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(54) **HOLSTER FOR ELECTROCAUTERY TIP**

HOLSTER FÜR ELEKTROKAUTERISATIONSSPITZE

ETUI POUR POINTE DE CAUTERISATION ELECTRIQUE

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Description

TECHNICAL FIELD

[0001] The present invention is directed to electrosurgery/cautery apparatus, and, more particularly, to a holster for holding and cleaning electrocautery tips used in electrosurgery.

BACKGROUND ART

[0002] During electrosurgery, electrocautery knives are used for cauterization as well as cutting, for example, to destroy dead tissue, to stop bleeding, and to prevent the spread of infection. In this process, the blade, or tip, of the electrocautery knife accumulates debris and should be frequently cleaned to remove unwanted tissue and maintain a clean incision.

[0003] In the past, sandpaper pads or a single slot molded into the edge of a holster in which the knife is kept have been used to clean electrocautery blades.

[0004] An electrosurgery/cautery system and method are disclosed in U.S. Patent 4,196,734, issued on April 8, 1980, to F.W. Harris. This patent is an example of electrosurgery apparatus. However, no holster or cleaning mechanism for the electrocautery tips is disclosed.

[0005] A surgical knife cleaner is disclosed in U.S. Patent 4,547,923, issued on October 22, 1985, to J.H. DeVries et al. In this patent, a readily attachable base has a cradle to retain a closely coiled strand on an axis parallel to the base. The cradle has edges to limit the introduction of the knife blade in the direction transverse to the axis of the coil and to clean the edge of the knife blade. However, the coiled strand is metal, and repeated insertion of a coated electrocautery tip thereinto will cause degradation of the coating and thus reduced effectiveness of the blade.

[0006] A disposable electrocautery/cutting instrument with integral smoke evacuation is disclosed in U.S. Patent 5,234,428, issued on August 10, 1993 to D.L. Kaufman. This patent is an example of electrosurgery apparatus, specifically, the pencil portion which secures and holds the electrocautery tip, or blade. However, no holster or cleaning mechanism for the electrocautery tips is disclosed.

[0007] A surgical holster is disclosed in U.S. Patent 5,533,618, issued on July 9, 1996, to R.F. Pickels, Jr. The surgical holster is suitable for carrying elongated surgical instruments, such as for use with a laparascope when carrying out Minimal Invasive Surgery. The surgical holster has a backing plate which supports a plurality of detachable receptacle members contained on the backing plate in fixed engagement. The device is made of a transparent thermoplastic which is electrically insulating, nonflammable, and which can be sterilized at temperatures above 300°F. However, the holster has no provision for cleaning electrocautery tips.

[0008] Gold-plated electrosurgical tips are disclosed in U.S. Patents 5,643,256, issued on July 1, 1997, and 5,885,281, issued on March 23, 1999, both to R. Wilfrido Urueta. Both patents are specifically directed to improved electrosurgical tips, which reduce adhesion of tissue debris to the tips and provide more efficient cutting and cauterization of tissue with less power consumption.

[0009] A need remains for a holster for holding electrosurgical knives as well as providing a mechanism for cleaning the tips during surgery.

[0010] Document US-A-3 986 648 discloses a holder comprising a unitary receptacle having an upper portion configured to support the handle and a lower portion attached to the upper portion, a blade cleaning material secured to a first outwardly-extending member of the upper portion near its top and clamping attachment means secured to a second outwardly-extending member in turn secured to the upper portion for attaching the holder to a clamping surface.

DISCLOSURE OF INVENTION

[0011] In accordance with the present invention, a self-cleaning holster for holding an electrosurgical instrument and for cleaning a blade secured to the electrosurgical instrument is provided. The holster comprises:

(a) a unitary receptacle comprising a first portion, a transition portion, and a second portion, the unitary receptacle having a front and a back, the unitary receptacle comprising

(i) the first portion having an open top, a downwardly-depending, larger, tapered cylindrical side, and an open bottom,
(ii) the second portion having an open top, a downwardly-depending, cylindrical side, and a closed bottom, and
(iii) the transition portion comprising an open top, a downwardly-depending, smaller, tapered cylindrical side, and an open bottom, the open bottom of the first portion terminating at the open top of the transition portion and the open top of the second portion terminating at the open bottom of the transition portion, the transition portion thereby providing a transition from the first portion to the second portion;

(b) a first outwardly-extending member integral with the unitary receptacle and extending out from the front of the cylindrical side of the first portion at its top, the first outwardly-extending member having a top surface and a bottom surface, at least the top surface provided with a blade-cleaning material;
(c) a second outwardly-extending member integral with the unitary receptacle and extending out from the back of the cylindrical side of the first portion at

its top, the second outwardly-extending member having a top surface and a bottom surface and an attachment means secured to the top surface and the bottom surface; and

(d) a cylinder of a blade-cleaning material contained in the second portion of the receptacle.

[0012] The holster of the present invention is directed, among other things, to holding electrosurgical knives and cleaning the electrosurgical tips associated therewith, such as the tips disclosed in the two patents to Urueta referenced above (5,643,256 and 5,885,281), although the holster is not limited to these electrosurgical tips, but may be employed with other electrosurgical tips.

[0013] Other objects, features, and advantages of the present invention will become apparent upon consideration of the following detailed description and accompanying drawings, in which like reference designations represent like features throughout the FIGURES.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The drawings referred to in this description should be understood as not being drawn to scale except if specifically noted.

FIG. 1 is a perspective view of the self-cleaning holster of the present invention;

FIG. 2 is a top plan view of the self-cleaning holster for electrocautery tip of the present invention;

FIG. 3 is a front elevational view thereof;

FIG. 4 is a left side elevational view thereof;

FIG. 5 is a rear elevational view thereof;

FIG. 6 is a bottom plan view thereof; and

FIG. 7 is a cut-away view of the lower portion of the holster.

BEST MODES FOR CARRYING OUT THE INVENTION

[0015] Reference is now made in detail to a specific embodiment of the present invention, which illustrates the best mode presently contemplated by the inventors for practicing the invention. Alternative embodiments are also briefly described as applicable.

[0016] Electrocautery instruments are often employed in surgery to perform incisions in the flesh of a patient. The electrocautery instrument both cuts flesh and simultaneously cauterizes it, providing a relatively clean cut with minimal bleeding. Examples of electrocautery surgery include cardiovascular, ophthalmology, neurosurgery, dermatology, and plastic surgery, although the self-cleaning holster of the present invention is not limited to these specific procedures.

[0017] Electrocautery instruments, also known as electrosurgical instruments, typically comprise an insulating handle that fits in the hands of the operating surgeon and an electrically-conducting electrocautery blade or tip secured to one end of the handle. The electrocautery blade or tip is electrically energized to an electrical potential for cutting and cauterizing flesh. The blade may be uni-polar or bi-polar. Such electrocautery instruments are well-known and do not form a part of this invention, except to the extent that they are supported and cleaned by the self-cleaning holster described and claimed herein.

[0018] During electrocautery surgery, the operating surgeon often needs to clean the blade of particles of flesh that adhere to the blade. Further, the operating surgeon needs to put the instrument down temporarily to perform other tasks. In both instances, the blade is electrically "hot"; that is, an electrical potential exists on the electrically-conducting blade. Laying the electrocautery instrument down on a surface could present hazards to operating room personnel if the surface is also electrically-conducting. Further, such a placement could expose operating personnel to potential hazards by someone inadvertently picking up the instrument by the blade instead of the handle. The present invention solves these problems.

[0019] Turning now to the Figures, the self-cleaning holster 10 of the present invention is shown. The holster 10 comprises three main portions: a unitary receptacle 12, a first outwardly-extending member 14 integral with the unitary receptacle, and a second outwardly-extending member 16, also integral with the unitary receptacle.

[0020] The unitary receptacle 12 has a front 18 and a back 20. The unitary receptacle further comprises a first portion 22, a second portion 24, and a transition portion 26.

[0021] The first portion 22 has an open top 28, a downwardly-depending, larger, tapered cylindrical side 30, and an open bottom 32. The second portion 24 has an open top 34, a downwardly-depending, cylindrical side 36, and a closed bottom 38. The transition portion 26 comprises an open top 40, a downwardly-depending, smaller, tapered cylindrical side 42, and an open bottom 44. The open bottom 32 of the first portion 22 terminates at the open top 40 of the transition portion 26. The open top 34 of the second portion 24 terminates at the open bottom 44 of the transition portion 26. The transition portion 26 thereby provides a transition from the first portion 22 to the second portion 24.

[0022] The first outwardly-extending member 14 extends out from the front 18 of the cylindrical side 30 of the first portion 22 at its top 28. The first outwardly-extending member 14 has a top surface 46 and a bottom surface 48. At least the top surface 46 is provided with a blade-cleaning material 50. However, the bottom surface 48 may also be provided with the blade-cleaning material 50. Although the first outwardly-extending member 14 may extend horizontally from the top 28, advantageously, it is angled upward at an angle θ of about 3° to 10° from a horizontal plane 52 extending across the top. The slight angle facilitates movement of debris scraped from the blade into the interior of the holster 10.

The blade-cleaning material 50 comprises a rough surface formed on the top surface 46 (and bottom surface 48, if desired), as described more fully below.

[0023] The presence of blade-cleaning material on the top surface 46 (and, optionally, the bottom surface 48), permits the surgeon to clean the blade, or tip, during surgery as it becomes covered with flesh and other debris, using a simple wiping motion of the blade over the blade-cleaning material.

[0024] The second outwardly-extending member 16 extends out from the back 20 of the cylindrical side 30 of the first portion 22 at its top 28. The second outwardly-extending member 16 has a top surface 54, a bottom surface 56 and an attachment means 58 secured to the top surface and the bottom surface. The attachment means 58 may comprise a spring-loaded clamp or coil clamp 60, sized to clamp around the edge of a Mayo instrument table. The attachment means 58 comprises the same material as the holster 10, but may be of a denser variety for increased strength. The attachment means 58 includes a releasable clip portion 62, which advantageously is mounted underneath the second outwardly extending member 16 on bottom surface 56. The releasable clip portion 62 is mounted so that the handle thereof is interior to the attachment means relative to the spring loaded clamp or coil clamp 60. The underneath, inward mounting places the clip portion 62 out of the way so that accidental release of the holster 10 from its attachment is minimized.

[0025] The attachment means 58 may comprise a flat paddle clip, as shown, or a spring-loaded, wide-base C-clamp. The attachment means 58 provides a pressure of about 10 oz/in^2 on each clamping face, as an example.

[0026] The attachment means 58 permits the holster 10 to be securely attached to a surface chosen by the operating surgeon, such as an instrument table, the operating table, a near-by support, or suitable attachment location (not shown).

[0027] Bristles of a blade-cleaning material 150 are contained in the second portion 24 of the receptacle 12. The blade-cleaning material 150 may be the same as the blade-cleaning material 50 secured to the first outwardly-extending member 14 or different. Preferably, for ease of production, the blade-cleaning material 150 is the same as the blade-cleaning material 50. The blade-cleaning material 150 is oriented so that the blade-cleaning operation takes place by insertion of an electrocautery tip (not shown) into the interior of the cylinder 24.

[0028] The unitary receptacle 12, the first outwardly-extending member 14, and the second outwardly-extending member 16 are all one piece, or integral, and are formed in one forming operation, using an inert material, preferably a polymeric material, such as, but not limited to, nylon, polyethylene, polypropylene (e.g., high density polypropylene), polytetrafluoroethylene, and other such plastics commonly used in operating rooms. A typical wall thickness for all parts of the unitary receptacle 12 is about 0.025 to 0.05 inch for providing sufficient sturdiness for the receptacle to be durable and not yield or bend under reasonable externally-applied pressure.

[0029] The inner diameter of the first portion 22 of the unitary receptacle 12 is sized to approximate the diameter of the handle of the electrocautery knife (not shown), and the taper of the side 30 serves to support the handle so that the electrocautery tip (not shown) penetrates into the second portion 24, but is not simply allowed to drop into the second portion, thereby possibly causing damage to the tip.

[0030] The inner diameter of the second portion 24 is sized, together with blade-cleaning material 150, to actively clean the tip during insertion and removal of the electrocautery knife, without causing undue restriction on insertion and removal. Thus, the simple act of placing the knife in the holster serves to both securely hold and support the knife while simultaneously cleaning the tip.

[0031] The blade-cleaning material 50, 150 preferably comprises the same material as the unitary receptacle 12, and is formed in the same operation as the unitary receptacle. In this way, processing costs are minimized, since no separate operations, such as adhering the blade-cleaning material 50, 150 to the first outwardly-extending member 14 and the interior of the second portion 24 of the receptacle 12, respectively, are required.

[0032] The blade-cleaning material 50, as mentioned above, comprises a rough surface of a plastic material, preferably the same plastic material as the holster 10 and is formed during the holster forming operation. A suitable pattern is a cross-hatch, comprising peaks and valleys, in which the peaks of plastic scrape off debris from the blade and the valleys collect it. Bristles of the plastic material may alternately be used; exemplary dimensions are bristles about 0.03 inch long and about 0.015 inch thick.

[0033] The blade-cleaning material 150, as mentioned above, comprises bristles of a plastic material. The length of the bristles 150 is typically about 2/5 the inside diameter of the second portion 24. The bristles have a packing density of about 400 bristles per square inch, although the invention is not so limited.

[0034] Following use in an electrocautery operating procedure, the holster is discarded, so that for each patient operated on, a new holster is used.

INDUSTRIAL APPLICABILITY

[0035] The self-cleaning holster disclosed herein is expected to find use in electrosurgery for the storing of electrocautery instruments and the cleaning of electrocautery tips attached thereto.

Claims

1. A self-cleaning holster (10) for holding and cleaning an electrosurgical instrument comprising a handle and a blade, said holster (10) comprising:

   (a) a unitary receptacle (12) comprising (i) an upper portion (22), said upper portion (22) having a top (28) and configured to hold and support said handle, and (ii) a lower portion (24), attached to said upper portion (22) and including a first blade-cleaning material (150) therein, for cleaning said blade;
   (b) a second blade-cleaning material (50) secured to a first outwardly-extending member (14) of said upper portion (22) near its top (28); and
   (c) a clamping attachment means (58) secured to a second outwardly-extending member (16) in turn secured to said upper portion (22) near its top (28) for attaching said self-cleaning holster (10) to a clamping surface.

2. The self-cleaning holster (10) of Claim 1 wherein said unitary receptacle (12) and said first and second outwardly-extending members (14, 16) comprise a plastic selected from the group consisting of nylon, polyethylene, polypropylene, and polytetrafluoroethylene.

3. The self-cleaning holster (10) of Claim 2 wherein said first blade-cleaning material (150) and said second blade-cleaning material (50) both comprise the same material as said unitary receptacle (12).

4. The self-cleaning holster (10) of Claim 3 wherein said first and second blade-cleaning materials (150, 50) consist essentially of bristles of said plastic.

5. The self-cleaning holster (10) of Claim 3 wherein said first blade-cleaning material (150) comprises a rough surface, comprising a plurality of peaks and valleys.

6. The self-cleaning holster (10) of Claim 1 wherein said attachment means (58) secured to said second outwardly-extending member (16) comprises a clamp (60) having two opposed faces for attaching said holster (10) to a surface.

7. The self-cleaning holster (10) of Claim 6 wherein said clamp (60) is either a flat paddle clip or a spring-loaded C-clamp.

8. The self-cleaning holster (10) of Claim 6 wherein said clamp (60) includes a spring or coil to urge said two opposed faces in clamping arrangement to said surface.

9. The self-cleaning holster (10) of Claim 1 wherein

   (a) said unitary receptacle (12) comprises a first portion (22), a transition portion (26), and a second portion (24), said unitary receptacle (12) having a front (18) and a back (20), said unitary receptacle (12) comprising

      (i) said first portion (22) having an open top (28), a downwardly-depending, larger, tapered cylindrical side (30), and an open bottom (32),
      (ii) said second portion (24) having an open top (34), a downwardly-depending, cylindrical side (36), and a closed bottom (38), and
      (iii) said transition portion (26) comprising an open top (40), a downwardly-depending, smaller, tapered cylindrical side (42), and an open bottom (44), said open bottom (32) of said first portion (22) terminating at said open top (40) of said transition portion (26) and said open top (34) of said second portion (24) terminating at said open bottom (44) of said transition portion (26), said transition portion (26) thereby providing a transition from said first portion (22) to said second portion (24);

   (b) said first outwardly-extending member (14) is integral with said unitary receptacle (12) and extends out from said front (18) of said cylindrical side (30) of said first portion (22) at its top (28), said first outwardly-extending member (14) having a top surface (46) and a bottom surface (48), at least said top surface (46) provided with said second blade-cleaning material (50);
   (c) said second outwardly-extending member (16) is integral with said unitary receptacle (12) and extends out from said back (20) of said cylindrical side (30) of said first portion (22) at its top (28), said second outwardly-extending member (16) having a top surface (54) and a bottom surface (56) and said attachment means (58) secured to said top surface (54) and said bottom surface (56); and
   (d) a cylinder of said first blade-cleaning material (150) contained in said second portion (24) of said receptacle (12).

Patentansprüche

1. Selbstreinigendes Holster (10) bzw. Halfter zum Halten und Reinigen eines elektrochirurgischen Instruments, umfassend einen Handgriff und eine Klinge, wobei das Holster (10) umfaßt:

(a) einen einheitlichen bzw. einstückigen Behälter (12), umfassend (i) einen oberen Abschnitt (22), wobei der obere Abschnitt (22) eine Oberseite (28) aufweist und konfiguriert ist, um den Handgriff zu halten und zu unterstützen, und (ii) einen unteren Abschnitt (24), der an den oberen Abschnitt (22) angelenkt bzw. angebracht ist und ein erstes klingenreinigendes Material (150) darin enthält, um die Klinge zu reinigen;
(b) ein zweites, klingenreinigendes Material (50), das an ein erstes bzw. an einem ersten, sich nach außen erstreckendes Glied (14) des oberen Abschnitts (22) nahe seiner Oberseite (28) gesichert ist; und
(c) klemmende Festlegungsmittel bzw. Klemmfestlegungsmittel (58), die an ein zweites bzw. an einem zweiten, sich nach außen erstreckendes Glied (16) gesichert sind, welches wiederum an den bzw. dem oberen Abschnitt (22) nahe seiner Oberseite (28) gesichert ist, um das selbstreinigende Holster (10) an einer Klemmoberfläche festzulegen.

2. Selbstreinigendes Holster (10) nach Anspruch 1, wobei der einheitliche Behälter (12) und das erste und zweite, sich nach außen erstreckende Glied (14, 16) einen Kunststoff umfassen, der aus der Gruppe bestehend aus Nylon, Polyethylen, Polypropylen und Polytetrafluorethylen gewählt ist.

3. Selbstreinigendes Holster (10) nach Anspruch 2, wobei das erste klingenreinigende Material (150) und das zweite klingenreinigende Material (50) beide dasselbe Material wie der einheitliche Behälter (12) umfassen.

4. Selbstreinigendes Holster (10) nach Anspruch 3, wobei das erste und zweite, klingenreinigende Material (150, 50) im wesentlichen aus Bürsten aus dem Kunststoff bestehen.

5. Selbstreinigendes Holster (10) nach Anspruch 3, wobei das erste klingenreinigende Material (150) eine rauhe Oberfläche, umfassend eine Mehrzahl von Spitzen und Vertiefungen umfaßt.

6. Selbstreinigendes Holster (10) nach Anspruch 1, wobei die Festlegungsmittel (58), die an das zweite bzw. dem zweiten, sich nach außen erstreckende (n) Glied (16) gesichert sind, eine Klammer bzw. Klemme (60) umfassen, die zwei gegenüberliegende Seiten zum Festlegen des Holster (10) an einer Oberfläche umfassen.

7. Selbstreinigendes Holster (10) nach Anspruch 6, wobei die Klammer (60) entweder eine flache Paddelklammer oder eine federbelastete C-Klammer ist.

8. Selbstreinigendes Holster (10) nach Anspruch 6, wobei die Klammer (60) eine Feder oder eine Spule umfaßt, um die zwei gegenüberliegenden Seiten in klemmender Anordnung zu der Oberfläche zu zwingen bzw. zu beaufschlagen.

9. Selbstreinigendes Holster (10) nach Anspruch 1, wobei

(a) der einheitliche Behälter (12) einen ersten Abschnitt (22), einen Übergangsabschnitt (26) und einen zweiten Abschnitt (24) umfaßt, wobei der einheitliche Behälter (12) eine Vorderseite (18) und eine Rückseite (20) aufweist, wobei der einheitliche Behälter (12) umfaßt

(i) den ersten Abschnitt (22), der eine offene Oberseite (28), eine nach unten hängende, größere, geneigte bzw. sich verjüngende, zylindrische Seite (30) und einen offenen Boden (32) aufweist,
(ii) den zweiten Abschnitt (24), der eine offene Oberseite (34), eine nach unten hängende, zylindrische Seite (36) und einen geschlossenen Boden (38) aufweist, und
(iii) den Übergangsabschnitt (26), der eine offene Oberseite (40), eine nach unten hängende, kleinere, geneigte bzw. sich verjüngende, zylindrische Seite (42) und einen offenen Boden (44) aufweist, wobei der offene Boden (32) des ersten Abschnitts (22) an der offenen Oberseite (40) des Übergangsabschnitts (26) endet und die offene Oberseite (34) des zweiten Abschnitts (24) an dem offenen Boden (44) des Übergangsabschnitts (26) endet, wobei der Übergangsabschnitt (26) dadurch einen Übergang von dem ersten Abschnitt (22) zu dem zweiten Abschnitt (24) zur Verfügung stellt;

(b) das erste, sich nach außen erstreckende Glied (14) einstückig bzw. integral mit dem einheitlichen Behälter (12) ist und sich von der Vorderseite (18) der zylindrischen Seite (30) des ersten Abschnitts (22) an seiner Oberseite (28) erstreckt, wobei das erste, sich nach außen erstreckende Glied (14) eine obere Oberfläche (46) und eine Bodenoberfläche (48) aufweist, wobei wenigstens die obere Oberfläche (46) mit dem zweiten, klingenreinigenden Material (50) versehen ist;
(c) das zweite, sich nach außen erstreckende Glied (16), einstückig bzw. integral mit dem einheitlichen Behälter (12) ist und sich von der Rückseite (20) der zylindrischen Seite (30) des

ersten Abschnitts (22) an seiner Oberseite (28) erstreckt, wobei das zweite, sich nach außen erstreckende Glied (16) eine obere Oberfläche (54) und eine Bodenoberfläche (56) und die Festlegungsmittel (58) aufweist, die an die obere Oberfläche (54) und die Bodenoberfläche (56) gesichert sind; und
(d) ein Zylinder des ersten, klingenreinigenden Materials (150) in dem zweiten Abschnitt (24) des Behälters (12) enthalten ist.

Revendications

1. Étui autonettoyant (10) pour contenir et nettoyer un instrument électrochirurgical comprenant une poignée et une lame, ledit étui (10) comprenant :

(a) un réceptacle unitaire (12) comprenant (i) une partie supérieure (22), ladite partie supérieure (22) ayant un dessus (28) et étant configurée pour contenir et soutenir ladite poignée, et (ii) une partie inférieure (24), fixée à ladite partie supérieure (22) et incluant un premier matériau (150) de nettoyage de la lame, pour nettoyer ladite lame;

(b) un second matériau (50) de nettoyage de la lame fixé à un premier membre (14) s'étendant vers l'extérieur de ladite partie supérieure (22) à proximité de son dessus (28) ; et

(c) un moyen (58) de fixation par clampage fixé à un second membre (16) s'étendant vers l'extérieur lui-même fixé à ladite partie supérieure (22) près de son dessus (28) pour fixer ledit étui autonettoyant (10) à une surface de clampage.

2. Étui autonettoyant (10) selon la revendication 1 dans lequel ledit réceptacle unitaire (12) et lesdits premier et second membres s'étendant vers l'extérieur (14, 16) sont en plastique choisi dans le groupe comprenant le nylon, le polyéthylène, le polypropylène et le polytétrafluoroéthylène.

3. Étui autonettoyant (10) selon la revendication 2 dans lequel ledit premier matériau (150) de nettoyage de la lame et ledit second matériau (50) de nettoyage de la lame sont du même matériau que ledit réceptacle unitaire (12).

4. Étui autonettoyant (10) selon la revendication 3 dans lequel les dits premier et second matériaux (150, 50) de nettoyage de la lame consistent essentiellement en fibres du dit plastique.

5. Étui autonettoyant (10) selon la revendication 3 dans lequel ledit premier matériau (150) de nettoyage de la lame comprend une surface rugueuse, comprenant une pluralité de sommets et de creux.

6. Étui autonettoyant (10) selon la revendication 1 dans lequel ledit moyen (58) de fixation fixé au dit second membre (16) s'étendant vers l'extérieur comprend un clamp (60) ayant deux faces opposées pour fixer ledit étui (10) à une surface.

7. Étui autonettoyant (10) selon la revendication 6 dans lequel ledit clamp (60) est soit un clip à pales soit une pince en C à ressort.

8. Étui autonettoyant (10) selon la revendication 6 dans lequel ledit clamp (60) inclut un ressort ou une bobine pour appuyer lesdites deux faces opposées en arrangement de clampage sur ladite surface.

9. Étui autonettoyant (10) selon la revendication 1 dans lequel :

(a) ledit réceptacle unitaire (12) comprend une première partie (22), une partie de transition (26) et une seconde partie (24), ledit réceptacle unitaire (12) ayant un avant (18) et un arrière (20), ledit réceptacle unitaire (12) comprenant :

(i) ladite première partie (22) ayant un dessus (28) ouvert, un côté cylindrique conique plus large (30) dépendant vers le bas, et un fond (32) ouvert,

(ii) ladite seconde partie (24) ayant un dessus (34) ouvert, un côté cylindrique (36) dépendant vers le bas et un fond (38) fermé, et

(iii) ladite partie (26) de transition comprenant un dessus (40) ouvert, un côté cylindrique conique plus petit (42) dépendant vers le bas et un fond (44) ouvert, ledit fond (32) ouvert de ladite première partie (22) se terminant au niveau du dit dessus (40) ouvert de ladite partie de transition (26) et ledit dessus (34) ouvert de ladite seconde partie (24) se terminant au niveau du dit fond (44) ouvert de ladite partie de transition (26), ladite partie de transition (26) fournissant ainsi une transition depuis ladite première partie (22) vers ladite seconde partie (24) ;

(b) ledit premier membre (14) s'étendant vers l'extérieur est solidaire dudit réceptacle unitaire (12) et s'étend vers l'extérieur depuis ledit avant (18) du dit côté cylindrique (30) de ladite première partie (22) sur son dessus (28), ledit premier membre (14) s'étendant vers l'exté-

rieur ayant une surface supérieure (46) et une surface (48) de fond, au moins ladite surface supérieure (46) étant dotée du dit second matériau (50) de nettoyage de la lame ;

(c) ledit membre (16) s'étendant vers l'extérieur est solidaire du dit réceptacle unitaire (12) et s'étend vers l'extérieur depuis le dit arrière (20) du dit côté cylindrique (30) de ladite première partie (22) sur son dessus (28), ledit second membre (16) s'étendant vers l'extérieur ayant une surface supérieure (54) et une surface (56) de fond et ledit moyen (58) de fixation fixé à ladite surface supérieure (54) et à ladite surface (56) de fond ; et

(d) un cylindre du dit premier matériau (150) de nettoyage de la lame est contenu dans ladite seconde partie (24) du dit réceptacle (12).

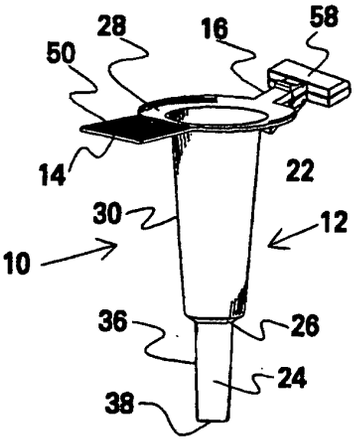

FIG. 1

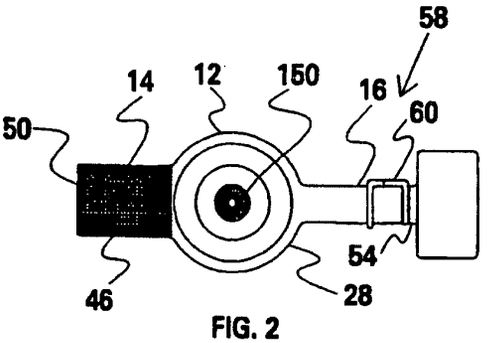

FIG. 2

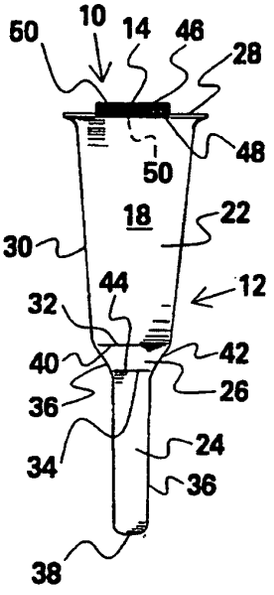

FIG. 3

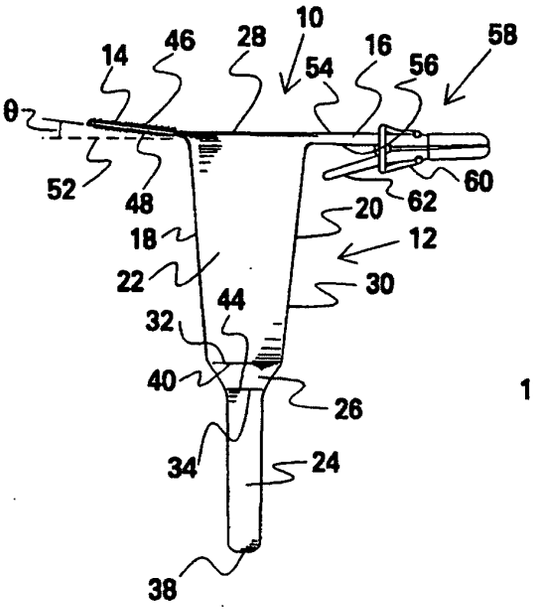

FIG. 4

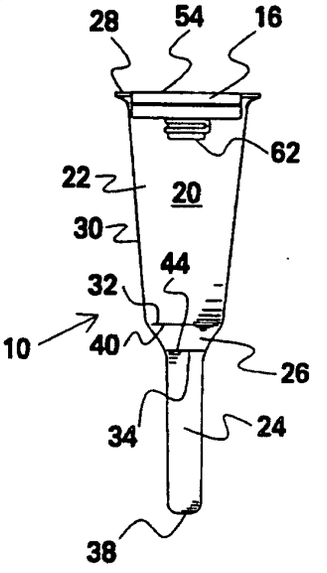

FIG. 5

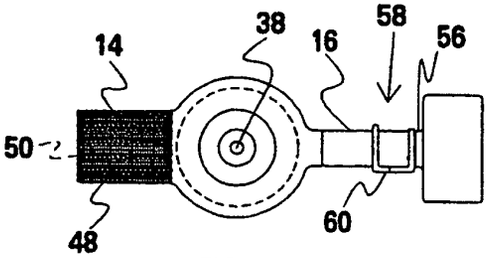

FIG. 6

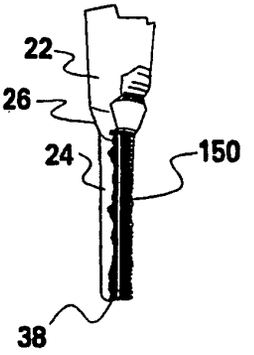

FIG. 7