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COMBINATION SURGICAL INSTRUMENT FOR CUTTING  
AND REMOVING SUTURES  
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3,266,493

Fig. 1.

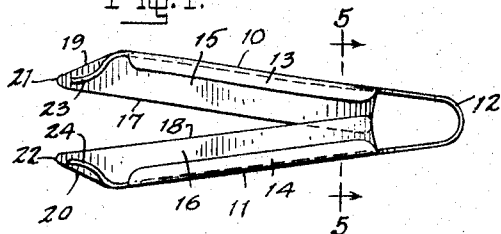


Fig. 3.

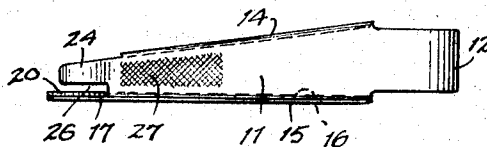


Fig. 2.

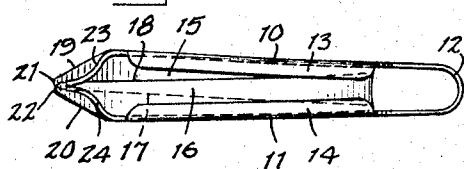


Fig. 4.

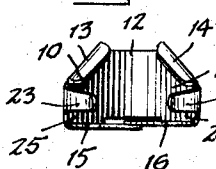


Fig. 5.

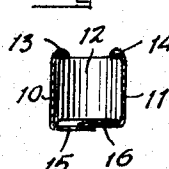


Fig. 6.

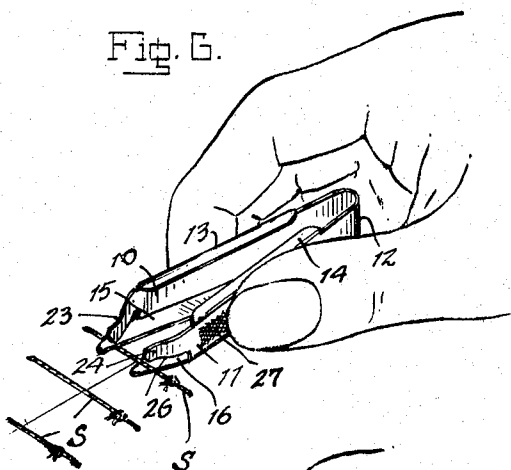


Fig. 7.

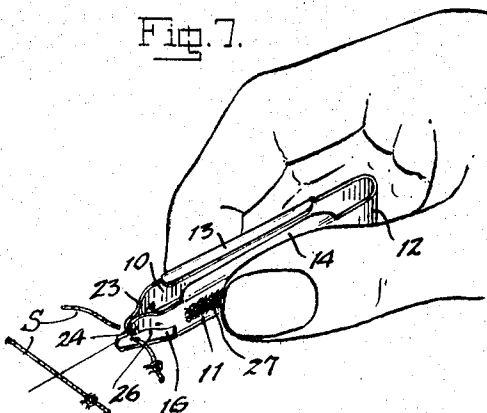
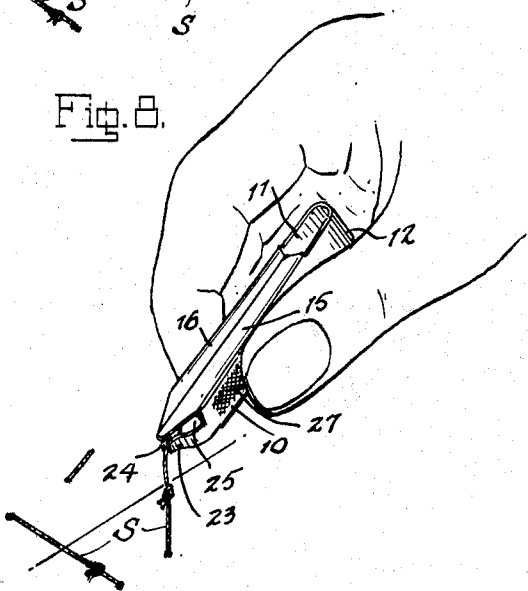


Fig. 8.



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## COMBINATION SURGICAL INSTRUMENT FOR CUTTING AND REMOVING SUTURES

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7 Claims. (Cl. 128—318)

The present invention relates to a combination surgical instrument for cutting and removing sutures, an object of the invention being to provide a combination instrument of this character of one-piece construction which may be produced and sealed in a sterile package at such low cost that it warrants disposal following a single use. The present practice is to provide a pair of scissors and separate tweezers in a sterilized dressing package, making the suture cutting and removal procedure expensive, time-consuming and inefficient.

The present invention combines in a single instrument cutting means functioning as scissors or snips and gripping means functioning as tweezers or forceps, and it is proposed to so relate these means that the suture can be cut and removed as a continuous operation while the instrument is still held in the fingers of the operator, the design of the instrument being such that it may be readily rotated by the fingers to position either the cutting means or the gripping means in the proper relation to effectually perform its function.

A further object is to provide a combined instrument wherein the cutting means is in the form of shear blades extending longitudinally of a pair of finger grip legs connected by an integral resilient bight which normally holds the blades in open position, and further to provide gripping fingers carried by the respective legs which cooperatively serve to limit the closing movement of the blades. It is further proposed to provide the gripping fingers in such relation to the blades that each may perform its separate function without interference from the other.

Other objects and advantages will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawings wherein a satisfactory embodiment of the invention is shown. However, it will be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawings:

FIG. 1 is a plan view of the combination surgical instrument according to the invention, the same being shown in its normal open position;

FIG. 2 is a plan view showing the instrument in its closed position;

FIG. 3 is a side elevation of the instrument in its open position;

FIG. 4 is a front elevation;

FIG. 5 is a transverse sectional view taken along the line 5—5 of FIG. 1;

FIG. 6 is a perspective view showing the manner in which the instrument is initially engaged with a suture preparatory to cutting;

FIG. 7 is a perspective view showing the instrument following its shearing operation to cut the suture; and

FIG. 8 is a perspective view showing the position of the instrument following rotation between the fingers of the operator from the cutting position as seen in FIGS. 6 and 7 to the suture-removing position, and showing the instrument operated to grip and remove the cut suture.

Referring to the drawing the combination surgical instrument according to the exemplary embodiment of

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the invention illustrated therein is of one-piece construction and is formed of suitable hard resilient material, for example strip or sheet steel, having inherent resilience and appropriate hardness so that die-cut edges of the material will provide sharp cutting edges suitable for effecting the sheer cut of sutures or the like without the necessity for grinding or tempering. The instrument is of generally hair-pin shape comprising a pair of finger grip side legs 10 and 11 connected by a resilient bight 12, the side legs being preferably tapered toward their free ends, preferably by inclining their upper edges while their lower edges remain horizontal or parallel to the horizontal plane coincident to the longitudinal axis of the instrument.

The upper edges of the legs are respectively provided with inwardly bent longitudinal flanges 13 and 14 which, in addition to imparting longitudinal stiffness to the side legs, provide auxiliary finger grip surfaces to facilitate manipulation and operation of the instrument by the fingers of the operator, as will hereinafter more fully appear. Along the lower edges of the side legs there are respectively provided inwardly bent shear blades 15 and 16 having inwardly disposed cutting edges 17 and 18 parallel to the side legs, the width of the blades being such that they lie between the side legs in overlapped relation with the blade 16 superimposed upon the blade 15, the cutting edges in the normal open position as seen in FIG. 1 diverging forwardly from a point of intersection forwardly of their rearward ends. Like the flanges 13 and 14 the outer surfaces of the blades also provide auxiliary finger grip surfaces to facilitate manipulation and operation of the instrument, as will hereinafter more fully appear. The blades 15 and 16 project forwardly with respect to the forward ends of the side legs 10 and 11 and the flanges 13 and 14 and the outer edges 19 and 20 of the projected portions are inclined inwardly to form pointed ends which are preferably blunted by rounding as at 21 and 22.

At the forward ends of the side legs there are respectively provided a pair of resilient tweezer fingers 23 and 24 curved inwardly and forwardly from the side legs with their forward ends disposed slightly rearwardly of the blunted ends 21 and 22 and slightly outwardly of the cutting edges 17 and 18 and being respectively spaced from the pointed ends of the blades by notches 25 and 26. In addition to permitting relative flexing movement of the tweezer fingers, the notches provide clearance spaces over the pointed ends of the blades to enable the pointed end of either blade member to be inserted beneath a suture to be cut, as will presently more fully appear. In the closed position of the instrument as seen in FIG. 2 the tweezer fingers meet in the central longitudinal vertical plane of the instrument and limit the closing movement of the blades to a point where their edges are slightly overlapped at the forward point ends. The outer surfaces of the side legs are preferably knurled as at 27 to facilitate gripping by the fingers of the operator.

In operation the surgical instrument is grasped between the thumb and forefinger with the blade portions downwardly disposed as illustrated in FIG. 6, and with the instrument in its open position the pointed end of the blade 16 is engaged beneath the suture S to be cut, the portion of the suture lying over the inserted blade being disposed within the notch 26. Thereupon the instrument is pressed to its closed position as seen in FIG. 7, causing the cutting edges of the blades to gradually overlap at their forward ends as the point of intersection of the two cutting edges moves forwardly. The suture is thus cut or snipped by the shear cutting action of the blades. The closing movement is limited by contact of the tweezer fingers, their slight resilience providing cushioned contact

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which permits a more effective shearing action while at the same time preventing the cutting edge of the blade 16 from contacting the inner surface of the opposed side leg 10. The natural tendency of the thumb and forefinger when gripping the instrument during the cutting action is for the thumb to engage the side leg 11 and slightly overlap the flange 13 and for the forefinger to engage the side leg 10 and slightly overlap the blade 15. As a result the thumb exerts a slight downward pressure upon the side leg 11 and the forefinger exerts a slight upward pressure upon the side leg 10, thus causing the blades to be pressed or wiped together as they are closed and insuring an effective shearing action by the cutting edges.

Immediately following the cutting of the suture the instrument is rotated a half turn between the thumb and fingers to dispose the blades upwardly and the tweezer fingers downwardly as seen in FIG. 8, whereupon one end of the cut suture may be grasped between the gripping fingers and removed. While still holding the instrument the operator may then again rotate it a half turn to dispose the blades downwardly in position to start the cutting and removing procedure for the next suture. Thus the complete removal of a series of sutures may be carried out following the removal of the instrument from its sterile package, without the necessity for laying it down. The chance of contamination and infection is thus greatly reduced. Finally, the instrument may be disposed of in a manner to prevent its re-use or, if desired, subjected to suitable sterilization procedures to enable its safe re-use.

What is claimed is:

1. A combination suture cutting and removing surgical instrument comprising:

(A) a pair of transversely facing longitudinal finger grip side legs each having upper and lower longitudinal edges,

(B) a resilient bight hingedly connecting said side legs at their rearward ends for relative transverse swinging movement from a normally open spring biased position to a closed position,

(C) a pair of longitudinal blades respectively extending transversely inwardly from said lower longitudinal edges of said side legs, each said blade being disposed in a plane substantially parallel to the transverse direction of swinging movement of said side legs and having

(1) a longitudinal cutting edge inwardly spaced from its respective side leg, and

(2) a forward pointed end portion extending forwardly of the forward end of its respective side leg for insertion beneath a suture and having an inner edge forming part of the cutting edge of its respective blade,

(3) said blades being slideably engaged one with

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the other in overlapped relation with their cutting edges normally intersecting each other intermediate their ends and diverging forwardly from their point of intersection, whereby as said side legs are pressed toward each other in closing direction the point of intersection moves forwardly along said pointed end portions beyond the forward ends of said side legs, and

(D) a pair of transversely opposed gripping fingers respectively extending forwardly from the forward ends of said legs, and

(1) disposed in overlying relation to said pointed end portions of said blades and upwardly spaced therefrom to provide suture receiving spaces beneath said fingers, and

(2) having transversely opposed surfaces arranged to contact each other as said side legs are pressed toward each other in closing direction to limit their closing movement.

2. The invention as defined in claim 1, wherein said gripping fingers are symmetrical and extend forwardly and inwardly from the forward ends of said respective side legs for contact of said transversely opposed surfaces with each other in the central vertical longitudinal plane of the instrument.

3. The invention as defined in claim 1, further characterized by a pair of longitudinal flanges respectively extending inwardly from said upper longitudinal edges of said side legs.

4. The invention as defined in claim 3, wherein the longitudinal inner edges of said flanges and said longitudinal cutting edges of said blades are parallel to said side legs.

5. The invention as defined in claim 3, wherein said upper longitudinal edges of said respective side legs are inclined forwardly in convergent relation to said lower longitudinal edges.

6. The invention as defined in claim 3, wherein said flanges and said blades extend transversely substantially at right angles to said side legs.

7. The invention as defined in claim 3, wherein said instrument is of one-piece form shaped from a single piece of hard resilient sheet material.

#### References Cited by the Examiner

##### UNITED STATES PATENTS

|           |        |          |           |
|-----------|--------|----------|-----------|
| 1,216,889 | 2/1917 | Todd     | 30—289    |
| 1,725,173 | 8/1929 | Anderson | 128—321   |
| 2,806,325 | 9/1957 | Fox      | 30—135 X  |
| 3,054,182 | 9/1962 | Whitton  | 128—305 X |

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