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(54) **END CAP FOR A RAIL FOR A WINDOW COVERING**

(57) An end cap for use on a rail for a covering for an architectural opening. At least one securement leg secures the end cap to the rail.

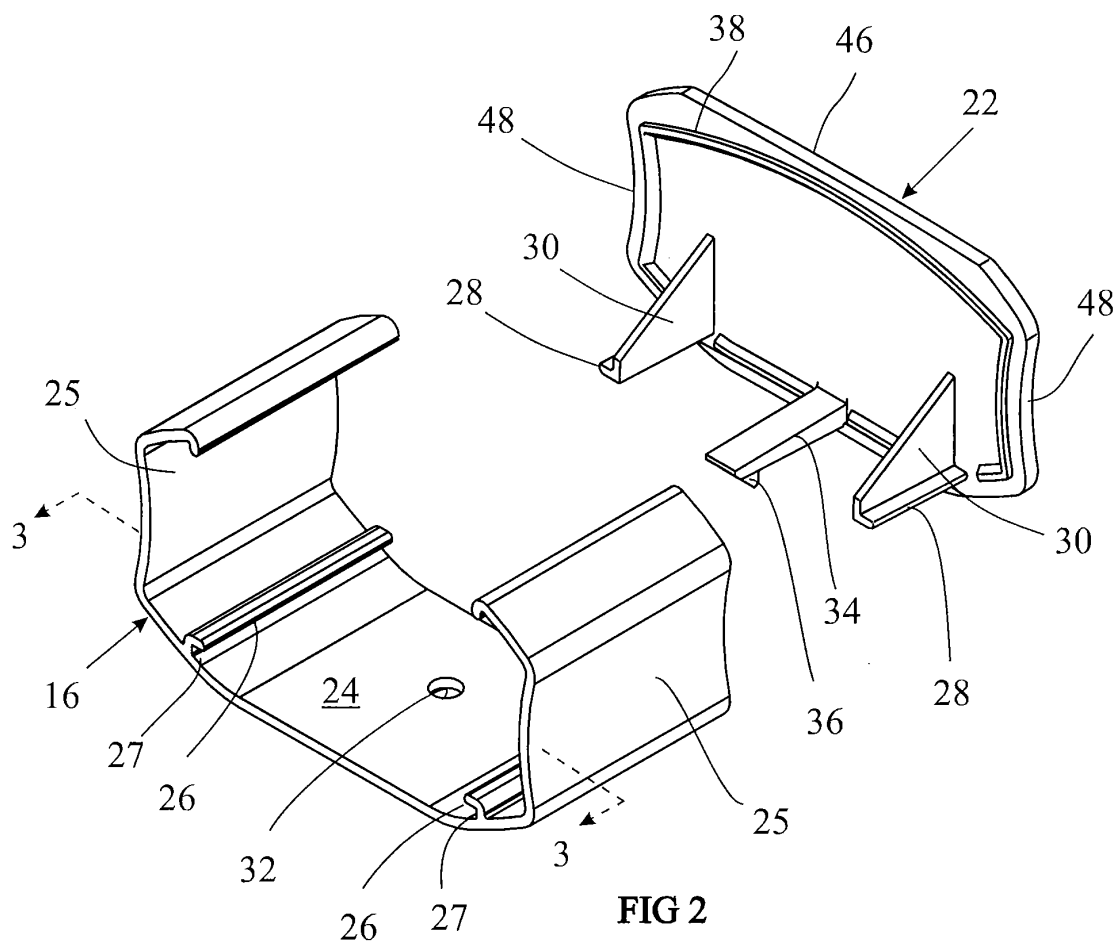


FIG 2

Description

BACKGROUND

[0001] This application is a continuation-in-part of US application SN 14/089,861, filed November 26, 2013, which claims priority from SN 61/873,055, filed Sept. 3, 2013 and 61/734,048, filed December 6, 2012, all of which are incorporated herein by reference.

[0002] The present invention relates to an end cap for use on a rail for a window covering. More specifically, it relates to a removable end cap with a bias to ensure a tight fit against the end of the rail.

[0003] In typical prior art end caps, securement means such as crush ribs have been used to ensure a tight fit against the end of a rail. While this is effective for single use applications, if the end cap needs to be removed, it usually is not possible to reuse the end cap and still have a tight fit that will ensure the end cap will not fall out.

SUMMARY

[0004] In one embodiment of the present invention, an end cap mounting arrangement is provided with the end cap having an arcuate cross-sectional shape which is flattened when the end cap is installed, creating a bias, which results in a releasable, reusable end cap with a tight fit against the end of a rail.

[0005] According to the present invention, there is provided an arrangement for securing an end cap onto a rail of a covering for an architectural opening, said arrangement comprising: an elongated rail extending in a longitudinal direction, and having an elongated base wall and elongated legs projecting away from said base wall, said rail defining an end; an end cap, having a slightly arcuate shape when at rest, said end cap including first and second opposed edges and a central portion between said first and second edges, with said first and second edges located closer to said rail than said central portion when at rest; and a first securement leg which projects inwardly from said end cap and contacts a surface that is fixed relative to said rail to secure said end cap to said rail in a flattened condition, with said first and second edges of said end cap abutting said end of said rail and with the arcuate shape of said end cap flattened out.

[0006] According to the present invention, there is also provided an arrangement for securing an end cap onto a rail of a covering for an architectural opening, said arrangement comprising: an elongated rail extending in a longitudinal direction, and having an elongated base wall and elongated legs projecting away from said base wall, said rail defining a flat end; a first longitudinally-extending tracks projecting inwardly from said elongated rail; an end cap, having first and second opposed edges and third and fourth opposed edges, said first and second opposed edges lying adjacent to said elongated legs, and said fourth opposed edge lying adjacent to said base wall when said end cap is assembled onto said rail; and

a first securement legs which project inwardly from said end cap and is received in said first elongated tracks; wherein said legs and tracks are arranged such that, as said end cap is pushed into said end of said rail, and said legs is pushed into said longitudinally-extending tracks, said third edge of said end cap contacts said rail before said first, second and fourth edges, and, when said end cap is fully assembled onto said end of said rail, all of said first, second, third and fourth edges of said end cap contact rail.

[0007] According to the present invention, there is also provided an arrangement for securing an end cap onto a rail of a covering for an architectural opening, said arrangement comprising: an end cap comprising first and second securement legs cantilevered off of a third leg projecting inwardly from said end cap between said first and second securement legs; wherein: each of said first and second securement legs flexes relative to said third leg and defines a respective free end with a respective wing projecting outwardly from each of said respective free ends; and said legs, wings, and tracks are arranged and shaped such that, as said end cap is pushed into one of said first and second ends of the rail, said first and second wings enter first and second longitudinal tracks on the rail and wedge against the first and second longitudinal tracks, causing said first and second securement legs to be squeezed together, toward each other, in a squeezing direction.

[0008] There may be provided an arrangement for securing an end cap onto a rail of a covering for an architectural opening as above, wherein each of said first and second securement legs has a rear edge adjacent to said end cap, and wherein at least one of said first and second securement legs is shaped to provide greater flexibility between said wing and said third securement leg at said rear edge than in other portions of said wing.

[0009] There may be provided an arrangement for securing an end cap onto a rail of a covering for an architectural opening as above, wherein squeezing said first and second legs together in said squeezing direction causes said end cap to move relative to the rail in a direction perpendicular to said squeezing direction.

[0010] There may be provided an arrangement for securing an end cap onto a rail of a covering for an architectural opening as above, wherein the movement of said end cap in a direction perpendicular to the squeezing direction causes said third leg to move toward and press against a base of the rail.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011]

Figure 1 is a perspective view of a window covering including a head rail, a pleated shade portion, an intermediate rail, a cellular shade portion, and a bottom rail;

Figure 2 is a perspective view of the intermediate rail

and end cap of Figure 1, with the rail broken away;
 Figure 3 is a section view along line 3-3 of Figure 2;
 Figure 4 is a perspective view of the assembled rail
 and end cap of Figure 2, with the rail broken away
 and with the projection on the beam of the end cap
 and the corresponding through opening in the rail
 shown in phantom;

Figure 5 is the same view as Figure 4, but removing
 the phantom lines;

Figure 6 is a broken away front view of the rail and
 end cap of Figure 2 with the end cap aligned with
 the rail in preparation for installation onto the rail;

Figure 7 is the same view as Figure 6 but with the
 end cap partially installed onto the rail;

Figure 8 is the same view as Figure 7 but with the
 end cap fully installed onto the rail;

Figure 9 is a view from the bottom, looking up, of the
 rail and end cap of Figure 6;

Figure 10 is a view from the bottom, looking up, of
 the rail and end cap of Figure 7;

Figure 11 is a view from the bottom, looking up, of
 the rail and end cap of Figure 8;

Figure 12 is a view taken along the section 12-12 of
 Figure 4;

Figure 13 is the same as Figure 12 but for an alter-
 native embodiment;

Figure 14 is the same as Figure 12 but for another
 alternative embodiment;

Figure 15 is a perspective view of a rail and end cap
 for yet another alternative embodiment, with the rail
 broken away;

Figure 16 is a perspective view of the assembled rail
 and end cap of Figure 15, with the rail broken away;

Figure 17 is a broken away front view of the rail and
 end cap of Figure 15 with the end cap aligned with
 the rail in preparation for installation onto the rail;

Figure 18 is the same view as Figure 17 but with the
 end cap partially installed onto the rail;

Figure 19 is the same view as Figure 18 but with the
 end cap fully installed onto the rail;

Figure 20 is a view from the bottom, looking up, of
 the rail and end cap of Figure 17;

Figure 21 is a view from the bottom, looking up, of
 the rail and end cap of Figure 18;

Figure 22 is a view from the bottom, looking up, of
 the rail and end cap of Figure 19;

Figure 23 is a section view along line 23-23 of Figure
 16, with a top plate added to close up the top opening
 of the rail so as to hide any mechanism housed inside
 the rail;

Figure 24 is a perspective view of a rail and end cap
 for another alternative embodiment, with the rail broken
 away;

Figure 25 is a perspective view of the assembled rail
 and end cap of Figure 24, with the rail broken away;
 Figure 26 is a section view along line 26-26 of Figure
 25;

Figure 27 is a plan view of the end cap of Figure 24;

Figure 28 is a perspective view of a rail and end cap
 for another alternative embodiment, with the rail broken
 away;

Figure 29 is a perspective view of the assembled rail
 and end cap of Figure 28, with the rail broken away;
 and

Figure 30 is a plan view of the end cap of Figure 28.

DESCRIPTION

[0012] Figure 1 shows a window covering 10 including
 a head rail 12, a pleated shade portion 14, an interme-
 diate rail 16, a cellular shade portion 18, and a bottom
 rail 20. Any one of the rails 12, 16, 20 (or all three of the
 rails) may house components (not shown) to assist the
 user in raising or lowering the window covering 10. The
 rails 12, 16, 20 are elongated and include end caps, such
 as the end cap 22 on the intermediate rail 16, which pro-
 vide a pleasing, aesthetic finish to the rail 16, and provide
 access to any components housed in the rail 16 during
 assembly of the window covering 10 and also later on,
 during adjustment or replacement of the components
 housed in the rail 16. Of course, other types of window
 coverings, such as Venetian blinds, also have rails with
 end caps and may use the end cap mounting arrange-
 ment of this invention.

[0013] Figures 2-11 show the end cap 22 and rail 16
 of Figure 1 in more detail. Referring to Figures 2 and 3,
 the rail 16 has a "U"-shaped profile including an elongat-
 ed base wall 24 and two elongated legs 25 projecting
 away from the base wall 24. The end of the rail 16 is flat,
 lying in a vertical plane. Two opposed tracks 26 project
 away from the inner surface of the base wall 24. These
 tracks 26 extend parallel to the longitudinal axis of the
 rail 16 and are designed and sized to slidably receive
 mating wings 28 on corresponding outriggers 30 project-
 ing from the inner surface of the end cap 22. The tracks
 26 have a hook-shaped cross-section, projecting away
 from the base wall 24 and then inwardly, toward the cen-
 tral axis of the rail 16, forming a space 27 between the
 inwardly projecting portion and the base wall 24. The
 mating wings 28 project outwardly, away from the central
 axis of the rail 16, and are received in the respective
 spaces 27 formed by the tracks 26.

[0014] The rail 16 also defines an opening 32 through
 the base wall 24 of the rail 16. The opening 32 is located
 between the tracks 26 near the end of the rail 16.

[0015] In addition to the previously described outrig-
 gers 30, a beam 34 projects from the inner surface of the
 end cap 22 in a horizontal direction substantially parallel
 to the wings 28 (See also Figure 6). A projection 36 ex-
 tends from the free end of the beam 34 toward the base
 wall 24. The projection 36 is sized and located such that
 it is received in the opening 32 in the rail 16 when the
 end cap 22 is snapped onto the rail 16, as described later.
 The projection 36 defines a sloped leading surface 40
 (See Figure 6) to ease the beam 34 onto the base wall
 24 of the rail 16, and a slightly tapered shoulder 42 on

the opposing surface of the projection 36 to pull the end cap 22 into the rail 16 and to lock the projection 36 into the opening 32 (See also Figures 4 and 5).

[0016] The end cap 22 also includes an inwardly-projecting, discontinuous flange 38 extending along substantially the entire perimeter of the end cap 22 and spaced inwardly a short distance from the perimeter. This flange 38 fits inside the end of the rail 16, with the first and second opposed edges 48 and the third and fourth opposed edges 46, 46* of the end cap 22 abutting the end of the rail 16. The flange 38 provides a light stop to prevent light from passing completely through any small gaps that may exist between the end cap 22 and the end of the rail 16.

[0017] Referring to Figure 6, the dotted vertical line 44 is perpendicular to the horizontal direction of the wings 28. It may be appreciated that the top edge 46 of the end cap 22 lies slightly forward of the dotted line 44, while the bottom edge 46* lies on the dotted line 44. As the end cap 22 is installed onto the rail 16 by sliding the wings 28 horizontally into the tracks 26 and pushing the end cap 22 against the rail 16 (See Figure 7), the top edge 46 of the end cap 22 impacts first against the end of the rail 16. The end cap 22 is then pushed further into the rail 16 until the projection 36 on the beam 34 snaps into the opening 32 in the base wall 24 of the rail 16, which also coincides with the position where the end cap 22 fits tightly against the rail 16, as shown in Figure 8. The wall 42 of the projection 36 abuts the wall of the opening 32, which is fixed relative to the rail 16, so the wall of the opening 32 serves as a retaining wall, providing a positive stop that prevents the end cap 22 from being pulled back out of the rail 16. The scale is distorted and the distance that the end cap 22 is pushed into the rail 16 between Figures 7 and 8 is exaggerated to illustrate the point.

[0018] It should be noted that the wall 42 of the projection 36 is slightly tapered relative to the wall of the opening 32, so that the beam 34 pulls the end cap 22 further toward the rail 16 as the projection 36 moves further into the opening 32.

[0019] In order to move the end cap from the position shown in Figure 7 to the position shown in Figure 8, the end cap pivots about the top edge 46 relative to the rail 16. This causes the wings 28 to push upwardly against the bottom surface of their respective tracks 26, which are fixed relative to the rail 16, wedging the wings 28 against the tracks 26. Even though the actual horizontal distance traveled is small, it is enough to wedge the wings 28 against their corresponding tracks 26 for a tight fit between the end cap 22 and the rail 16 and creates a tension in the end cap 22 which retains the end cap 22 on the rail 16 (See Figure 8).

[0020] The beam 34 also exerts a downward force on the base wall 24 of the rail 16, which lifts the wings 28 upwardly against the tracks 26.

[0021] Referring to Figure 9, the dotted line 47 shows that, when at rest, the end cap 22 has a slightly arcuate shape. The front and rear edges (first and second op-

posed edges) 48 of the end cap 22 are located slightly inwardly, away from the dotted line 47 and toward the rail 16, and the central portion of the end cap 22, located between the opposed edges 48, is located further away from the rail 16. As the end cap 22 is installed onto the rail 16 by sliding the wings 28 into the tracks 26 and pushing the end cap 22 against the rail 16 (See Figure 10), the edges 48 of the end cap 22 impact against the rail 16. The installer continues pushing the end cap 22 toward the rail 16, flattening the curvature of the end cap 22 until the projection 36 on the beam 34 snaps into the opening 32 in the base wall 24 of the rail 16, which also coincides with the position where the end cap 22 is flattened and fits tightly against the rail 16, as shown in Figure 11.

[0022] Referring again to Figures 8 and 11, with the end cap 22 installed onto the rail 16, it may be appreciated that the end cap 22 lies flat against the end of the rail 16 and no longer displays the slight curvature or slanting away from either of the axes 44 and 47.

[0023] As the end cap 22 is pushed inwardly into the end of the rail 16, the projection 36 on the beam 34 riding on the base wall 24 of the rail 16 causes the beam 34 to flex upwardly. As the projection 36 on the beam 34 slides past the vertical edge of the opening 32 on the base wall 24 of the rail 16, the beam 34 snaps back downwardly, and the projection 36 abuts the edge of the opening 32 (the retaining wall), providing a positive stop that secures the projection 36 in the opening 32. The beam 34 serves as a securement leg to keep the end cap 22 secured onto the rail 16 in a flattened condition. The wings 28 wedged in the tracks 26 also are abutting surfaces fixed relative to the rail 16 (i.e. the tracks 26) and serve as securement legs to keep the end cap 22 pulled snugly against the end of the rail 16 in a flattened condition. These securement legs 34, 28 act against the bias of the flattened end cap 22, which wants to return to its original, arcuate shape. The securement legs 34, 28 hold the end cap 22 tightly to the rail 16, under tension provided by the spring action of the flattened end cap 22. Figure 12 shows the projection 36 on the beam 34 abutting the edge of the opening 32, which serves as a retaining wall.

[0024] To remove the end cap 22 from the rail 16, the user pushes upwardly on the projection 36 on the beam 34 until it clears the base wall 24 of the rail 16, and then grasps the end cap 22 and pulls outwardly. Once the projection 36 has cleared the opening 32, the end cap 22 may be pulled straight out. The end cap 22 may be reinstalled over and over again with no detrimental effect on its performance.

[0025] While this description refers to top, bottom, front and rear, it is understood that the rail 16 could be rotated so that the base wall 24, which is shown in this embodiment as being located at the bottom, becomes the front wall or the rear wall or the top wall, and the directions of the corresponding elements would change accordingly.

[0026] An alternative embodiment, shown in Figure 13, is the same as the embodiment described above except that, instead of the opening 32, there is a body 32* pro-

jecting upwardly from the base wall 24 of the rail 16 in the same position as the opening 32. The body 32* has a vertical wall on an inner side, which is fixed relative to the rail 16 and serves as a retaining wall, such that, when the projection 36 passes over the body 32*, the projection 36 abuts the retaining wall on the body 32*, thereby having the same effect of providing a positive stop to secure the beam 34 in position on the rail 16. As was noted in the previous embodiment, there is a slight angle between the wall of the projection 36 and the abutting retaining wall, so that the beam 34 pulls the end cap 22 toward the end of the rail 16 as the projection 36 moves downwardly into the retaining wall on the body 32*.

[0027] While the body 32* in this embodiment is formed as part of the rail 16, it alternatively could be a separate member secured to the rail 16, in which case its retaining wall still would be fixed relative to the rail 16.

[0028] Another alternative embodiment shown in Figure 14 includes a rail 16** which has a bump 32** (instead of an opening 32) formed on the base wall 24. The projection 36 passes over the bump 32**, which is a body projecting from the rail that provides an abutting retaining wall which is at an angle to the vertical. This angled retaining wall also causes the projection 36 to pull the end cap inwardly, toward the rail as the projection 36 passes over the bump 32**.

[0029] Another alternative embodiment (not shown) is the same as the first embodiment except that it has no opening 32 or body 32* on the rail 16 but simply relies upon the wedging of the beam 34 pushing downwardly on the base wall 24 and of the wings 28 pushing upwardly on the tracks 26 to secure the end cap on the rail 16 against the biasing force of the flattened end cap 22 which wants to return to its arcuate shape. This alternative embodiment has the advantage that no holes (such as the hole 32 of Figure 12) or discontinuities (such as the dimple 32* or 32** of Figures 13 and 14 respectively) are seen by the user on the rail 16.

[0030] Figures 15-23 show another embodiment of an end cap 22' and rail 16. The rail 16 is identical to the rail 16 described above except that there is no need for an opening 32 or bump 32**. The end cap 22' is similar to the end cap 22 of Figure 2 in that it has wings 28' distally mounted on outriggers 30'. However, in this embodiment, as best appreciated in Figure 20, the outriggers 30' are not in contact with the end plate 22' but instead are cantilevered off of a beam 50 which is centrally connected along beam portions 52 to the end plate 22'. This allows the outriggers 30' to rotate slightly in the "z" direction (in the vertical direction, See Figure 15) relative to the beam 50 and relative to the end plate 22'. This, in turn, permits the wings 28' to float up or down relative to the beam 50 as required. In this arrangement, the outriggers 30' and beam 50 form an "M" shaped profile, as best appreciated in Figure 23, with the wings 28' projecting outwardly from the free ends of the "M".

[0031] As shown in Figure 23, the beam 50 pushes against the bottom of the rail 16 when the end cap 22' is

installed on the rail 16, serving as a securement leg, and the outwardly projecting wings 28' are received in the spaces 27 formed between the tracks 26 and the bottom surface of the rail 16, so each of the wings 28' (together with its respective outrigger 30') also serves as a securement leg. As the wings 28' engage the tracks 26, the wings 28' are wedged against the tracks 26 and are squeezed together, toward each other, in a squeezing direction. Squeezing the wings 28' together in this particular geometry lifts the beam 50 and the end cap 22' relative to the base of the rail 16 (i.e. moves the end cap in a direction perpendicular to the squeezing direction).

[0032] As shown in Figure 17, the beam 50 has a tapered front edge 58, which eases the beam 50 into the inside of the rail 16.

[0033] The wings 28' are parallel to each other and are mirror images of each other. As shown in Figure 15, the wings 28' are tapered in both the "x" and "z" directions, which helps the wings 28' enter into the spaces 27 beneath and between the tracks 26 and helps cause the deflection of the outriggers 30'. As shown in Figure 17, the top surfaces of the wings 28' are at a lower elevation at the end directed toward the rail 16 and taper to a higher elevation at the end adjacent to the end cap 22'. As shown in Figure 15, the outer surfaces of the wings 28' are closer together at the end directed toward the rail 16 and taper further outwardly in the "y" direction as they approach the end cap 22', which helps the wings 28' enter easily into the spaces 27 beneath and between the tracks 26.

[0034] Referring to Figure 17, the dotted vertical line 44 is perpendicular to the horizontal direction of the wings 28'. It may be appreciated that the top edge 46' of the end cap 22 lies slightly forward of the dotted line 44, while the bottom edge 46* lies on the dotted line 44. As the end cap 22' is installed onto the rail 16 by sliding the wings 28' horizontally into the tracks 26 and pushing the end cap 22' against the rail 16, the top edge 46' of the end cap 22' impacts first against the end of the rail 16, as shown in Figure 18. The end cap 22' is then pushed further into the rail 16 until the end cap 22' fits tightly against the rail 16, with all four edges of the end cap abutting the flat end of the rail, as shown in Figure 19.

[0035] In order to move the end cap 22' from the position shown in Figure 18 to the position shown in Figure 19, the end cap 22' pivots about the top edge 46' relative to the rail 16. This pivoting causes the wings 28' to wedge tightly into the space 27 between the tracks 26 and the rail 16 such that the end cap 22' is held snugly against the rail 16 and cannot accidentally be pried off. Thus, the wings 28' serve as securement legs.

[0036] Referring to Figure 20, the dotted line 47 shows that, when at rest, the end cap 22' has a slightly arcuate shape. The front and rear edges (first and second opposed edges) 48' of the end cap 22' are located slightly inwardly, away from the dotted line 47 and toward the rail 16, and the central portion of the end cap 22', located between the opposed edges 48', is located further away from the rail 16. As the end cap 22' is installed onto the

rail 16 by sliding the outwardly projecting wings 28' under the tracks 26 and pushing the end cap 22' against the rail 16, the front and rear edges 48' of the end cap 22' impact against the rail 16, as shown in Figure 21. The installer continues pushing the end cap 22' toward the rail 16, flattening the curvature of the end cap 22' until the end cap 22' is flattened and fits tightly against the rail 16, as shown in Figure 22. This flattening of the end cap 22' results in a spring force which helps retain the end cap 22' on the rail 16.

[0037] Referring again to Figures 19 and 22, with the end cap 22' installed onto the rail 16, it may be appreciated that the end cap 22' lies flat against the end of the rail 16 and no longer displays the slight curvature or slanting away from either of the axes 44 and 47.

[0038] Figure 23 is a section view along line 23-23 of Figure 16, showing the end cap 22' mounted on the rail 16. It may be appreciated that there is a projection 54 adjacent the top edge 46' of the end cap 22', and intermediate the front and rear edges 48' of the end cap 22'. This projection 54 provides a support surface for an arcuate plate 56, which is wedged between the two elongated legs 25 of the rail 16 (See Figure 2) projecting away from the base wall 24 of the rail 16. This arcuate plate 56 spans the opening of the rail 16 so as to cover and hide any mechanism housed inside the rail 16.

[0039] Figures 24-30 show other embodiments of an end cap 22** which have a higher holding power than the end cap 22' described above, and in which the degree of holding power can be fine-tuned as desired. Comparing the end cap 22' of Figure 23 with the end cap 22** of Figures 24-27 (especially as seen in Figure 26), it may be appreciated that the beam 50**, outriggers 30** and wings 28** of this end cap 22** forms a more flattened-out, bow-shaped profile as compared with the "M" shaped profile formed by the beam 50, outriggers 30' and wings 28' of the previous end cap 22'. As in the previous embodiment, the outriggers 30** are cantilevered from the beam 50**, and the wings 28** are distally mounted on the outriggers 30**.

[0040] In the geometry of this embodiment, the end cap 22** moves toward the base of the rail 26 as the end cap 22** is installed onto the rail 26 and the wings 28** are squeezed together (again moving perpendicularly to the squeezing direction). This causes the beam 50** to press against the base of the rail 26. The downward force of the beam 50** against the bottom of the rail, and the counteracting upward force of the wings 28** against the bottom of the track 26 provide additional friction and a higher degree of grip of the end cap 22** on the rail 16 than in the previous end cap 22'.

[0041] It should be noted that the amount of movement of the outriggers 30** is very small, and the degree of interference fit of the wings 28** between the tracks 26 and the rail 16 is also very small. However, the spring force provided by the outriggers 30** and the spring force caused by the deformation of the end cap 22** as it is installed on the rail (flattening from the arcuate shape

shown in Figure 20 to a flat shape shown in Figure 22) allow for numerous removals and reinstallations of the end cap 22** onto the rail 16 without the end cap 22** losing its gripping force on the rail 16. The end cap 22** continues to hold well on the end of the rail 16 even after many removals and reinstallations.

[0042] Figures 28-30 show a further modification to the end cap 22**. This modification involves cutting out notches 58** from the rear edge of each of the outriggers 30**. These notches 58** allow greater flexing of the rear portion of the wings 28** relative to the beam 50**, which reduces the wedging between the wings 28** and the rail 16. This reduces the degree of holding power between the end cap 22** and the rail 16 as compared with the embodiment of Figures 24-27. The amount of holding power can be adjusted by adjusting the length of the notches 58** from the rear edge of the outriggers 30**.

[0043] It should be noted that the end cap 22** may be manufactured with the notches 58** already present instead of cutting out these notches 58** off of the end cap 22** of Figures 26 and 27. It should also be noted that the length of these notches 58** may be varied from zero (essentially no notches present, as shown in Figures 24-27) which maximizes the degree of holding power for this embodiment of the end cap 22**, to whatever length is needed to obtain the desired degree of holding power; the longer the length of the notches 58**, the lower the degree of holding power. Furthermore, there may be a notch 58** in only one of the outriggers 30. Also, while the embodiment of Figure 28 has identical notches that are mirror images of each other, the notches 58** may have different lengths or have different profiles in order to obtain just the desired amount of holding power. Finally, the notches 58** may be replaced by, or used in conjunction with, changes in thickness of the outriggers 30** adjacent to the wings 28**, providing the wings 28** with more flexibility relative to the beam 50** adjacent to the rear edge of the wings 28** and ultimately reducing the holding power of the end cap 22**.

[0044] It is understood that the installation and removal of this end cap 22** is essentially identical to that of the end cap 22' described earlier.

[0045] While the embodiments described above are for an end cap secured to the right end of the rail, it is understood that a mirror image end cap would be used on the left end of the rail.

[0046] It will be obvious to those skilled in the art that modifications may be made to the embodiments described above without departing from the scope of the present invention as claimed.

Claims

1. An arrangement for securing an end cap onto a rail of a covering for an architectural opening, said arrangement comprising:

- an elongated rail extending in a longitudinal direction, and having an elongated base wall and elongated legs projecting away from said base wall, said rail defining an end;
 an end cap, having a slightly arcuate shape when at rest, said end cap including first and second opposed edges and a central portion between said first and second edges, with said first and second edges located closer to said rail than said central portion when at rest; and
 a first securement leg which projects inwardly from said end cap and contacts a surface that is fixed relative to said rail to secure said end cap to said rail in a flattened condition, with said first and second edges of said end cap abutting said end of said rail and with the arcuate shape of said end cap flattened out.
2. An arrangement for securing an end cap onto a rail of a covering for an architectural opening as recited in claim 1, wherein said first securement leg has a free end with a projection extending from said free end.
 3. An arrangement for securing an end cap onto a rail of a covering for an architectural opening as recited in claim 2, wherein said projection of said first securement leg abuts a retaining wall that is fixed relative to said rail to provide a positive stop that retains said end cap in a flattened condition when said end cap is installed on said rail.
 4. An arrangement for securing an end cap onto a rail of a covering for an architectural opening as recited in claim 3, wherein there is a taper on at least one of said projection and said retaining wall so that said first securement leg pulls said end cap further toward said end of said rail as said projection moves further into said retaining wall.
 5. An arrangement for securing an end cap onto a rail of a covering for an architectural opening as recited in claim 1, wherein said first securement leg includes a wing which is received in a longitudinal track on said rail, and wherein said wing wedges against the longitudinal track.
 6. An arrangement for securing an end cap onto a rail of a covering for an architectural opening as recited in claim 5, further comprising a second securement leg, wherein
 each of said first and second securement legs include a respective wing;
 said rail has two longitudinal tracks; and
 each of said wings wedges against a respective one of said longitudinal tracks when said end cap is pushed into said rail.
 7. An arrangement for securing an end cap onto a rail of a covering for an architectural opening as recited in claim 6, wherein said first and second securement legs are cantilevered off of a third leg projecting inwardly from said end cap between said first and second securement legs.
 8. An arrangement for securing an end cap onto a rail of a covering for an architectural opening as recited in claim 6, further comprising a third leg projecting inwardly from said end cap between said first and second securement legs and having a projection that abuts a retaining wall that is fixed relative to said rail to provide a positive stop that retains said end cap in a flattened condition when said end cap is installed on said rail.
 9. An arrangement for securing an end cap onto a rail of a covering for an architectural opening as recited in claim 3 or 8, wherein the retaining wall is on an edge of an opening in said base wall of said rail.
 10. An arrangement for securing an end cap onto a rail of a covering for an architectural opening as recited in claim 3 or 8, wherein the retaining wall is on a body projecting from said rail.
 11. An arrangement for securing an end cap onto a rail of a covering for an architectural opening as recited in claim 6, wherein:
 said longitudinal tracks lie adjacent to said base of said rail,
 said end cap has third and fourth opposed edges, said fourth edge lying adjacent to said base of said rail, and
 said first and second securement legs and respective wings are arranged so that, as said end cap is pushed into said end of said rail, and said wings are pushed into said longitudinal tracks, said third edge of said end cap contacts said rail before said first, second, and fourth edges, and, when said end cap is fully assembled onto said end of said rail, all of said first, second, third, and fourth edges of end cap contact said rail.
 12. An arrangement for securing an end cap onto a rail of a covering for an architectural opening as recited in claim 11, wherein said first and second securement legs are cantilevered off of a third leg projecting inwardly from said end cap between said first and second securement legs.
 13. An arrangement for securing an end cap onto a rail of a covering for an architectural opening as recited in claim 12, wherein said first and second securement legs flex relative to said third leg, and said legs, wings, and rails are arranged such that, as said end

cap is pushed onto the end of said rail, and said wings enter their respective rails, said first and second securement legs are squeezed together in a squeezing direction, which causes said end cap to move relative to said rail in a direction perpendicular to the squeezing direction.

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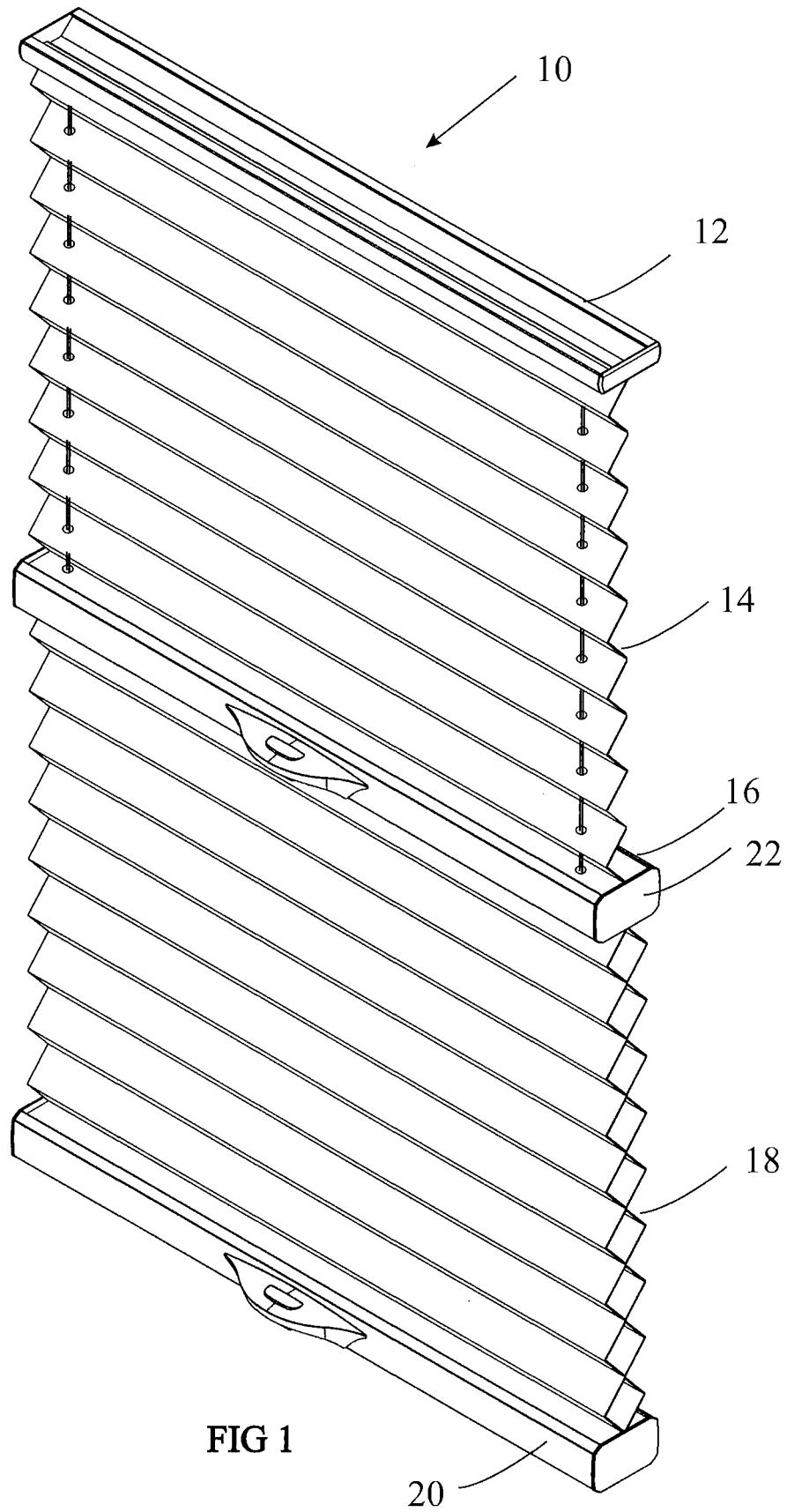
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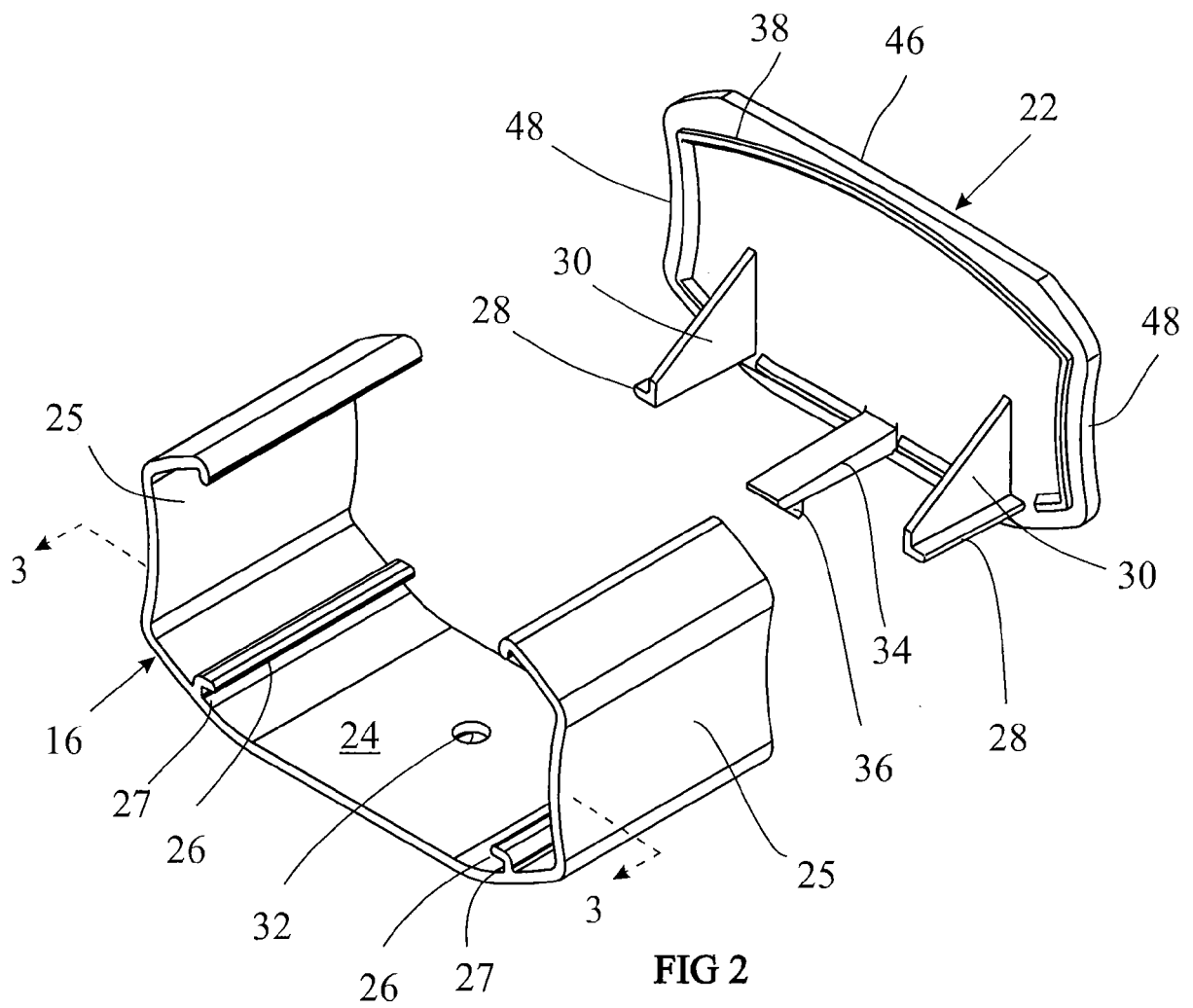
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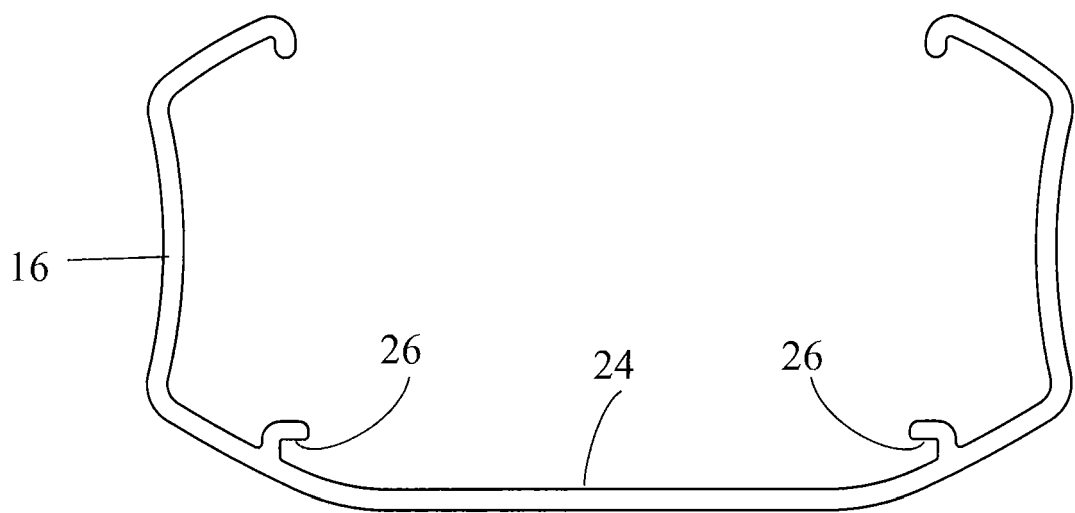


FIG 3

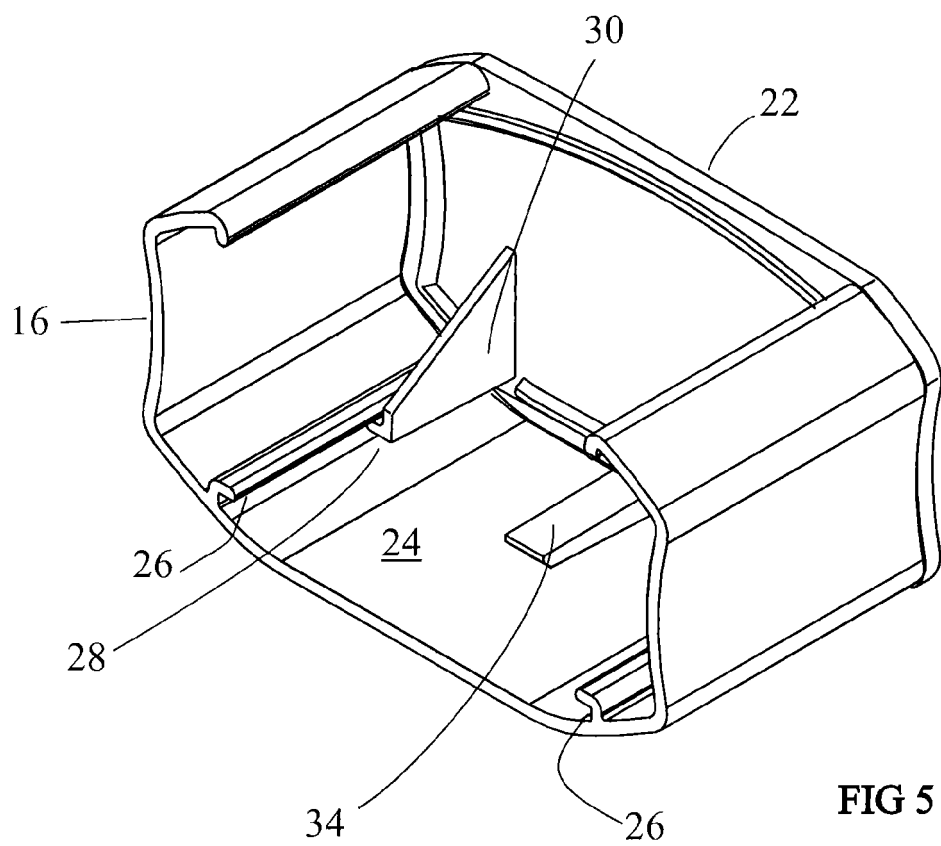
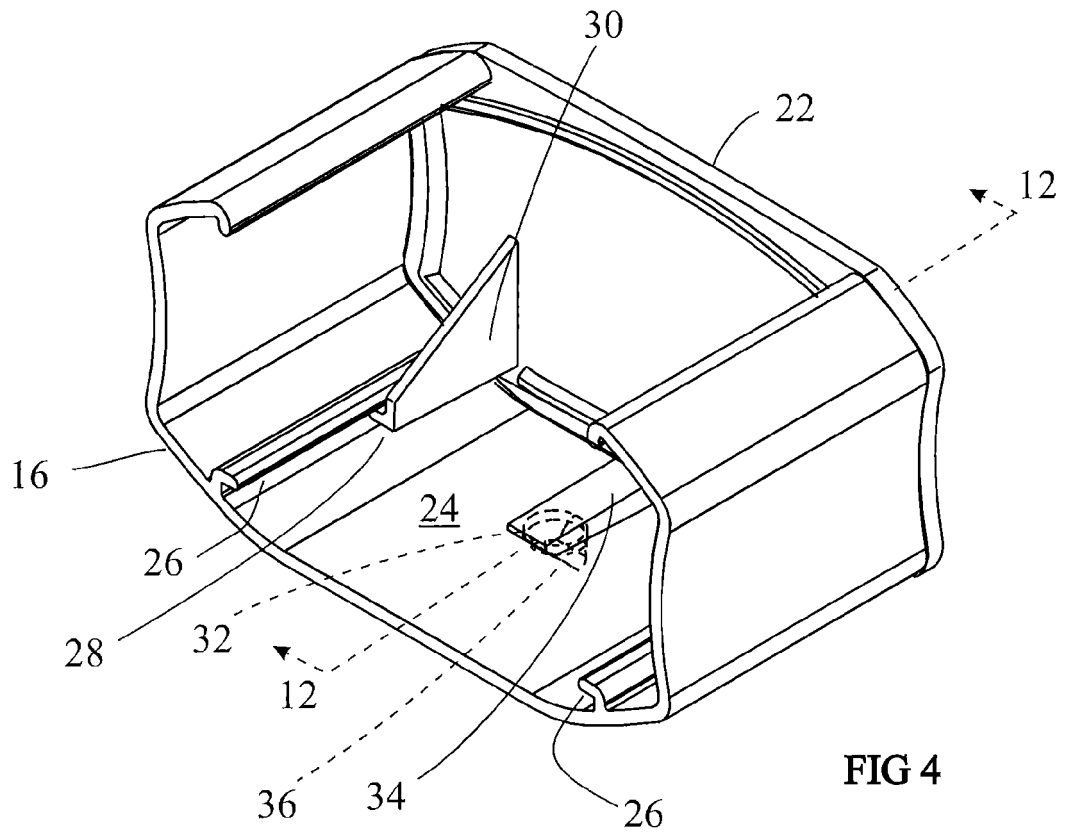


FIG 6

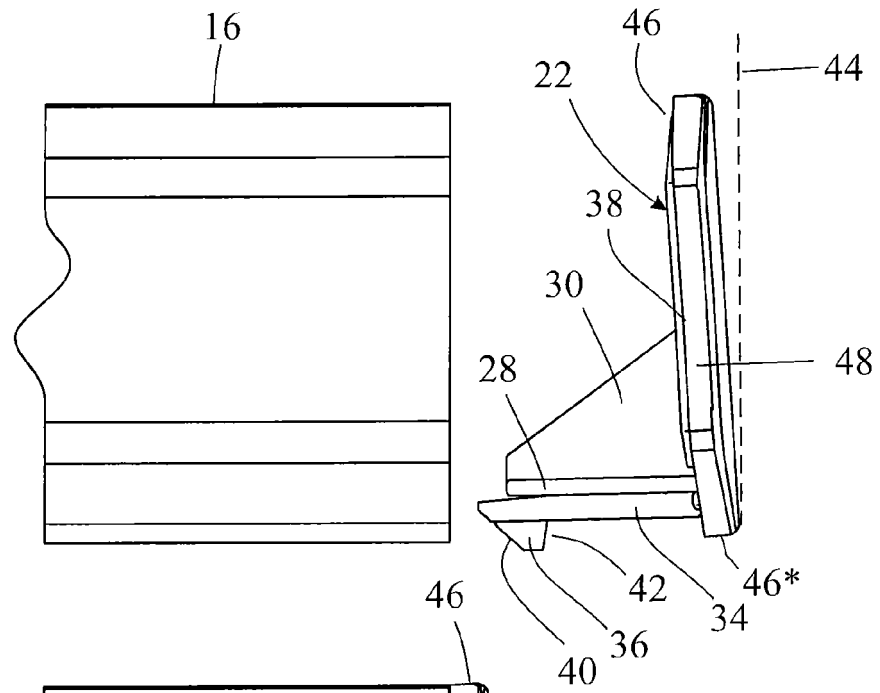


FIG 7

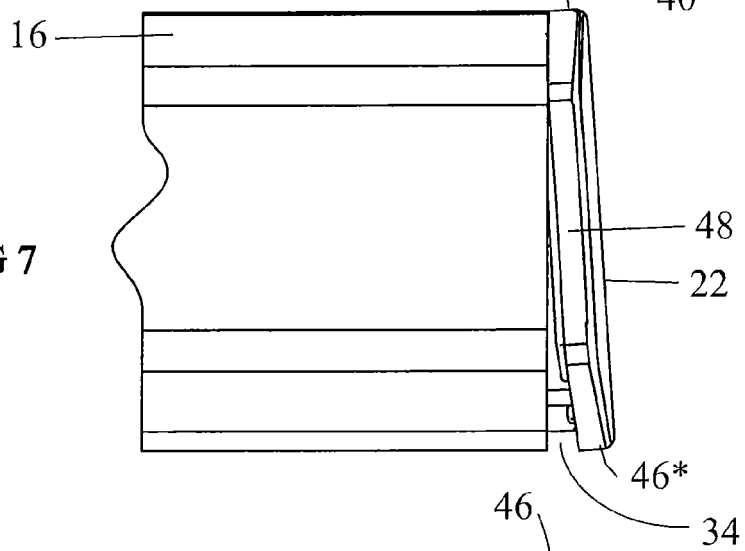
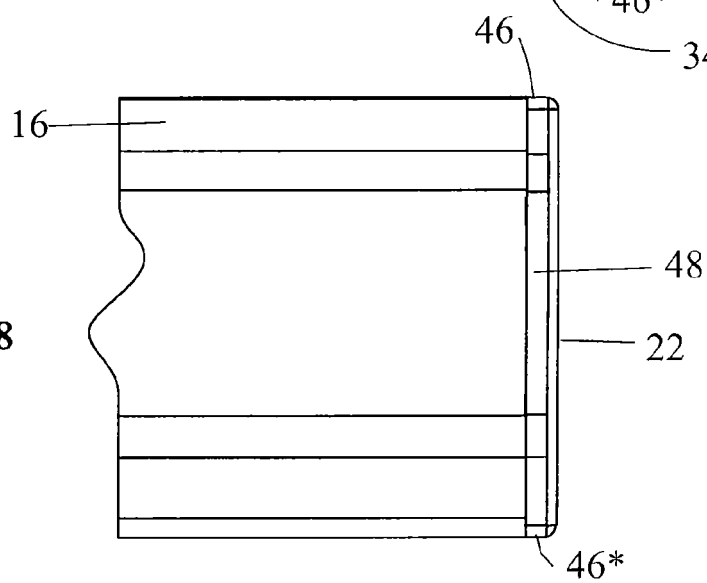
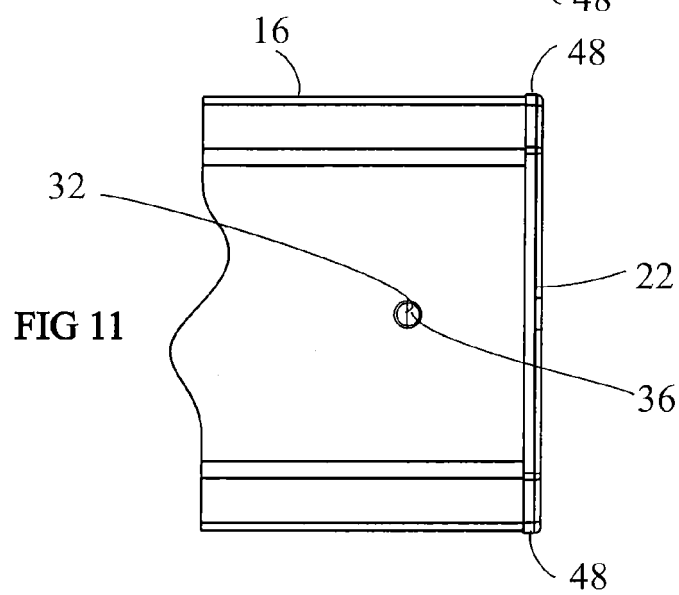
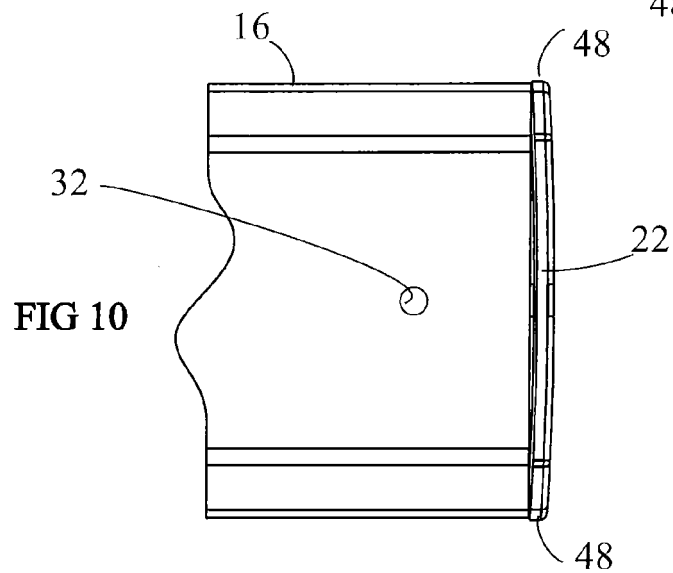
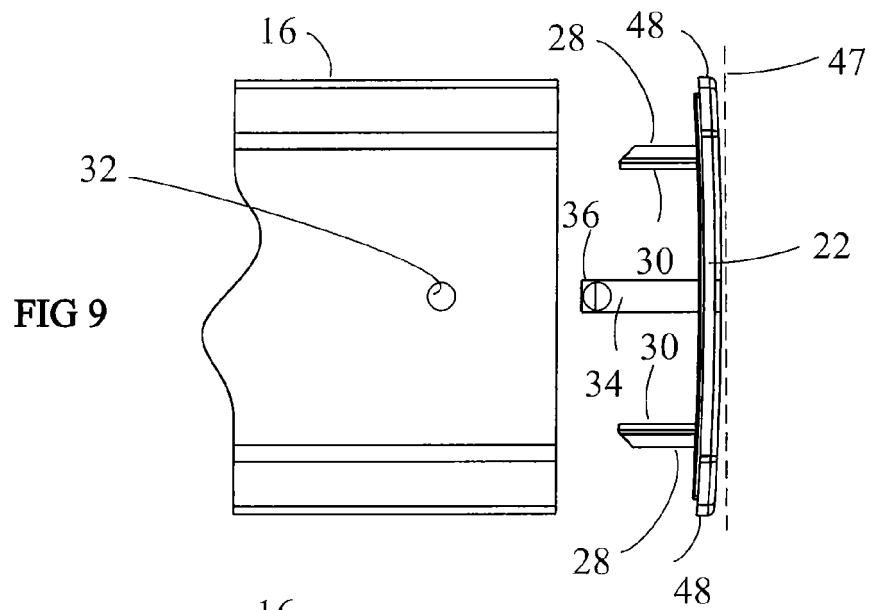
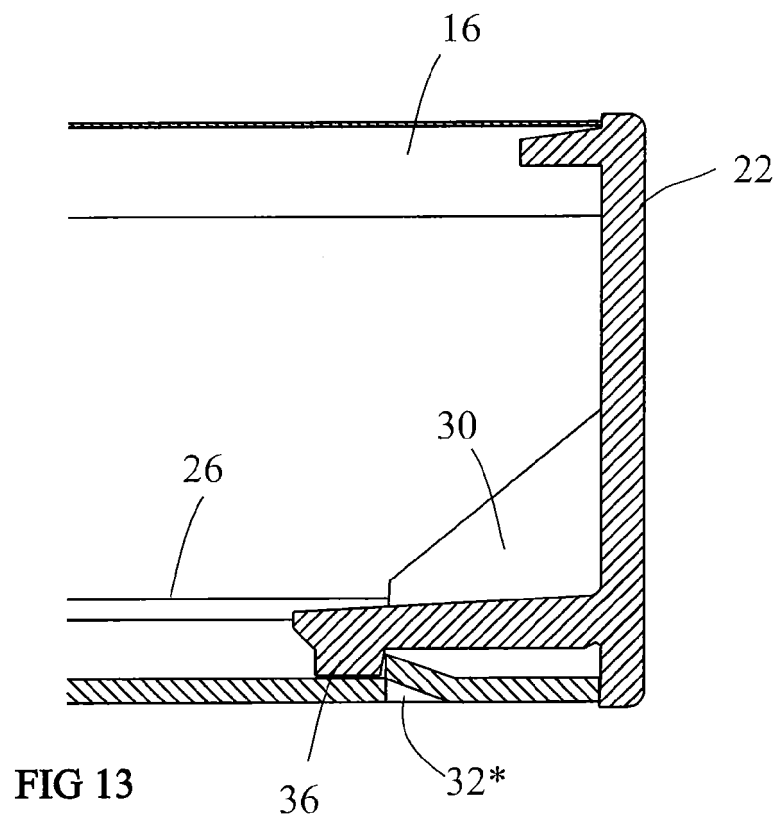
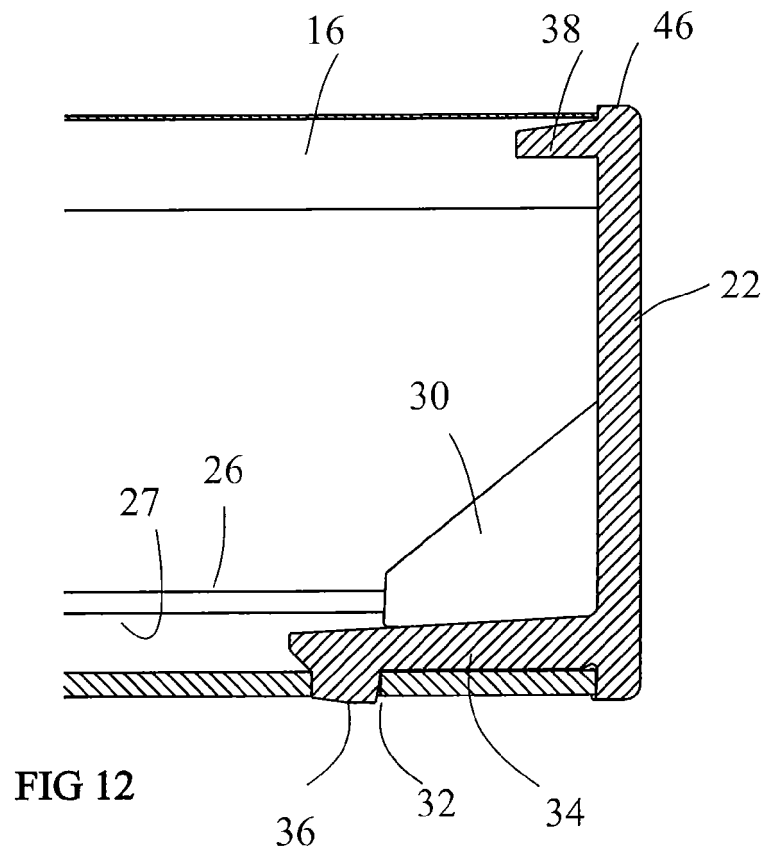


FIG 8







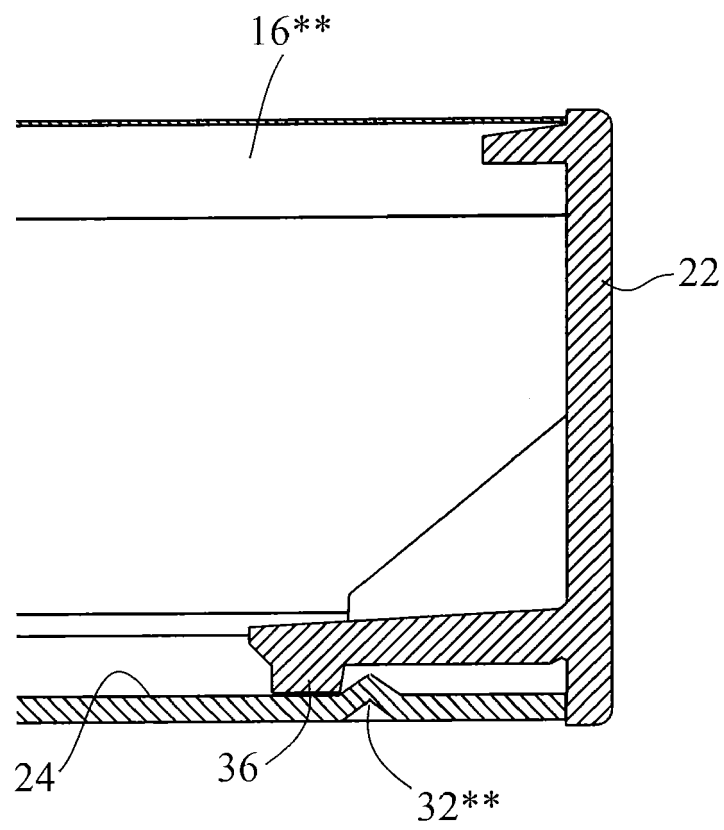


FIG 14

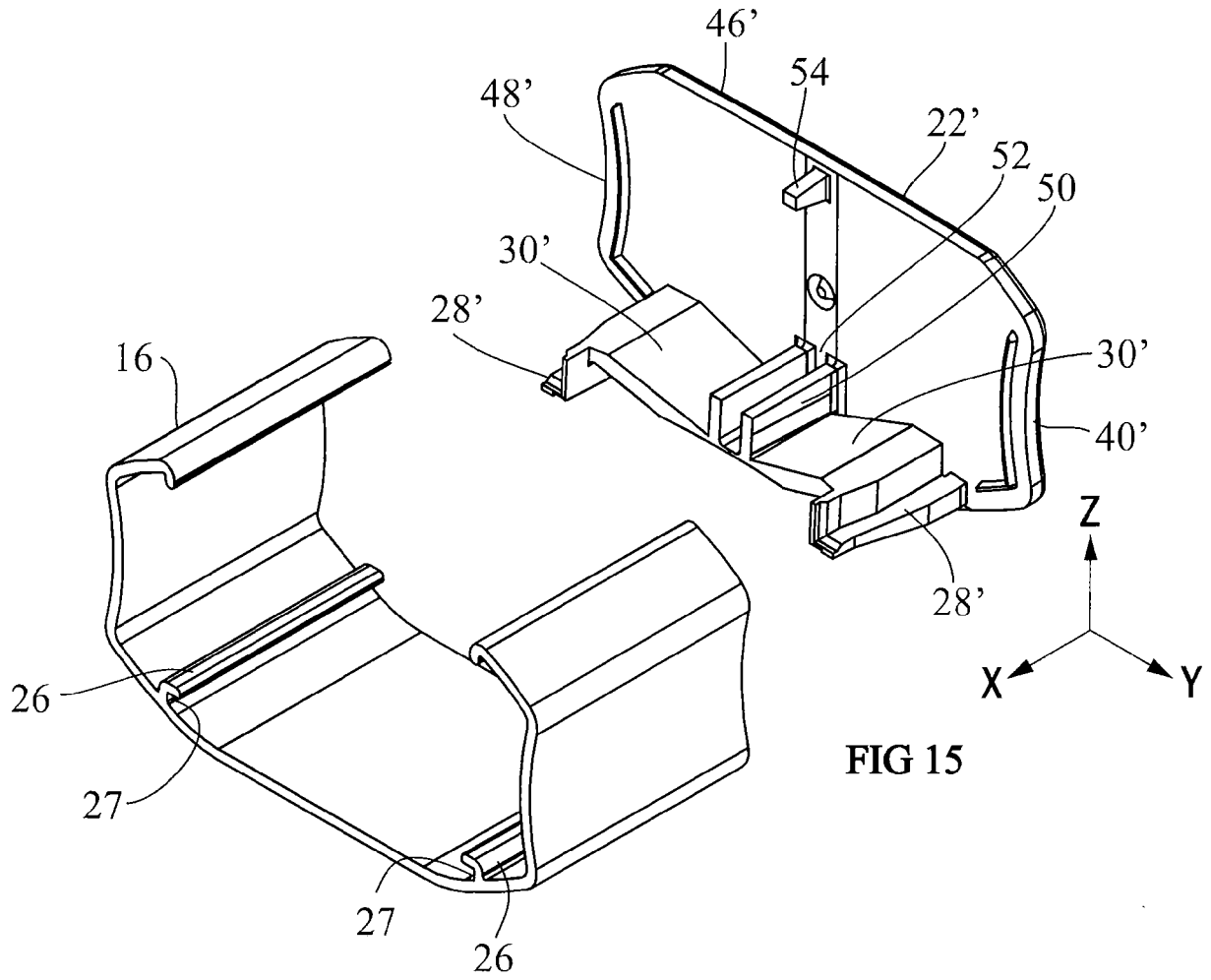


FIG 15

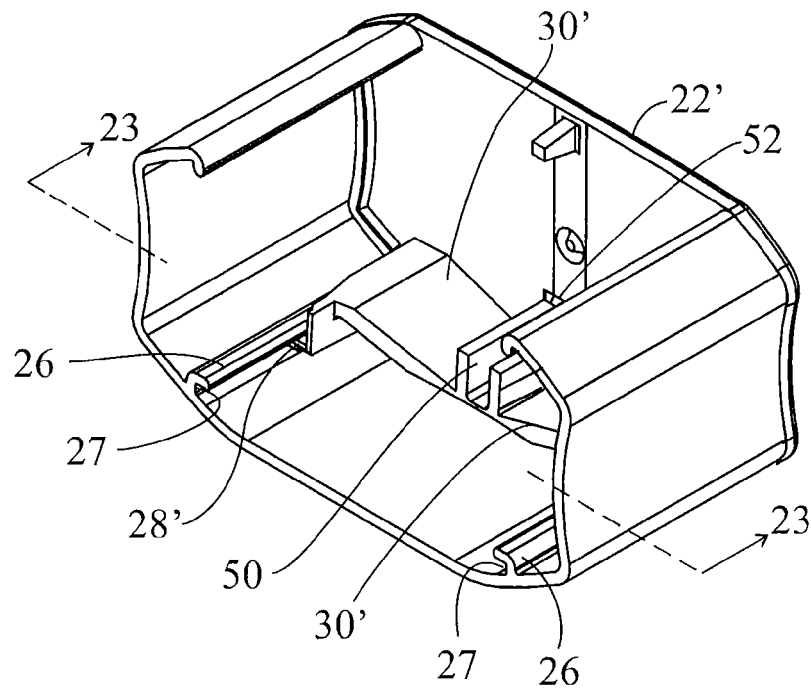


FIG 16

FIG 17

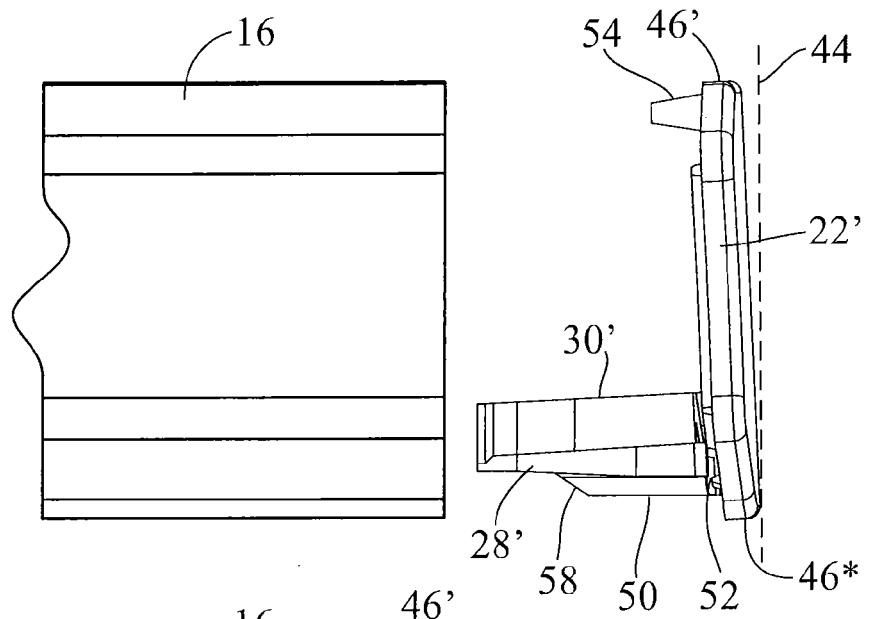


FIG 18

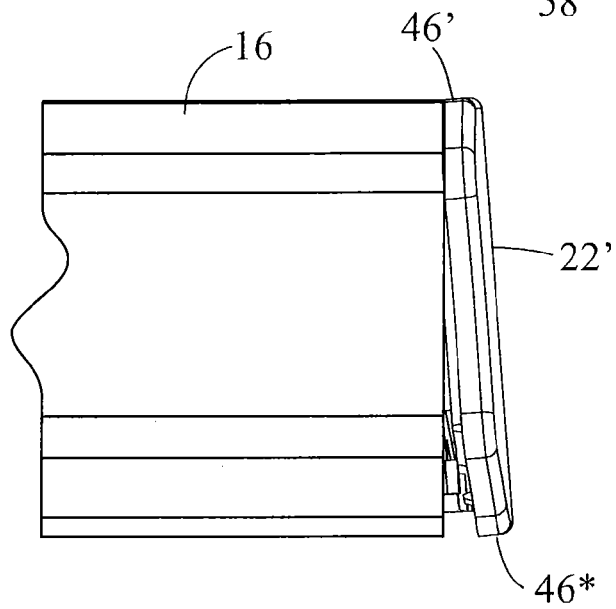


FIG 19

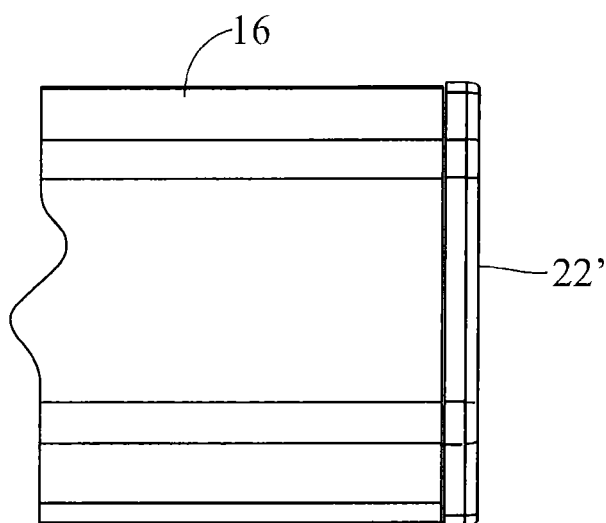


FIG 20

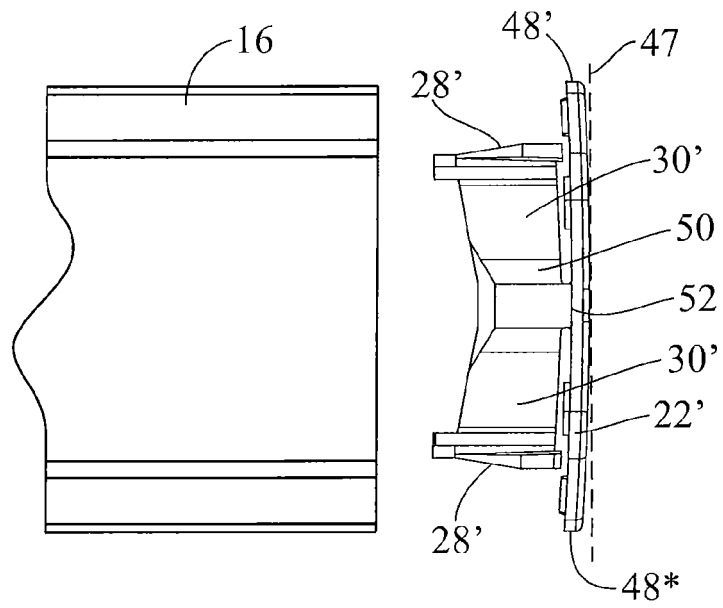


FIG 21

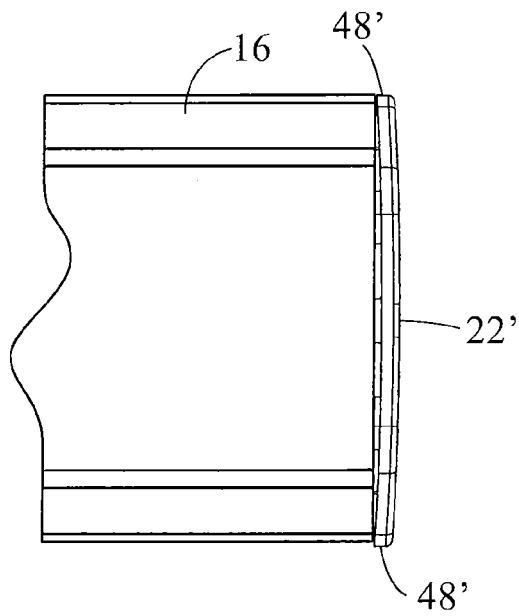
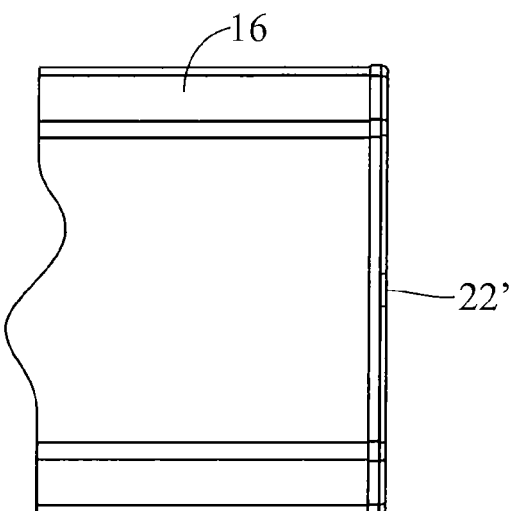


FIG 22



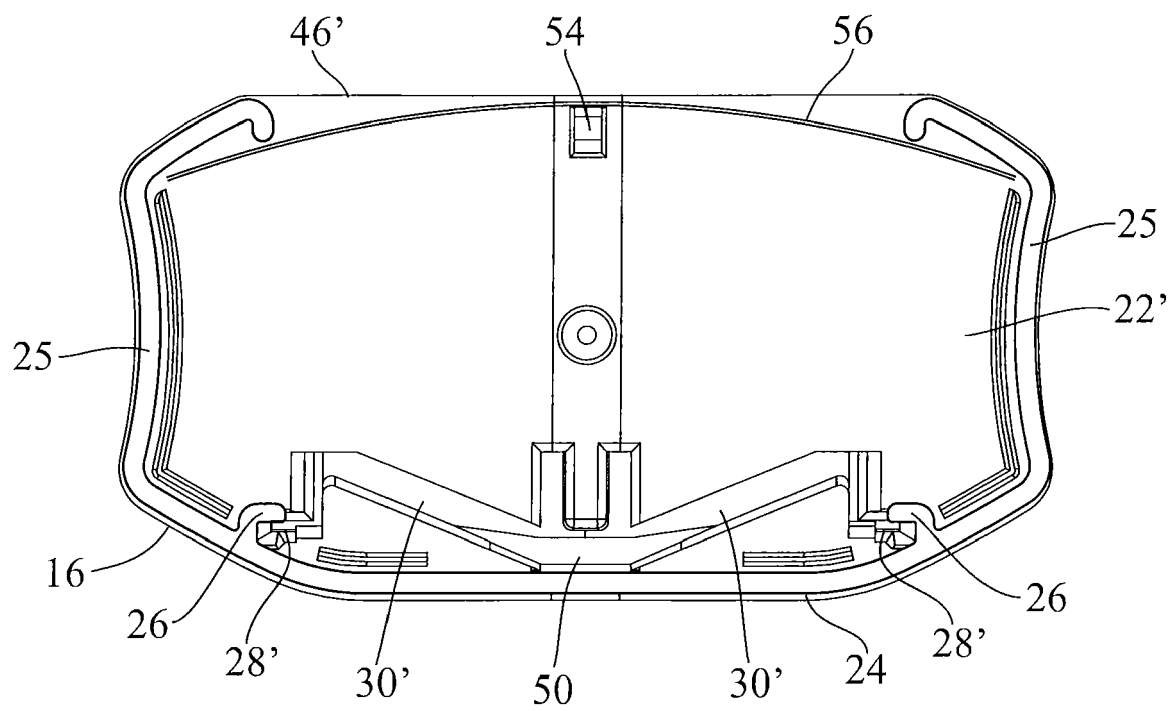


FIG 23

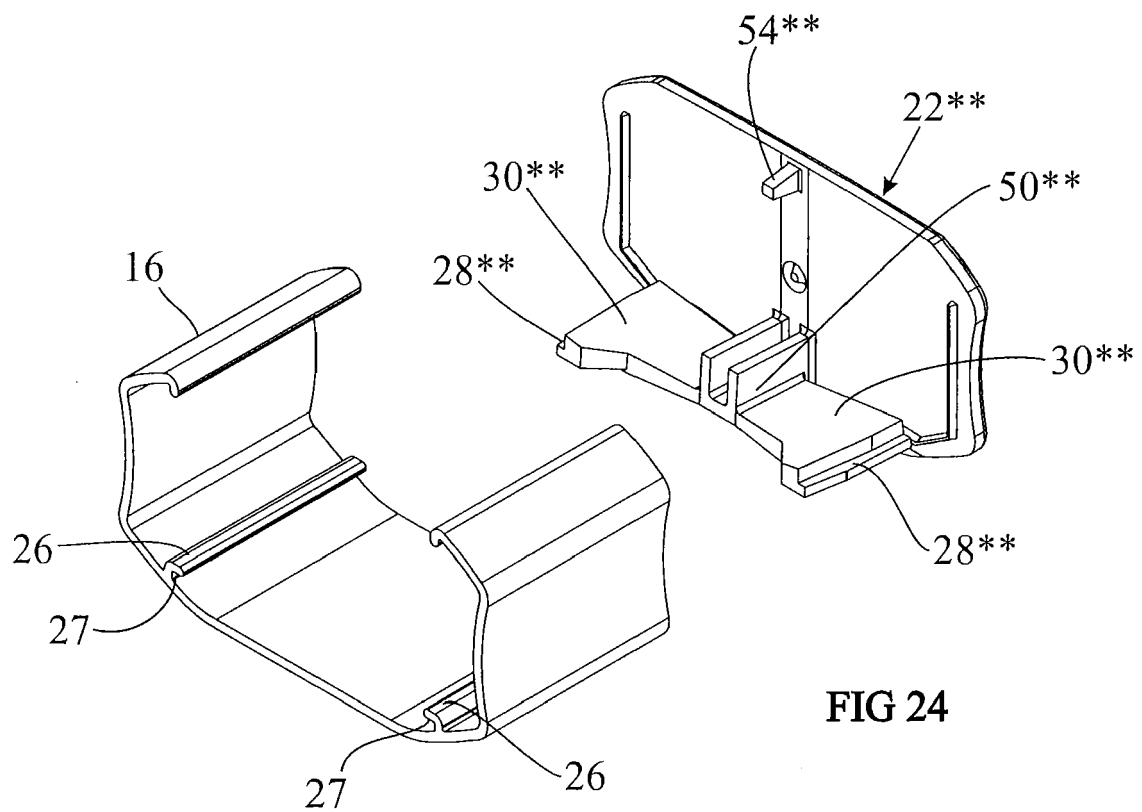


FIG 24

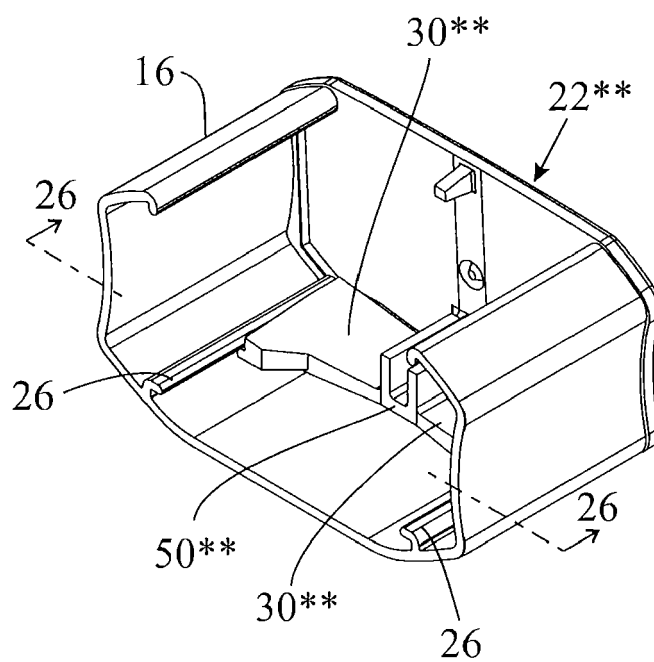


FIG 25

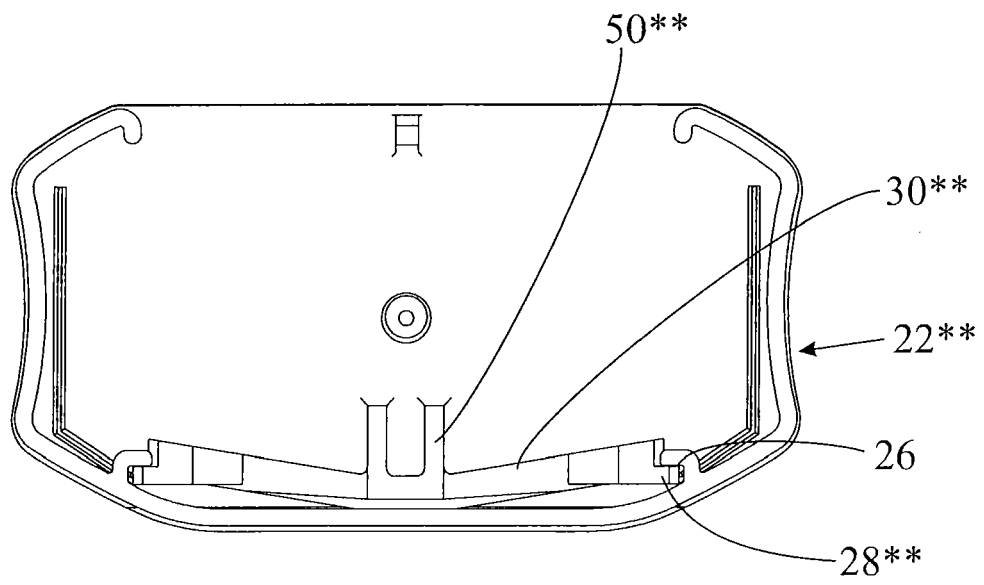


FIG 26

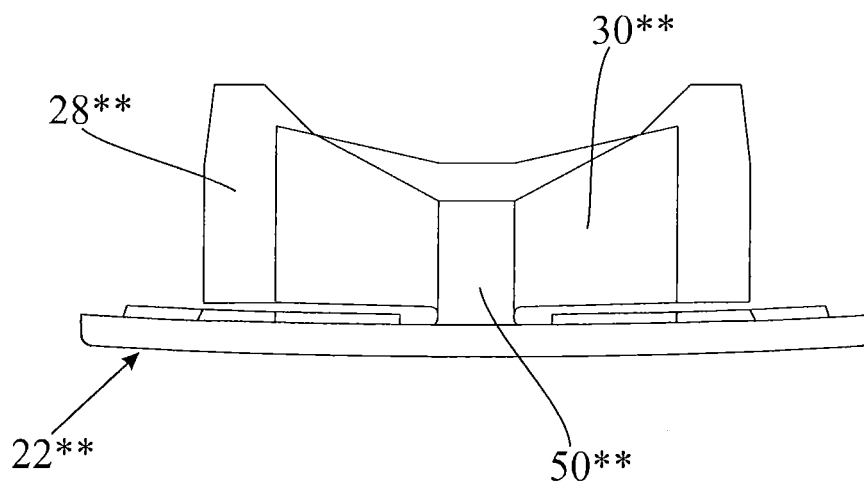


FIG 27

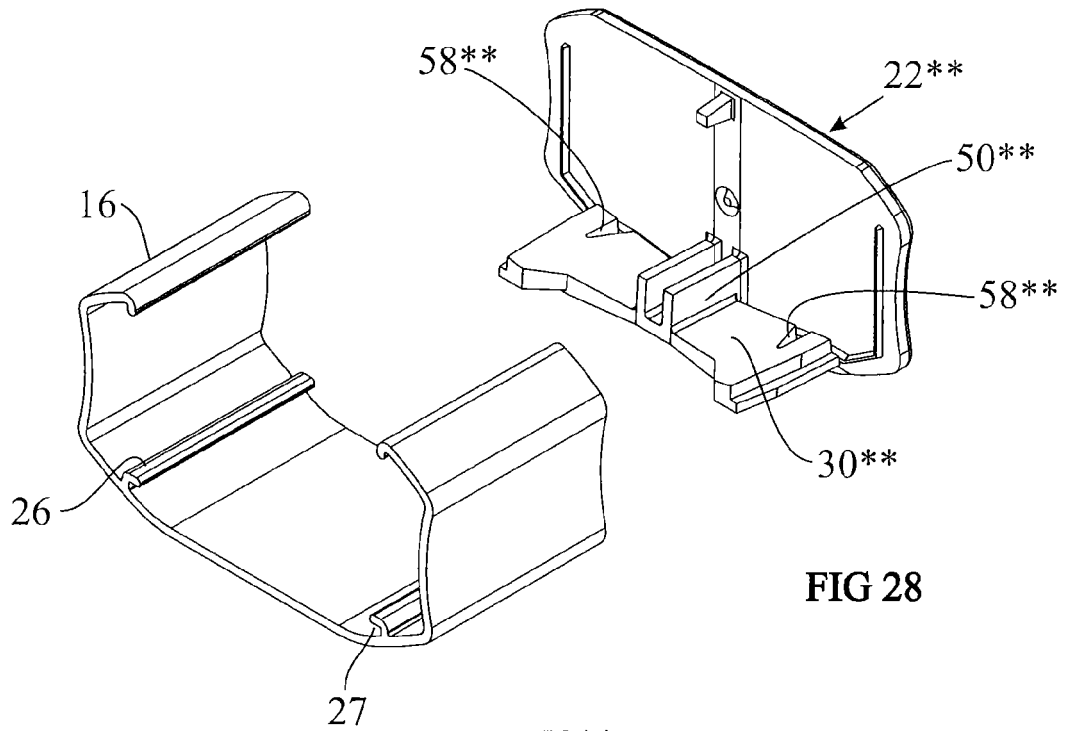


FIG 28

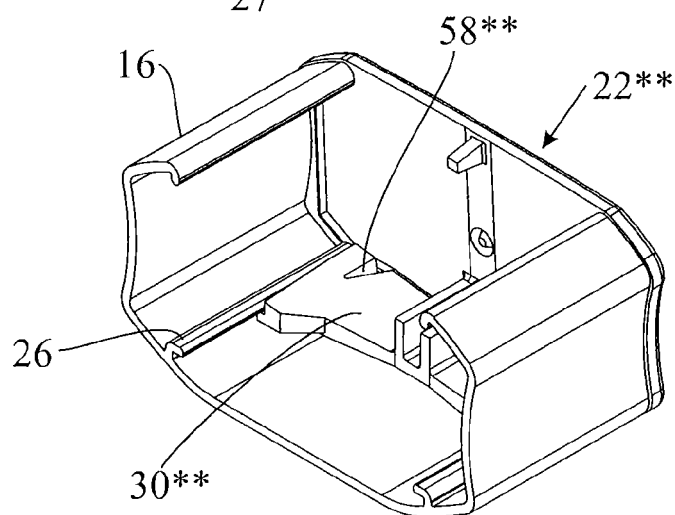


FIG 29

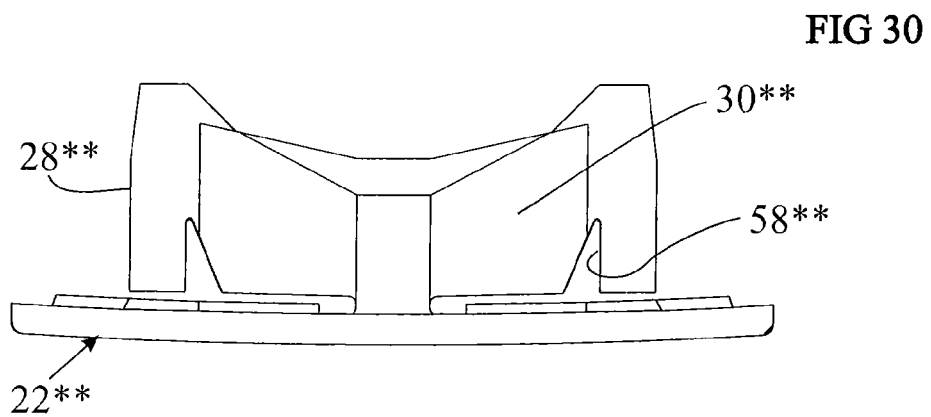


FIG 30



EUROPEAN SEARCH REPORT

Application Number
EP 16 16 5394

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			E06B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 9 August 2016	Examiner Weißbach, Mark
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