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(54) **Improved seal with anti-theft device for articles having slender portions**

(57) A seal with anti-theft device for articles having slender portions, that comprises a hollow body (12) containing an electronic signaling component (13a) and forming a contact plane for a slender portion of an article to be protected, a pair of parallel and mutually opposite guides (15) for a substantially bridge-shaped slider (21) protruding from the body (12), the slider having a flat portion (22) from the ends of which mutually parallel and facing wings (23) protrude at right angles; the hollow body (12) and the slider (21) are coupled through irre-

versible engagement elements, and the slender portion is retained between the plane (22) and a parallel plane formed by the slider, the engagement elements comprising a plate (17) that protrudes from the body (12) parallel and internally to the guides (15), portions (16) having a sawtooth surface formed on the plate (17) at the outward face, and on the inward face of each one of the wings (23), respective complementary sawtooth portions (24) for engaging a corresponding one of the portions (16) having a sawtooth surface.

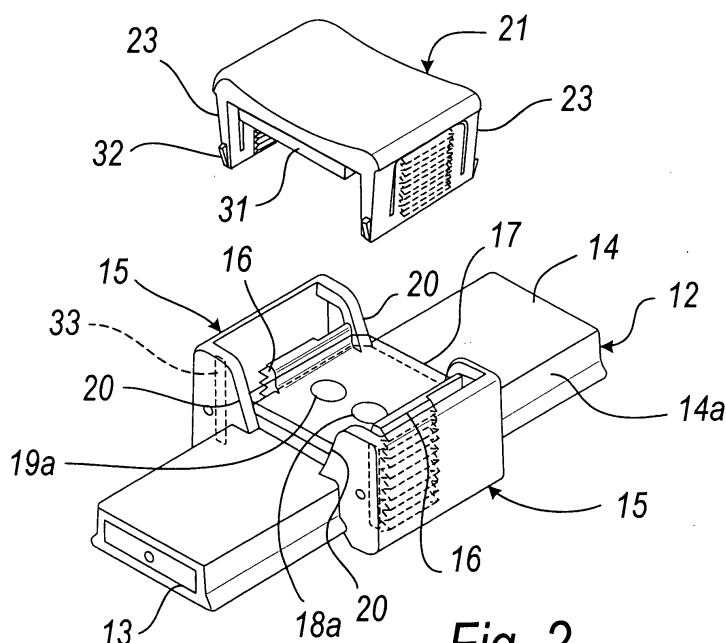


Fig. 2

Description

[0001] The present invention relates to an improved seal with anti-theft device for articles having slender portions.

[0002] Such seal is particularly suitable to be applied to the temples of eyeglasses.

[0003] It is well-known that eyeglasses are currently usually provided, at points of sale, with suitable seals on which a customizing decoration or, more simply, the trademark of the manufacturer is applied.

[0004] In recent times, in particular, it is common to integrate within said seals an anti-theft device that is capable of activating electronic alarm circuits, which are usually arranged proximate to the exits.

[0005] The seals usually comprise a box-like body from which a tab protrudes which is constituted by articulated consecutive elements and is shaped so that it can fold back, so as to produce, in combination with said body, a containment seat for the slender portion of the article to which the seal is to be applied.

[0006] An electronic signaling component of the per se known type is inserted in the box-like body.

[0007] Furthermore, the seal is provided with a slider, which engages irreversibly a guide that is rigidly coupled to the box-like body.

[0008] The slider has a mushroom-shaped head, which enters and slides within a complementarily shaped seat formed in the tab, so as to block said tab in the folded position.

[0009] In this manner, the slender portion is retained in the seat formed by the folding of the tab by way of the irreversible locking of the slider.

[0010] In particular, the slider slides in a direction that is perpendicular to the slender portion and lies on the imaginary plane, formed by the box-like body, on which said slender portion rests.

[0011] The retention of the temple is in fact provided by the head of the slider and by the edge of the tab, and is therefore performed on a plane that is parallel to the contact plane.

[0012] Although this type of seal ensures many advantages, unfortunately it also has drawbacks.

[0013] First of all, the structure of the body of the seal allows a limited sliding range for the slider, to the point that it may reach the end of its stroke without being able to lock the slender portion conveniently.

[0014] Accordingly, in this type of seal there is a limited range of rod-like portions that can be retained therein without relative rotations occurring.

[0015] For example, many problems can occur in trying to apply the anti-theft seal to articles that have slender portions with a particularly narrow cross-section.

[0016] In addition to this, unfortunately, the bulk of the anti-theft seal applied for example to temples of eyeglasses causes many difficulties linked to the operations performed to arrange said eyeglasses in the display stands located at the points of sale.

[0017] The seals can in fact be applied to a temple without ensuring the locking of said temple in the containment seat, and while preventing extraction they can however rotate easily with respect to said temple, reaching an inclined position and thus making it difficult to arrange the eyeglasses in display stands.

[0018] Currently commercially available seals, moreover, cannot be applied at all to articles that have large, slender portions, since the containment seat that they form has a rather small cross-section with respect to the overall dimensions of the seal.

[0019] Moreover, the seals currently widely in use can be reused only partially, since in order to disengage them from the portions to which they have been applied it is necessary to break the mushroom-shaped head of the slider and it is then necessary to have a replacement part for the slider before being able to reuse said seals by applying them to a new slender portion.

[0020] In order to solve the cited drawbacks, a seal with anti-theft device has been devised which comprises a hollow body, suitable to contain an electronic signaling component, which forms a contact plane for a slender portion.

[0021] Two parallel and mutually opposite guides protrude from the body, and each guide has at least one sawtooth engagement surface for the irreversible sliding, along a direction that is perpendicular to the plane, of a slider that has wings with complementary sawtooth engagement surfaces.

[0022] The slender portion is retained between said plane and a parallel plane formed by said slider.

[0023] A first lining element is glued onto said hollow body in the region between said two guides.

[0024] A second lining element is instead glued onto the lower face of said slider and is interposed between said complementary sawtooth engagement surfaces.

[0025] Although the new seal has achieved its intended aim, it still has the drawback that when it is closed onto the corresponding slender portion the two elastomer lining elements produce considerable friction thereon.

[0026] Under traction, the friction effect is so high that it overcomes the adhesion force of the adhesive and the lining elements easily separate.

[0027] It is therefore simple for an ill-intentioned individual to slide the seal off the product and steal said product.

[0028] In order to solve these drawbacks, an annular lining element in which said slender portion is to be inserted has been arranged between said sawtooth engagement surfaces of the slider and has been rigidly coupled thereto by being monolithically provided with a tab, which is likewise annular and surrounds a portion thereof, but this has entailed a certain constructive complication of the assembly.

[0029] Other problems have been observed owing to the relative ease with which it is possible to insert a blade between the guides of the body and the wings of the

slider, disengaging the sawtooth engagement surfaces and therefore releasing the product to be protected.

[0030] The aim of the present invention is to provide a seal with anti-theft device for articles having slender portions that solves the drawbacks noted above.

[0031] Within this aim, an object of the present invention is to provide a seal with anti-theft device that cannot be slid off the article to which it is applied and which has reduced dimensions.

[0032] Another object is to provide a seal with anti-theft device that can also be applied to slender portions that have a small cross-section without the possibility of unwanted rotations or movements.

[0033] Another object is to provide a seal with anti-theft device that can also be applied without problems even to considerably large and slender portions.

[0034] Another object of the present invention is to provide a seal that can be reused completely after the article to which it is applied has been sold.

[0035] Another object of the present invention is to provide a seal with anti-theft device that is composed of a reduced number of parts that can be mutually assembled easily.

[0036] Another object is to provide a seal with anti-theft device that can be applied simply and rapidly.

[0037] Another object is to provide a seal with anti-theft device whose cost is comparable with that of known types.

[0038] This aim and these and other objects that will become better apparent hereinafter are achieved by a seal with anti-theft device for articles having slender portions, of the type that comprises a hollow body, which contains an electronic signaling component and forms a contact plane for a slender portion of an article to be protected, a pair of parallel and mutually opposite guides for a substantially bridge-shaped slider protruding from said body, said slider having a flat portion from the ends of which mutually parallel and facing wings protrude at right angles, said hollow body and said slider being coupled by means of irreversible engagement means, said slender portion being retained between said plane and a parallel plane formed by said slider, said seal being characterized in that said irreversible engagement means comprise a plate that protrudes from said body and is parallel and internal to each one of said guides, a portion having a sawtooth surface being formed on said plate at the outward face, said engagement means further comprising, on the inward face of each one of said wings, respective complementary sawtooth portions that are suitable to engage the corresponding portions having a sawtooth surface that are formed on each one of said plates.

[0039] Further characteristics and advantages of the present invention will become better apparent from the following detailed description of a preferred embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a perspective view of the seal with anti-theft device according to the invention, with an associated rod-like portion of an article to be protected;

Figure 2 is an exploded view of the seal according to the invention;

Figure 3 is a bottom plan view of the seal according to the invention;

Figure 4 is a perspective view of an extractor tool that is used to disengage a seal with anti-theft device from a rod-like portion to which it has been applied;

Figure 5 is a longitudinal sectional view of a portion of the seal, taken along the line V-V;

Figure 6 is a transverse sectional view of the seal, taken along the line VI-VI.

[0040] With reference to the figures, a seal with anti-theft device for articles having slender portions is generally designated by the reference numeral 10 and is preferably made of plastics.

[0041] In this case, the seal 10 is applied to a temple 11 of a pair of eyeglasses, shown partially in the above cited figures for the sake of simplicity.

[0042] The seal 10 comprises a hollow body 12, which is substantially flattened and longitudinally elongated and on which there is, at a smaller face, a slot 13 through which an electronic signaling component 13a, of the per se known type, is inserted and subsequently sealed.

[0043] The body 12 forms, at a larger face 14, a contact plane for the temple 11.

[0044] Two mutually facing guides 15 protrude from the edges 14a of the face 14 at a central region.

[0045] Each guide 15 is monolithic with the body 12 and is substantially constituted by a wall that is perpendicular to the body 12.

[0046] Blending portions 20, contoured so as to avoid sharp corners, protrude from the body 12 at the sides of each one of the guides 15.

[0047] A plate 17 protrudes from each edge 14a, between the blending portions 20, and is spaced from them; said plate is parallel and internal to a respective guide 15, and a portion 16 having a sawtooth surface is formed on said plate at the outward face.

[0048] A contact element 19 made of soft material, for example elastomer, is overmolded on the contact plane between the guides 15.

[0049] In order to improve the coupling, holes 19a are provided in the contact plane in order to be filled with the material of the element 19 during injection-molding.

[0050] The seal 10 is completed by a slider 21, which is also preferably made of plastics, is substantially bridge-shaped and has a flat portion 22, from the ends of which mutually parallel and facing wings 23 protrude at right angles.

[0051] The inner regions 23a of said wings 23, adjacent to the flat portion 22, are separated from the remaining part of the wings by means of a through slot

23b, which is shaped like an inverter letter U and causes the inner part of each one of said wings to cantilever.

[0052] The regions 23a are therefore elastically flexible.

[0053] Respective complementary sawtooth portions 24 are formed on the inward face of each one of the wings 23 and are shaped so as to be adapted to engage irreversibly with the corresponding sawtooth portions 16 formed on each of the plates 17.

[0054] Each one of the sawtooth portions 24 is arranged between two flat regions 26, which are dimensionally equivalent to the spaces between the plate 17 and the blending portions 20.

[0055] Advantageously, the sawtooth portions 24 and the flat regions 26 are delimited externally by the slot 23b.

[0056] The slider 21 is suitable to slide, by means of the wings 23, along the guides 15 in a direction that is perpendicular to the contact plane of the temple 11.

[0057] In particular, said sliding is irreversible and is performed by the sawtooth portions 24, which mesh and continuously move past the sawtooth protrusions 16 of the plates 17.

[0058] Conveniently, on the body 12, proximate to each guide 15, there is, starting from the face 14, a recess 28 that is related to the corresponding wing 23 of the slider 21.

[0059] Respective through holes 30 having a rectangular cross-section are formed from the bottom of each recess 28 at its ends and are exactly aligned with the regions between which each plate 17 with a sawtooth portion 16 is arranged.

[0060] A plate-like contact element 31 made of soft material such as an elastomer is overmolded on the flat portion 22 between the wings 23 of the slider 21 and is rigidly coupled to said slider.

[0061] The temple 11 is therefore retained in the seat formed by the plane of the face 14 of the body 12 and by the parallel plane formed by the flat portion 22 of the slider 21 once it has coupled irreversibly to the guides 15.

[0062] In this case, therefore, the slider 21 is capable of locking effectively slender portions that have both very small and very wide cross-sections without the possibility of unwanted rotations or relative movements or locking difficulties.

[0063] It should also be noted that the lateral edges of the wings 23 have, at their ends, teeth 32 that are suitable to be inserted in appropriately provided undercut slots 33 located inside the blending portions 20.

[0064] Insertion occurs by elastic deformation of the blending portions 20 and allows preassembly of the slider 21 on the body 12.

[0065] In the case of a temple 11 of eyeglasses, it is sufficient to insert said temple between the slider 21 and the body 12 and then mate the sawtooth portions 16 and 24.

[0066] Moreover, the seal 10 can be reused by using

an extractor tool for disengagement, which is shown schematically in Figure 6 and is designated by the reference numeral 34.

[0067] The extractor tool 34 is in fact provided with two pairs of tabs 35 with wedge-shaped tips, each of which has an abutment region 36 at the part that lies opposite the tips.

[0068] The tabs 35 can be inserted in the openings formed, in this case, by the holes 30 until the tips of the wings 23 abut against the abutment regions 36.

[0069] Once this has been done, the tabs 35 act on the regions 23a of the wings 23 so as to flex them outward and simultaneously disengage them from the plates 17.

[0070] The sawtooth portions 24 of the wings 23 in fact disengage from the corresponding sawtooth portions 16 of the plates 17, thus allowing the uncoupling of the slider 21 and accordingly the opening of the seal 10.

[0071] It should be noted in particular that the slender portion is retained between the slider 21 and the body 12 on a plane that is perpendicular to the contact plane of said temple.

[0072] In this manner, the effectiveness of the retention is in fact ensured with slender portions having any cross-section, even a very small one.

[0073] In practice it has been found that the present invention amply achieves the intended aim and objects.

[0074] An important advantage has been achieved by the present invention in view of the fact that a reusable seal with anti-theft device has been provided in which the portions for sawtooth coupling between the body 12 and the slider 21 are internal and are therefore further protected against disengagement attempts.

[0075] Another advantage arises from by the execution by overmolding of the soft elements between which the slender portion of the article to be protected passes.

[0076] Overmolding obtains each finished component with a single process, without requiring further work or assembly.

[0077] Another advantage of the present invention is that it provides a seal with anti-theft device whose cost is fully comparable with the cost of known models.

[0078] The present invention is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0079] All the details may further be replaced with other technically equivalent elements.

[0080] Furthermore, the materials employed, so long as they are compatible with the contingent use, as well as the dimensions, may be any according to requirements.

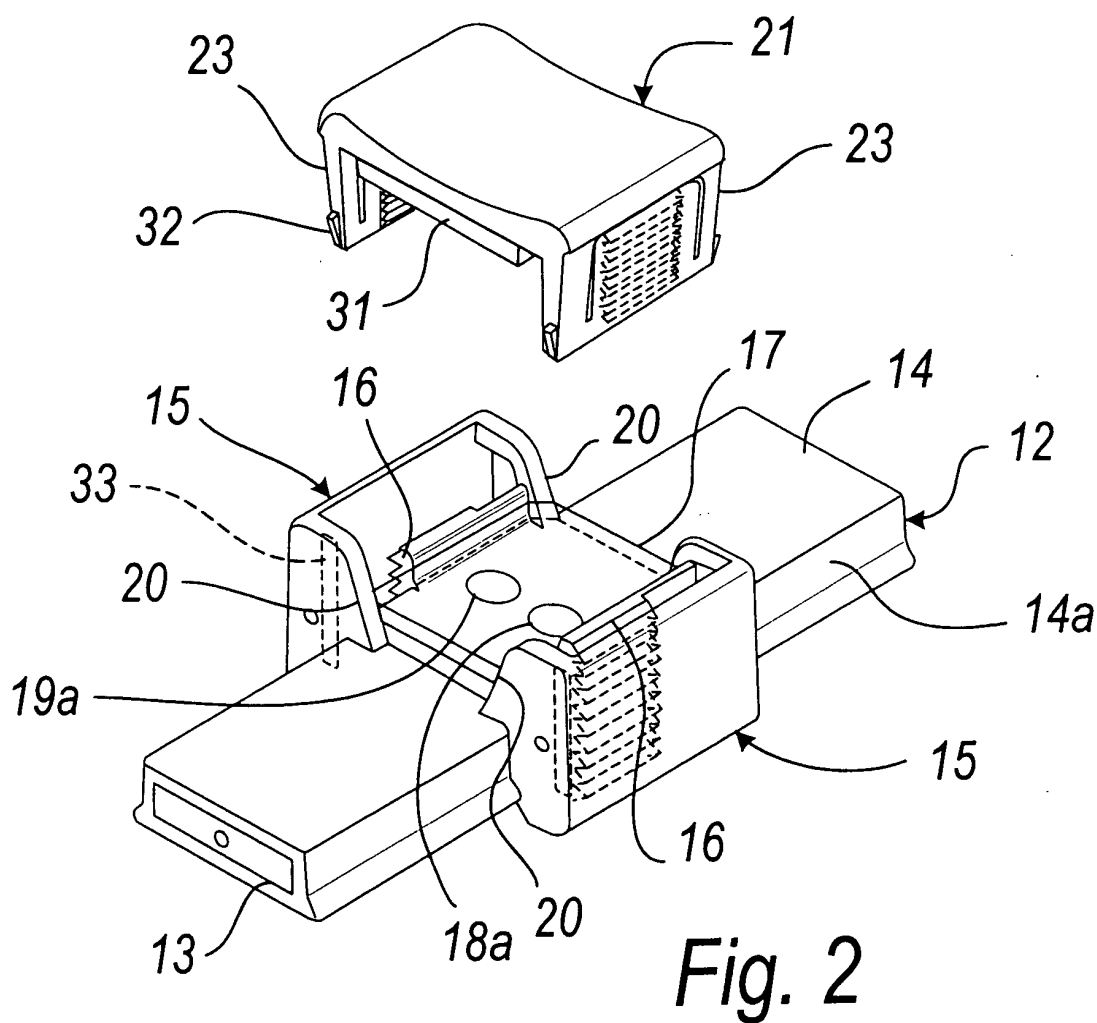
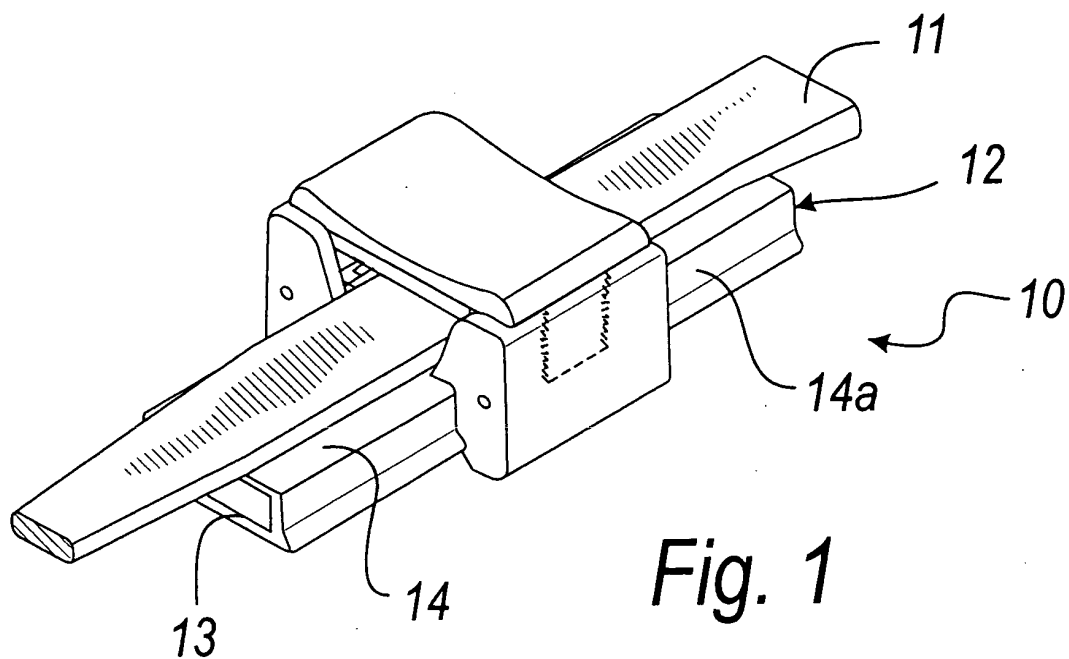
[0081] The disclosures in Italian Patent Application No. PD2002A000095 from which this application claims priority are incorporated herein by reference.

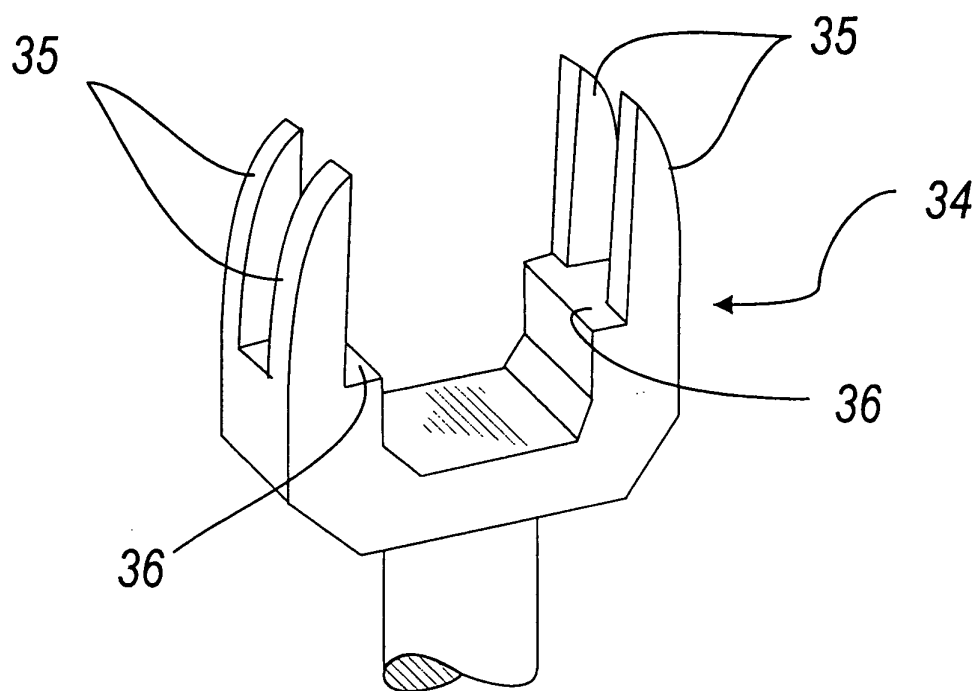
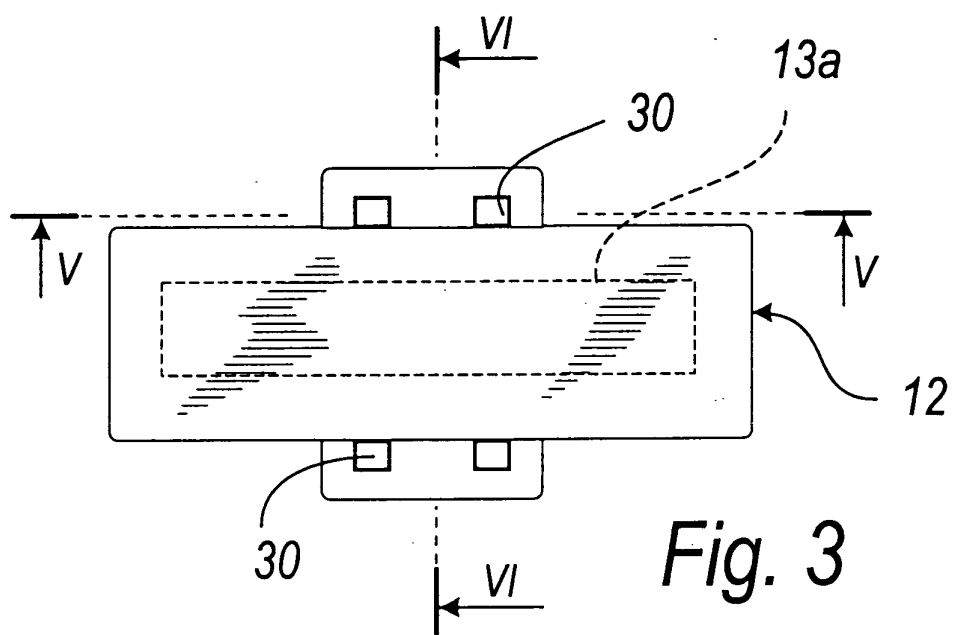
[0082] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of in-

creasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. A seal with anti-theft device for articles having slender portions, comprising a hollow body (12), which contains an electronic signaling component (13a) and forms a contact plane for a slender portion (11) of an article to be protected, a pair of opposite and parallel guides (15) for a substantially bridge-shaped slider (21) protruding from said body (12), said slider having a flat portion (22) with parallel and facing wings (23) protruding at right angles from ends thereof, said hollow body (12) and said slider (21) being coupled by way of irreversible engagement means, said slender portion (11) being retained between said flat portion (22) and a parallel plane formed by said slider (21), the seal being **characterized in that** said irreversible engagement means comprise respective plates (17) that protrude from said body (12) and are arranged parallel and internally with respect to said guides (15), and portions (16) having a sawtooth surface, which are formed on said plate (17) at the outward face, said engagement means further comprising, provided on the inward face of each one of said wings (23), respective complementary sawtooth portions (24) adapted to engage each a corresponding one of the portions (16) having a sawtooth surface that are formed on each one of said plates (17).
2. The seal according to claim 1, **characterized in that** each guide (15) is substantially constituted by a wall that is perpendicular to said body (12), blending portions (20) protruding from the sides of each guide (15), said plate (17) protruding from said body (12) between said blending portions (20) so that it is spaced from them and is parallel and internal to said guide (15).
3. The seal according to one or more of the preceding claims, **characterized in that** said wings (23) of said slider (21) have internal regions (23a) that are adjacent to said flat portion (22) and are separated from the remaining part by way of a through slot (23b), which is shaped like an inverted letter U and makes the inner portion of each one of said wings (23) to cantilever, said regions (23a) being elastically flexible and said sawtooth portions (24) being formed on said regions.
4. The seal according to one or more of the preceding claims, **characterized in that** said sawtooth portions (24) are each arranged between two flat regions (26) which are dimensionally equivalent to the spaces between said plate 17 and said blending portions (20).
5. The seal according to one or more of the preceding claims, **characterized in that** a contact element (19) made of soft material, such as an elastomer, is overmolded on the contact plane of said body (12) between the guides (15).
6. The seal according to claim 5, **characterized in that** it further comprises holes (19a) in the contact plane for coupling improvement and which are filled with material from the element (19) during injection molding.
7. The seal according to one or more of the preceding claims, **characterized in that** it comprises, on said body (12), proximate to each guide (15), a recess (28) that is related to the corresponding wing (23) of the slider (21), respective through holes (30) being formed from the bottom of each recess (28) at its ends, said holes having a rectangular cross-section and being aligned exactly with the regions between which each plate (17) is arranged with sawtooth portions (16).
8. The seal according to one or more of the preceding claims, **characterized in that** it comprises a flat contact element (31), made of a soft material, such as an elastomer, that is overmolded on the flat portion (22) between said wings (23) of said slider (21) and is rigidly coupled to said slider.
9. The seal according to one or more of the preceding claims, **characterized in that** the lateral edges of the wings (23) of said slider (21) have supported, at their ends, teeth (32) shaped for insertion in appropriately provided undercut recesses (33) that are internal to the blending portions (20).





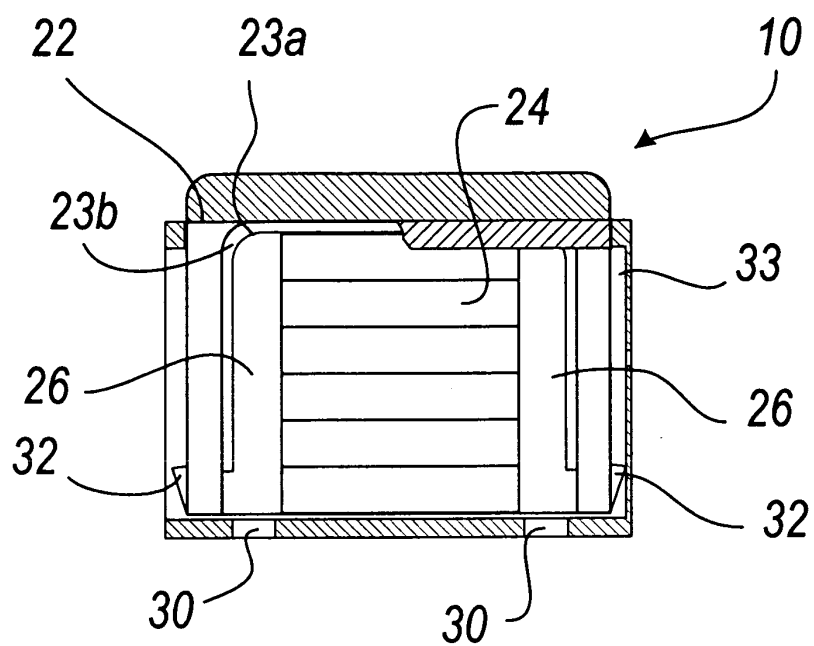


Fig. 5

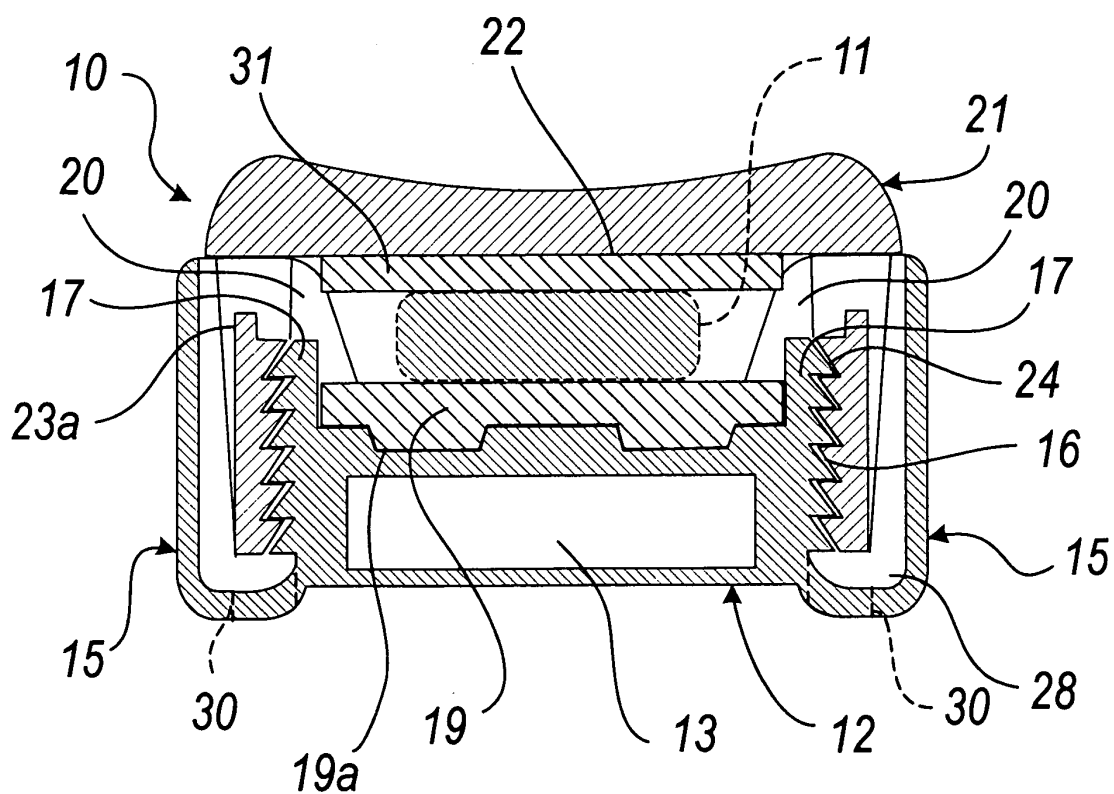


Fig. 6