

June 2, 1970

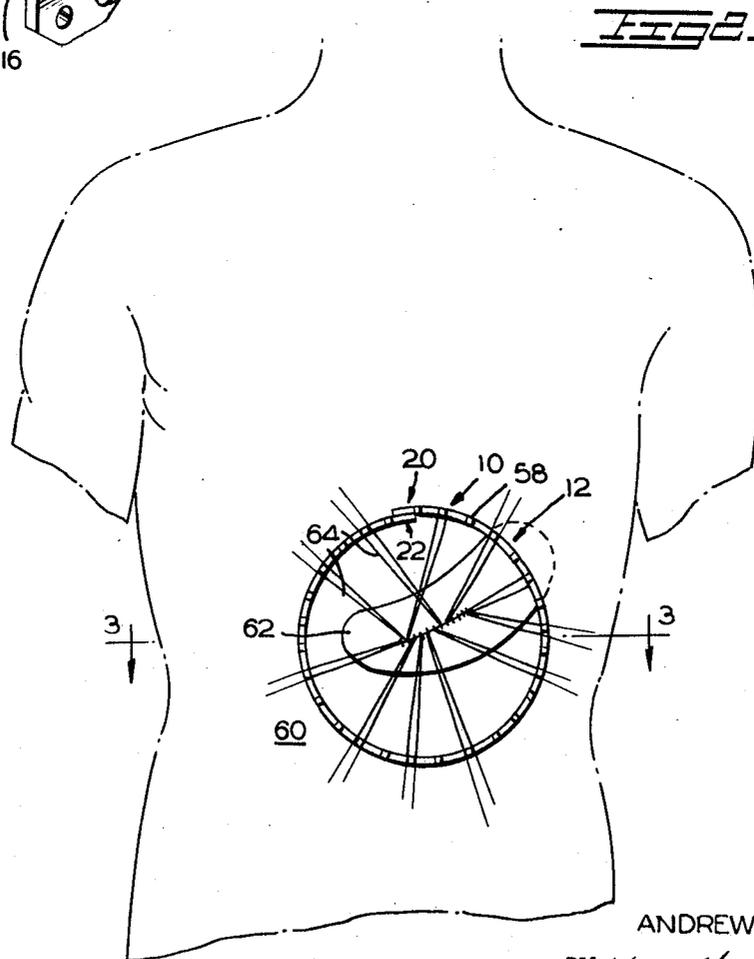
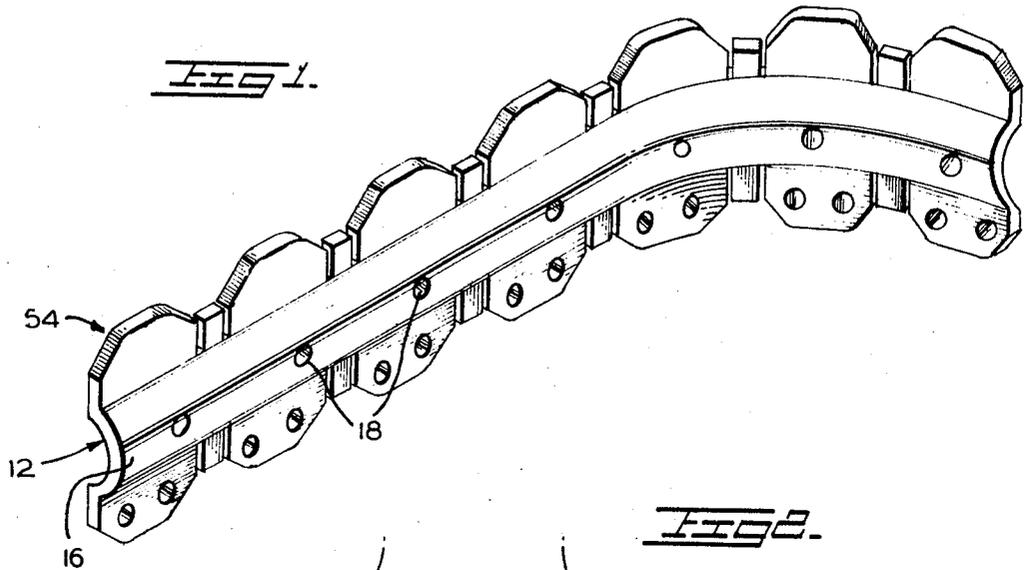
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3,515,129

SURGICAL RETRACTOR AND RETAINER DEVICE FOR SUTURES

Filed Dec. 29, 1967

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

FIG. 3.

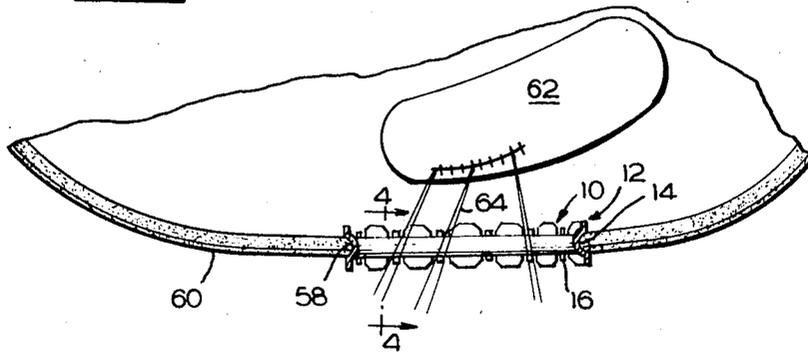


FIG. 4.

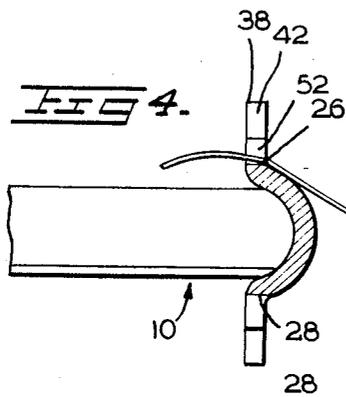


FIG. 5.

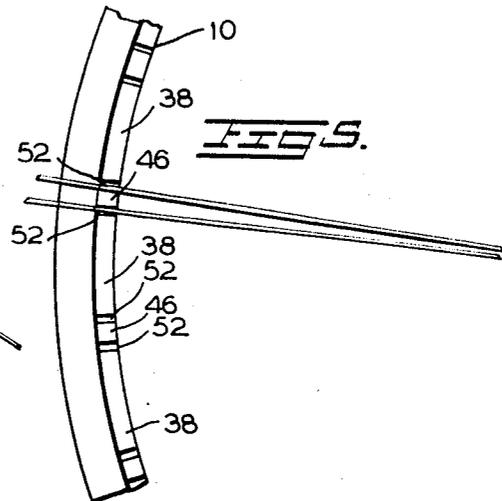


FIG. 6.

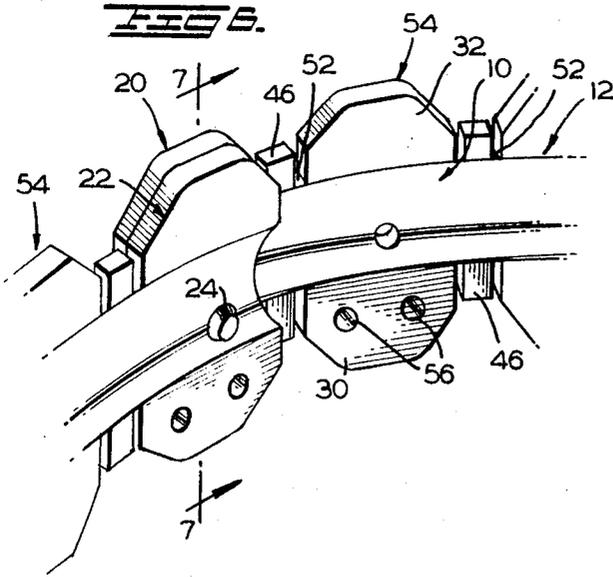
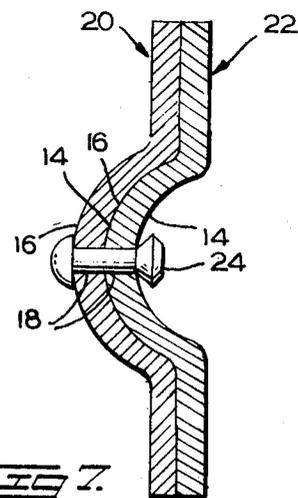


FIG. 7.



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3 Sheets-Sheet 3

FIG. 8.

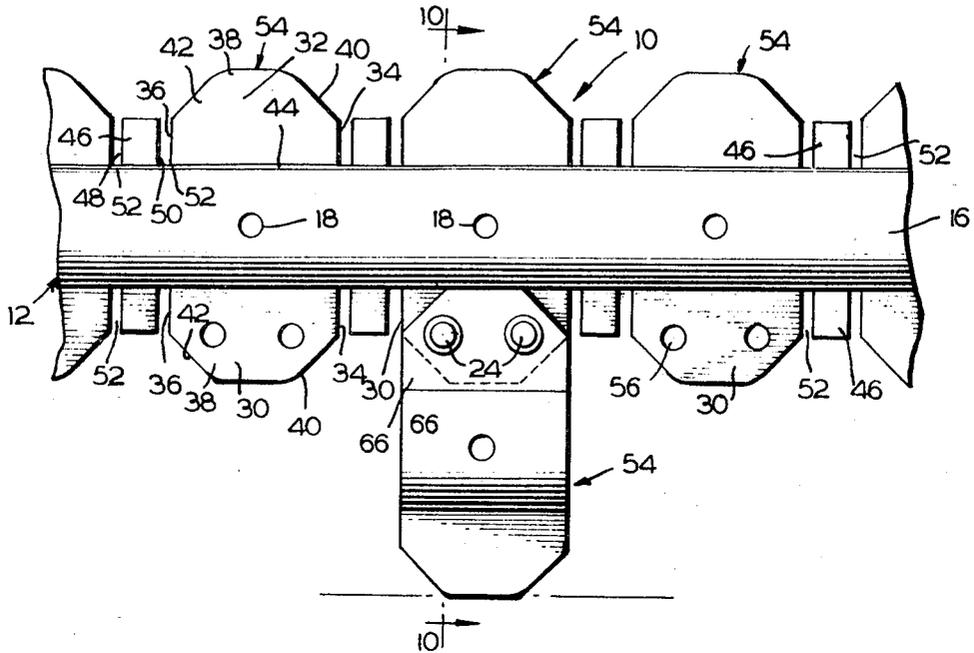


FIG. 9.

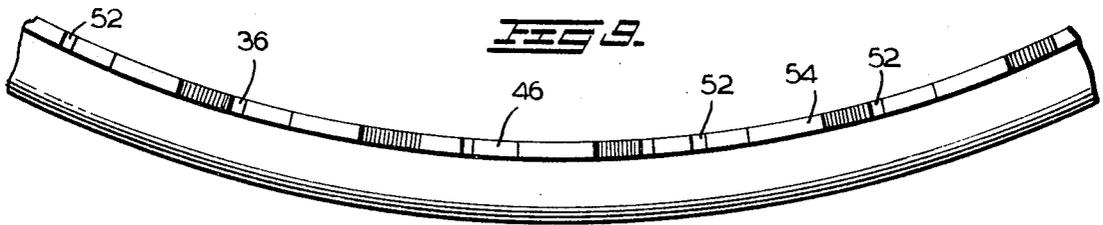
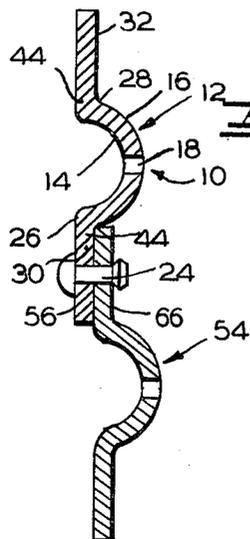


FIG. 10.



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1

2

3,515,129
**SURGICAL RETRACTOR AND RETAINER
DEVICE FOR SUTURES**

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U.S. Cl. 128—20

11 Claims

ABSTRACT OF THE DISCLOSURE

A surgical appliance composed of an elongated channel shaped strip of flexible plastic having overlapping ends provided with registering apertures to receive a connector for disposing the strip in generally circular form for emplacement, as a retractor, in an incision; the strip having coplanar lateral wings on its side edges and lateral fingers spacedly interposed between the wings and defining therewith suture holding slits with outer rounded ends of the wings serving as guides for the introduction of sutures from the incised area into the slits; and winged sections being severable from the strip and attachable by connectors to wings on the strip to provide mounting feet in the external incision-encompassing placement of the suture holding appliance.

This invention generally appertains to the field of surgical appliances and particularly relates to a novel suture holder and/or retractor.

The provision of surgical retractors of the expansible band type that are emplaced in an incision, especially one in the abdominal wall, are known in this art. For example, such devices may include a resilient metallic, annular ring which is split and has overlapping end portions, one of which is perforated and the other of which has protruding lugs to fit lockingly in the perforations so as to maintain the ring against the walls of the incision.

Also, the provision of retainer devices for sutures is generally known wherein a flat, open rectangular frame is provided for placement around a sutured area and carries punched out tabs around which surgical threads are wrapped.

Drawbacks commonly associated with such known retractors and suture holders are that they are mechanically complex, making it difficult for a surgeon to use them, in a swift and sure manner and without inconvenience and serious delay. Furthermore, such devices, even the expansible ring type, are limited in their size so that different sizes must be kept on hand for immediate selective use, depending upon the size and nature of the incision. In addition, such devices are intended, because of their initial costs, which is dictated by their mechanical formations and the materials from which they are fabricated, to be reused, and yet, such devices are difficult to sterilize and to handle, after sterilization.

Additionally, each device is intended for its special use and neither device can function, in and of itself, as a retractor and suture holder.

Accordingly, a primary object of the present invention is to provide a single surgical appliance, which can be easily, efficiently and conveniently used as a retractor and suture holder, as a suture holder or as a retractor, and which overcomes all of the stated and other drawbacks attendant with the known separate and individual retractors and suture holders.

Another object of this invention is to provide a surgical appliance of the above type which is formed at the time of use from a single, elongated strip of flexible plastic, which may be severed from a sterile supply in

strip form, and which is shaped upon itself so that it has overlapping end portions provided with registering apertures for receiving a resilient bead type connector or similar rivet type fastener.

Another object of this invention is to provide a suture holder that is formed from a selected length of a flexible strip curved upon itself and joined at its overlapping ends and having side edge portions formed to present lateral slits arranged in spaced fashion and adapted to receive and hold sutures emanating from an incised area that the holder bounds, either by being emplaced within the incision or by being supported externally on a patient's body in an encompassing position around the incision.

A further object of this invention is to provide a suture holder formed from an elongated channel shaped strip having a deep concave side which retractingly receives the walls of an incision in holding the incision open and in mounting the holder within the incision and having lateral wings on its side edges so that the strip is formed with contiguous winged sections that can be severed therefrom and attached to wings on the strip by snap-in connectors, whereby such severed and thusly attached winged sections serve as mounting feet for the external placement of the holder around an incision.

The foregoing and ancillary objects, including the provision of an inexpensive, efficient, compact and easily erected and positioned surgical appliance of the foregoing type, are attained by this invention, the preferred embodiment of which is set forth in the following description and illustrated in the accompanying drawings, wherein:

FIG. 1 is a perspective view of the strip used in the formation of the appliance;

FIG. 2 is a top plan view of the appliance, showing it emplaced in an abdominal incision;

FIG. 3 is a transverse sectional view, taken substantially on line 3—3 of FIG. 2;

FIG. 4 is a detailed cross-sectional view, taken substantially on line 4—4 of FIG. 3;

FIG. 5 is a fragmentary top plan view of the appliance, showing in greater detail the suture holding feature thereof;

FIG. 6 is a fragmentary perspective view of the overlapped and joined ends of the strip in the formation of the appliance;

FIG. 7 is a cross-sectional view taken substantially on line 7—7 of FIG. 6;

FIG. 8 is a fragmentary front elevational view of the appliance, showing the same positioned externally of an incision on a patient's body;

FIG. 9 is a top plan view of the appliance, as shown in FIG. 8; and

FIG. 10 is a detailed cross-sectional view, taken on line 10—10 of FIG. 8.

Referring now more particularly to the drawings, and initially to FIGS. 1 and 6, the surgical appliance 10, in any of its intended uses, is formed from an elongated strip 12 of flexible plastic material, such as polyethylene or polyvinyl chloride. The strip is selected of the desired length from a sterile supply in packaged strip form and is severed at the time of use from such supply strip.

The strip 12 is channel shaped and presents a deep concave side 14 and a convex side 16 in transverse cross section. At longitudinally spaced points along its longitudinal center line, the strip 12 is formed with transverse apertures 18 that extend through the opposing sides 14 and 16. The selected strip 12 has opposing end portions 20 and 22 which are arranged in overlapping relation when the strip is curved upon itself to form the annular shaped appliance 10. The appliance is of a diameter consequent with the size, shape and place of an incision in a patient's body and the intended use and placement of the appliance relative to the incision, as will be described.

3

The strip is curved upon itself so that the concave side 14 faces outwardly and constitutes the outer side of the annular appliance 10, while the convex side 16 constitutes the inner side of the appliance. The end portion 20 embraces with its concave side the convex innerlying side of the end portion 22. In such overlapped disposition, the apertures 18 in such end portions are brought into registry and receive a bead type connector 24, which is force fitted therethrough in an easy manual operation. Any other suitable type of resilient or non-resilient connector may be employed for holding the overlapped end portions together in the formation of the annular appliance.

The strip 12 is provided at the outer edges of the sides 14 and 16 with side edges 26 and 28 from which integral wings 30 and 32 laterally project in opposite directions. The wings are integral with the channel strip and are coplanar in their coextensive lengthwise and widthwise projections from the side edges. The wings 30 extend from the side edge 26 while the similar wings 32 extend from the side edge 28, with the oppositely extending wings being in alignment transversely of the strip or the formed annular appliance.

The wings are flat and have straight sides 34 and 36 disposed normal to the strip. The outer ends 38 of the wings are rounded so that they have inwardly curved sides 40 and 42 leading to the straight sides 34 and 36 of the wings. The wings are formed on the opposite side edges 26 and 28 so that their inner joined ends 44 extend equally along the length of the strip at the apertured points. In this way, the overlapped end portions 20 and 22 are defined by superimposed wings, as shown in FIGS. 6 and 7, so that the end portions are reinforced which adds to the securement of the end portions and the fixed annular form of the appliance.

The wings 30 and 32 on the side edges are spaced apart along the length of the strip or around the formed annular appliance 10 so that the adjoining sides of adjoining wings on each side edge are disposed in spaced relation and thin, flat rectangular fingers 46 are spacedly interposed between the sides of adjoining wings on each side edge. The fingers 46, which are integral with the channel strip and extend laterally in opposite aligned directions from the side edges, have opposing straight sides 48 and 50 which confront the sides 34 and 36 of the wings, so as to define therewith suture receiving and retaining slits 52. An individual and separate suture or end of a tied surgical thread is adapted to be introduced into each slit through the guided entrance or passageway defined by the inwardly curved sides 40 and 42 of the outer ends 38 of the wings. Thus, the slits 52 are provided laterally and in lengthwise spaced relation on the marginal side edge portions of the strip 12 or the formed appliance 10.

By virtue of the provision of the oppositely extending wings on the side edges 26 and 28 of the channel strip, it can be envisioned that the strip is composed of a series of contiguous winged sections 54, as will be described in more detail. Suffice it to note, at this point, that each of the wings 30 on the side edge 26 are formed with side by side spaced apart apertures 56, such apertures being formed through the wings adjacent the outer ends 38 thereof.

The use of the appliance 10 as a retractor and suture holder is illustrated in FIGS. 2 and 3. As shown therein, an incision 58 in the abdomen wall 60 is spread and held apart by the annular appliance which is emplaced in the incision so that the concave side 14 fully receives and retains the bounding flesh, membrane and muscle composition of the walls of the incision. In positioning the appliance, the surgeon, after the incision is made, curves an appropriate preselected length of the strip 12 upon itself and positions it in place, until the ends are overlapped with the appliance being of a selected diameter so that the outer concave side bears tightly on the surrounding walls of the incision. In such annular or circular form of the strip, the overlapped ends have their apertures 18 in

4

registry and the connector 24 is manipulated into the apertures so as to lock the ends together.

In such emplaced position in the incision 58, the appliance 10 will serve as an efficient retractor and will present at its interior an unobstructed large access opening for operating on an internal organ, such as the stomach 62. The incision in the stomach can be closed with sutures 64 which are individually brought out from their tied placement on the stomach and strung through the slits 52 which maintain the surgical threads in separate easily viewable fashion so that they can be counted and the wound examined for a final time before the appliance is removed and the incision is closed on the separate threads.

When it is desired to use the appliance only as an externally disposed suture holder, as shown in FIG. 8, a number of winged sections 54 are severed from an end of the strip, before the strip length is selected and the strip is curved upon itself and the ends secured to form the annular appliance. The severed wing sections, as shown in FIGS. 8 and 10, are positioned so that apertured ends 66 are superimposed on the apertured wings 30 with the two apertures in each being in registry. Bead type connectors 24 are inserted through the apertures to rivet the winged sections 54 on the selected wings 30 with the winged sections defining mounting or supporting feet that rest on the patient's body. Due to the flexibility of the strip and thus the formed appliance, the feet will accommodate themselves to the varying contours of the patient's body and the appliance in its external position, surrounding or encompassing the incision, will conform to such varying contours. The placement of the feet, in this respect, will be dictated from a viewpoint of properly positioning the appliance around the incision so that its uppermost side edge portion will be substantially level and afford easy access to the suture holders or slits 52 around the edge.

Thus, it can be seen that an easily formed and erected appliance is provided which will function, in any of its selected usages, in an optimum fashion. The ease and reliability of its on-the-spot formation will appeal to surgeons, as will its easy and effective placement relative to an incision. After the appliance has been used, it can be disposed of. However, it is envisioned that a reusable appliance can be formed on the spot and then dismantled for future use by withdrawing the end connector.

It can be appreciated that either in its emplaced position within an incision, where it functions as a retractor and suture holder or merely as a retractor, or in its placement on the patient's body, where it is disposed externally of the incision and encompasses or surrounds the incision, the appliance bounds the incised area.

While the best known forms of the present invention and environmental usages thereof have been set forth in the foregoing, it is to be understood that changes in both form and usage may be made within the terms and scope of the appended claims.

What is claimed is:

1. A surgical appliance comprising an annular band-like member formed from an elongated strip of flexible material having opposite ends and opposing longitudinal side edges, said ends being overlapped in shaping the strip into the annular form, fastening means for securing the overlapped ends together in the annular disposition of the member which is adapted to bound an incised area and means provided on the side edges for holding sutures emanating from a suture point within such bound area wherein such suture holding means includes retaining slits formed laterally on the side edges on the strip in spaced fashion along the length of the strip.

2. The surgical appliance of claim 1 wherein said strip is channel shaped and has a concave side and a convex side in transverse cross section, said annularly disposed member being adapted to be emplaced in an incision

5

with the concave side facing outwardly and retractingly receiving the edges of the incision.

3. The surgical appliance of claim 1 wherein said fastening means includes a connector, said overlapped ends of the strip having registering apertures through which the connector lockingly extends.

4. The surgical appliance of claim 3 wherein said strip formed from plastic and said connector is a resilient bead.

5. The surgical appliance of claim 1 wherein guide means is associated with the slits for the guided introduction of sutures into the slits.

6. The surgical appliance of claim 1 wherein said suture holding means includes integral wings formed laterally on the side edges and lateral fingers integrally formed on the side edges and spacedly interposed between the wings and defining suture retaining slits therewith.

7. The surgical appliance of claim 6 wherein said wings are coplanar in their lateral projection from the opposing side edges of the strip and the fingers lie in the same plane with the wings and are interposed therebetween and terminate inwardly of the outer ends of the wings, said outer ends of the wings being rounded to provide guide means for the introduction of sutures into the slits.

8. The surgical appliance of claim 7 wherein winged sections of the strip are severable therefrom to provide mounting feet for the member in the external placement of the member around an incision, the wings on one of the side edges being formed with apertures and one of the apertured wings of each severable winged section being adapted to be superimposed on an apertured wing of the strip with the apertures therein registered with the apertures in the strip wing and the winged section laterally projecting from the member and connectors fitted in the registering apertures to join the winged sections to the member so that they constitute mounting and supporting feet therefor.

9. A surgical appliance for use as a retractor, especially in abdominal incisions, comprising an annular band-like member formed from a channel shaped strip of flexible plastic having a curvilinear concave side and a curvilinear convex side in transverse cross section, said annular member having the concave side facing outwardly and the convex side inwardly, said opposing ends being overlapped with the concave side of one end embracing the convex side of the other, said strip being formed with centrally disposed transverse apertures arranged in longitudinally spaced fashion, said ends in their overlapper disposition having registering apertures, and a snap connector fitted

6

in the registering apertures, and a snap connector fitted in the registering apertures and joining the ends together in the annular formation of the member which is adapted to be emplaced in an incision with the concave side thereof retractingly receiving the bounding edges of the incision.

10. The surgical appliance of claim 9 wherein said strip has opposing side edges, at least one of the side edges being formed with lateral, longitudinally spaced slits defining suture holders for retaining sutures emanating from within the incised area bounded by the emplaced member.

11. The surgical appliance of claim 9 wherein said strip has opposing side edges at the outer edges of the concave and convex sides, flat wings integral with the side edges and projecting laterally therefrom, said wings being coplanar and being spaced along the length of the side edges and having substantially straight sides disposed normal to the strip, substantially straight, thin fingers integral with the strip and laterally extending from the side edges, said fingers being spacedly interposed between the sides of the wings and defining therewith suture receiving and holding slits, and the wings having rounded outer ends extending beyond the outer ends of the fingers and defining guides for the introduction of sutures emanating from within the incised area bounded by the emplaced member into the slits.

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