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(54) **INDICATOR ATTACHMENT MECHANISM AND METHOD AND APPARATUS FOR REMOVING INDICATORS FROM HANGERS**

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Description

Field of the Invention:

[0001] This invention relates to improvements in indicator attachment mechanisms for molded plastic hangers, such as garment hangers and to a method and apparatus for removing indicators from garment hangers.

Background of the Invention:

[0002] For purposes of displaying garments suspended on hangers in an orderly and attractive manner to the retail customer, it is often desired to affix an indicating means on the hanger in a position visible to the retail customer while the hanger is suspended on a rack. The indicating means identifies some attribute of the garment suspended from the hanger, such as size, quality, color, manufacturing data, or pattern.

[0003] The provision of a readily visible size indicator on a garment hanger is now accepted by retailers as a desirable addition to a garment hanger. To accommodate the various types of hangers available in the industry numerous indicating means have been developed in a variety of shapes, sizes and materials. Similarly, hangers have been developed to accommodate a variety of different indicating means.

[0004] In Australian Patent No. 638436 and corresponding U.S. Patent No. 5,388,354, assigned to the assignee of the present invention, a low-profile molded plastic indicator for a garment hanger which requires limited modification to the hook of the hanger to enable the indicator to be securely attached to the top of the hook where it is most visible is described. The improvements described in the above patents overcame the major disadvantages of one type of indicator (trapezium-shaped) described in U.S. Patent No. 4,322,902 which required a specially molded hook profile to support the indicator.

[0005] The indicator according to Australian Patent No. 638436 and U.S. Patent No. 5,388,354 is also designed to enable sorting into a predetermined orientation to enable automated handling and fitting of the indicators to hangers as described in U.S. Patent Nos. 5,272,806 and 5,285,566 which are assigned to the assignee of the present invention. For these reasons, the indicator has enjoyed considerable commercial success.

[0006] The indicator is retained on the hook by means of at least one abutment projecting from the hook which engages an aperture in the side wall of the indicator. While it is possible to disengage the indicator from the abutment(s) by bowing the side walls in the regions of the apertures, this is a difficult operation and often results in some damage to the indicator or to the hanger.

[0007] Furthermore, it is increasingly common for customers to require that the indicator be removable from the hanger for re-use with other sized garments or re-location and the attachment mechanism described above does not readily facilitate this operation. It is, of course, equally necessary for the indicator to remain securely attached to the hanger during the usual handling operations to which the hanger is subjected in day to day use.

[0008] US 5 272 806 discloses a molded plastic hanger having an indicator attachment device, said hanger having a hook formed with an upstanding web to be received within a downwardly opening cavity of a molded plastic indicator, and attachment means formed on said upstanding web to engage and releasably secure said indicator to said web. The indicator comprises sideballs with a respective opening to receive the attachment means of the hanger for retaining the indicator on the upstanding web of the hook. The attachment means formed on the upstanding web is a snap fit engagement means which is received by the openings of the indicator. The snap fit engagement means is formed as snap fit engagement barbs so that it is necessary to bend or flex the sidewalls of the indicator beyond the barbs before the indicator can be removed from the upstanding web of the hanger.

[0009] US 5 377 884 discloses a similar plastic hanger with a hook comprising support means for receiving and engaging an indicator. The support means comprises bosses projecting outwardly from each side of the support means. The indicator includes a hollow foursided body with an open top and an open bottom, whereby each of the two large side surfaces has an opening to receive a boss of the support means of the hanger. In order to separate the indicator from the hanger, one end of the indicator has to be moved towards the other end of the indicator, so that the side surfaces are bowed outwardly and the openings clear the bosses of the support means.

[0010] WO 94/07399 discloses a plastic hanger with an indicator attachment mechanism. The indicator attachment mechanism is positioned on the hook of the plastic hanger and comprises a mounting surface with a ridge running around its periphery. The ridge has three projections protruding there from inwardly over the plane in which the surface lies thus forming a small recess. The indicator is formed by a resilient tag which flexes sufficiently to be positioned behind the projections of the mounting surface. The mounting surface has an opening therethrough. The indicator tag, when placed in the indicator attachment mechanism, is deflected into the opening allowing it to slip behind the projections. The opening also allows an easy removal of the indicator tag by pushing a suitable implement, such as a pen or another pointed device, through the opening from the side opposite the mounting surface. The implement is pushed against the fitted tag, which will flex sufficiently such that it can be removed from the projections and taken off the mounting surface.

[0011] The object of the present invention is to provide a molded plastic hanger with an improved indicator at-

tachment device which securely fastens an indicator to the hanger but which permits removal of the indicator in a simple operation that reduces the likelihood of damage to the indicator or to the hanger. The object of the present invention is further to provide a combination of such a hanger and an indicator. The object of the present invention is further to provide an apparatus and a method for automatically removing and a device for manually removing such an indicator from such a hanger in a simple but efficient operation.

[0012] The above object is achieved by a molded plastic hanger according to claim 1, a combination of an indicator and a hanger according to claim 9, an apparatus according to claim 13, a device according to claim 20, a use of such a device according to claim 22 and a method according to claim 23. Advantageous features are defined in the corresponding subclaims.

Brief Description of the Drawings:

[0013] The foregoing and other objects of the invention may now be more readily ascertained from the following detailed description of preferred embodiments thereof, taken in conjunction with the accompanying drawings; in which:

Figure 1 illustrates a front elevation view of the hook of a hanger incorporating the improved indicator attachment mechanism of the present invention;
Figure 2 illustrates an enlarged sectional view taken along line 2-2 of Figure 1;
Figure 3 illustrates a front elevation view of a second embodiment of the hanger hook depicted in Figure 1 with an indicator of the type described in Australian Patent No. 638436 and U.S. Patent No. 5,388,354 held in place by the indicator attachment mechanism of the present invention;
Figure 4 is an enlarged sectional view taken along line 4-4 in Figure 3;
Figure 5 illustrates a front elevation view of a third embodiment of the hanger hook incorporating the indicator attachment mechanism of the present invention;
Figure 6 illustrates a front elevation view of a fourth embodiment of the hanger hook incorporating the indicator attachment mechanism of the present invention;
Figure 7 is a fragmentary front elevation view similar to Figure 1 illustrating a fifth embodiment of the indicator attachment mechanism;
Figure 8 illustrates a sectional view taken along line 8-8 of Figure 7;
Figure 9 illustrates a sectional view taken along line 9-9 of Figure 7;
Figure 10 illustrates a top view of Figure 3;
Figure 11 illustrates a perspective view of one embodiment of the decapping apparatus according to the present invention with a feeding rail with a plurality of hangers thereon;
Figure 12 illustrates a sectional view taken along line 12-12 of the decapping apparatus of Figure 11 in a first feed position;
Figure 13 illustrates the sectional view of Figure 12 with the two plates in a second and lower feed position;
Figure 14 illustrates a sectional view of the two plates in the lower position with a second embodiment of the front plate;
Figure 15 illustrates a sectional view taken along line 15-15 of the decapping apparatus of Figure 11;
Figure 16 illustrates a sectional view similar to Figures 13 and 14 with a third embodiment of the front plate, wherein the indicator is to be removed from a second embodiment of the hanger;
Figure 17 illustrates a partial sectional view taken perpendicular to the view of Figure 16;
Figure 18 illustrates a perspective view of the back plate of the decapping apparatus of Figure 11;
Figure 19 illustrates a perspective view of the front plate of the decapping apparatus of Figure 11;
Figure 20 illustrates an enlarged perspective view of one embodiment of the pin positioned on the back wall of the recess of the back plate;
Figure 21 illustrates an enlarged perspective view of a second embodiment of the pin positioned on the back wall of the recess of the back plate;
Figure 22 illustrates a top view of one embodiment of a manual decapping device according to the present invention; and
Figure 23 illustrates a sectional view of the manual decapping device taken along line 23-23 of Figure 22.

Detailed Description of the Preferred Embodiments:

[0014] Referring now in detail to the drawings, and to the embodiments depicted in Figures 1-10, there is illustrated generally a hook 2 adapted to engage a rod or other supporting means, with an upwardly projecting web 4 extending upwardly above the top contour 2a of hook 2 that engages the rod or other supporting device. An opening 6 is defined in said upwardly projecting web 4 such that upwardly projecting web 4 completely surrounds opening 6. Leg 8 descends from an upper portion 10 of the upwardly projecting web into the opening 6.

[0015] Referring to Figures 1 to 4 of the drawings, Figure 1 shows a first embodiment of the hook 2 of a molded plastic garment hanger in simplified form which in practice typically includes the usual strengthening ribs 12a, 12b shown in Figure 3 around the perimeter of the hook. The hook 2 is formed with a flange 14 defining a top region 16, which in a preferred embodiment is flattened and slightly larger in peripheral dimensions than the lowermost portion of an indicator 18 (shown in Figures 3, 4 and 10) having side walls 20, 22 formed with at least

one retention aperture 24, 26, as described in Australian Patent No. 638436 and U.S. Patent No. 5,388,354, the contents of which are incorporated into this specification by cross-reference. The apertures 24, 26 define through-openings which facilitate stacking of the indicator 18 with other indicators prior to fitting to a hanger.

[0016] The upstanding web 4 extends centrally from the top region 16 of the hook 2, and in this embodiment the web 4 is shaped similarly to the shape of the cavity of the indicator 18 so as to comfortably fit within that cavity. Alternatively, the web 4 can be configured in the manner shown in Figures 5 and 6 herein or Australian Patent No. 638436. In a preferred embodiment the upstanding web is narrow.

[0017] The web 4 is formed with integrally molded indicator attachment means 28. In the present embodiment the indicator attachment means includes central opening 6 from the upper portion of which a resilient detent leg 8 extends downwardly terminating in a laterally projecting portion 30 configured to engage one of the apertures 24 or 26 in the side wall of the indicator 18, as shown in Figure 4 of the drawings.

[0018] Since the detent leg 8 is narrow and is resiliently connected to web 4, it is easily deflected laterally by means of a probe or pin inserted into the aperture 24 or 26 which engages laterally projecting portion 30 to displace laterally projecting portion 30 toward the plane of the web to clear the aperture 24 or 26 and allow the indicator to be removed from the web 4. This operation can be achieved simply and quickly with little or no damage to the indicator 18 or the attachment means 28. Nevertheless, while the laterally projecting portion 30 remains in the position shown in Figure 4 of the drawings, the indicator 18 will remain securely fastened to the web 4 and will withstand all usual handling operations to which the hanger is usually subjected in day-to-day use.

[0019] To improve the flexibility of the detent leg 8, it can be reduced in thickness as shown at 200 in Figure 4 of the drawings.

[0020] Referring now to Figures 5, 6 and 7 of the drawings, third, fourth and fifth embodiments of the invention are shown in which the same reference numerals are used to indicate similar parts. In the embodiment of Figures 5 and 7, the resilient detent leg extends angularly from its point of attachment to the web 4, as shown most clearly in Figures 8 and 9 of the drawings, and has a shorter laterally projecting portion 30 formed at its free end. The upstanding web 4 of the hook 2 is further formed with a pair of ribs 34 on either side of the central semi-circular opening 6 to prevent the indicator (not shown in Figures 5 and 7) from being inadvertently laterally displaced to clear the laterally projecting portion 30 which engages the aperture of an indicator similar to that shown in Figure 4 of the drawings. If desired, ribs 34 can be provided in the embodiment of Figures 1-4 of the drawings.

[0021] Figure 6 illustrates the hook 2 of the present invention in which flange 14 is integrally formed as part of strengthening rib 12, and extends around the perimeter of the hook 2.

[0022] In the present invention the upstanding web 4 formed on the hook 2 of the hanger can be shaped and dimensioned similar to the shape of the cavity of the indicator 18 so as to comfortably fit within that cavity. By the same token, as depicted in Figure 5, upstanding web 4 can also be formed in the "normal" shape of the shape of the hook 2 so the hanger can be used with or without the indicator. The web can also be configured in the manner shown in Australian Patent No. 638436 and U. S. Patent No. 5,388,354 or in any other manner to accommodate the cavity dimensions of any other type of indicator, including indicators that have angled or sloping end walls to conform to the angularity of the hook design.

[0023] The indicator attachment mechanism described in the above embodiments provides a particularly simple and convenient means of retaining the indicator 18 on the web 4 of the hook 2 while enabling the indicator 18 to be conveniently removed in a simple operation which does not significantly damage either the indicator 18 or the hook 2 of the hanger. In this way, the disadvantages associated with the attachment mechanism described in our Australian Patent No. 638436 and U.S. Patent No. 5,388,354 are overcome in a simple but innovative manner.

[0024] In the preferred embodiment, the improved hanger hook of the present invention is formed of styrene which provides a clear virtually transparent hanger for maximum display of garments suspended therefrom. Alternately, the hanger could be formed from K resin, H. I. styrene, polypropylene or other suitable thermoplastic.

[0025] Referring now to Figures 11-21 of the drawings, a perspective view of an automated system for removing indicators from hangers is provided.

[0026] Figure 11 shows a perspective view of one embodiment of the decapping apparatus according to the present invention. A garment hanger 1 to be decapped is provided with an upstanding web 4, which extends from a top region 16 of the hook of the hanger 1. The web is formed with integrally molded indicator attachment means. The attachment means includes a central opening defined in the upper portion of the web 4 with a detent leg, which extends downwardly terminating in a laterally projecting portion 30 configured to engage one of the apertures 24, 26 in the side walls of the indicator 18. In a preferred embodiment the laterally projecting portion 30 is narrow and resiliently connected to the web 4. In the embodiment depicted in Figure 11 the top region 16 is flat and has a width larger than the indicator 18. As shown more clearly in Figure 12, side wall of the indicator 18 is not aligned with the side walls of the hook of the flange. A top view of the indicator and hook of this embodiment is provided in Figure 10 which more clearly shows top region 16 of hook 2 extending beyond side walls 22 and 24 of the indicator 18. In a

second preferred embodiment illustrated in Figure 16, the top region of the hook and the indicator have about the same width.

[0027] The method and apparatus for removing the indicator 18 from the hangers 2 will be hereinafter described with respect to Figures 11-21. Throughout this description, the term decapping will be used to describe the removal of the indicator 18 from hanger 1.

[0028] As illustrated in Figure 11, the laterally extending portion 30 is easily deflected laterally by means of a pin 120 inserted in the aperture 24 of the indicator 18 which engages the laterally extending portion 30 to displace it towards the plane of the web 4 to clear the aperture 24 and allow the indicator 18 to be removed from the hanger 1. With the decapping apparatus of the present invention, indicators 18 can be automatically removed from their respective hangers 1.

[0029] In this embodiment the hanger 1 is fed to the decapping apparatus by means of a feeding rail 105. The feeding rail 105 is inclined so that the hangers 1 move downwardly toward the decapping apparatus by gravity. The hangers 1 can be put onto the feeding rail 105 manually or automatically. Other means to feed hangers 1 to the decapping apparatus could comprise a screw conveyor, a belt conveyor, or any other appropriate means to carry the hangers toward the decapping apparatus.

[0030] The decapping apparatus includes a front plate 106, a back plate 107 and an actuating means 108. The actuating means 108 comprises an escapement valve, which is pneumatically driven and includes two rods. Each of the rods is connected to the plate 106 or 107 via respective connecting means 109 and 110. Front plate 106 and back plate 107 are arranged vertically and are facing each other. In the embodiment shown in Figure 11, the two plates 106 and 107 are almost quadratic, but any other appropriate shape, for example rectangular, can be used. The actuating means 108 moves the front plate 106 and the back plate 107 parallel to each other in a vertical plane. This movement is periodically repeated, so that one hanger after another can be decapped.

[0031] As can be seen in Figure 11, the feeding rail 105 extends under the two plates 106 and 107. The distance between the plates 106 and 107 when said plates are in their lower positions and the feeding rail 105 is preferably such that pin 120 in its lower position will be aligned with aperture 24 of indicator 18. The height of the assembly is adjusted to provide automatic operation for different styles of hanger hooks. As illustrated in Figure 11, the back plate 107 is in its lower position, and the front plate 106 is in its upper position. When the hanger 1 moves down the feeding rail 105 toward the decapping apparatus, the movement of the hanger 1 is stopped by the back plate 107. As shown in Figure 12, in operation, a plurality of hangers 1 are waiting in front of the decapping apparatus on the feeding rail 105 in line, to be decapped one after the other.

[0032] As shown in Figure 11, at the start of the decapping cycle, the back plate 107 is lowered to its lowermost position. Plate 107 has a recess 119 positioned on an outer portion of the surface facing the front plate 106. Recess 119 is dimensioned to correspond to the dimensions of the indicator 18, so that when a hanger 1 is pressed against the back plate 107, the indicator 18 is received in the recess 119. A pin 120 is provided on the back wall of the recess 119 in a position corresponding to the aperture 24 of the indicator 18. The dimensions, such as the size and the shape of the pin 120 are selected according to the dimensions, particularly the shape and the depth, of the aperture 18, so that the pin 120 enters the aperture 18 and is able to displace the laterally projecting portion 30 of the web 4 of the hanger 1 to clear the aperture 18, and allow the indicator 18 to be removed from the hanger 1 as described above. In the preferred embodiment shown in Figure 11, the pin 20 has a rectangular cross-section, but any other appropriate shape can be used, as will be described herein.

[0033] At the start of the decapping cycle, the front plate 106 is raised but only needs to be raised upwardly until it no longer covers the recess 119. In other words, the amplitude of the movement of the plates 106 and 107 has to be at least the height of the recess 119, so that the indicator 18 can be received in the recess 119.

[0034] After the indicator 18 is received in the recess 119 of the back plate 107, the front plate 106 is moved downwardly to seat the indicator 18 firmly or at least to hold the indicator firmly in the recess 19 of the back plate 107. In this position the pin 120 of the back plate 107 displaces the laterally extending portion 30 of the hanger 1, to permit the release of the indicator 18 from the hanger 1. The pin 120 is long enough to fully displace the laterally extending position 30 from the recess 24 of indicator 18, but is not long enough to engage the aperture 6 of hook 2. As is shown in Figure 12, the lower edge 146 of the front plate 106 can be beveled, so that the downward movement of the front plate 106 separates hanger 1 from the rest of the hangers so that front plate 106 enters between the hangers. In the embodiment shown in Figure 12, the lower edge is beveled towards the back plate 107.

[0035] As illustrated in Figure 15 when the pin 120 has displaced the laterally extending portion 30 from the indicator 18, the indicator may be removed from hanger 1 when the back plate 107 is moved upwardly to its upper position, while the front plate 106 stays in its lower position. Since pin 120 of the back plate 107 extends into the aperture 18 of the indicator 18, the back plate 107 carries the indicator 18 upwardly. In the embodiment shown in Figures 11-15, front plate 106 engages hanger 1 and prevents the hanger 1 from also being carried upwardly. Figure 13 illustrates this situation, wherein both of the plates 106 and 107 are in their lower positions and the beveled lower edge 146 of the front plate 106 holds the hanger 1 down by abutting against the edge of the top region 116 of the hook of the hanger 1.

Consequently, the pin 120 has two functions: displacing the laterally extending portion 30 of the hanger 1 to release the indicator 18 from the hanger 1 and carrying the indicator 18 upwardly to separate the indicator 18 from the hanger 1.

[0036] Figure 14 shows the decapper mechanism with a second embodiment of the front plate 106. The lower edge 148 has a step-shape to hold the edge of the top region 16 down. As depicted in this embodiment and Figure 2 top region 16 is preferably flat. For clarity of illustration, Figures 13 and 14 show only the plates 106 and 107 in their lower positions, a few hangers 1 and the feeding rail 105. As illustrated in Figure 11, the front plate 106 has an aperture or a window 118 having generally the same shape as the recess 119 of the back plate 107. When the back plate 107 is in its upper position and the front plate 106 is in its lower position, the recess 119 and the window 118 match, so that the indicator 18 can be removed from the recess 119 through the window 118. The window 118 can have any appropriate shape, as long as the indicator 18 can pass through it.

[0037] In the described embodiment, the indicator 18 is removed from the recess 119 by means of an air blast. As can be seen in Figure 11, the back wall of the recess 119 has an aperture 121, which is connected to an air control means by means of a tube 127, shown in Figure 15. The air blast through the opening 121 is controlled, so that, when the back plate 107 reaches its upper position, and the front plate 106 is in its lower position, an air blast is generated or enabled, which pushes the indicator 18 through the window 118 of the front plate 106. The released indicator 18 passes through the window 118 of the front plate 106 and is collected by a discharge tube 124, which is positioned in front of the window 118 and leads the released indicator to a container 125.

[0038] Upon removal of the indicator 18, hanger 1 continues, as soon as the back plate 107 is moved upwardly, to slide down the feeding rail 105. As illustrated in Figure 15, hanger 1 with web 4 is moving down the feeding rail 105 after being decapped. The decapped hanger is either collected manually or automatically therefrom, for example by means of a screw conveyor. Said screw conveyor can collect decapped hangers from a plurality of feeding rails 105 coming from respective decapping apparatuses.

[0039] As illustrated in Figures 11 and 12, the decapping apparatus is driven pneumatically, and further comprises position control means 111, air control means 114, a first timer 116, a second timer 117, and an air valve 137. The air valve 37 generates and/or controls the pressurized air, by which the decapping apparatus according to the preferred embodiment of the present invention is controlled and driven.

[0040] The air valve 137, the timers 116 and 117, the actuating means 108, the air control means 40 and the position control means 111 respectively are connected by air tubes for pneumatic control. Also, the entire apparatus is held and fixed to a holding means (not shown).

[0041] As shown in Figure 12, the position control means 111 comprises a first detector 112 for the position of the front plate 106 and a second detector 113 for the position of the back plate 107. The first detector 112 and the second detector 113 work on a pneumatical basis and have a similar structure. First and second detectors 112 and 113 each include generally a cylindrical tube illustrated by 144 and 145, respectively, and pistons 122 and 123, respectively, which are movable within each of said cylindrical tubes 144 and 146. The outer ends of pistons 122 and 123 are provided with contact plates, which are contacted by the upper sides of the front plate 106 and the back plate 107, respectively.

[0042] In the upper position, the front plate 106 and the back plate 107 press inwardly pistons 122 and 123, respectively, and cause a pneumatic signal in the position control means 111, thereby permitting a steady control of the position and the movement of the plates 106 and 107. Figure 12 shows a cross section of the control means 111 and the plates 106 and 107, whereby the position of the plates 106 and 107 is the same as in Figure 11. Also, the discharge tube 124 and a collecting container 125 for the released indicators 18 are illustrated.

[0043] Figure 15 illustrates a side view of the air control means 114 and the tube plates 106 and 107. The air control means 114 comprises a third detector 115 for detecting the position of the back plate 107. Third detector 115 has a cylindrical tube 149 and a piston 126, which, generally have the same shape and function as the first and second position detectors 112 and 113 as described above. In Figure 15, the back plate 107 is in its upper position, and the front plate 106 is in its lower position. The back plate having released and carried a indicator 18 upwardly from hanger 1, contacts a contact plate 26 of the position detector 115 and moves the contact plate 126 together with its piston into the cylindrical tube of the detector 115. This causes a pneumatic signal within the air control means 114, which enables a pressurized air blast through a tube 127, which is connected to the opening 121 of the back plate 107 by appropriate connection 128. The air blast through the opening 121 ejects the released indicator 18 through the window 118 of the front plate 106 into the discharge tube 124. The arrow in Figure 13 indicates the direction of the movement of the indicator 18.

[0044] In operation, the back plate 107 moves downwardly to its lower position, which is followed by an upward movement of the front plate 106 to its upper position. The whole movement cycle is repeated periodically, so that a plurality of hangers 1 can be decapped easily and reliably in an automated process. Since one of the plates 106 and 107 is always in its respective lower position, there will be always a number of hangers 1 on the feeding rail 105 waiting to be decapped one after another, as shown in Figures 12 to 15.

[0045] The actuating means 108 controls the movement of the two plates 106 and 107, so that the front plate 106 cannot move upwardly when the back plate 107 is not in its lower position, and the back plate 107 cannot move upwardly when the front plate 106 is not in its lower position. This ensures that the hangers to be decapped do not slide along the feeding rail 105 under the plates 106 and 107 without being decapped.

[0046] The first timer 116 controls the regular cycle of the movement of the two plates 106 and 107, whereas the second timer 117 enables a repeated downward movement of the front plate 106. If, for example the hook of the hanger 1 is bent or damaged, or the indicator 18 is bent or damaged, the front plate 106 is not permitted to slide downwardly to press or hold the indicator 18 into the recess 119, since its lower edge contacts the upper edge of the indicator 18 and is therefore restricted in its downward movement. In this case, the timer 117 gives a signal to the actuating means 108 to lift the front plate 106 up again and retry to move it downwardly. This is repeated, until the indicator 18 is properly received in the recess 119 of the back plate 107 and the front plate 106 can move to its lower position without resistance. This problem can already partially be avoided by an appropriate angle or bend of the lower edge of the front plate 106, as discussed above.

[0047] Figure 16 shows a cross-section of the two plates 106 and 107 in their lower positions and several hangers 1 to be decapped on feeding rail 105. These hangers 1 have a top region 16a on their hooks, which does not extend beyond the width of the indicators 18. In other words, the sidewalls of the indicators 18 are substantially even with the sidewalls of the hooks and the hangers. Therefore, the hangers 1 cannot be held down by the lower edge of the front plate 106 abutting the edge of the top region 16a, as described and shown with respect to Figures 13 and 14. Since the hangers 1 cannot be held down by the front plate 106, when the back plate 107 moves upwardly, this embodiment of the invention further includes a holding means 152 which is activated to hold down the hanger 1 being decapped, while the back plate 107 is moving up. The holding means 152 is pivotable around an axis 155. In the present embodiment the holding means includes two parallel L-shaped arms 153, which are connected by a cross bar 154, as depicted in Figures 16 and 17.

[0048] In the holding position, the two arms 153 of the holding means 152 extend parallel to both sides of the feeding rail 105 and the hook of the hanger 1, so that the arms 152 extend perpendicularly to the hanger 1. The hanger 1 cannot move upwardly, since its upper edge abuts the lower surface of the arms 152. After the indicator 18 is removed from the hanger 1, the holding means is pivoted back to a free position (dashed lines in Figure 16), so that the decapped hanger 1 can move down the rail 105. In a different embodiment (not shown) the holding means could include a similarly shaped holding means being swung horizontally to hold the hanger 1 down.

[0049] In Figures 11 to 16, the structure of the front plate 106 and the back plate 107 is only schematically shown. Figures 18 and 19 show detailed perspective views of the back plate 107 and the front plate 106, respectively.

[0050] Figure 18 shows the back plate 107 in a perspective front view. The recess 119 is formed in the lower portion of a wall member 132 extending from the middle portion of the back plate 107. The recess 119 can be dimensioned to accommodate the indicator 18 which, as depicted, has a basically rectangular shape. The recess 119 is provided with the pin 120 and the aperture 121. The dimensions of the recess 119 are slightly larger than the dimensions of the indicator 18 to be decapped, so that the indicator 18 can be oriented properly upon entering into the recess 119. This is important to ensure that the aperture 24 of the indicator 18 receives the pin 120.

[0051] The recess 119 can be replaced by any other appropriate means, for example a frame or a single sidewall, as long as the pin 120 can enter into the opening 24 to release the indicator attachment mechanism to remove the indicator 18, when the indicator 18 is pressed or held against the back plate. The shape of the pin 120 in Figure 18 is basically rectangular, but can be any other appropriate shape as necessary to match opening 24.

[0052] As shown in Figure 18, plate 107 has two rail or slide members 130 and 131 bolted thereto, which are positioned to each side of the wall member 132 defining a space between the wall member and the rail members 130 and 131 respectively. The rail members 130 and 131 each have a generally rectangular shape with concave surfaces and extend the complete height of the back plate 107. The lower sides of the rail members 130 and 131 and the wall member 132 are connected by a common base plate 129, which extends from and over the entire length of the back plate 107. Rail or slide members 130 and 131 guide the movement of the plates 106 and 107 in connection with bearing assemblies 133, 134, 135 and 136, which are shown in Figure 15.

[0053] Figure 19 shows a perspective back view of the front plate 106. The bearing assemblies 133, 134, 135 and 136 each have a generally longitudinal shape and extend vertically from and over a portion of the height of the front plate 106. One pair of bearing members 133 and 134 is located to the left of the window 18, and another pair of bearing assemblies 135 and 136 is located to the right of the window 118. Each pair of bearing assemblies defines a space therebetween wherein the rail or slide members 30 and 31 of the back plate 107 can be inserted, when the decapping apparatus of the present invention is assembled. In other words, the rail or slide member 130 is received in the space between the bearing assemblies 135 and 136, and the rail or slide member 131 is received in the space between the bearing assemblies 133 and 134. This enables an exact reciprocable movement of the plates 106 and 107. In a

particularly preferred embodiment slide members 133, 134, 135 and 136 are a pair of roller-bearing assemblies having parallel rollers which engage rail members 130 and 131 and support the plates from either side.

[0054] Figure 20 shows an enlarged perspective view of the pin 120 of the recess 119. In the preferred embodiment pin 120 has a generally rectangular shape and is sufficiently small to be able to enter into the opening 24 of the indicator 18 to be decapped. Also, the pin 120 has a height sufficient to displace the laterally extending portion 30 of the web of the hanger 1 thereby enabling the indicator 18 to be released from the hanger 1.

[0055] Figure 21 shows an enlarged perspective view of a second preferred embodiment of the pin 120 of the recess 119. In this embodiment, the pin 120 has a generally oval shape. Other shapes, for example a cylindrical shape, can be substituted as appropriate.

[0056] Referring now in detail to Figures 22 and 23, there is illustrated a tool for manually removing indicators 18 from hangers 1. Figure 22 shows a top view of one embodiment of the manual decapper, and Figure 23 shows a sectional view taken along line 23-23 in Figure 22.

[0057] More particularly, the device for manually removing an indicator from a garment hanger has a plate 138 which can have a rectangular shape as shown in Figures 22 and 23. The plate 138 can be made of metal or molded plastic and comprises at least one recess 139, which is provided with a pin 140. The recess 139 and the pin 140 correspond to the above-described recess 119 and pin 120 of the back plate 107 of the automatic decapping apparatus. The recess 139 and the pin 140 perform exactly the same functions as described in relation to recess 119 and pin 120. The only difference is that with the manual decapper, the indicator 18 has to be pressed manually onto the recess 139, so that the pin 140 is inserted in the opening 24 of the indicator 18 to displace the laterally extending portion 30 of the hanger and to effect release of the indicator 18 from the hanger 1. In this embodiment the indicator 18 or at least the body with hanger 1 has to be manually held or pressed onto the recess 139, to manually separate the plate 139 with the indicator 18 from the hanger 1. In a preferred embodiment the plate 138 can define through-holes 176 for mounting the device to a support (not shown).

[0058] All the variations and features explained in view of the recess 119 and the pin 120 of the back plate 107 of the decapping apparatus are also true for the recess 139 and the pin 140 of the plate 138 of the manual decapper. The pin 140 can also be configured as shown in Figures 20 and 21. In the preferred embodiment shown in Figures 22 and 23, the plate 138 has a rectangular shape for ease of handling by the operator with the recess 139 being provided at a long side of the plate 138. However, in the alternative, the recess can be provided at a short side of the plate 138. Or the decapper device 138 can have further recesses, so that depending on the size and the shape of the indicator 18 to be removed multiple applications with the manual decapper of the present invention can be performed. For ease of operation the operator may chose to mount the device 138 to a support (not shown) via through-holes 176 so that it is not necessary for the operator to handle the manual device 138 but only the hangers and the removed indicators.

[0059] In the embodiment shown in the Figures 22 and 23, a further recess 141 is provided on one of the short sides of the rectangular plate 138. The recess 141 is provided with a pin 142 positioned on the edge of the short side 143 and has no side walls. This allows the recess 141 and the pin 142 to be applied to indicator caps 18 of any configuration. In addition, the short side 143 can be curved thereby adapting to the form of the hook of the hanger 1, from which the indicator 18 is to be removed. It should be understood, that for the recess 141 and the pin 142 the above-described features and variations explained in view of the recesses 119 and 139, and the pins 120 and 140 are also true and applicable.

[0060] Also, it should be understood that although preferred embodiments of the present invention have been described, various modifications by one skilled in the art can be made without departing from the scope of the invention as defined in the enclosed claims. Particularly, the decapping apparatus of the described embodiment is pneumatically driven. However, the decapping apparatus, namely the plates 106 and 107 could also be driven by means of electrical, mechanical or any other appropriate drive mechanism. Also, the position control means 111 and the air pressure control means 114 can work using optical, electrical or any other appropriate detection means which detects the position of the plates 106 and 107, respectively. The released indicator 18 can also be ejected from the recess 119 through the window 118 of the front plate 106 by means other than a pressurized air blast, as described above. For example, the decapped indicator 18 could be ejected through the window 18 by means of an ejection pin or vacuum ejector.

[0061] Furthermore, the present invention has been described and illustrated in conjunction with a single type of indicator 18. The present invention can also be used without any adaptation or easily adapted to accommodate other types of indicators.

Claims

1. A molded plastic hanger (1) having an indicator attachment device, said hanger (1) having a hook (2) formed with an upstanding web (4) to be received within a downwardly opening cavity of a molded plastic indicator, and attachment means (28) formed on said upstanding web (4) to engage and releasably secure said indicator to said web (4), wherein said attachment means (28) comprises a

resilient detent means (8) formed in said upstanding web (4), said resilient detent means (8) having a laterally projecting portion (30) being displaceable to engage and releasably secure said indicator.

2. The hanger (1) of claim 1, wherein said resilient detent means (18) comprises an integrally molded leg extending downwardly from an opening (6) formed in said upstanding web (4) and terminating in said laterally projecting portion (30).

3. The hanger (1) of claim 2, wherein said laterally projecting portion (30) is formed to extend outwardly of said upstanding web (4) beyond the plane defined by a side of said web (4).

4. The hanger (1) of claim 2, wherein said opening (6) has a top edge, a bottom edge and side edges and said leg extends downwardly from said top edge.

5. The hanger (1) of claim 2, wherein said opening (6) defined by said upstanding web (4) is substantially semi-circular.

6. The hanger (1) of claim 2, wherein said opening (6) defined by said upstanding web (4) is substantially square.

7. The hanger (1) of claim 2, wherein said upstanding web (4) is substantially rectangular in configuration.

8. The hanger (1) of claim 2, wherein said upstanding web (4) is shaped and dimensioned to correspond to the top contour of the hook (2).

9. In combination, an indicator (18) and a hanger (1) with an indicator attachment device, said hanger (1) comprising a hook (2) formed with an upstanding web (4) and an indicator attachment means (28) formed on said upstanding web (4) to engage and releasably secure said indicator (18) to said web (4); and
said indicator (18) comprising side walls formed with at least one opening adapted to receive said attachment means (28) for retaining said indicator (18) on said upstanding web (4) of said hook (2),
wherein said attachment means (28) comprises a resilient detent means (8) formed in said upstanding web (4) and having a laterally extending portion (30) being displaceable to engage said side wall opening to prevent removal of said indicator (18) from said hook (2) and to be disengaged from said opening to facilitate removal of said indicator from said hook without damage to said indicator or to said hook.

10. The combination of claim 9, wherein said indicator (18) has aligned apertures in opposite side walls positioned to receive said laterally extending portion (30) in either of said openings, said apertures facilitating stacking with other indicators prior to engagement with said upstanding web.

11. The combination of claim 9, wherein said resilient detent means (8) comprises an integrally molded leg extending downwardly from an opening formed in said upstanding web and terminating in said laterally projecting portion (30).

12. The combination of claim 11, wherein said laterally projecting portion (30) is formed to extend outwardly of said upstanding web (4) beyond the plane defined by a side of the web.

13. An apparatus for automatically removing an indicator (18) from a hanger (1) having an indicator attachment mechanism; said apparatus comprising:

a first means for receiving said indicator (18) affixed to said hanger (1), said first means including a first plate (107) defining a recess (119), such that said indicator (18) affixed to said hanger (1) is received by said recess (119), said first means further including a pin (120) positioned to displace said indicator attachment mechanism;
a second means (106) for securing said hanger (1) for removal of said indicator (18);
actuating means for driving said first and second means (107, 106) upwardly and downwardly, such that said first plate (107) is driven downwardly to receive said indicator (18) and then driven upwardly while the hanger (1) is secured by said second means (106); and
means (114) for ejecting said indicator from said recess in said first plate.

14. The apparatus of claim 13, wherein said second means (106) includes an edge (146) for holding a top region of said hanger (1) to prevent said hanger (1) from moving when said indicator (18) is removed by the upward movement of said first means.

15. The apparatus of claim 13, wherein said first plate (107) further defines an aperture (122) and said means (114) for ejecting said indicator (18) generates an air blast that passes through said aperture (121) to eject said indicator (18) from said recess.

16. The apparatus of claim 13, wherein said recess (119) of said first plate (106) substantially defines the size and shape of said indicator (18).

17. The apparatus of claim 13, wherein second means (106) includes a second plate defining a window (118) through which said indicator (18) passes after

said indicator is separated from said hanger.

18. The apparatus of claim 17, wherein said window (118) in said second plate substantially defines the size and shape of the indicator (18).

19. The apparatus of claim 13, further comprising a means for feeding a plurality of hangers one-by-one to said first means by gravity.

20. A device for manually removing an indicator (18) from a hanger (1) with an indicator attachment mechanism, said device including a plate with at least one recess for receiving at least a portion of said indicator (18), said plate further including a pin positioned within said recess such that when said indicator (18) affixed to said hanger (1) rests in said recess said pin releases said indicator attachment mechanism.

21. The device according to claim 20, wherein said indicator attachment mechanism comprises a resilient detent leg (30) and said pin has a height sufficient to depress said leg (30) to release said indicator (18) from said hanger (1).

22. Use of a device according to claim 20 or 21 for removing an indicator (18) from a hanger (1) with a resilient indicator attachment mechanism, comprising the steps of:

inserting said pin positioned within said recess into said indicator (18) to displace and disengage the resilient indicator attachment mechanism and thereby release said indicator (18) from said indicator attachment mechanism; and
removing said indicator (18) from said hanger (1).

23. A method for automatically removing an indicator (18) from a garment hanger (1) having an indicator attachment mechanism, said method comprising:

holding a plurality of hangers (1) with indicators (18);
selectively engaging and receiving one of said indicators (18) affixed to one of said hangers (1) from said plurality of hangers in a recess of a first plate;
inserting a pin included in said first plate into said indicator to displace said indicator attachment mechanism;
securing said hanger (1) for removal of said indicator (18); and
removing said indicator (18) from said hanger (1) by carrying said indicator upwardly in said first plate.

24. The method of claim 23, further comprising moving said first plate upwardly and aligning said recess with said indicator (18) therein with a window in a second plate and ejecting said indicator from said recess through said window into a discharge tube.

25. The method according to claim 24, wherein before said indicator (18) is selectively engaged, the method comprises moving a second plate upwardly to permit said indicator (18) affixed to said garment hanger (1) to advance along a feeding rail and rest in said recess in said first plate and then moving said second plate downwardly to prevent a second indicator affixed to a second hanger in said plurality of hangers with indicators from advancing and, after said indicator is disengaged from said hanger, moving said second plate upwardly to permit said second indicator affixed to said second hanger to advance.

26. The method according to claim 23, wherein said displacing comprises depressing a resilient detent leg (30) included in said indicator attachment mechanism with a pin on said first plate to release said indicator (18) from said hanger (1).

Patentansprüche

1. Gegossener Kunststoffkleiderbügel (1) mit einer Informationsträgerbefestigung, der einen Haken (2), an dem eine nach oben stehende Rippe (4) gebildet ist, die in einen sich nach unten öffnenden Hohlraum eines gegossenen Kunststoffinformationsträgers gelangt, und eine an der nach oben stehenden Rippe (4) gebildete Befestigungseinrichtung (28), mit der der Informationsträger an dieser Rippe (4) lösbar befestigt wird, aufweist, wobei die Befestigungseinrichtung (28) eine in der nach oben stehenden Rippe (4) gebildete elastische Halteeinrichtung (8) mit einem zur Seite ragenden Abschnitt (30), der bewegt werden kann, um den Informationsträger lösbar zu befestigen, umfasst.

2. Kleiderbügel (1) nach Anspruch 1, bei dem die elastische Halteeinrichtung (8) einen angeformten Arm umfasst, der von einer in der nach oben stehenden Rippe (4) gebildeten Öffnung (6) nach unten ragt und in dem zur Seite ragenden Abschnitt (30) endet.

3. Kleiderbügel (1) nach Anspruch 2, bei dem der zur Seite ragende Abschnitt (30) so geformt ist, dass er von der nach oben stehenden Rippe (4) über die von einer Seite der Rippe (4) gebildete Ebene nach außen ragt.

4. Kleiderbügel (1) nach Anspruch 2, bei dem die Öff-

nung (6) einen oberen Rand, eiren unteren Rand sowie Seitenränder aufweist und der Arm vom oberen Rand nach unten ragt.

5. Kleiderbügel (1) nach Anspruch 2, bei dem die in der nach oben stehenden Rippe (4) gebildete Öffnung (6) im Wesentlichen halbkreisförmig ist.

6. Kleiderbügel (1) nach Anspruch 2, bei dem die in der nach oben stehenden Rippe (4) gebildete Öffnung (6) im Wesentlichen quadratisch ist.

7. Kleiderbügel (1) nach Anspruch 2, bei dem die nach oben stehende Rippe (4) im Wesentlichen rechtekkig geformt ist.

8. Kleiderbügel (1) nach Anspruch 2, bei dem die nach oben stehende Rippe (4) so geformt und dimensioniert ist, dass sie von oben gesehen der Kontur des Hakens (2) entspricht.

9. Kombination aus einem Informationsträger (18) und einem Kleiderbügel (1) mit einer Informationsträgerbefestigung, wobei der Kleiderbügel (1) einen Haken (2), an dem eine nach oben stehende Rippe (4) gebildet ist, und eine an der nach oben stehenden Rippe (4) gebildete Informationsträger-Befestigungseinrichtung (28), mit der der Informationsträger (18) an dieser Rippe (4) lösbar befestigt wird, umfasst und der Informationsträger (18) Seitenwände umfasst, in denen mindestens eine Öffnung gebildet ist, in die die Befestigungseinrichtung (28) gelangen kann, um den Informationsträger (18) an der nach oben stehenden Rippe (4) des Hakens (2) festzuhalten, wobei die Befestigungseinrichtung (28) eine in der nach oben stehenden Rippe (4) gebildete elastische Halteeinrichtung (8) mit einem zur Seite ragenden Abschnitt (30) umfasst, der bewegt werden und in die Seitenwandöffnung eingreifen kann, um ein Entfernen des Informationsträgers (18) vom Haken (2) zu verhindern, und aus dieser Öffnung gelöst werden kann, um das Entfernen des Informationsträgers (18) vom Haken (2) ohne Beschädigung des Informationsträgers (18) oder des Hakens (2) zu erleichtern.

10. Kombination nach Anspruch 9, bei der der Informationsträger (18) in gegenüberliegenden Seitenwänden aufeinander ausgerichtete Öffnungen aufweist, sie so positioniert sind, dass der zur Seite ragende Abschnitt (30) in eine dieser Öffnungen gelangen kann, wobei diese Öffnungen das Stapeln von Informationsträgern, bevor diese auf die nach oben stehenden Rippe (4) gesetzt werden, erleichtern.

11. Kombination nach Anspruch 9, bei der die elastische Halteeinrichtung (8) einen angeformten Arm umfasst, der von einer in der nach oben stehenden Rippe (4) gebildeten Öffnung (6) nach unten ragt und in dem zur Seite ragenden Abschnitt (30) endet.

12. Kombination nach Anspruch 11, bei der der zur Seite ragende Abschnitt (30) so geformt ist, dass er von der nach oben stehenden Rippe (4) über die von einer Seite der Rippe (4) gebildete Ebene nach außen ragt.

13. Gerät zur automatischen Entfernung eines Informationsträgers (18) von einem Kleiderbügel (1), der eine Informationsträgerbefestigung aufweist, mit

- einer ersten Einrichtung zur Aufnahme des am Kleiderbügel (1) befestigten Informationsträgers (18), die eine erste Platte (107) mit einer Aussparung (119), von der der am Kleiderbügel (1) befestigte Informationsträger (18) aufgenommen wird, und einen Stift (120), der durch seine Anordnung die Informationsträgerbefestigung bewegen kann, umfasst,
- einer zweiten Einrichtung (106) zum Festhalten des Kleiderbügels (1) bei der Entfernung des Informationsträgers (18),
- einer Betätigungseinrichtung zum Bewegen der ersten und zweiten Einrichtung (107, 106) nach oben und unten, so dass die erste Platte (107) nach unten bewegt wird, um den Informationsträger (18) aufzunehmen, und dann nach oben bewegt wird, während der Kleiderbügel (1) von der zweiten Einrichtung (106) festgehalten wird, sowie
- einer Einrichtung (114) zum Auswerfen des Informationsträgers (18) aus der Aussparung (119) der ersten Platte (107).

14. Gerät nach Anspruch 13, bei dem die zweite Einrichtung (106) einen Rand (146) aufweist, der einen oberen Bereich des Kleiderbügels (1) hält, um zu verhindern, dass sich der Kleiderbügel (1) bewegt, wenn der Informationsträger (18) durch die Aufwärtsbewegung der ersten Einrichtung entfernt wird.

15. Gerät nach Anspruch 13, bei dem die erste Platte (107) weiterhin eine Öffnung (121) aufweist und die Einrichtung (114) zum Auswerfen des Informationsträgers (18) einen Luftstrom erzeugt, der durch diese Öffnung (121) strömt und den Informationsträger (18) aus der Aussparung (119) auswirft.

16. Gerät nach Anspruch 13, bei dem die Aussparung (119) der ersten Platte (107) die Große und Form des Informationsträgers (18) maßgeblich bestimmt.

17. Gerät nach Anspruch 13, bei dem die zweite Einrichtung (106) eine zweite Platte mit einem Fenster

(118), durch das der Informationsträger (18) nach dem Abtrennen vom Kleiderbügel hindurchgedrückt wird, umfasst.

18. Gerät nach Anspruch 17, bei dem das Fenster (118) der zweiten Platte die Große und Form des Informationsträgers (18) maßgeblich bestimmt.

19. Gerät nach Anspruch 13, das weiterhin eine Einrichtung umfasst, die der ersten Einrichtung mehrere Kleiderbügel durch Schwerkraft nacheinander zuführt.

20. Vorrichtung zum manuellen Entfernen eines Informationsträgers (18) von einem Kleiderbügel mit einer Informationsträgerbefestigung, wobei diese Vorrichtung eine Platte mit mindestens einer Aussparung zur Aufnahme zumindest eines Teils des Informationsträgers (18) aufweist und diese Platte weiterhin einen in dieser Aussparung angeordneten Stift aufweist, so dass dieser Stift die Informationsträgerbefestigung löst, wenn der am Kleiderbügel (1) befestigte Informationsträger (18) in dieser Aussparung sitzt.

21. Vorrichtung nach Anspruch 20, bei der die Informationsträgerbefestigung einen elastischen Haltearm (30) umfasst und der Stift eine Höhe aufweist, die ausreicht, um diesen Haltearm (30) zur Seite zu drücken und den Informationsträger (18) vom Kleiderbügel (1) zu lösen.

22. Verwendung einer Vorrichtung nach Anspruch 20 oder 21 zum Entfernen eines Informationsträgers (18) von einem Kleiderbügel (1) mit einer elastischen Informationsträgerbefestigung, mit den Schritten

- Einführen des in der Aussparung angeordneten Stifts in den Informationsträger (18), um die elastische Informationsträgerbefestigung zur Seite zu bewegen und außer Eingriff zu bringen und damit den Informationsträger (18) von der Informationsträgerbefestigung zu lösen, sowie
- Entfernen des Informationsträgers (18) vom Kleiderbügel (1).

23. Verfahren zur automatischen Entfernung eines Informationsträgers (18) von einem Kleiderbügel (1), der eine Informationsträgerbefestigung aufweist, mit den Schritten

- Halten mehrerer Kleiderbügel (1) mit Informationsträgern (18),
- selektives Aufnehmen eines der an einem der Kleiderbügel (1) befestigten Informationsträgers (18) in einer Aussparung einer ersten Platte,
- Einführen eines an der ersten Platte vorgesehenen Stifts in den Informationsträger (18), um die Informationsträgerbefestigung zur Seite zu bewegen,
- Festhalten des Kleiderbügels (1) zum Entfernen des Informationsträgers (18) sowie
- Entfernen des Informationsträgers (18) vom Kleiderbügel (1) durch Anheben des Informationsträgers (18) in der ersten Platte.

24. Verfahren nach Anspruch 23, das weiterhin das Anheben der ersten Platte und das Ausrichten der den Informationsträger (18) enthaltenden Aussparung auf ein Fenster einer zweiten Platte sowie das Auswerfen des Informationsträgers (18) aus der Aussparung durch dieses Fenster in ein Abführrohr umfasst.

25. Verfahren nach Anspruch 24, das vor dem selektiven Aufnehmen des Informationsträgers (18) das Anheben einer zweiten Platte, um zu ermöglichen, dass sich der am Kleiderbügel (1) befestigte Informationsträger (18) auf einer Zuführschiene nähert und in die Aussparung der ersten Platte setzt, und anschließendes Senken der zweiten Platte, um zu verhindern, dass sich ein zweiter, an einem zweiten Kleiderbügel befestigter Informationsträger nähert, sowie, nachdem der Informationsträger (18) vom Kleiderbügel (1) gelöst wurde, das Anheben der zweiten Platte, um zu ermöglichen, dass sich der am zweiten Kleiderbügel befestigte zweite Informationsträger nähert, umfasst.

26. Verfahren nach Anspruch 23, bei dem das Zur-Seite-Bewegen das Drücken auf einen in der Informationsträgerbefestigung vorgesehenen elastischen Haltearm (30) mit einem an der ersten Platte vorgesehenen Stift umfasst, um den Informationsträger (18) vom Kleiderbügel (1) zu lösen.

Revendications

1. Cintre en matière plastique moulée (1) comportant un dispositif de fixation d'indicateur, ledit cintre (1) comportant un crochet (2) comprenant un plat vertical (4) devant être reçu dans une cavité ouverte vers le bas d'un indicateur en matière plastique moulée, et un moyen de fixation (28) formé sur ledit plat vertical (4) de façon à accrocher et à fixer de manière libérable ledit indicateur audit plat (4),
dans lequel ledit moyen de fixation (28) comprend un moyen d'arrêt élastique (8) formé dans ledit plat vertical (4), ledit moyen d'arrêt élastique (8) comportant une partie faisant saillie latéralement (30) déplaçable de façon à accrocher et à fixer de manière libérable ledit indicateur.

2. Cintre (1) selon la revendication 1, dans lequel ledit moyen d'arrêt élastique (8) comprend une patte moulée d'un seul tenant s'étendant vers le bas depuis une ouverture (6) formée dans ledit plat vertical (4) et se terminant dans ladite partie faisant saillie latéralement (30).

3. Cintre (1) selon la revendication 2, dans lequel ladite partie faisant saillie latéralement (30) est façonnée de façon à s'étendre vers l'extérieur dudit plat vertical (4) au-delà du plan défini par un côté dudit plat (4).

4. Cintre (1) selon la revendication 2, dans lequel ladite ouverture (6) comporte un bord supérieur, un bord inférieur et des bords latéraux et ladite patte s'étend vers le bas depuis ledit bord supérieur.

5. Cintre (1) selon la revendication 2, dans lequel ladite ouverture (6) définie par ledit plat vertical (4) est sensiblement semi-circulaire.

6. Cintre (1) selon la revendication 2, dans lequel ladite ouverture (6) définie par ledit plat vertical (4) est sensiblement carrée.

7. Cintre (1) selon la revendication 2, dans lequel ledit plat vertical (4) présente une conformation sensiblement rectangulaire.

8. Cintre (1) selon la revendication 2, dans lequel ledit plat vertical (4) a une forme et des dimensions correspondant au contour supérieur du crochet (2).

9. Combinaison d'un indicateur (18) et d'un cintre (1) doté d'un dispositif de fixation d'indicateur, ledit cintre (1) comprenant un crochet (2) comprenant un plat vertical (4) et un moyen de fixation d'indicateur (28) formé sur ledit plat vertical (4) pour accrocher et fixer de manière libérable ledit indicateur (18) audit plat (4) ; et

ledit indicateur (18) comprenant des parois latérales comprenant au moins une ouverture conçue pour recevoir ledit moyen de fixation (28) de façon à retenir ledit indicateur (18) sur ledit plat vertical (4) dudit crochet (2),

dans laquelle ledit moyen de fixation (28) comprend un moyen d'arrêt élastique (8) formé dans ledit plat vertical (4) et comportant une partie s'étendant latéralement (30) déplaçable de façon à s'accrocher à ladite ouverture de paroi latérale afin d'empêcher tout retrait dudit indicateur (18) dudit crochet (2) et à être décrochée de ladite ouverture pour faciliter le retrait dudit indicateur dudit crochet sans endommager ledit indicateur ou ledit crochet.

10. Combinaison selon la revendication 9, dans laquelle ledit indicateur (18) comporte des ouvertures alignées dans les parois latérales opposées positionnées de façon à recevoir ladite partie s'étendant latéralement (30) dans l'une ou l'autre desdites ouvertures, lesdites ouvertures facilitant son empilement avec d'autres indicateurs avant son accrochage audit plat vertical.

11. Combinaison selon la revendication 9, dans laquelle ledit moyen d'arrêt élastique (8) comprend une patte moulée d'un seul tenant s'étendant vers le bas depuis une ouverture formée dans ledit plat vertical et se terminant dans ladite partie faisant saillie latéralement (30).

12. Combinaison selon la revendication 11, dans laquelle ladite partie faisant saillie latéralement (30) est façonnée de façon à s'étendre vers l'extérieur dudit plat vertical (4) au-delà du plan défini par un côté du plat.

13. Appareil destiné à retirer automatiquement un indicateur (18) d'un cintre (1) comportant un mécanisme de fixation d'indicateur ; ledit appareil comprenant :

un premier moyen destiné à recevoir ledit indicateur (18) fixé audit cintre (1), ledit premier moyen comprenant une première plaque (107) définissant un évidement (119), de sorte que ledit évidement (119) reçoit ledit indicateur (18) fixé audit cintre (1), ledit premier moyen comprenant en outre un ergot (120) positionné de façon à déplacer ledit mécanisme de fixation d'indicateur ;

un second moyen (106) destiné à bloquer ledit cintre (1) en vue du retrait dudit indicateur (18) ;

un moyen d'actionnement destiné à entraîner vers le haut et vers le bas lesdits premier et second moyens (107, 106), de sorte que ladite première plaque (107) est entraînée vers le bas de façon à recevoir ledit indicateur (18), puis est entraînée vers le haut pendant que le cintre (1) est bloqué par ledit second moyen (106) ; et

un moyen (114) destiné à éjecter ledit indicateur dudit évidement dans ladite première plaque.

14. Appareil selon la revendication 13, dans lequel ledit second moyen (106) comprend un bord (146) destiné à tenir une zone supérieure dudit cintre (1) afin d'empêcher ledit cintre (1) de bouger lors du retrait dudit indicateur (18) sous l'action du déplacement vers le haut dudit premier moyen.

15. Appareil selon la revendication 13, dans lequel ladite première plaque (107) définit en outre une ouverture (122) et ledit moyen (114) destiné à éjecter ledit indicateur (18) produit un jet d'air qui traver-

se ladite ouverture (121) pour éjecter ledit indicateur (18) dudit évidement.

16. Appareil selon la revendication 13, dans lequel ledit évidement (119) de ladite première plaque (106) définit sensiblement la taille et la forme dudit indicateur (18).

17. Appareil selon la revendication 13, dans lequel le second moyen (106) comprend une seconde plaque définissant une fenêtre (118) que traverse ledit indicateur (18) après la séparation dudit indicateur dudit cintre.

18. Appareil selon la revendication 17, dans lequel ladite fenêtre (118) dans ladite seconde plaque définit sensiblement la taille et la forme de l'indicateur (18).

19. Appareil selon la revendication 13, comprenant en outre un moyen destiné à avancer par gravité un par un une pluralité de cintres vers ledit premier moyen.

20. Dispositif destiné à retirer manuellement un indicateur (18) d'un cintre (1) doté d'un mécanisme de fixation d'indicateur, ledit dispositif comprenant une plaque comportant au moins un évidement destiné à recevoir au moins une partie dudit indicateur (18), ladite plaque comprenant en outre un ergot positionné dans ledit évidement de sorte que lorsque ledit indicateur (18) fixé audit cintre (1) repose dans ledit évidement, ledit ergot libère ledit mécanisme de fixation d'indicateur.

21. Dispositif selon la revendication 20, dans lequel ledit mécanisme de fixation d'indicateur comprend une patte d'arrêt élastique (30) et ledit ergot présente une hauteur suffisante pour enfoncer ladite patte (30) afin de libérer ledit indicateur (18) dudit cintre (1).

22. Utilisation d'un dispositif selon la revendication 20 ou 21 pour retirer un indicateur (18) d'un cintre (1) doté d'un mécanisme de fixation d'indicateur élastique, comprenant les étapes consistant à :

insérer ledit ergot positionné dans ledit évidement dans ledit indicateur (18) de façon à déplacer et à débloquer ledit mécanisme de fixation d'indicateur élastique et à libérer ainsi ledit indicateur (18) dudit mécanisme de fixation d'indicateur ; et
retirer ledit indicateur (18) dudit cintre (1).

23. Procédé consistant à retirer automatiquement un indicateur (18) d'un cintre pour vêtement (1) comportant un mécanisme de fixation d'indicateur, ledit procédé comprenant les étapes consistant à :

tenir une pluralité de cintres (1) dotés d'indicateurs (18) ;
introduire et recevoir sélectivement un des indicateurs (18) fixé à l'un desdits cintres (1) de ladite pluralité de cintres dans un évidement d'une première plaque ;
insérer un ergot compris dans ladite première plaque dans ledit indicateur de façon à déplacer ledit mécanisme de fixation d'indicateur ;
bloquer ledit cintre (1) en vue du retrait dudit indicateur (18) ; et
retirer ledit indicateur (18) dudit cintre (1) en tirant ledit indicateur vers le haut dans ladite première plaque.

24. Procédé selon la revendication 23, comprenant en outre les étapes consistant à déplacer vers le haut ladite première plaque, aligner ledit évidement avec ledit indicateur (18) qui s'y trouve avec une fenêtre dans une seconde plaque et éjecter ledit indicateur dudit évidement à travers ladite fenêtre dans un tube d'évacuation.

25. Procédé selon la revendication 24, dans lequel avant que ledit indicateur (18) ne soit introduit sélectivement, le procédé comprend les étapes consistant à déplacer vers le haut une seconde plaque pour permettre audit indicateur (18) fixé audit cintre pour vêtement (1) d'avancer le long d'un rail d'alimentation et de reposer dans ledit évidement dans ladite première plaque, puis déplacer vers le bas ladite seconde plaque pour empêcher un second indicateur fixé à un second cintre de ladite pluralité de cintres dotés d'indicateurs d'avancer et, après le décrochage dudit indicateur dudit cintre, déplacer vers le haut ladite seconde plaque pour permettre audit second indicateur fixé audit second cintre d'avancer.

26. Procédé selon la revendication 23, dans lequel ladite étape de déplacement comprend l'étape consistant à enfoncer une patte d'arrêt élastique (30) comprise dans ledit mécanisme de fixation d'indicateur à l'aide d'un ergot sur ladite première plaque pour libérer ledit indicateur (18) dudit cintre (1).

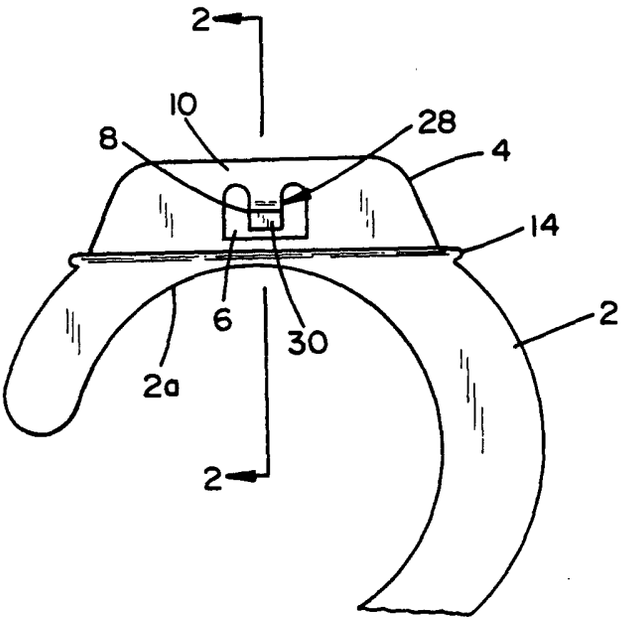

FIG.1

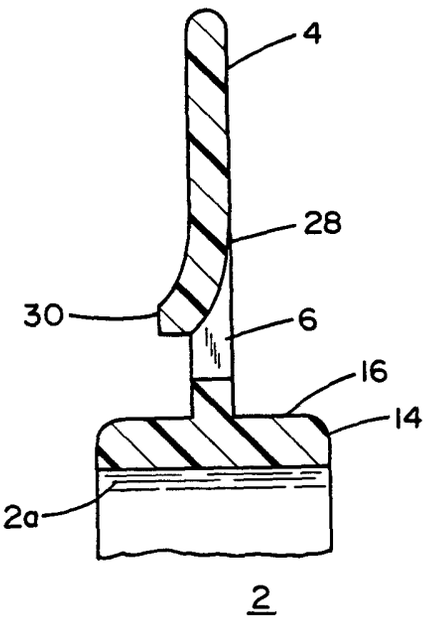

FIG.2

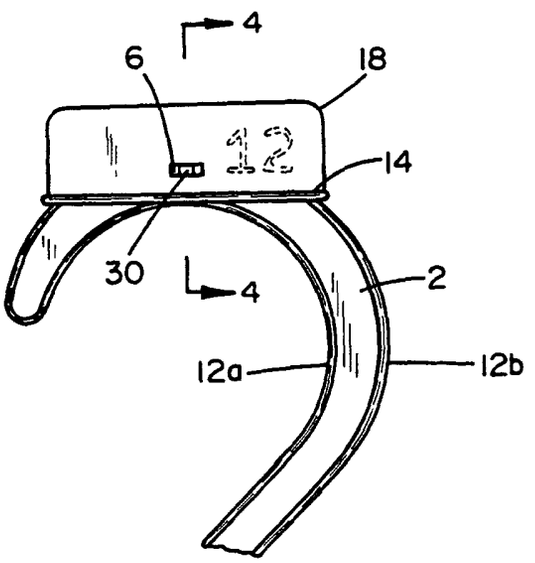

FIG.3

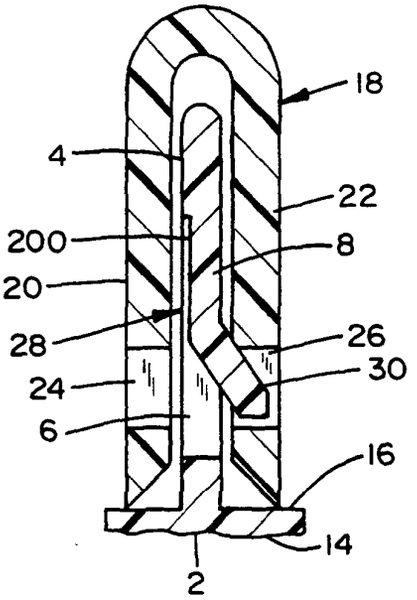

FIG.4

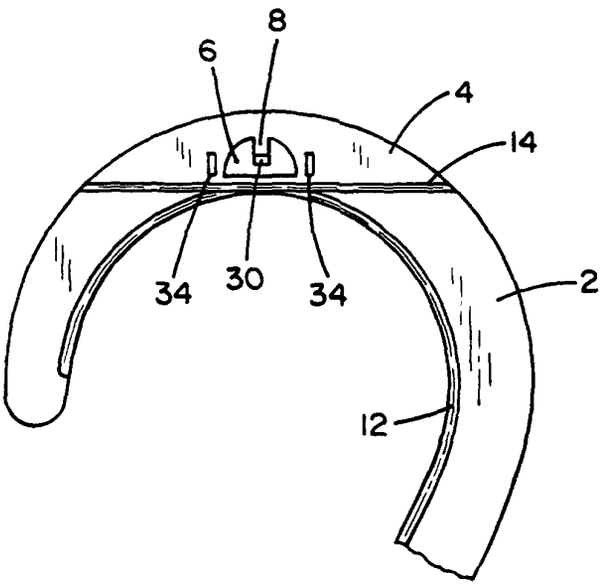

FIG.5

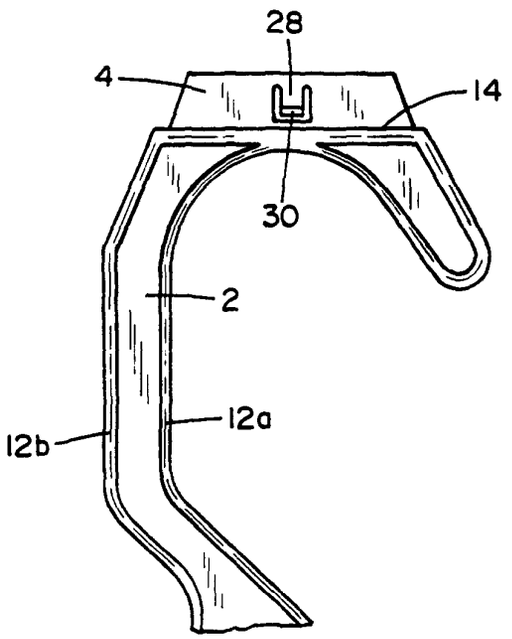

FIG.6

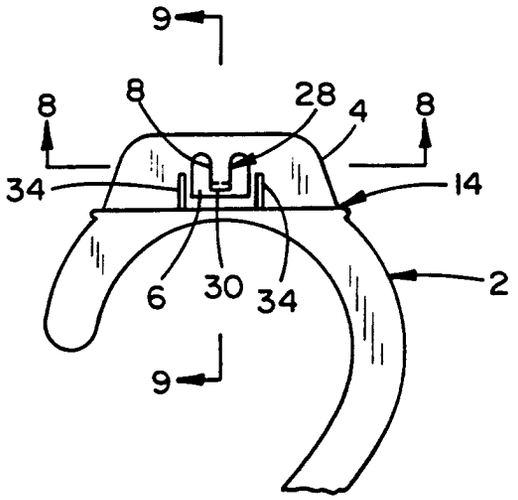

FIG.7

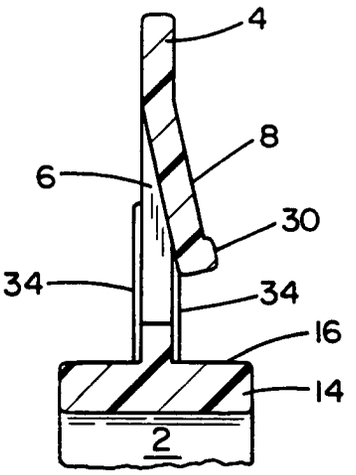

FIG.9

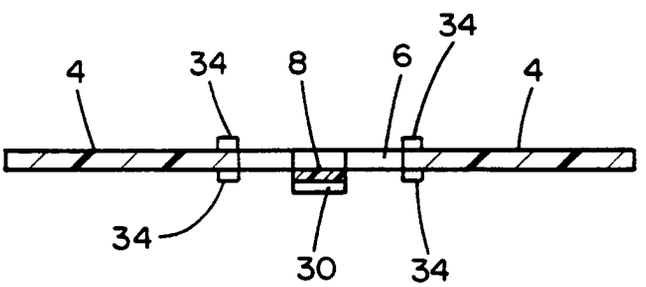

FIG.8

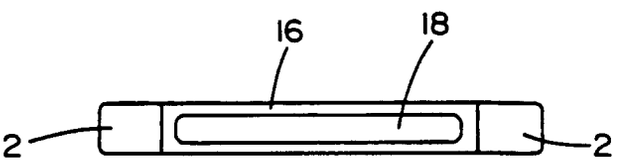

FIG.10

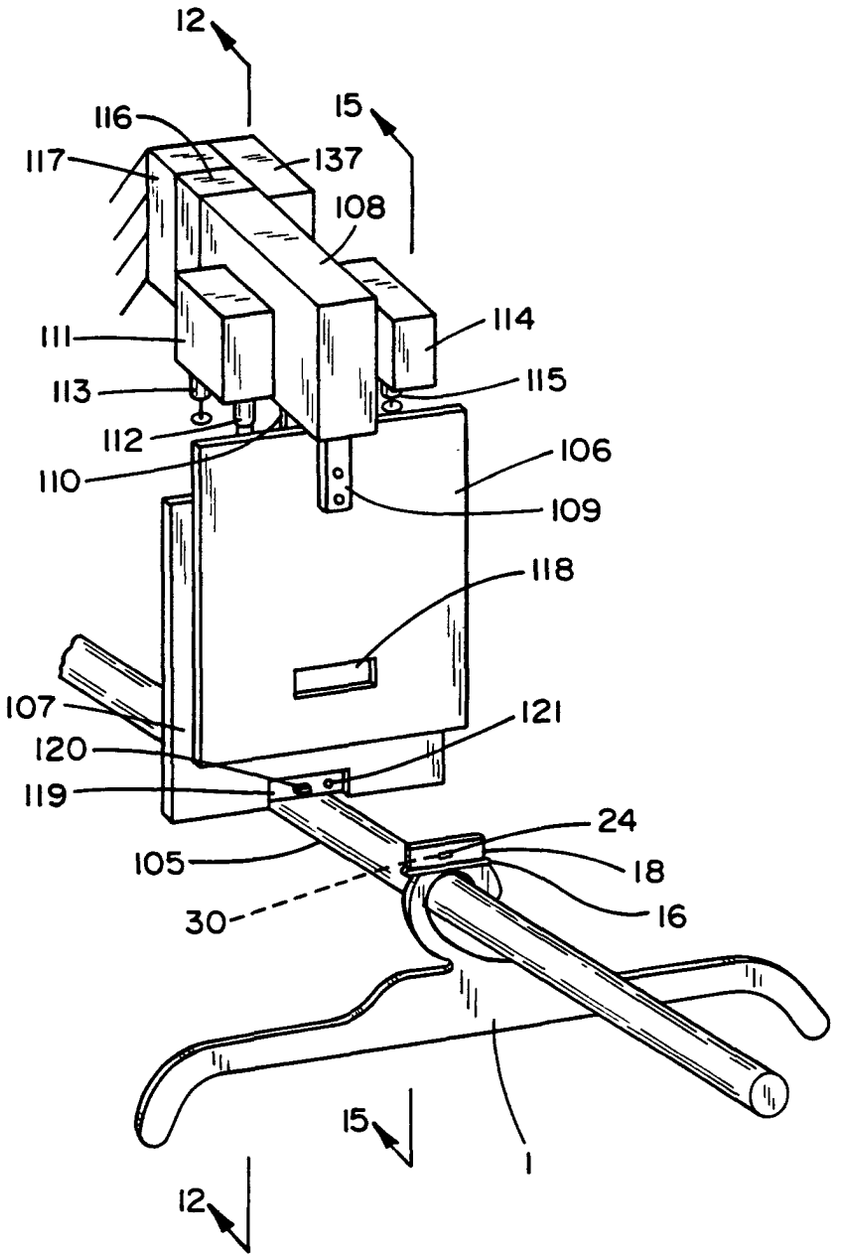
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FIG.11

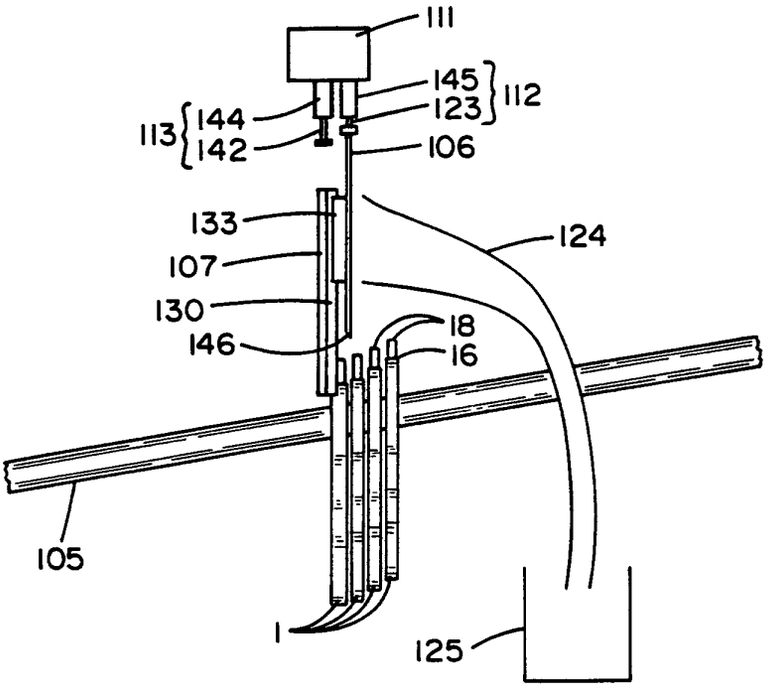
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FIG.12

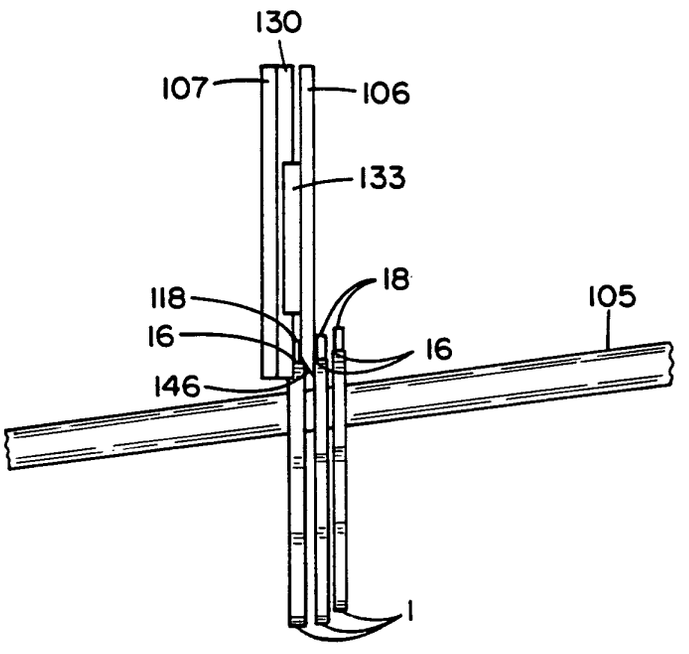
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FIG.13

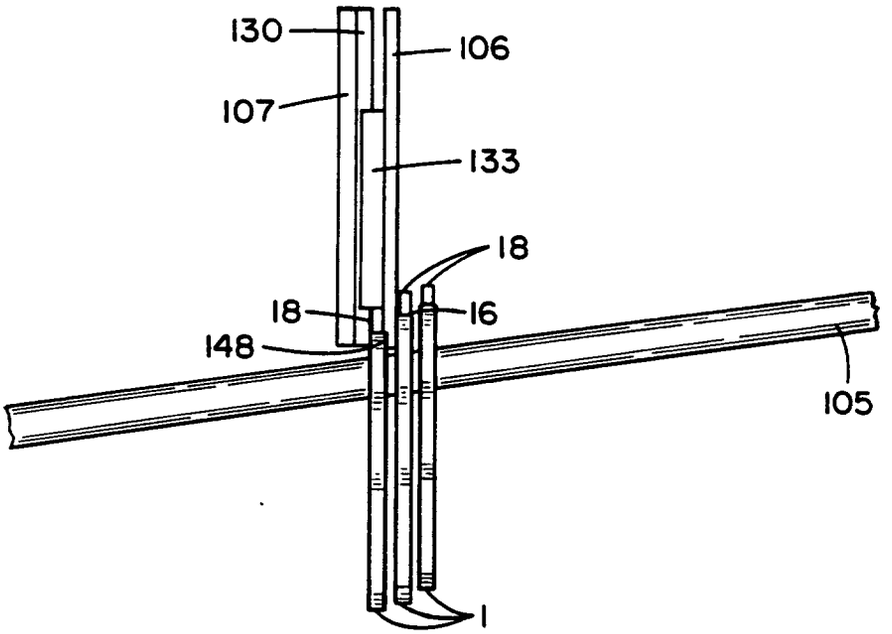
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FIG.14

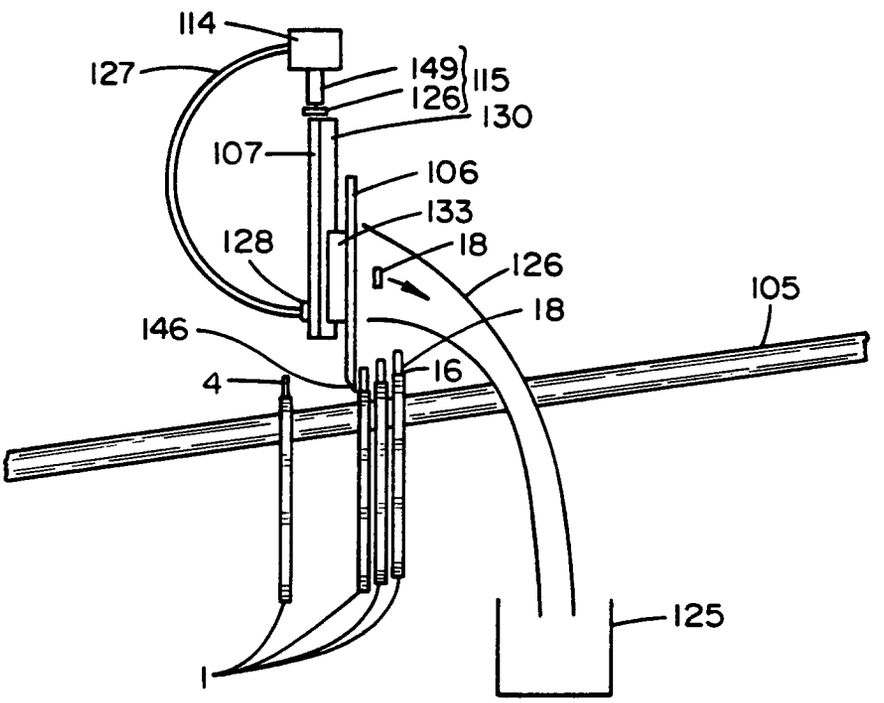
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FIG.15

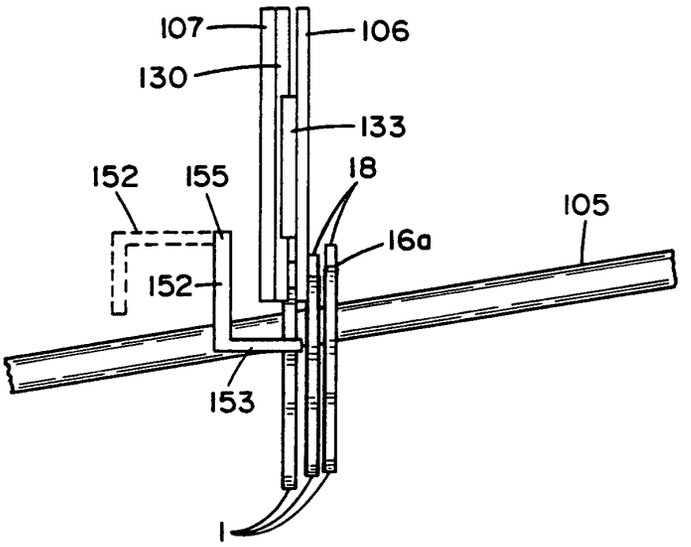

FIG.16

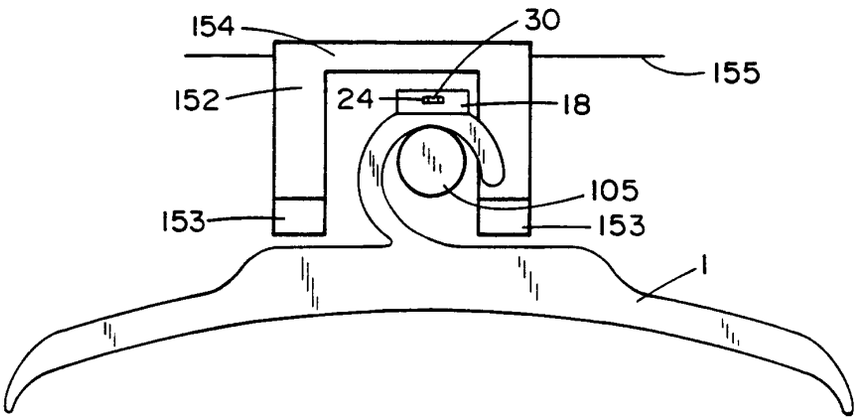

FIG.17

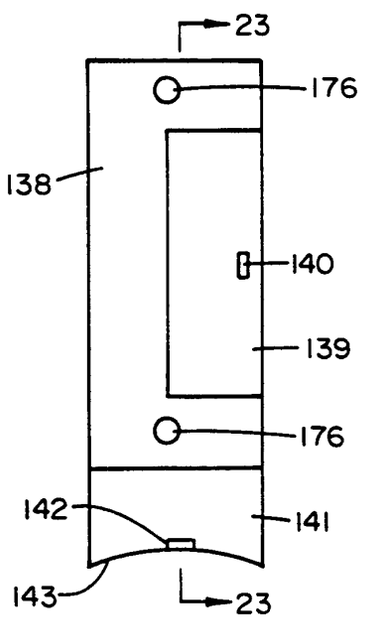

FIG.22

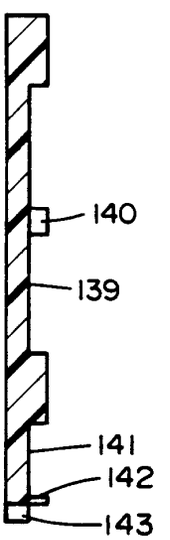

FIG.23

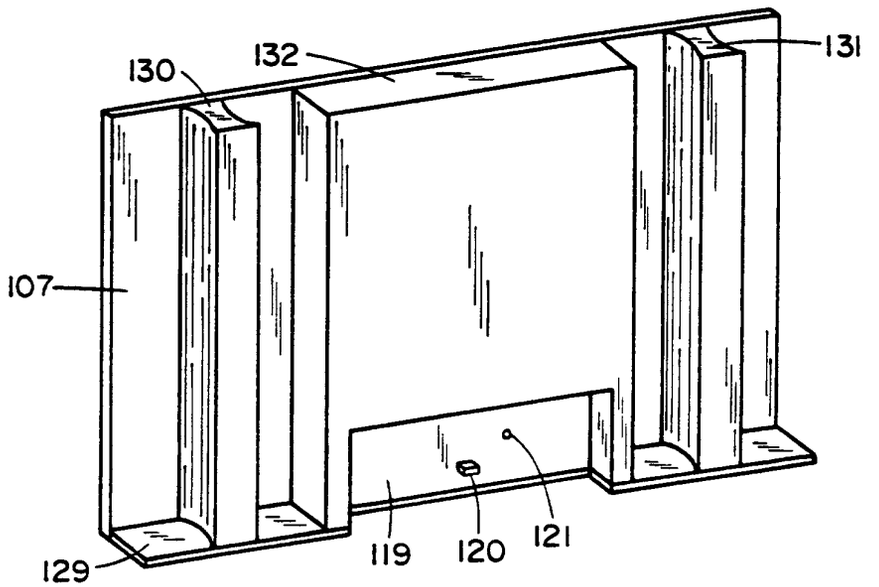

FIG.18

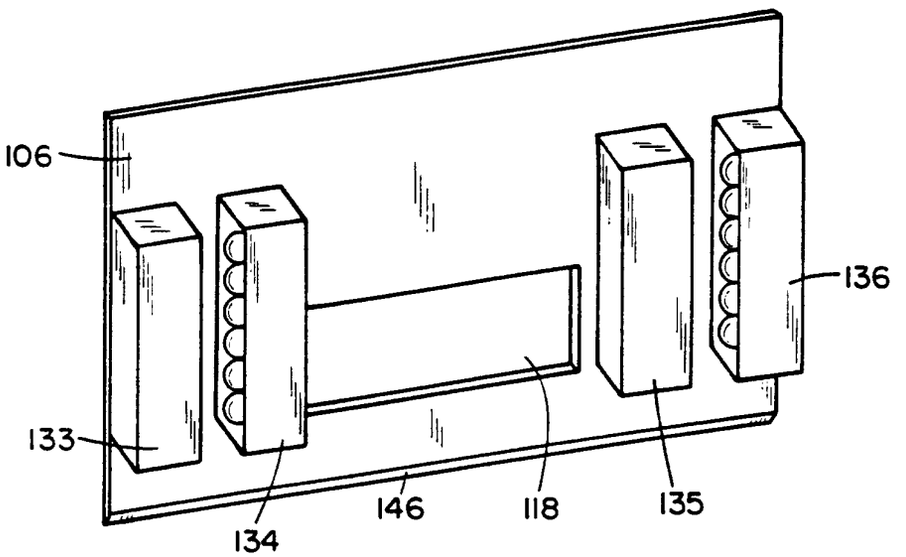

FIG.19

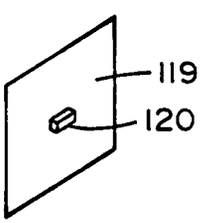

FIG.20

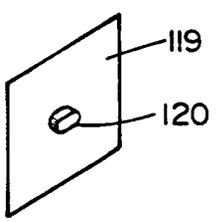

FIG.21