the blind 201 releases its lift cords 211 etc.

[0029] As also seen from Figures 9-14, the cord lock 203 also has a vertically-extending cylindrical cord-guiding pin 249. The cord-guiding pin 249 can be mounted at two different horizontal locations in the housing 233, corresponding to either a second pair of vertically-aligned holes 251A and 251B (as shown in Figures 11 and 12) or a third pair of vertically-aligned holes 253A and 253B (as shown in Figures 13 and 14) in the top and bottom walls 255 and 257, respectively, of the housing. The cord lock housing 233 has an interior left-facing laterally-extending wall with a shoulder 220, against which the right side 222A of the front portion 222 of the locking lever 227 can abut to limit its rightward movement during counter-clockwise pivoting of the locking lever as shown in Figures 11 and 13.

[0030] As further seen from Figures 10-14, the cord lock housing 233 features, on its longitudinally opposite sides, a pair of longitudinally-resilient tongues 271 and 273. The tongues 271 and 273 extend frontwardly and longitudinally away from middle portions of longitudinally opposite sides of the housing 233. The tongues are thereby adapted to frictionally engage internal portions of the head rail 205 on longitudinally opposite sides of the opening 263 in the front of the head rail and on longitudinally opposite sides of the housing, so as to retain the housing in the opening.

[0031] Figures 15 and 16 show a third embodiment of a cord lock 303 of the invention which is similar to the cord lock 103 of Figures 8-14 and for which corresponding reference numerals (greater by 200) are used below for describing the same parts or corresponding parts.

[0032] As seen from Figures 15 and 16, the cord lock 303 has a horizontally- and rearwardly-extending locking lever 327. A front portion 322 of the locking lever 327 contains a generally laterally-extending cord-guiding passage 326, and a rear portion (not shown) of the locking lever 327 has a vertically- and rearwardly-extending surface with a cord-gripping formation (not shown). The cord lock 303 also has a vertically- and frontally-extending locking surface (not shown) on the rear wall (not shown) of its housing 333.

[0033] As also seen from Figures 15 and 16, the cord lock housing 333 features a stepped horizontally-extending lower wall 357. A vertically-extending threshold 340 divides the lower wall 357 into a right lower section 357A, adjacent the locking surface (not shown), and a left upper section 357B, adjacent a cord-guiding pin (not shown) between the locking lever's cord-guiding passage 326 and cord-gripping formation (not shown). In the unlocked position of the cord lock 303, shown in Figure 15, parts of the front portion 322 of the locking lever 327 rest on the lower section 357A of the lower wall 357. In the locked position of the cord lock 303 shown in Figure 16, parts of the front portion 322 of the locking lever 327 rest on the upper section 357B of the lower wall 357. As a result, during the clockwise rotation of the locking lever 327 about its pivot pin 329 from its unlocked position to its locked positions, parts of the front portion 322 of the lock-

ing lever transfer from the lower section 357A onto the upper section 357B, and the horizontally-extending bottom edge 328 of the locking lever moves over the threshold 340. As long as a user of the blind, provided with the cord lock 303, is pulling downwardly on the lift cords (not shown) to maintain the cord lock unlocked, parts of the front portion 322 of the locking lever 327 are also pulled downwardly, thereby making it difficult for the bottom edge 328 of the front portion 322 of the locking lever 327 to pass over the threshold 340 onto the upper section 357B. However, once the user releases tension on the lift cords to allow the locking lever to move automatically into its locked position, parts of the front portion 322 of the locking lever 327 are no longer being pulled downwardly and the bottom edge 328 of the front portion 322 of the locking lever 327 can pass over the threshold 340 onto the upper section 357B with the automatic clockwise rotation of the locking lever. In this way, a simple indexing of the locking lever is obtained between its unlocked and locked positions. This arrangement is very cost effective as it does not require any additional parts.

[0034] Figures 17-19 show a fourth embodiment of a cord lock 403 of the invention which is similar to the cord lock 103 of Figures 8-14 and for which corresponding reference numerals (greater by 300) are used below for describing the same parts or corresponding parts.

[0035] As seen from Figures 17-19, the cord lock 403 has a horizontally- and rearwardly-extending locking lever 427. A front portion 422 of the locking lever 427 contains a generally laterally-extending cord-guiding passage 426, and a separate rear portion 424 of the locking lever 427 has a vertically- and rearwardly-extending surface with a cord-gripping formation 445. A front part 424B of the rear portion 424 and an adjacent rear part 422B of the front portion 422 are pivotally connected to the pivot pin 429. At least the front part 424B of the rear portion 424 lies atop the rear part 422B of the front portion 422. The cord lock 403 also has a vertically- and frontally-extending locking surface 461 on the rear wall 447 of its housing 433.

[0036] As seen from Figure 19, the front and rear portions 422, 424 of the locking lever 427 can swivel counter-clockwise about the pivot pin 429 when a user of a blind with the cord lock 403 pulls lift cords (not shown), extending through the cord lock 403. However, the rear portion 424 can swivel counter-clockwise further, preferably by about 15°, than the front portion 422 with longitudinal movement of the lift cords toward the cord-guiding pin 449. The limit to the counter-clockwise swivel of the rear portion 424, relative to the front portion 422, is established by the abutment of a vertically-extending left front edge 470 of the rear portion 424 with an adjacent vertically-extending left rear edge 472 of the front portion 422. Thereby, the cord-gripping formation 445 on the rear portion 424 of the locking lever can swivel further away from the locking surface 461 on the rear wall 447 of the housing when the user of the blind pulls the lift cords. The housing 433 has a left-facing laterally-extending interior wall with

a shoulder 420, against which the right side 422A of the front portion 422 of the locking lever 427 can abut to limit its rightward movement during counter-clockwise pivoting of the locking lever as shown in Figure 19.

[0037] As seen from Figure 18, the front and rear portions 422, 424 of the locking lever 427 can also swivel clockwise about the pivot pin 429 when the user releases the lift cords (not shown). However, the rear portion 424 can swivel clockwise further than the front portion 422 with longitudinal movement of the lift cords away from the cord-guiding pin 449. The limit to the clockwise swivel of the rear portion 424, relative to the front portion 422, is established by the abutment of a vertically-extending right rear edge 474 of the rear portion with an adjacent vertically-extending right front edge 476 of the front portion. Thereby, the cord-gripping formation 445 on the rear portion 424 of the locking lever can engage the locking surface 461 on the rear wall 447 of the housing to hold the lift cords when the user releases his grip on them.

[0038] This invention is, of course, not limited to the above-described embodiments which may be modified without departing from the scope of the invention as defined by the appended claims. In this regard, the terms in the foregoing description and the following claims, such as "longitudinal", "lateral", "left", "right", "vertical", "horizontal", "clockwise", "counter-clockwise", "upwardly" and "downwardly", have been used only as relative terms to describe the relationships of the various elements of the cord lock of the invention for window coverings. For example, the cord locks 3, 103, 203, 303 and 403 could be for slatted venetian blinds or the like, rather than for blinds such as pleated blinds 1 and 101.

Claims

1. A cord lock (103, 203, 303, 403), especially for a window covering, particularly a pleated blind (101, 201, 301, 401), which includes:

- a housing (133, 233, 333, 433) adapted to be fitted to a longitudinally-extending head rail (105, 205, 305, 405) of a window covering, the housing having parallel first and second walls (155, 255, 355, 455, 157, 257, 357, 457) and a rear wall (147, 247, 347, 447);
- a pivot pin (129, 229, 329, 429) that extends between the first and second walls of the housing;
- a locking lever (127, 227, 327, 427), within the housing, having one end adjacent the rear wall (147, 247, 347, 447) and a cord-guiding passage (126, 226, 326, 426) at an opposite end, the locking lever being pivotable about said pivot pin (129, 229, 329, 429); **characterized in that:**

the rear wall (147, 247, 347, 447) has a locking surface (161, 261, 361, 461) extending

- between the first and second walls;
the locking lever (127, 227, 327, 427) has one end adjacent the locking surface (1612, 261, 361, 461), the opposite end being remote from the locking surface (161, 261, 361, 461);
the locking lever (127, 227, 327, 427) has a cord-gripping formation (145, 245, 345, 445) on said one end and said pivot pin (129, 229, 329, 429) is located between the cord-gripping formation (145, 245, 345, 445) and the cord-guiding passage (126, 226, 326, 426) so that the cord-gripping formation can move towards and away from engagement with the locking surface with pivoting movement of the locking lever about the pivot pin and can tightly hold pull cords, extending between the locking lever (127, 227, 327, 427) and the rear wall (147, 247, 347, 447), when the cord-gripping formation (145, 245, 345, 445) is urged towards the locking surface (161, 261, 361, 461); and **in that** the cord lock further includes:
- a fixed guiding surface (149, 249, 349, 449) located laterally either rearwardly or forwardly of the pivot pin (129, 229, 329, 429) with respect to said rear wall (147, 247, 347, 447) and located between the front and rear of the locking lever (127, 227, 327, 427) so as to allow pull cords to extend along the cord-gripping formation (145, 245, 345, 445), around the fixed guiding surface (149, 249, 349, 449) and through the cord-guiding passage (126, 226, 326, 426).
2. The cord lock (103, 203, 303, 403) of claim 1 wherein the first and second walls (155, 255, 355, 455, 157, 257, 357, 457) and the locking lever (127, 227, 327, 427) extend horizontally, the cord-guiding passage (126, 226, 326, 426) extends laterally, and the pivot pin (129, 229, 329, 429) and the fixed guiding surface (149, 249, 349, 449) extend vertically.
 3. The cord lock (103, 203, 303, 403) of claim 2 wherein the pivot pin (129, 229, 329, 429) is located laterally between the fixed guiding surface (149, 249, 349, 449) and the locking surface (161, 261, 361, 461).
 4. The cord lock (103, 203, 303, 403) of claim 3 wherein the pivot pin (129, 229, 329, 429) is located longitudinally between the fixed guiding surface (149, 249, 349, 449) and the locking surface (161, 261, 361, 461).
 5. The cord lock (103, 203, 303, 403) of claim 3 or 4 arranged to support an upper portion of a lift cord (111, 113, 114) of a window covering to extend slidably upwardly to the cord-guiding passage (126, 226, 326, 426) and then horizontally and laterally through the cord-guiding passage (126, 226, 326, 426), then horizontally and laterally about the fixed guiding surface (149, 249, 349, 449), then horizontally and longitudinally about the cord-gripping formation (145, 245, 345, 445) and then horizontally and longitudinally between the cord-gripping formation and the locking surface (161, 261, 361, 461).
 6. The cord lock (103, 203, 303, 403) of any one of claims 1-5 wherein the fixed guiding surface (149, 249, 349, 449) also extends between the first and second walls (155, 255, 355, 455, 157, 257, 357, 457) of the housing.
 7. The cord lock (303) of any one of claims 1-5 wherein a lower first wall (357) has a lower section (357A) on a longitudinal side adjacent the locking surface and an upper section (357B) on an opposite longitudinal side adjacent the cord-guiding surface.
 8. The cord lock (303) of claim 7 wherein a vertically-extending threshold (340) is between the lower section (357A) and the upper section (357B) of the lower first wall (357).
 9. The cord lock (403) of any one of claims 1-8 wherein the locking lever (427) has a first portion (422), in which is located the cord-guiding passage (426), and a second portion (424), on which is located the cord-gripping formation (445), wherein adjacent first and second parts (422B, 424B) of the first and second portions (422, 424) are pivotally connected to the pivot pin (429), and wherein the second portion (424) can swivel further, preferably by about 15°, than the first portion (422) about the pivot pin (429) with pivoting movement of the locking lever about the pivot pin.
 10. The cord lock (403) of claim 9 wherein at least the second part (424B) of the second portion (424) lies atop the first part (422B) of the first portion (422).
 11. The cord lock (403) of claim 9 or 10 wherein swiveling of the second portion (424), relative to the first portion (422), about the pivot pin (429) is limited by abutment of their adjacent confronting edges (470, 472, 474, 476).
 12. The cord lock of claim 1 wherein in use a lift cord is slidably arranged through a pull element with its free end connected stationary with respect to the housing (133, 233, 333, 433).
 13. The cord lock of claim 1 wherein the fixed guiding surface (149, 249, 349, 449) is part of a pin, selectively mountable in one of at least two different predetermined positions.

14. The cord lock of claim 1 or 13 wherein the fixed guiding surface (149, 249, 349, 449) is on an element that can selectively be mounted in at least two different positions in the housing.

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Patentansprüche

1. Schnurklemme (103, 203, 303, 403), speziell für eine Fensterabdeckung, insbesondere eine Faltjalousie (101, 201, 201, 401), umfassend

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- ein Gehäuse (133, 233, 333, 433), das in eine in Längsrichtung verlaufende Kopfschiene (105, 205, 305, 405) einer Fensterabdeckung eingesetzt werden kann und parallele erste und zweite Wände (155, 255, 355, 455, 157, 257, 357, 457) und eine Rückwand (147, 247, 347, 447) hat;

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- einen Drehzapfen (129, 229, 329, 429), der sich zwischen der ersten und der zweiten Wand des Gehäuses erstreckt;

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- einen Arretierhebel (127, 227, 327, 427) innerhalb des Gehäuses, der mit einem Ende in der Nähe der Rückwand (147, 247, 347, 447) angeordnet ist und an einem entgegengesetzten Ende einen Schnurführungsdurchlass (126, 226, 326, 426) hat, wobei der Arretierhebel um besagten Drehzapfen (129, 229, 329, 429) schwenkbar ist, **dadurch gekennzeichnet, dass**

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die Rückwand (147, 247, 347, 447) eine Arretierfläche (161, 261, 361, 461) hat, die sich zwischen der ersten und der zweiten Wand erstreckt;

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der Arretierhebel (127, 227, 327, 427) mit einem Ende in der Nähe der Arretierfläche (161, 261, 361, 461) angeordnet ist und das entgegengesetzte Ende von der Arretierfläche (161, 261, 361, 461) entfernt angeordnet ist;

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der Arretierhebel (127, 227, 327, 427) eine schnurgreifende Gebilde (145, 245, 345, 445) an besagtem einen Ende aufweist und der besagte Drehzapfen (129, 229, 329, 429) zwischen dem schnurgreifenden Gebilde (145, 245, 345, 445) und dem Schnurführungsdurchlass (126, 226, 326, 426) angeordnet ist, so dass sich das schnurgreifende Gebilde mit der Schwenkbewegung des Arretierhebels um den Drehzapfen in den Eingriff und aus dem Eingriff mit der Arretierfläche bewegen kann und Zugschnüre, die sich zwischen dem Arretierhebel (127, 227, 327, 427) und der Rückwand (147, 247, 347, 447) erstrecken, fest halten kann, wenn das schnurgreifende Gebilde (145, 245, 345, 445) zur Arretierfläche (161, 261, 361, 461) gedrückt wird, **und dass** die Schnurklemme weiter umfasst:

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- eine feststehende Führungsfläche (149, 249,

349, 449), die lateral in Bezug auf die besagte Rückwand (147, 247, 347, 447) entweder hinter oder vor dem Drehzapfen (129, 229, 329, 429) und zwischen der Vorderseite und der Rückseite des Arretierhebels (127, 227, 327, 427) angeordnet ist, so dass sich Zugschnüre entlang des schnurgreifenden Gebildes (145, 245, 345, 445), um die feststehende Führungsfläche (149, 249, 349, 449) und durch den Schnurführungsdurchlass (126, 226, 326, 426) erstrecken können.

2. Schnurklemme (103, 203, 303, 403) gemäß Anspruch 1, bei der die erste und die zweite Wand (155, 255, 355, 455, 157, 257, 357, 457) und der Arretierhebel (127, 227, 327, 427) sich horizontal erstrecken, der Schnurführungsdurchlass (126, 226, 326, 426) sich lateral erstreckt und der Drehzapfen (129, 229, 329, 429) und die feststehende Führungsfläche (149, 249, 349, 449) sich vertikal erstrecken.

3. Schnurklemme (103, 203, 303, 403) gemäß Anspruch 2, bei der der Drehzapfen (129, 229, 329, 429) lateral zwischen der feststehenden Führungsfläche (149, 249, 349, 449) und der Arretierfläche (161, 261, 361, 461) angeordnet ist.

4. Schnurklemme (103, 203, 303, 403) gemäß Anspruch 3, bei der der Drehzapfen (129, 229, 329, 429) in Längsrichtung zwischen der feststehenden Führungsfläche (149, 249, 349, 449) und der Arretierfläche (161, 261, 361, 461) angeordnet ist.

5. Schnurklemme (103, 203, 303, 403) gemäß Anspruch 3 oder 4, die so angeordnet ist, dass sie einen oberen Abschnitt einer Hubschnur (111, 113, 114) einer Fensterabdeckung so aufnimmt, dass dieser sich verschieblich nach oben zum Schnurführungsdurchlass (126, 226, 326, 426) und dann horizontal und lateral durch den Schnurführungsdurchlass (126, 226, 326, 426), dann horizontal und lateral über die feststehende Führungsfläche (149, 249, 349, 449), dann horizontal und in Längsrichtung um das schnurgreifende Gebilde (145, 245, 345, 445) und dann horizontal und in Längsrichtung zwischen dem schnurgreifenden Gebilde und der Arretierfläche (161, 261, 361, 461) erstreckt.

6. Schnurklemme (103, 203, 303, 403) gemäß einem der Ansprüche 1 bis 5, bei der die feststehende Führungsfläche (149, 249, 349, 449) sich ebenfalls zwischen der ersten und der zweiten Wand (155, 255, 355, 455, 157, 257, 357, 457) des Gehäuses erstreckt.

7. Schnurklemme (303) gemäß einem der Ansprüche 1 bis 5, bei der eine untere erste Wand (357) einen unteren Abschnitt (357A) auf einer Längsseite in der

Nähe der Arretierfläche und einen oberen Abschnitt (357B) auf einer gegenüberliegenden Längsseite in der Nähe der Schnurführungsfläche aufweist.

8. Schnurklemme (303) nach Anspruch 7, bei der eine vertikal verlaufende Schwelle (240) zwischen dem unteren Abschnitt (357A) und dem oberen Abschnitt (357B) der unteren ersten Wand (357) vorgesehen ist. 5
9. Schnurklemme (403) gemäß einem der Ansprüche 1 bis 8, bei der der Arretierhebel (427) einen ersten Abschnitt (422) aufweist, in dem der Schnurführungsdurchlass (426) angeordnet ist, und einen zweiten Abschnitt (424) aufweist, auf dem das schnurgreifende Gebilde (445) angeordnet ist, wobei benachbarte erste und zweite Teile (422B, 424B) der ersten und zweiten Abschnitte (422, 424) schwenkbar mit dem Drehzapfen (429) verbunden sind und wobei bei einer Schwenkbewegung des Arretierhebels um den Drehzapfen der zweite Abschnitt (424) weiter, vorzugsweise um etwa 15° weiter, um den Drehzapfen (429) schwenken kann als der erste Abschnitt (422). 10
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10. Schnurklemme (403) gemäß Anspruch 9, bei der mindestens der zweite Teil (424B) des zweiten Abschnitts (424) oberhalb des ersten Teils (422B) des ersten Abschnitts (422) liegt. 25
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11. Schnurklemme (403) gemäß Anspruch 9 oder 10, bei der das Schwenken des zweiten Abschnitts (424) im Verhältnis zum ersten Abschnitt (422) um den Drehzapfen (429) beschränkt ist durch das Gegen-
einanderstoßen ihrer benachbarten einander gegenüberliegenden Kanten (470, 472, 474, 476). 35
12. Schnurklemme gemäß Anspruch 1, bei der im Gebrauch eine Hubschnur verschieblich durch ein Zuelement angeordnet ist und mit ihrem freien Ende in Bezug auf das Gehäuse (133, 233, 333, 433) ortsfest verbunden ist. 40
13. Schnurklemme gemäß Anspruch 1, bei der die feststehende Führungsfläche (149, 249, 349, 449) Teil eines Stifts ist, der wahlweise in einer von mindestens zwei verschiedenen vorgegebenen Positionen angebracht werden kann. 45
14. Schnurklemme gemäß Anspruch 1 oder 13, bei der die feststehende Führungsfläche (149, 249, 349, 449) auf einen Element vorgesehen ist, das wahlweise in mindestens zwei verschiedenen Positionen im Gehäuse angebracht werden kann. 50

Revendications

1. Dispositif de blocage de cordon (103, 203, 303, 403) spécialement destiné à une couverture de fenêtre, particulièrement à un store à plis (101, 201, 301, 401), lequel comporte :

- un logement (133, 233, 333, 433) adapté pour être ajusté à un rail de tête s'étendant longitudinalement (105, 205, 305, 405) d'une couverture de fenêtre, le logement présentant des première et seconde parois parallèles (155, 255, 355, 455, 157, 257, 357, 457) et une paroi arrière (147, 247, 347, 447) ;
- une broche de pivotement (129, 229, 329, 429) qui s'étend entre les première et seconde parois du logement;
- un levier de blocage (127, 227, 327, 427), situé à l'intérieur du logement, comportant une extrémité adjacente à la paroi arrière (147, 247, 347, 447) et un passage pour guider le cordon (126, 226, 326, 426) au niveau d'une extrémité opposée, le levier de blocage pouvant pivoter autour de ladite broche de pivotement (129, 229, 329, 429) ; **caractérisé en ce que :**

la paroi arrière (147, 247, 347, 447) présente une surface de blocage (161, 261, 361, 461) s'étendant entre les première et seconde parois ;
le levier de blocage (127, 227, 327, 427) possède une extrémité adjacente à la surface de blocage (161, 261, 361, 461), l'extrémité opposée étant éloignée de la surface de blocage (161, 261, 361, 461) ;
le levier de blocage (127, 227, 327, 427) comporte une configuration de prise de cordon (145, 245, 345, 445) sur ladite extrémité et ladite broche de pivotement (129, 229, 329, 429) est placée entre la configuration de prise de cordon (145, 245, 345, 445) et le passage de guidage de cordon (126, 226, 326, 426) de sorte que la configuration de prise de cordon peut se déplacer vers et à distance d'un engagement avec la surface de blocage par un mouvement de pivotement du levier de blocage autour de la broche de pivotement et peut maintenir tendus les cordons de tirage, s'étendant entre le levier de blocage (127, 227, 327, 427) et la paroi arrière (147, 247, 347, 447), lorsque la configuration de prise de cordon (145, 245, 345, 445) est poussée vers la surface de blocage (161, 261, 361, 461) ; **et en ce que** le blocage de cordon comporte, de plus :

- une surface de guidage fixe (149, 249, 349,

- 449) placée latéralement, soit vers l'arrière, soit vers l'avant de la broche de pivotement (129, 229, 329, 429) par rapport à ladite paroi arrière (147, 247, 347, 447) et placée entre l'avant et l'arrière du levier de blocage (127, 227, 327, 427) de façon à permettre aux cordons de tirage de s'étendre le long de la configuration de prise de cordon (145, 245, 345, 445), autour de la surface de guidage fixe (149, 249, 349, 449) et à travers le passage de guidage de cordon (126, 226, 326, 426).
2. Dispositif de blocage de cordon (103, 203, 303, 403) selon la revendication 1, dans lequel les première et seconde parois (155, 255, 355, 455, 157, 257, 357, 457) et le levier de blocage (127, 227, 327, 427) s'étendent horizontalement, le passage de guidage de cordon (126, 226, 326, 426) s'étend latéralement, et la broche de pivotement (129, 229, 329, 429) et la surface de guidage fixe (149, 249, 349, 449) s'étendent verticalement.
 3. Dispositif de blocage de cordon (103, 203, 303, 403) selon la revendication 2 dans lequel la broche de pivotement (129, 229, 329, 429) est placée latéralement entre la surface de guidage fixe (149, 249, 349, 449) et la surface de blocage (161, 261, 361, 461).
 4. Dispositif de blocage de cordon (103, 203, 303, 403) selon la revendication 3 dans lequel la broche de pivotement (129, 229, 329, 429) est placée longitudinalement entre la surface de guidage fixe (149, 249, 349, 449) et la surface de blocage (161, 261, 361, 461).
 5. Dispositif de blocage de cordon (103, 203, 303, 403) selon la revendication 3 ou 4 agencé afin de supporter une partie supérieure d'un cordon de levage (111, 113, 114) d'une couverture de fenêtre afin de s'étendre de façon à coulisser vers le haut vers le passage de guidage de cordon (126, 226, 326, 426) et ensuite horizontalement et latéralement à travers le passage de guidage de cordon (126, 226, 326, 426), puis horizontalement et latéralement autour de la surface de guidage fixe (149, 249, 349, 449), puis horizontalement et longitudinalement autour de la configuration de prise de cordon (145, 245, 345, 445) et ensuite horizontalement et longitudinalement entre la configuration de prise de cordon et la surface de blocage (161, 261, 361, 461).
 6. Dispositif de blocage de cordon (103, 203, 303, 403) selon l'une quelconque des revendications 1 à 5, dans lequel la surface de guidage fixe (149, 249, 349, 449) s'étend également entre les première et seconde parois (155, 255, 355, 455, 157, 257, 357, 457) du logement.
 7. Dispositif de blocage de cordon (303) selon l'une quelconque des revendications 1 à 5 dans lequel une première paroi inférieure (357) présente une section inférieure (357A) sur un côté longitudinal adjacent à la surface de blocage et une section supérieure (357B) sur un côté longitudinal opposé adjacent à la surface de guidage de cordon.
 8. Dispositif de blocage de cordon (303) selon la revendication 7, dans lequel un seuil s'étendant verticalement (340) se trouve entre la section inférieure (357A) et la section supérieure (357B) de la première paroi inférieure (357).
 9. Dispositif de blocage de cordon (403) selon l'une quelconque des revendications 1 à 8, dans lequel le levier de blocage (427) possède une première portion (422), dans laquelle est placé le passage de guidage de cordon (426) et une seconde portion (424) sur laquelle est placée la configuration de prise de cordon (445), dans lequel des première et seconde parties adjacentes (422B, 424B) des première et seconde portions (422, 424) sont raccordées à pivotement à la broche de pivotement (429) et dans lequel la seconde portion (424) peut pivoter davantage, de préférence de 15° environ, que la première portion (422) autour de la broche de pivotement (429) avec un mouvement de pivot du levier de blocage autour de la broche de pivotement.
 10. Dispositif de blocage de cordon (403) selon la revendication 9 dans lequel au moins la seconde partie (424B) de la seconde portion (424) repose au-dessus de la première partie (422B) de la première portion (422).
 11. Dispositif de blocage de cordon (403) selon la revendication 9 ou 10 dans lequel un pivotement de la seconde portion (424) par rapport à la première portion (422), autour de la broche de pivotement (429) est limité par la butée de leurs bords opposés adjacents (470, 472, 474, 476).
 12. Dispositif de blocage de cordon selon la revendication 1 dans lequel, en fonctionnement, un cordon de levage est disposé de façon à coulisser à travers un élément de tirage, son extrémité libre étant raccordée de façon fixe par rapport au logement (133, 233, 333, 433).
 13. Dispositif de blocage de cordon selon la revendication 1 dans lequel la surface de guidage fixe (149, 249, 349, 449) fait partie d'une broche, pouvant être montée, de façon sélective, dans l'une d'au moins deux positions prédéterminées différentes.
 14. Dispositif de blocage de cordon selon la revendication 1 ou 13 dans lequel la surface de guidage fixe

(149, 249, 349, 449) se trouve sur un élément qui peut être monté, de façon sélective, dans au moins deux positions différentes dans le logement.

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Fig.1.

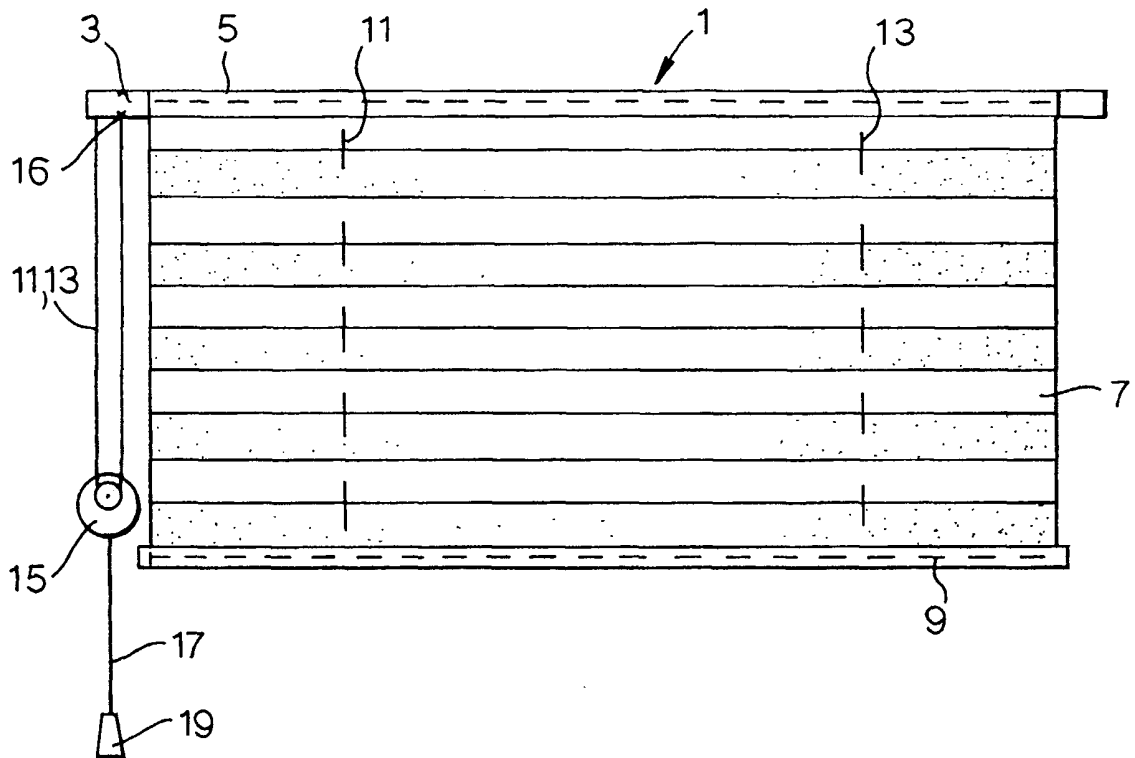


Fig.2.

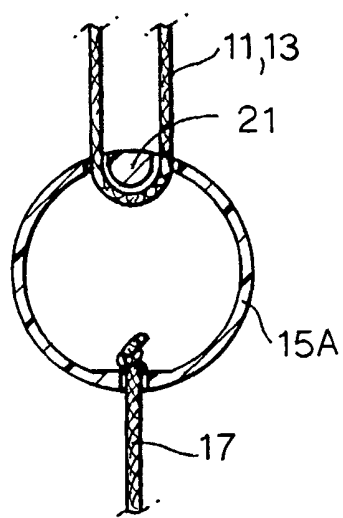


Fig.3.

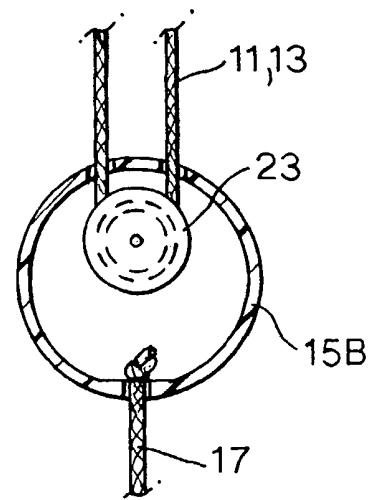
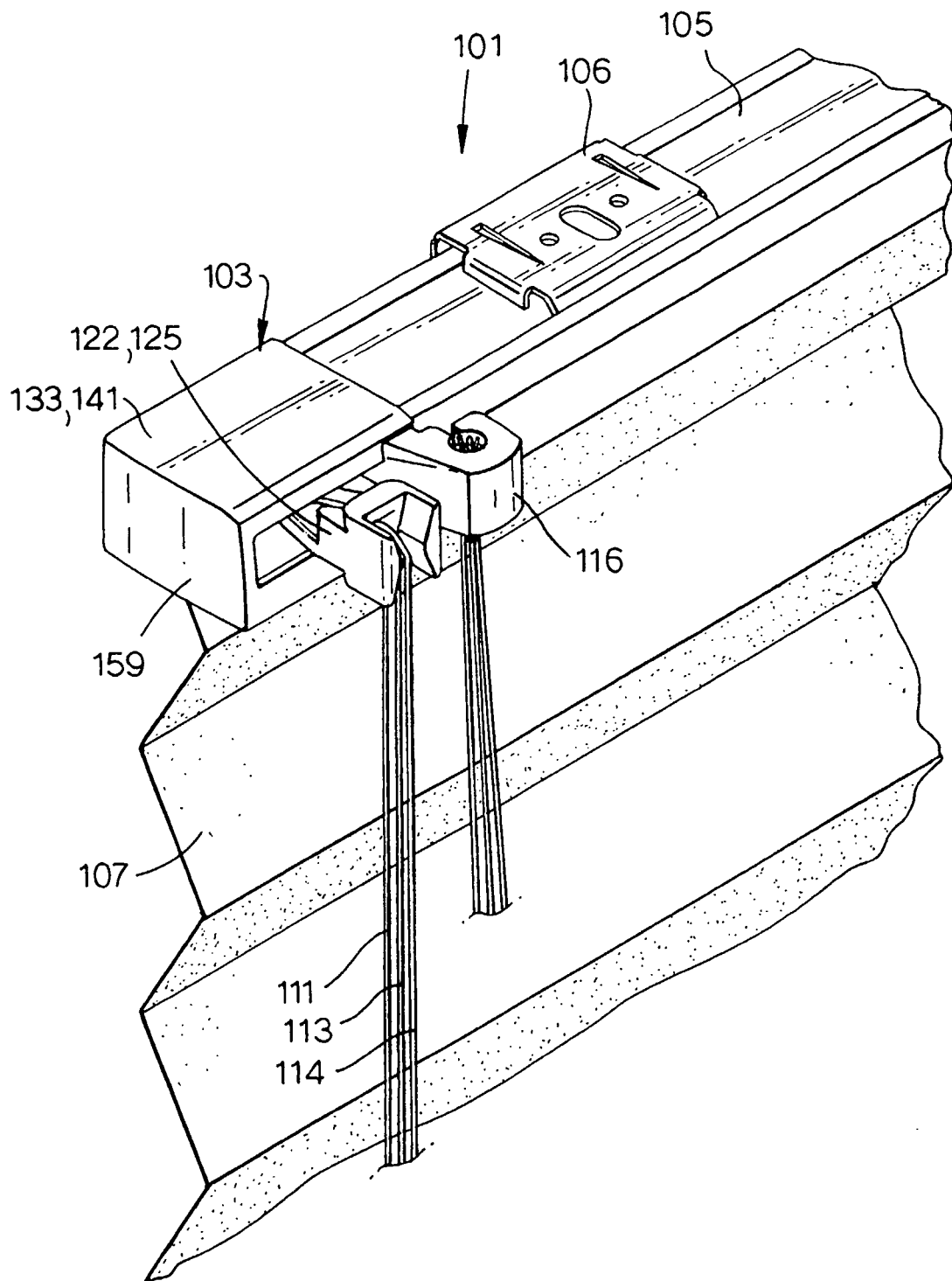


Fig.4.



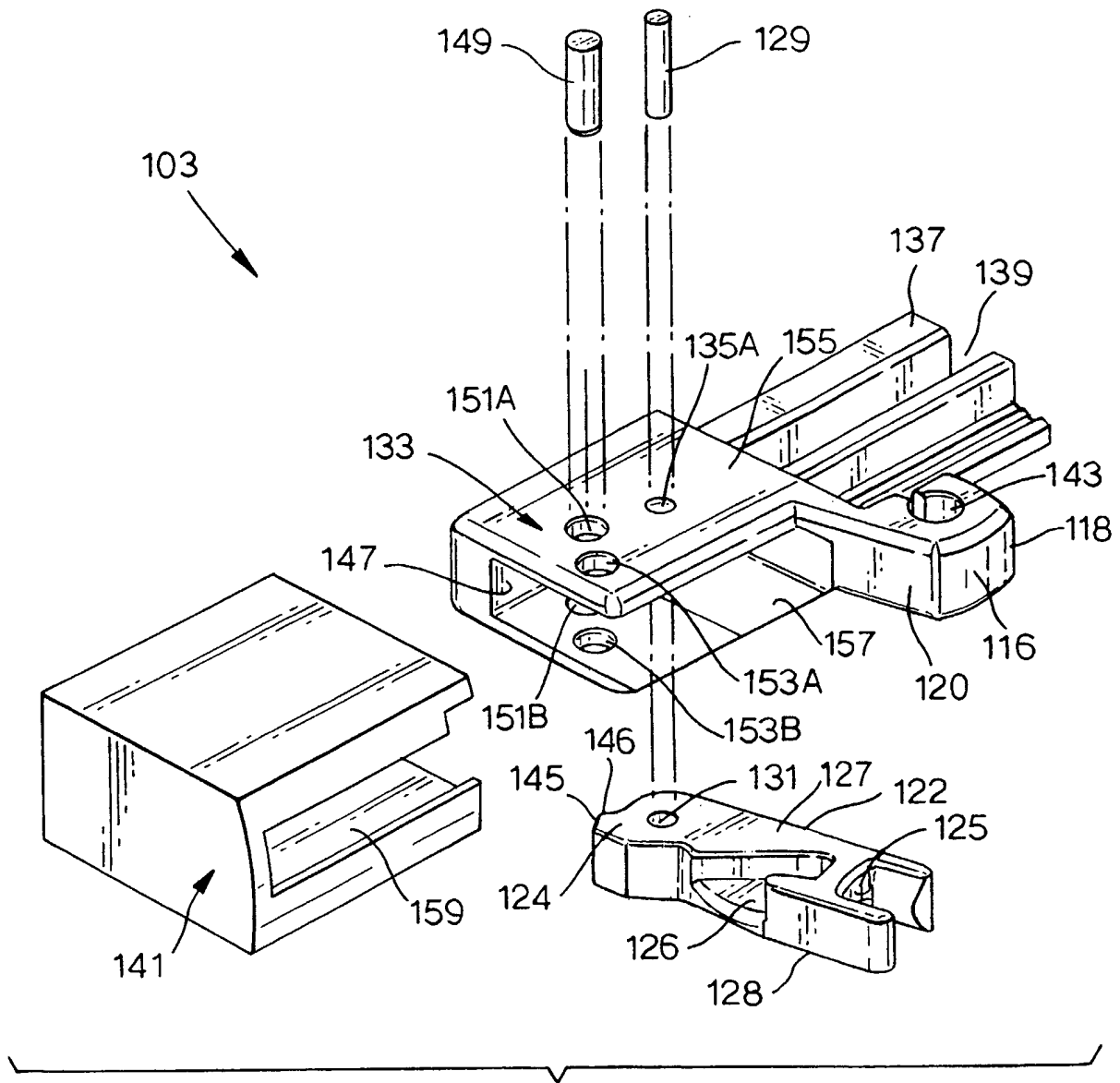


Fig.5.

Fig.6.

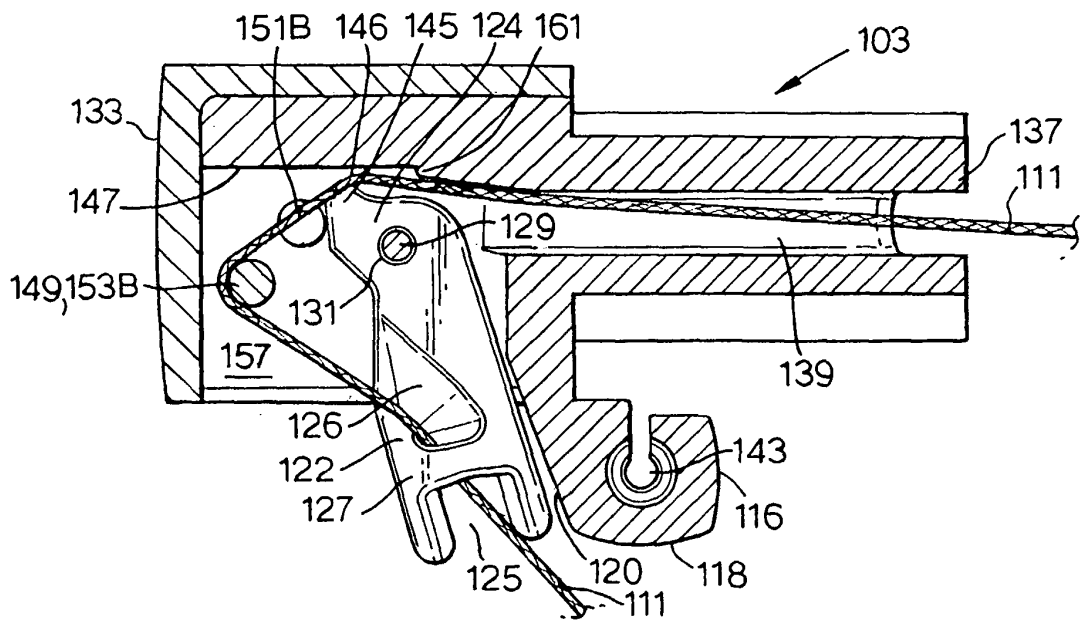


Fig.7.

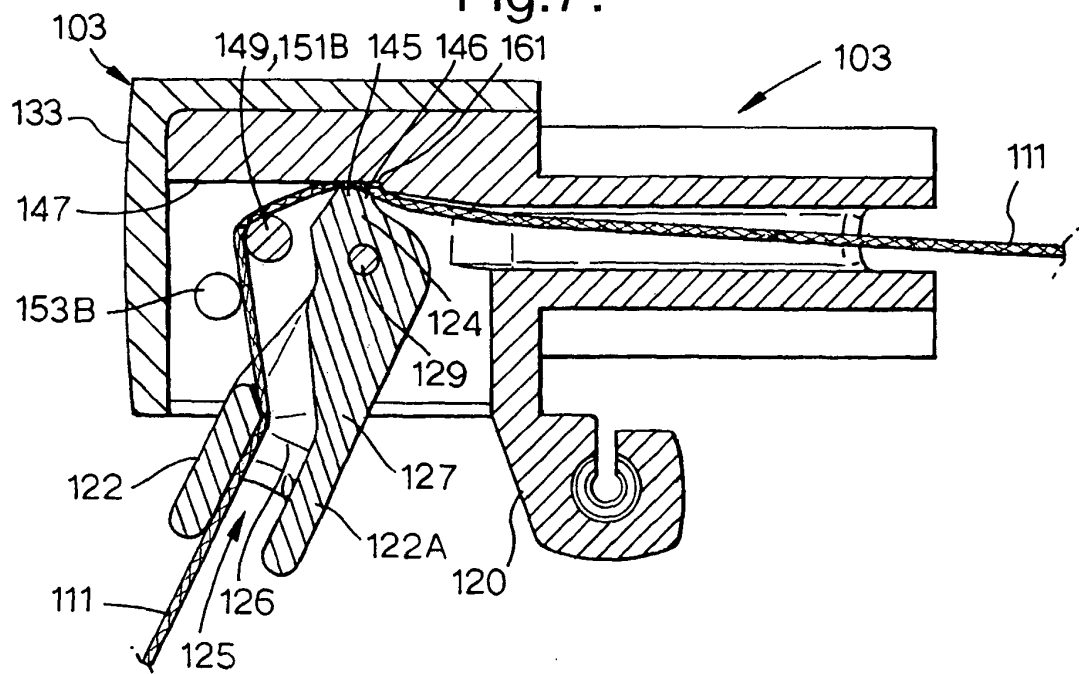


Fig.8.

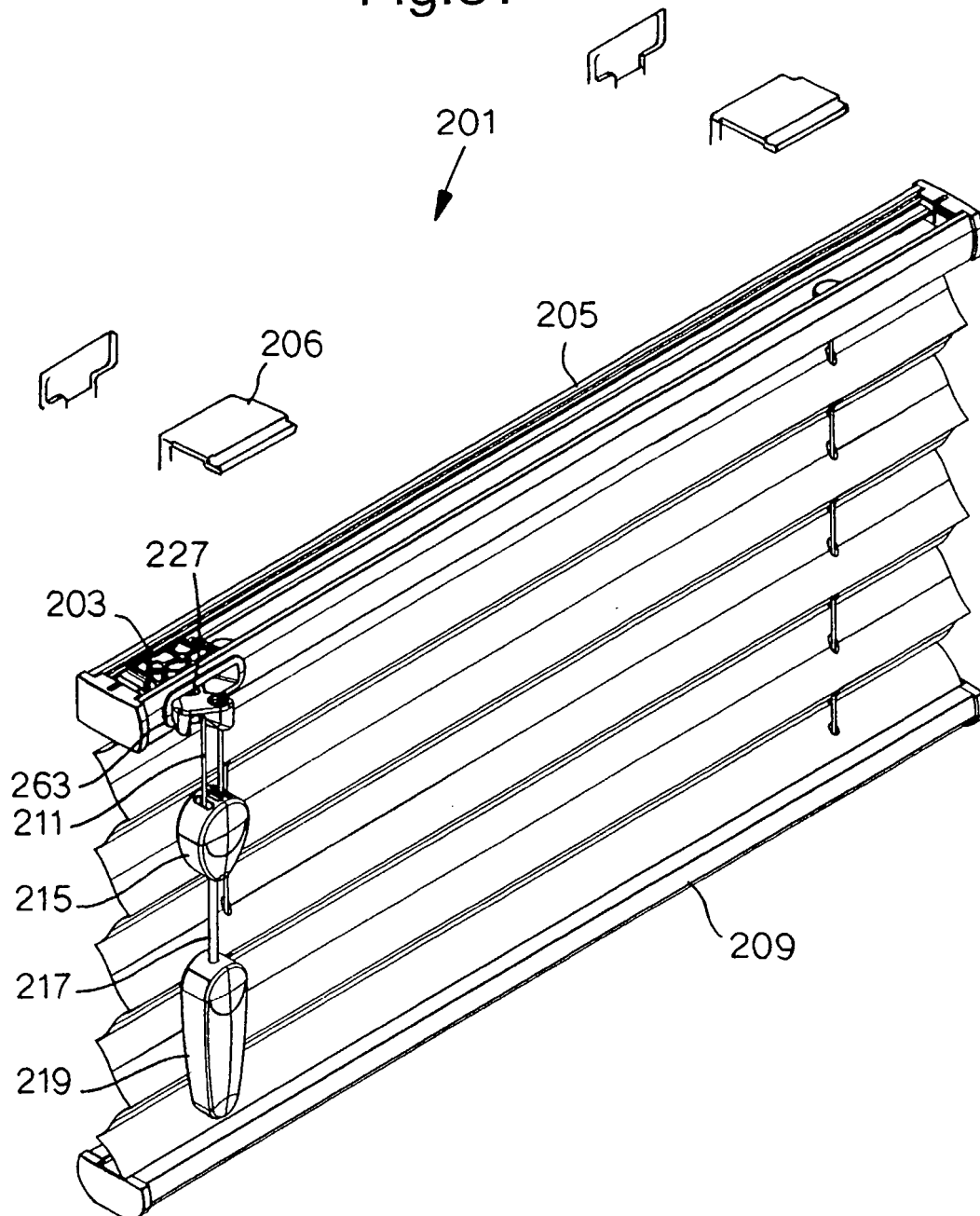
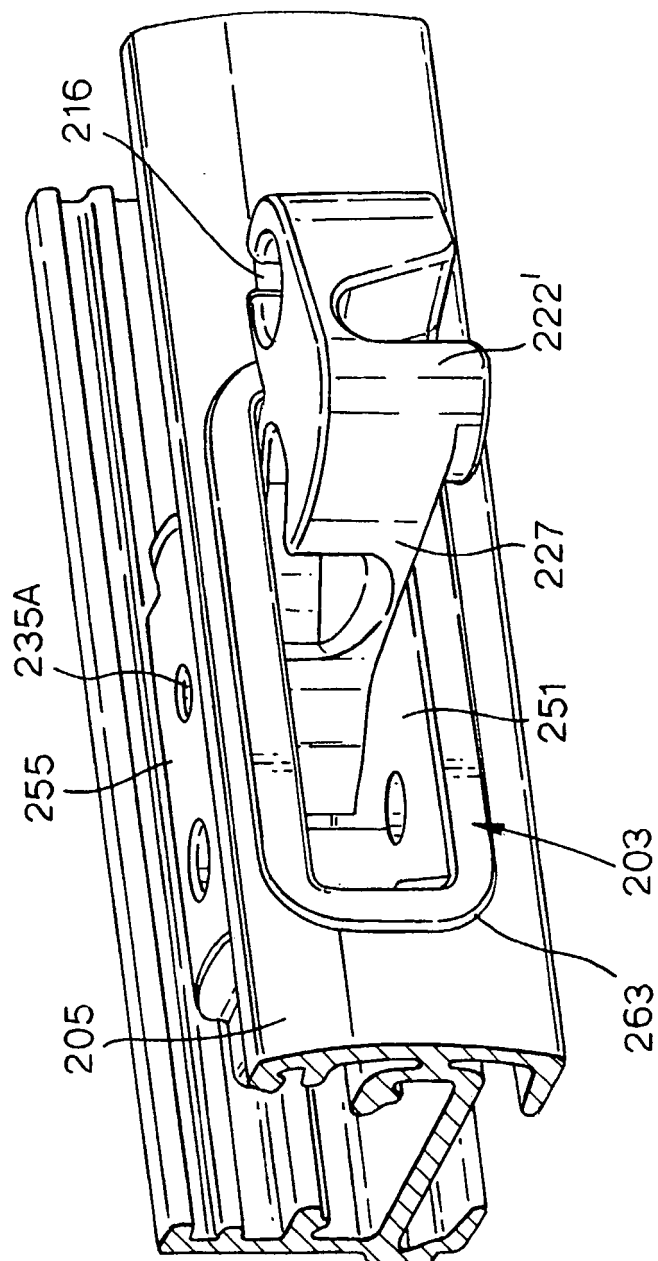


Fig.9.



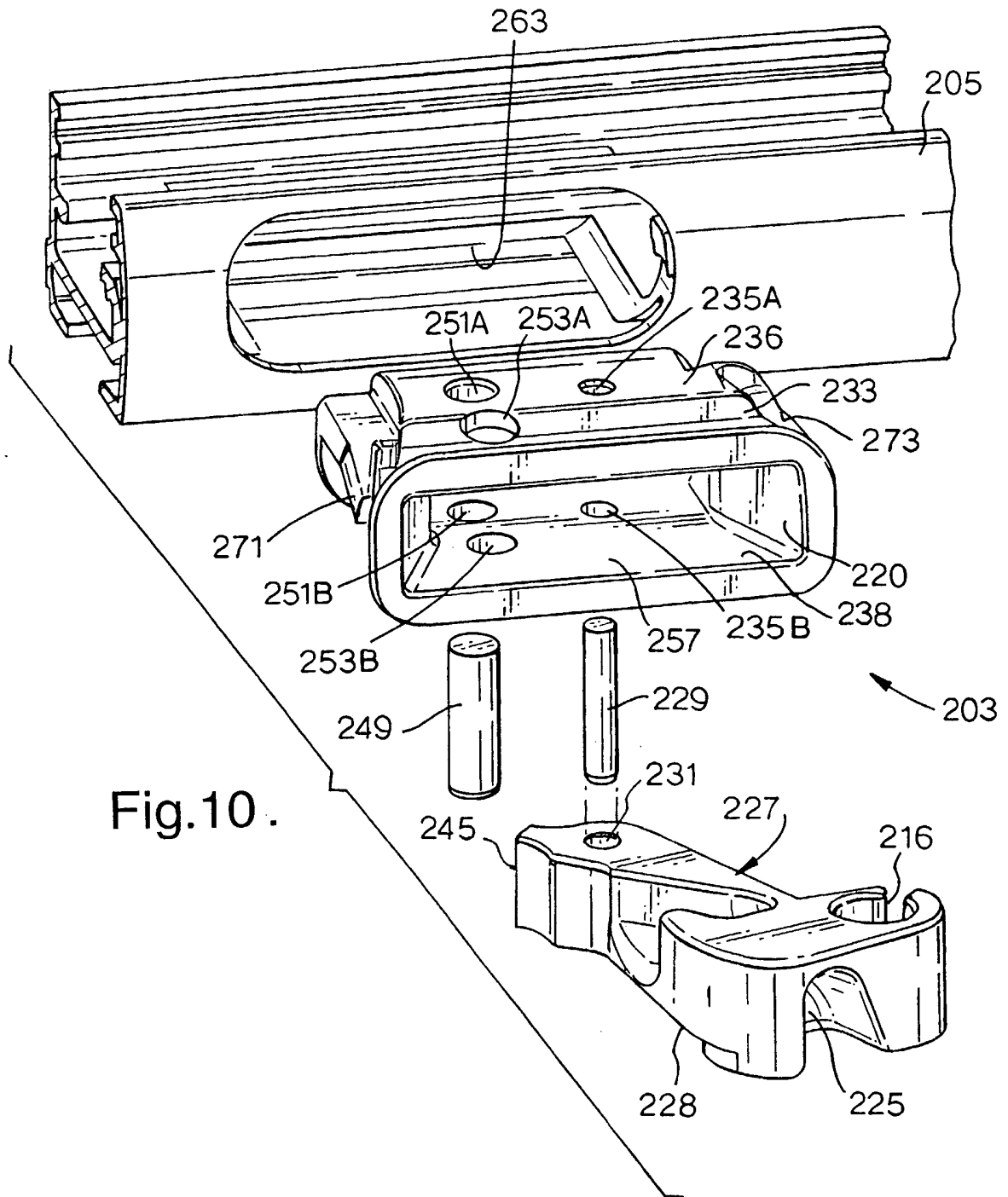


Fig.10.

Fig.11.

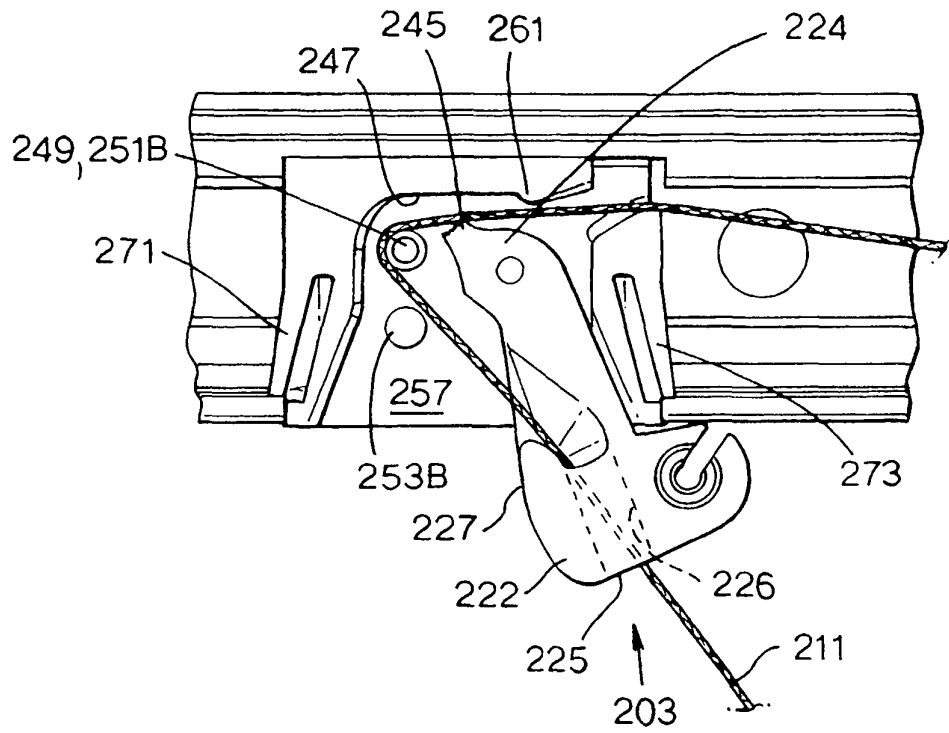


Fig.12.

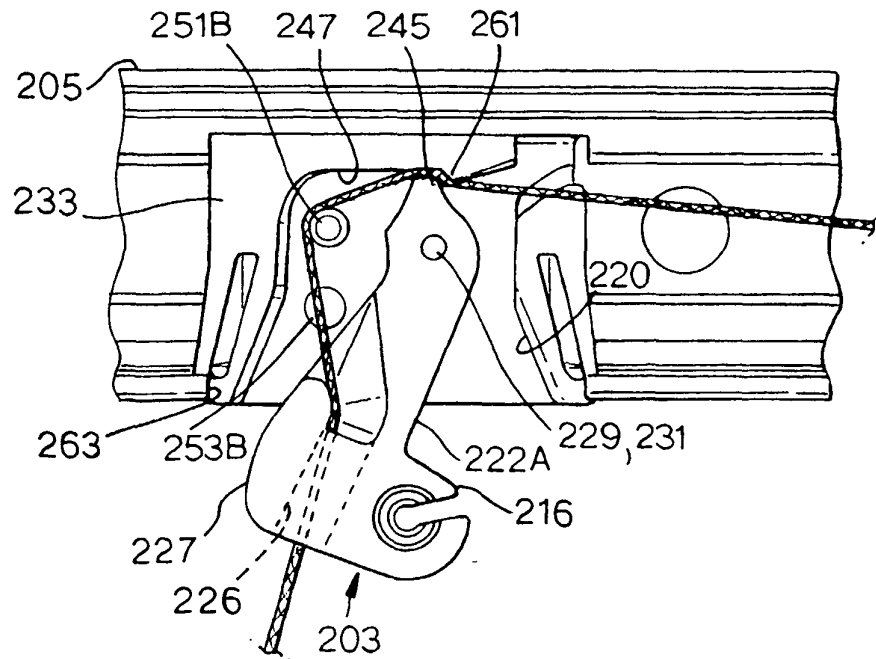


Fig.13.

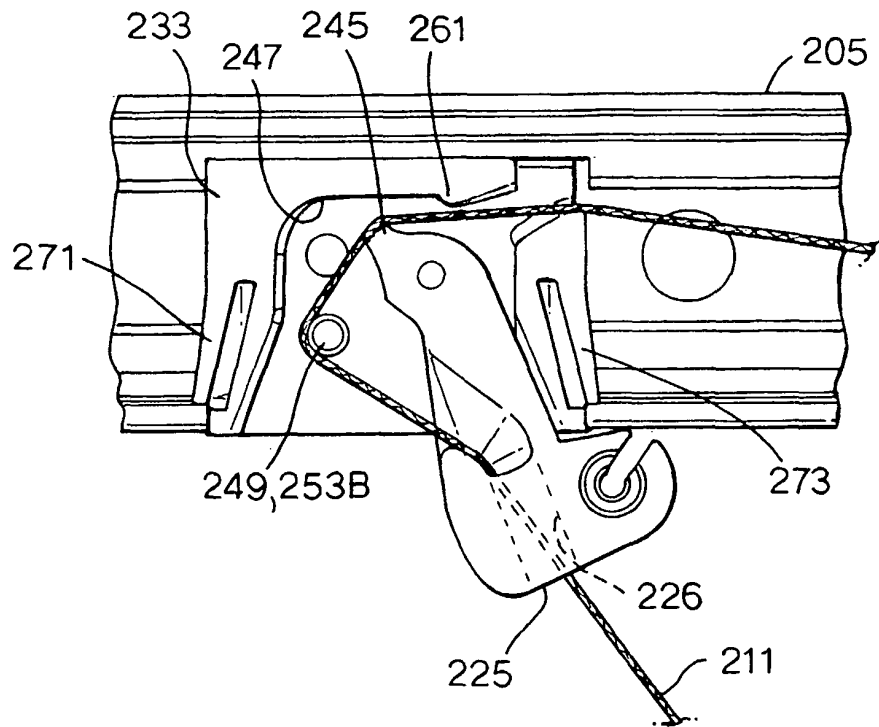


Fig.14.

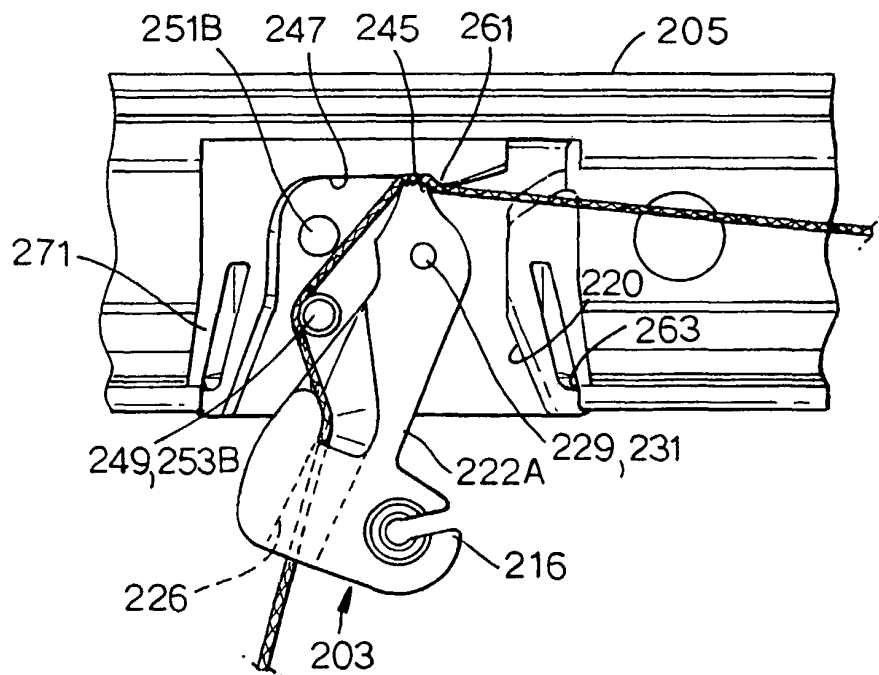


Fig.15.

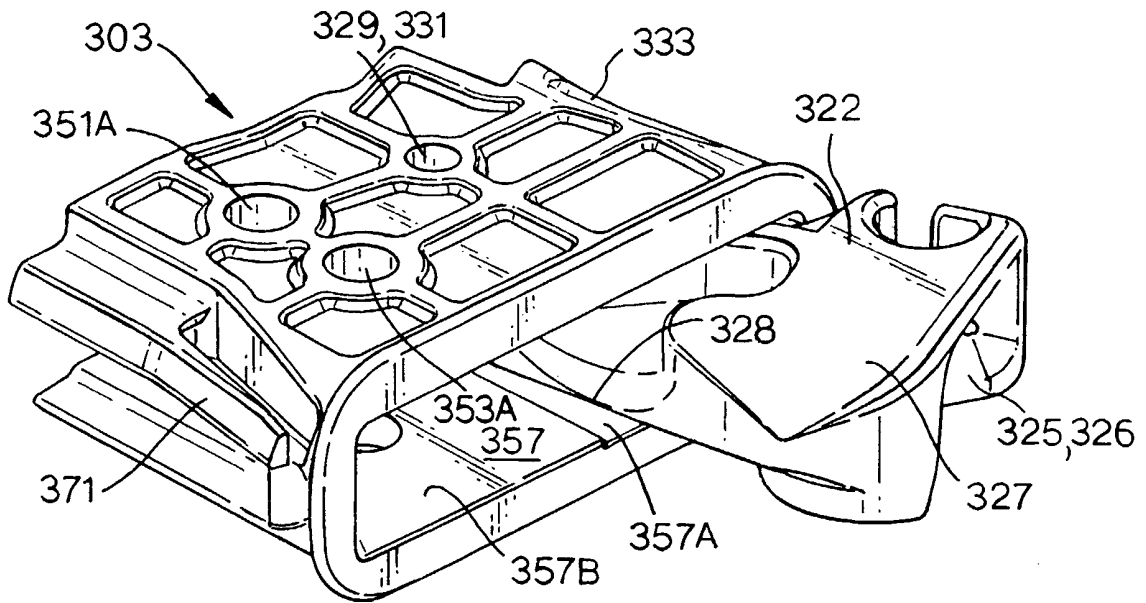


Fig.16.

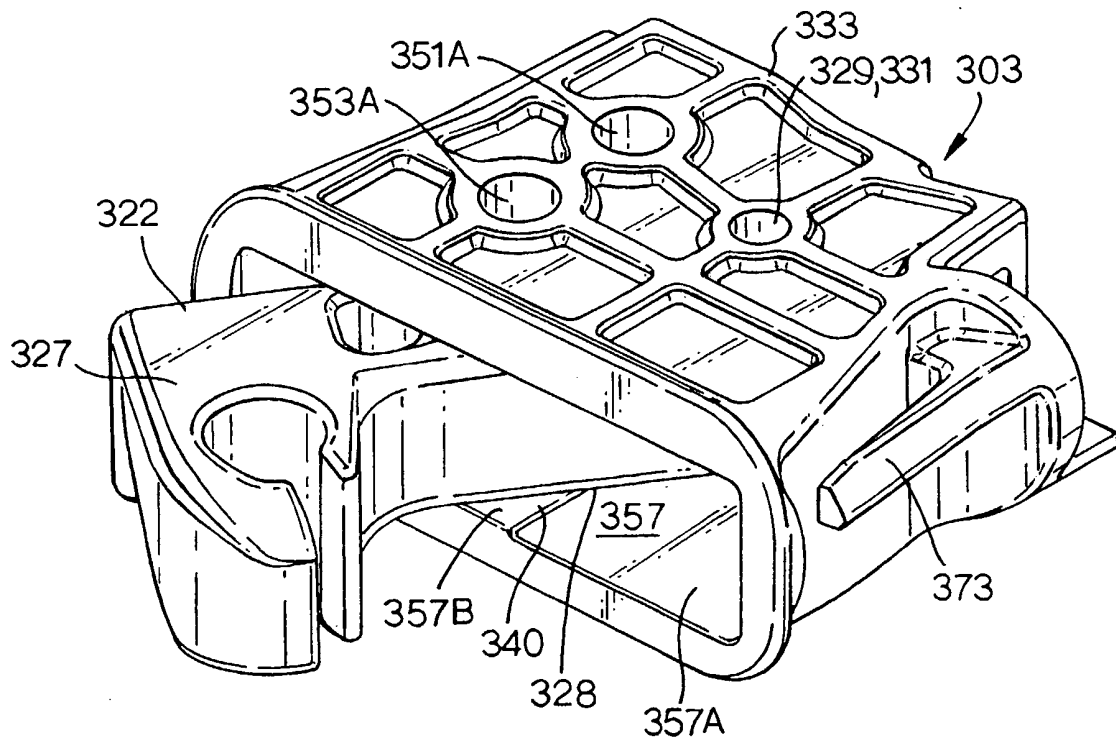


Fig.17.

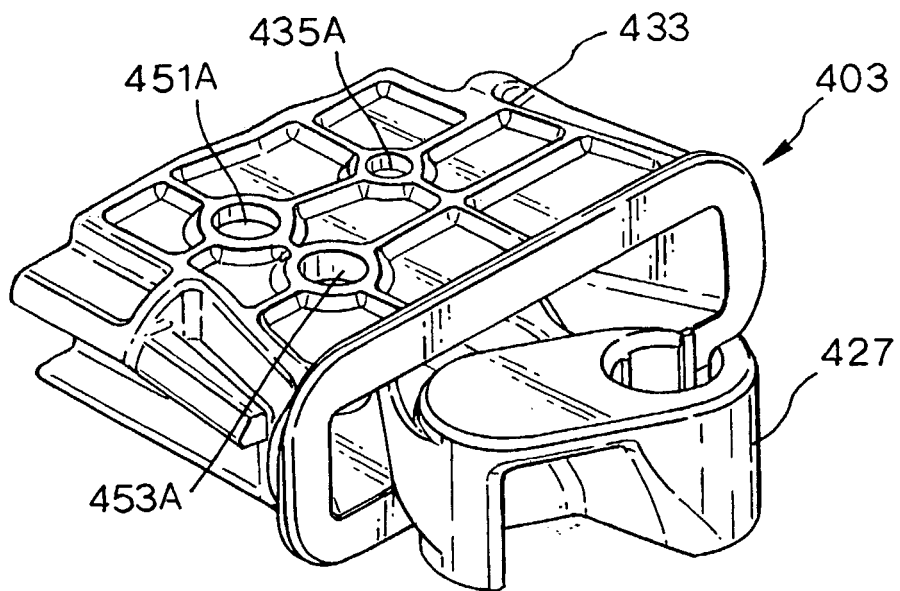


Fig.18.

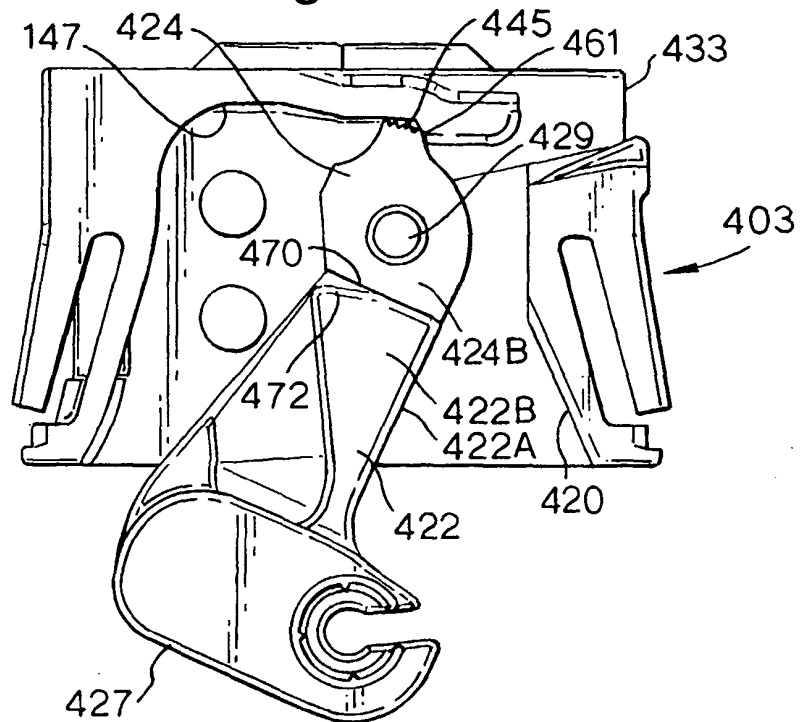
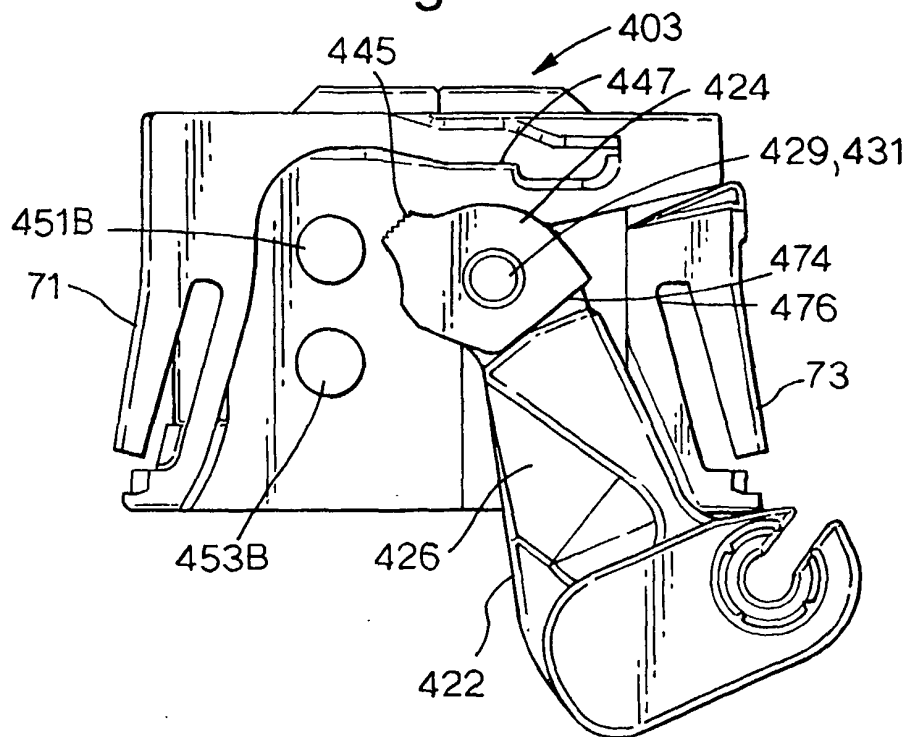


Fig.19.



REFERENCES CITED IN THE DESCRIPTION

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