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Frame assemblies for security screens

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(71) Applicant(s)
Jim Reid

(72) Inventor(s)
Reid, Jim

(74) Agent/Attorney
Griffith Hack, 167 Eagle Street, Brisbane, QLD, 4000

ABSTRACT

A frame assembly for security screens comprising frame portions forming a recess;

a gripping means for gripping a generally planar member within the recess, an urging means for urging the gripping means to grip the generally planar member and a retaining means for retaining the urging means within the recess and wherein the gripping means includes at least one side surface with a deformable material for gripping the generally planar member with the opposite side surface of the gripping means so as to prevent lateral withdrawal movement of the generally planar member from within the recess.

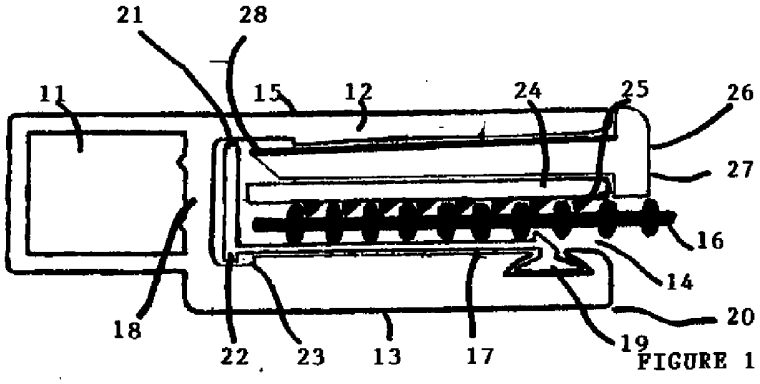

FIGURE 1

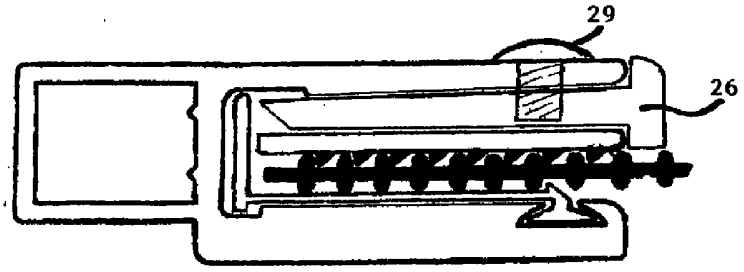

FIGURE 2

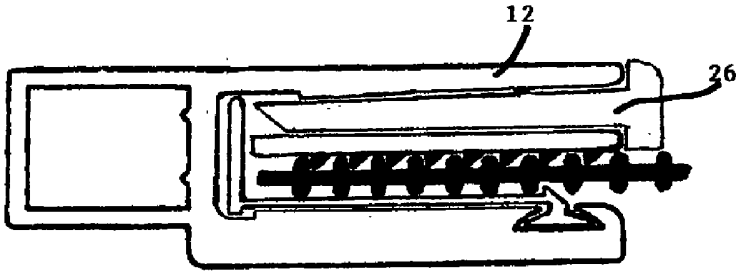

FIGURE 3

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Patents Act 1990

COMPLETE SPECIFICATION

STANDARD PATENT

Applicant:

JIM REID

Invention Title:

FRAME ASSEMBLIES FOR SECURITY SCREENS

The following statement is a full description of this invention, including the best method of performing it known to me/us:

FRAME ASSEMBLIES FOR SECURITY SCREENS

The present invention relates primarily to building security.

The applicant's prior patent, AU 200047349, discloses different types of frame assemblies for fastening a security screen such as steel mesh within a channel of an outer frame.

In the above patent, frame assemblies are shown in which a tubular frame component is provided with a recess between generally parallel side walls. In one embodiment, a frame is shown with an insert having teeth which are configured to engage a wire screen mesh located in the recess. A wedge-like device is inserted behind the insert and forces the teeth of the insert into the mesh and through a soft PVC extrusion located on the opposite side of the mesh. The present invention provides an alternative type of frame assembly.

According to the present invention there is provided a frame assembly for security screens comprising frame portions forming a recess.

A gripping means for gripping a generally planar member within the recess, an urging means for urging the gripping means to grip the generally planar member and a retaining means for retaining the urging means within the recess and wherein the gripping means includes at least one side surface with a deformable material for gripping the generally planar member with the opposite side surface of the gripping means so as to prevent lateral withdrawal movement of the generally planar member from within the recess.

The deformable material preferably is resilient.

The deformable material may be soft and/or flat.

The deformable material may be made from a soft substance.

The deformable material may comprise a deformable member.

It is preferred that the deformable material has

a high friction surface which resists relative lateral movement of the generally planar member when pressed there against.

It should be understood that the generally planar member includes a sheet of material including a security screen such as a wire screen mesh.

It is preferred that the deformable material has a generally even surface which contacts the generally planar member.

The gripping means may include first and second gripping portions or surfaces on opposite faces of the generally planar member.

Each first and second surface may comprise a deformable material for gripping the generally planar member.

Preferably the deformable material is generally flat.

The deformable material may be in the form of a gel, spray, mat or coating applied to the gripping portion.

The deformable material may provide a smooth outer surface.

The deformable material may comprise a layer of a deformable substance.

According to another aspect of the present invention there is provided a frame assembly for security screens comprising frame portions forming a recess, a gripping means for gripping a generally planar member within the recess, an urging means for urging the gripping means to grip the planar member and a retaining means for retaining the urging means within the recess and wherein the gripping means includes at least one side surface with a plurality of protrusions for gripping the generally planar member with the opposite side surface of the gripping means so as to prevent lateral withdrawal movement of the generally planar member from within the recess.

One gripping surface may be attached to an inner surface of the recess of the frame portion.

Preferably the one gripping surface includes a coupling portion which couples with a coupling portion of the inner surface.

The coupling portion of the gripping surface may comprise a male or female portion and the coupling portion of the inner surface may comprise a complementary female or male portion. Alternatively, the coupling portions may comprise combinations of male and female portions and matching portions.

The coupling portion of the gripping surface may include a foot portion which fits into a channel of the inner surface.

One gripping surface may be located on an inner/upper surface of an insulator.

The insulator may be attached to the inner surface.

The deformable material may be located on the inner surface of the insulator.

It is preferred that the insulator has a plurality of projections on its lower surface which couple with a recess on the inner surface.

Preferably the plurality of projections include teeth.

The insulator may have a foot at one end for receipt in the recess.

Preferably the foot is located at an outer end of the insulator.

The insulator may include an elbow portion at an opposite end.

Preferably the elbow portion includes an upright end which extends behind the generally planar member when located in the recess.

It is preferred that the urging means comprises a keeper/wedge member which is adapted to fit in the recess between one side wall of the frame portion and the

generally planar member.

The wedge member is preferably located between the side wall and one gripping surface of the gripping means.

The gripping means may include a gripping sheet. Alternatively, the gripping means includes a gripping element/member having one gripping surface adjacent the generally planar member.

Preferably, one gripping portion comprises a substantially flat member interposed between one side of the wedge member and one face of the generally planar member.

The one gripping portion may have one face with a plurality of projections for engaging an opposing surface of the generally planar member.

The projections may be in the form of teeth.

The wedge member may have a generally T-shape with the top of the T forming a head section.

Preferably the head section provides a limit on how far the wedge member can be inserted into the recess.

According to one embodiment, one edge of the head section is adapted to prevent lateral movement of one gripping portion when inserted in the recess.

Preferably the wedge member includes an elongate leg portion which is adapted to press against one gripping portion when inserted in the recess.

According to one embodiment of the invention the retaining means includes a fastener which prevents movement of the wedge member when it is inserted with its elongate leg portion in the recess.

The fastener may be in the form of a pin, screw, bolt, clip or other fastening device.

According to one embodiment of the invention the fastener is in the form of a screw or rivet which is inserted through a side wall of one frame portion and a leg portion of the wedge member.

According to another embodiment, the fastener is

in the form of a deformable material located on either opposing surface of the wedge member or side wall of the adjacent frame portion.

The fastener may be in the form of a glue.

Alternatively the fastener may be a clip which is in the form of an extension from the head section of the wedge member, which is flexible and has a catch for receipt in a recess in an outer wall of the frame portion adjacent the wedge member.

The wedge member may be provided with a coupling portion which allows a clip to be attached to it from part of the adjacent side wall of the adjacent frame portion.

The fastening means may be in the form of a tape with a deformable material on either face thereof and which is adapted to contact opposing faces of the wedge member and adjacent side wall of the adjacent frame portion.

According to one embodiment of the present invention, one gripping surface includes teeth for engaging with the generally planar member and the opposite gripping surface comprises the deformable material.

According to one embodiment the insulator comprises the deformable material.

It is preferred that the insulator extends around an inner face of the recess preventing contact of the generally planar member with the frame portions.

It is preferred that the foot portion of the insulator fits in a recess located near an outer end of a lower wall of the frame portions.

According to one embodiment, the wedge member, deformable material and generally planar member are arranged in the recess in a layered configuration.

Preferred embodiments of the present invention will now be described by way of example only with reference to the accompanying drawings, in which:

Figure 1 shows a side cross-sectional view of a frame assembly according to a first embodiment of the

present invention;

Figure 2 shows a cross-sectional side view of a frame assembly according to a second embodiment of the present invention;

Figure 3 shows a cross-sectional side view of a frame assembly according to a third embodiment of the present invention;

Figure 4 shows a cross-sectional side view of a frame assembly according to a fourth embodiment of the present invention;

Figure 5 shows a cross-sectional side view of a frame assembly according to a fifth embodiment of the present invention;

Figure 6 shows a cross-sectional side view of a frame assembly according to a sixth embodiment of the present invention;

Figure 7 shows a cross-sectional side view of a frame assembly according to a seventh embodiment of the present invention;

Figure 8 shows a cross-sectional side view of a frame assembly according to an eighth embodiment of the present invention;

Figure 9 shows a cross-sectional side view of a frame assembly according to a ninth embodiment of the present invention;

Figure 10 shows a cross-sectional side view of a frame assembly according to a tenth embodiment of the present invention; and

Figure 11 shows a cross-sectional side view of a frame assembly according to an eleventh embodiment of the present invention..

As shown in Figure 1, the frame assembly is shown as having a generally square tubular outer section 11 with two lateral side walls 12 and 13 extending from the right hand side of the tube 11 and forming a recess 14 therebetween. The lower side wall 13 is thicker than the upper side wall 12 and extends below the level of the

tubular section 11. In contrast, the side wall 12 has an outer surface 15 which is continuous with the top of the tubular section 11.

A wire screen mesh 16 is shown inserted in the recess above an insulator 17 which extends along the inner surface of the lower side wall 13 and vertically upwardly adjacent side wall 18 of the tubular section 11.

The insulator 17 has a downwardly extending triangular shaped foot extending from its outermost end near the opening to the recess 14. This foot 19 is located in a wedge-shaped channel which extends across the opening of the recess 14 in the inner face of the side wall 13 near its outermost edge 20. The main part of the insulator is a thin mat-like structure with the inner vertical section 21 having an upper end which contacts the inner face of the upper side wall 12 and a lower heel 22 which is located in a slight depression 23 in the inner surface of side wall 13 adjacent side wall 18.

A smooth flat planar element 24 is located above the wire screen mesh 16 and runs substantially in parallel to the side walls 12 and 13. It may be provided on its lower surface with a set of teeth 25 as shown. Alternatively, the teeth may be replaced by a deformable material which is part of the element 24 or alternatively a layer provided on the lower surface of element 24.

A T-shaped wedge 26 is inserted in the recess behind (above) element 24 until its T-shaped head 27 abuts the outer ends of the top wall 12 and element 24.

It is noted that the wedge 26 has an upper surface 28 which slopes inwardly from the head section 27 to its tip 28. This surface is provided with a soft deformable material having a high friction coefficient such as a high friction tape or double-sided tape. The tape may be adhered to the upper surface of the wedge 26. In use, the frame assembly is configured as shown in Figure 1 with the wedge 26 forced into the recess above element 24 so that there is frictional engagement between

the upper surface through the soft deformable material and the adjacent lower surface of side wall 12. The lower surface of side wall 12 may increase in width towards the inner end of recess 14 so as to ensure the wedge 26 forces the element 24 downwardly the further the wedge 26 is inserted into the recess 14.

The pressure applied by the wedge 26 forces the teeth 25 to bite into the wire screen mesh 16 and forces it against the upper side of the insulator 17. The insulator is then held firmly within the recess 14 and the wedge 26 blocks removal of the element 24 which in turn in combination with the wedge 26 and side walls 12, 13 and insulator 17 prevent removal of wire screen mesh 16. The deformable material may also be provided on the upper surface of the insulator or may be configured to be an inherent feature of the insulator. Therefore, in this embodiment and other embodiments the element 24 may be configured either with teeth or with a deformable substance and the insulator may also be configured with teeth or a deformable substance or likewise an element similar to element 24 situated on its top surface.

According to another embodiment, a deformable substance may be provided on both faces of like elements 24 situated on both sides of the wire screen mesh 16.

The deformable material may be spread onto a supporting surface of may be in the form of a mat or strip of material-like tape. The tape may have one side with an adhesive for connecting it to a supporting surface and the other side with the deformable substance or inherent resilient deformability characteristics which allow it to provide a high friction resistance to lateral movement of the wire screen mesh if it is withdrawn from the recess with all the components assembled as in any of the Figures.

In Figure 2 a screw or rivet 29 is provided vertically through an end region of wall 12 and the leg of wedge 26. This fastener is provided instead of the soft

deformable material on the upper surface of the leg of the wedge 26 in Figure 1.

In Figure 3 silicon or glue is used on the opposing faces of wall 12 and wedge 26 to keep the wedge within the recess 14.

In Figure 4 the head 27 of the wedge 26 is provided with a flexible clip extension 30 extending from its upper right hand corner. This clip extension 30 consists of a right angle section with its outer end in the form of a catch 31. The catch can be bent downwardly so that it fits into an opening 32 provided in the external surface of the outer end of wall 12. Thus in Figure 5 the catch 31 is positioned in the opening 32 so as to prevent removal of the wedge from the recess 14.

In Figure 6 a different type of fastener is provided in the form of a clip 33 which is essentially a curved elbow shaped element with catches 34 and 35 provided at each end. These catches 34, 35 engage with a depression of 36 provided in the head section 27 of wedge 26 and a matching catch 37 extending vertically upwardly and at right angles parallel to the upper surface of the frame 10 at the outer end of wall 12.

The clip 33 therefore extends around a corner edge of the wall 12 and head section 27 to retain the wedge 26 in the recess 14.

Figure 7 shows an alternative clip configuration in which clip 38 has a short vertical downwardly extending leg at one end and a longer downwardly extending leg 40 at the other. Each leg fits into a complimentarily shaped recess 41, 42 in the top surface of the end of wall 12 and top edge of head section 27 of wedge 26. An upwardly extending ridge 43 on the top surface of the leg of the wedge 26 near the head section 27 abuts an opposing upstanding end wall 44 of wall 12.

In Figure 8 top section 45 of the head section 27 is attached to the opposing upstanding edge wall 46 of wall 12. Attachment is provided by a double sided tape or

adhesive 47.

In Figure 9 an alternative embodiment is shown in which a single wedge 50 with teeth 51 on its upper surface has a lower flat surface 52 which abuts against the top surface of the wire screen mesh 53.

The wedge 50 is retained within recess 54 of frame member 55 which has a similar structural appearance to the frame members of the previous embodiments. Upper wall 56 which corresponds to upper wall 12 in the previous embodiments is provided with teeth 57 on its inner surface which engage with teeth 51 of wedge 50. This serves to keep the wedge within the recess and the wedge 54 has its lower surface 52 as a flat hard surface or it may be provided with a deformable material as previously described to apply a gripping pressure to the wire screen mesh 53 and retain it within recess 54.

The upper surface of the lower wall 58 which corresponds to wall 13 in the previous embodiments, is provided with an insulator 59 in a similar fashion to the previous embodiments. The lower surface may be provided with any of the options previously outlined in relation to the previous embodiments.

Figure 10 shows a further variation of the frame assembly shown in Figure 9 in which the insulator has a lower surface provided with a tooth like configuration which engages with matching teeth/ridges/recesses in the top surface of lower wall 58.

The shape of the wedge shown in Figures 9 and 10 may be changed to allow increased gripping pressure as the wedge is inserted deeper into the recess. Likewise the configuration of the top wall 56 may be altered to enable the wedge to apply greater gripping pressure as it is inserted deeper into the recess 54.

In its preferred form, a deformable material is provided on both surfaces opposing the wire screen mesh. Therefore a soft pliable surface contacts both surfaces of the wire screen mesh and the gripping pressure applied by

the wedge ensures maximum frictional engagement between the deformable substance and the wire screen mesh so that lateral withdrawal of the wire screen mesh is prevented.

In addition to the above the engaging teeth 51 and 57 may be replaced by engaging soft deformable materials provided on the inner and upper surface respectively of the wall 56 and wedge 50.

It should also be noted that the insulator and security screen mesh could be provided closer to the top wall and the wedge and other components of previous embodiments are located closer to the bottom wall.

It is also possible that the singular frame construction be replaced by a multiple frame construction which forms the recesses.

According to the eleventh embodiment of the invention shown in Figure 11, an insulator 62 is provided in combination with wedge 50. The insulator 62 has projections or teeth 63 on its upper surface facing the lower side of wire screen mesh 64 and lower teeth 65 on its bottom surface which are adapted to engage with upstanding teeth 66 on the upper inside face of lower wall 58. Although not shown, the lower surface of wedge 50 is provided with the soft deformable material.

The soft deformable material may be a double-sided or single-sided foam tape made of any one of the following:

acrylic carrier with acrylic adhesive;

polyurethane carrier with acrylic adhesive or rubber adhesive;

polyethylene carrier with acrylic adhesive or rubber adhesive.

Alternatively the deformable material may be single sided rubber tape as follows:

rubber carrier with embossed silicone on one side and acrylic glue or rubber glue on the other side.

Double sided rubber tape as follows:

rubber carrier with embossed silicone on both

sides.

It should be noted that for each of the above embodiments, particular types of gripping surfaces are described. For each of those embodiments, alternative types of gripping faces may be included. Thus, where the gripping surfaces are a deformable material, the deformable material may be replaced by a gripping surface having rigid or flexible teeth or projections. The gripping surfaces may also include a combination of deformable material on one gripping face and teeth on the other gripping surface. Furthermore, in some embodiments where sufficient gripping pressure can be applied, a hard flat surface may act as one gripping surface as long as the other gripping surface comprises a soft deformable material or gripping teeth/projections.

For each of the previous embodiments, it should also be understood that a wire screen mesh has been used as a specific example. However, any form of security screen or generally planar member is also able to be gripped by the described frame assemblies.

CLAIMS:

1. A frame assembly for security screens comprising frame portions forming a recess, a gripping means for gripping a generally planar member within the recess, an urging means for urging the gripping means to grip the generally planar member and a retaining means for retaining the urging means within the recess and wherein the gripping means includes at least one side gripping portion comprising a deformable material for gripping the generally planar member with another side portion of the gripping means so as to prevent lateral withdrawal movement of the generally planar member from within the recess.

2. The frame assembly as claimed in claim 1 wherein the deformable material is resilient.

3. The frame assembly as claimed in claim 1 or claim 2 wherein the deformable material is soft.

4. The frame assembly as claimed in claim 1 wherein the deformable material comprises a deformable member.

5. The frame assembly as claimed in claim 1 wherein the deformable material has a high friction surface which resists relative lateral movement of the generally planar member when pressed there against.

6. The frame assembly as claimed in claim 5 wherein the gripping means comprises first and second portions comprising a deformable material for gripping the generally planar member.

7. The frame assembly as claimed in claim 6 wherein the deformable material is generally flat.

8. A frame assembly for security screens comprising frame portions forming a recess, a gripping means for gripping a generally planar member within the recess, an urging means for urging the gripping means to grip the planar member and a retaining means for retaining the urging means within the recess and wherein the

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gripping means includes at least one side surface with a plurality of protrusions for gripping the generally planar member with the opposite side surface of the gripping means so as to prevent lateral withdrawal movement of the generally planar member from within the recess.

9. The frame assembly as claimed in claim 1 or 8 wherein the gripping means comprises at least one gripping portion attached to an inner surface of the recess of the frame portion.

9. The frame assembly as claimed in claim 9 wherein the one gripping portion includes a coupling portion which couples with a coupling portion of the inner surface.

11. The frame assembly as claimed in claim 10 wherein the coupling portion of the gripping portion comprises a male of female portion and the coupling portion of the inner surface comprises a complementary female or male portion.

12. The frame assembly as claimed in claim 11 wherein the coupling portion of the gripping portion includes a foot portion which fits into a channel of the inner surface.

13. The frame assembly as claimed in claim 12 wherein the gripping portion is located on an inner surface of an insulator.

14. The frame assembly as claimed in claim 13 wherein the insulator is attached to the inner surface.

15. The frame assembly as claimed in claim 14 wherein the deformable material is located on the inner surface of the insulator.

16. The frame assembly as claimed in claim 15 wherein the insulator has a plurality of projections on its lower surface which couple with a recess on an the inner surface.

17. The frame assembly as claimed in claim 16 wherein the plurality of projections include teeth.

18. The frame assembly as claimed in claim 13

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wherein the insulator has a foot at one end for receipt in the recess.

19. The frame assembly as claimed in claim 18 wherein the foot is located at an outer end of the insulator.

20. A frame assembly as claimed in claim 19 wherein the insulator includes an elbow portion at an opposite end.

21. The frame assembly as claimed in claim 20 wherein the elbow portion includes an upright end which extends behind the generally planar member when located in the recess.

22. The frame assembly as claimed in claim 1 or 8 wherein the urging means comprises a wedge member which is adapted to fit in the recess between one side wall of the frame portion and the generally planar member.

23. The frame assembly as claimed in claim 22 wherein the wedge member is located between the side wall and one gripping portion of the gripping means.

24. The frame assembly as claimed in claim 1 or 8 wherein the gripping means includes a gripping sheet.

25. The frame assembly as claimed in claim 24 wherein the gripping means includes a gripping member having one gripping surface adjacent the generally planar member.

26. The frame assembly as claimed in claim 22 wherein one gripping portion comprises a substantially flat member interposed between one side of the wedge member and one face of the generally planar member.

27. The frame assembly as claimed in claim 1 or 8 wherein one gripping portion has one face with a plurality of projections for engaging an opposing surface of the generally planar member.

28. The frame assembly as claimed in claim 27 wherein the projections are in the form of teeth.

29. The frame assembly as claimed in claim 22 wherein the wedge member has a generally T-shape with the

top of the T forming a head section.

30. The frame assembly as claimed in claim 29 wherein the head section provides a limit on how far the wedge member can be inserted into the recess.

31. The frame assembly as claimed in claim 30 wherein one edge of the head section is adapted to prevent lateral movement of one gripping portion when inserted in the recess.

32. The frame assembly as claimed in claim 22 wherein the wedge member includes an elongate leg portion which is adapted to press against one gripping portion when inserted in the recess.

33. The frame assembly as claimed in claim 1 or 8 wherein the retaining means includes a fastener which prevents movement of the wedge member when it is inserted with its elongate leg portion in the recess.

34. The frame assembly as claimed in claim 22 wherein the wedge member is provided with a coupling portion which allows a clip to be attached to it from part of the adjacent side wall of the adjacent frame portion.

35. The frame assembly as claimed in claim 33 wherein the fastener may be in the form of a tape with a deformable material on either face thereof and which is adapted to contact opposing faces of the wedge member and adjacent side wall of the adjacent frame portion.

36. The frame assembly as claimed in claim 1 or 8 wherein one gripping portion includes teeth for engaging with the generally planar member and the opposite gripping portion comprises the deformable material.

37. The frame assembly as claimed in claim 13 wherein the insulator comprises the deformable material.

38. The frame assembly as claimed in claim 37 wherein the insulator extends around the inner face of the recess preventing contact of the generally planar member with the frame portions.

39. The frame assembly as claimed in claim 18 wherein the foot portion of the insulator fits in a recess

located near an outer end of the lower wall of the frame portions.

40. The frame assembly substantially as hereinbefore described with reference to any one of Figures 1 to 11 of the accompanying drawings.

Dated this 29th day of September 2005
JIM REID
By his Patent Attorneys
GRIFFITH HACK
Fellows Institute of Patent and
Trade Mark Attorneys of Australia

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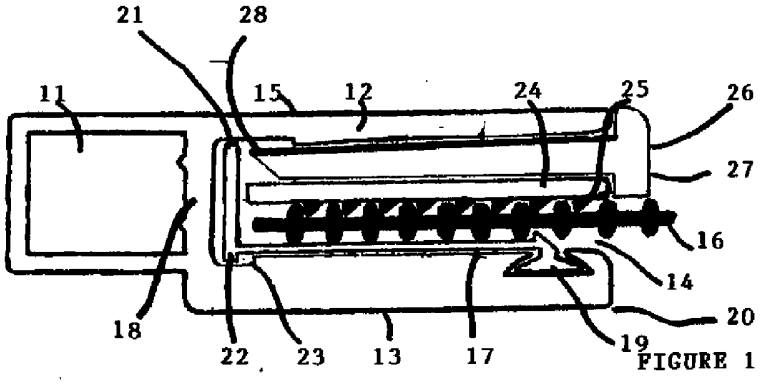

FIGURE 1

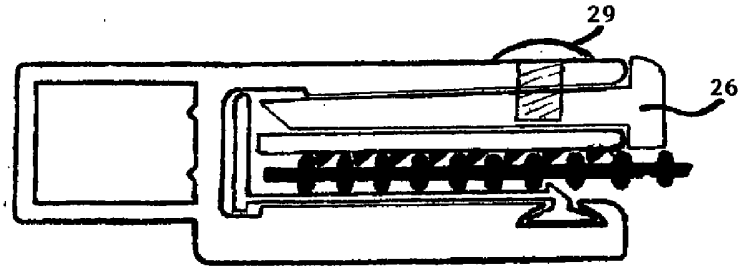

FIGURE 2

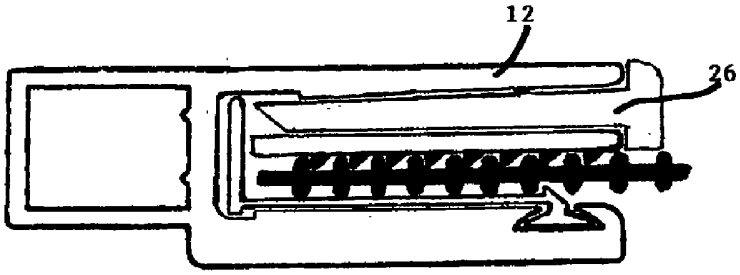

FIGURE 3

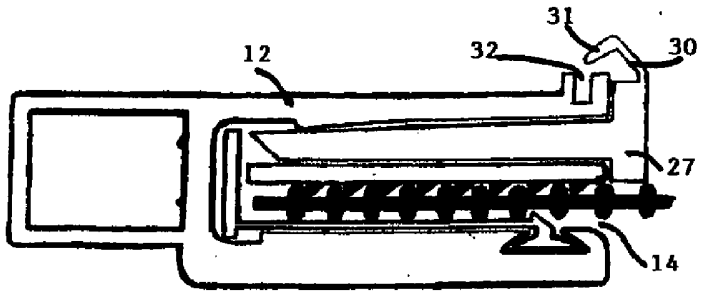

FIGURE 4

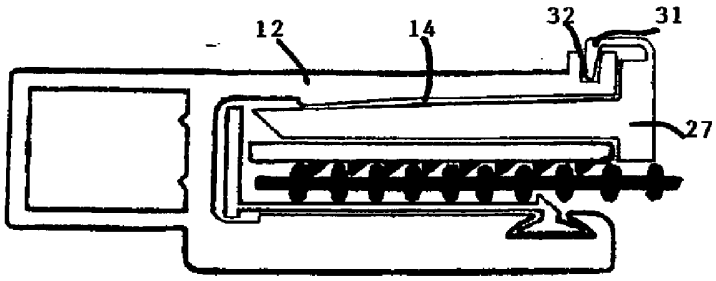

FIGURE 5

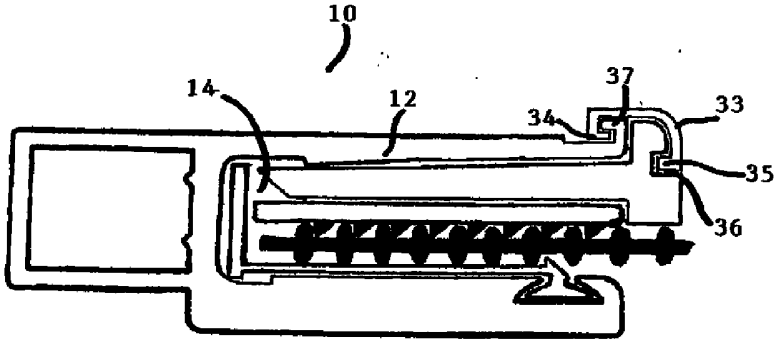

FIGURE 6

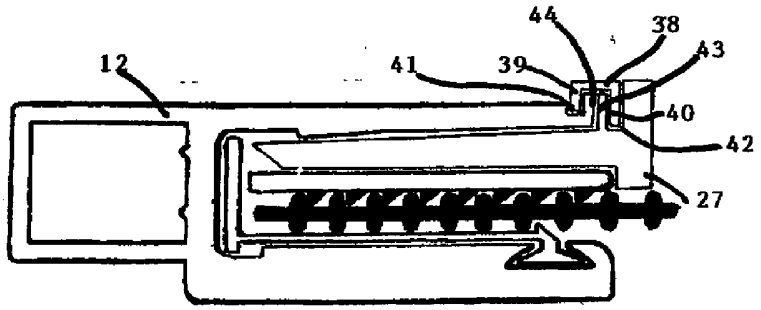

FIGURE 7

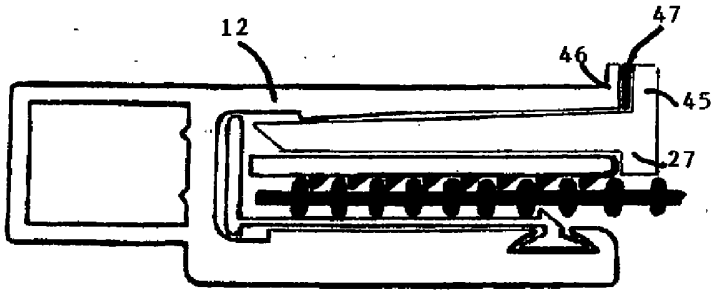

FIGURE 8

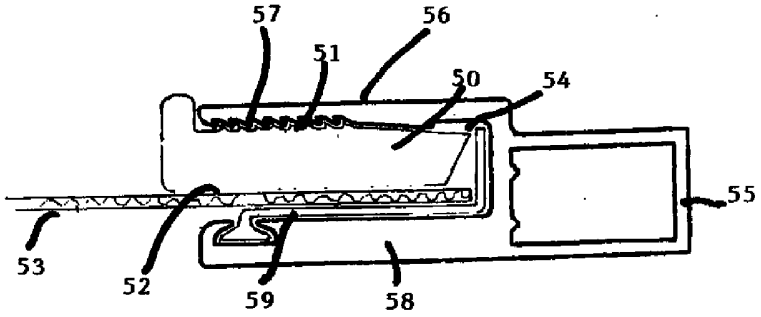

FIGURE 9

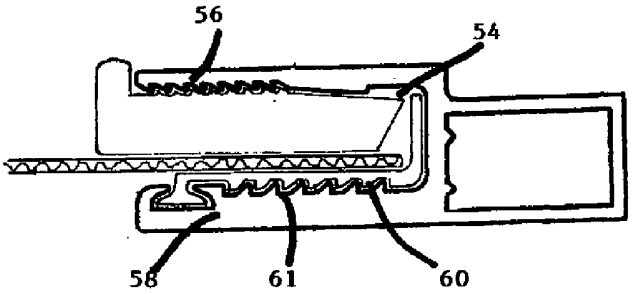

FIGURE 10

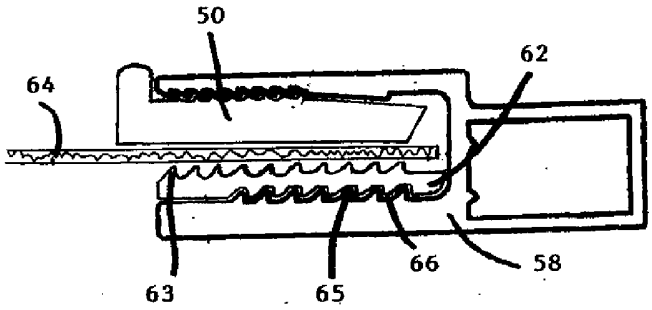

FIGURE 11