

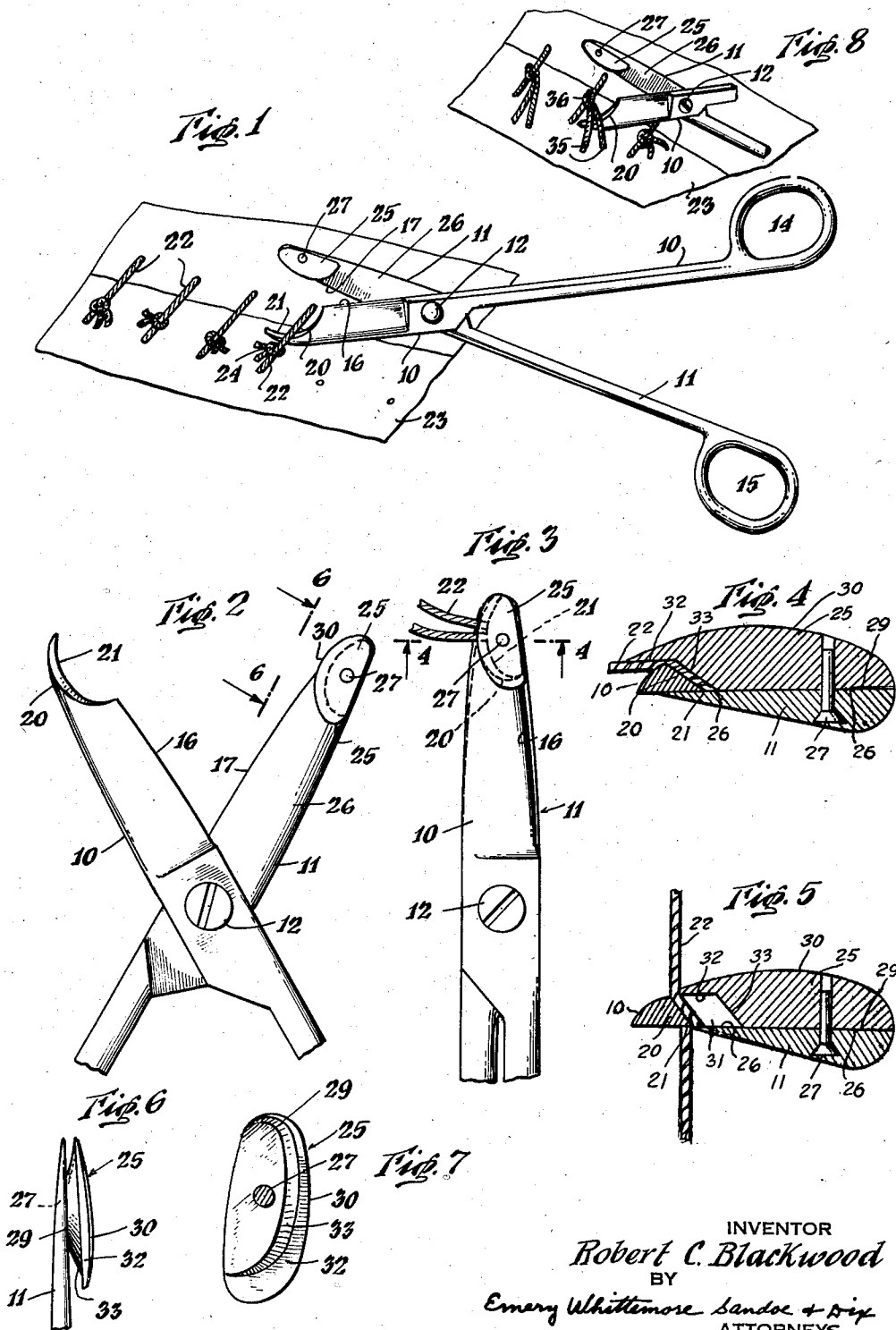
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SCISSOR INSTRUMENT

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SCISSOR INSTRUMENT

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1 Claim. (Cl. 30—134)

This invention relates in general to an improved pair of scissors or shears for severing sutures, or strings, or strands of different gauges, and more particularly the invention relates to an improved pair of surgical scissors particularly adapted to grasp and cut embedded sutures and to create a grasping of such intensity on one of the cut ends of the suture that the suture will be so tightly held after cutting that it may be readily removed from its embedded position. These two steps of cutting and pulling may readily take place all in one stroke.

Further, the invention pertains broadly to an improved pair of scissors, either a physician's curved, or straight shears, or the ordinary straight scissors, and which readily grasp and hold a strand or cord, and during the process of cutting the strand one end thereof is pinched to a very considerable degree so that the scissors have to be opened to release the strand that has been pinched.

One of the main features of the improved invention herein is to provide a novel type of scissors which will cut strands, strings, or other flexible binding cords, or the like, and in so doing will pinch one end of the strand to such an extent that the pinched end cannot be removed from the scissors until they are opened.

Another feature of this invention is to provide a novel type of surgical scissors with two specially adapted cutting blades. One blade is formed with a relatively sharp pointed end to go under a suture and with a depression somewhat like a crescent construction just back of the pointed end, and a small shoulder usually running the length of the crescent section and adjacent the cutting edge of the crescent section. The other cooperating scissors blade is provided with a pincher element which cooperates with the shoulder part of the crescent portion of the first blade and as the scissor blades are brought together for cutting, they also pinch the suture, string, or strand between the shoulder of the first blade and the pincher element of the second blade to thereby firmly grasp and hold the suture or string or strand mechanically and upon moving the scissors will pull the suture from the wound in case of a suture, or from around a package in the case of a wound string or strand.

This novel pair of scissors is also readily adapted to cut free ends of a tie close to the knot after the tie has been completed and to hold these free ends under pinched condition until the scissors are moved away and thereafter opened. By removing the free ends of a suture from the area of a wound and while the ends are under pinched condition, there is no likelihood of these ends falling into the wound, or any part of the sterile field.

These and other objects and features of advantage of the present invention will become more apparent when taken in connection with the illustration of the invention in the accompanying drawings, in which:

Fig. 1 is a perspective view of the improved scissors of the invention as used to cut and remove surgical sutures;

Fig. 2 is a top plan view of the invention in strand-releasing position;

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Fig. 3 is a top plan view of the invention in strand-retaining or pinching position;

Fig. 4 is an enlarged section along the line 4—4 of Fig. 3;

Fig. 5 is a view similar to Fig. 4 before the strand has been severed;

Fig. 6 is an enlarged section along the line 6—6 of Fig. 2;

Fig. 7 is an enlarged bottom plan view of the strand-retaining element of the invention; and

Fig. 8 is a perspective view of the invention as used to sever the free ends of a suture knot.

Referring now to the drawings, the perspective view of Fig. 1 shows a shearing or scissor instrument comprising, basically, a long, thin first cutting member or blade 10, a long, thin second cutting member or blade 11, and a pin 12, which extends through the first member 10 and the second member 11 and is firmly affixed to the second member 11. The first member 10 is free to pivot with respect to the pin 12 and the second member 11. Formed in a pair of ends of the members 10 and 11, respectively, are the finger holes 14 and 15, by means of which the first member 10 and the second member 11 may be manually pivoted with respect to each other in a scissors-like action. The first member 10 and the second member 11 each have cutting edges 16 and 17, respectively, which shear across each other when the first member 10 and the second member 11 are brought into generally parallel relationship.

The first blade 10 has been partially cut away at the end opposite the finger hole 14 to form a concave recess having a cutting edge 21 on the inner surface of said blade, the outer surface of said blade adjacent to said cutting edge 21 being tapered towards said cutting edge forming a crescent shaped shoulder 20 along it. As shown in Fig. 2, shoulder 20 comprises the area defined by the convexo-concavo lines 20, 21, the numeral 20 being intended however to designate the entire shoulder. This cutting edge 21 preferably forms a point of the cutting edge 16 of the first member or blade 10. As seen in Fig. 1, a suture 22, which has been sewn through the epidermic 23 of a patient, has been joined in a knot 24. A portion of the suture 22 near the knot 24 overlies the shoulder 20, preparatory to the shearing action. Thus, in removing a suture the sharp or pointed end of member or blade 10 is pushed under the suture as noted. Another illustration of the shoulder 20 and other parts of the instrument may be seen in Fig. 2.

Affixed to the end of the second member or blade 11 opposite the finger hole 15 is a strand-retaining element 25, which extends beyond cutting edge 17 and otherwise the periphery of which conforms generally to the periphery of the end portion of the second member or blade 11. This strand-retaining element 25 lies against the inner surface 26 of the second member 11 and preferably is rigidly attached thereto such as by the screw 27. In its preferred construction, the strand-retaining element 25 (Figs. 6 and 7) is a unitary body having an inside surface 29 which is mounted in engagement with the inner surface 26 of the second member 11. The outer surface 30 of the strand-retaining element 25 terminates in a lip 32, which is spaced from the inside surface 29 by a recess 31. A recess wall 33 is generally convex and extends from the lip 32 to the inner surface 26 of the second member 11. It is within the recess 31 that a strand is pinched and retained. The inner surfaces of blades 10, 11 are flat. Their outer surfaces are tapered towards their cutting edges 16, 17.

In the operation of this improved scissor structure the cutting edges 16 and 17 approach each other and finally parallel each other when the invention is in strand-retaining position which may best be noted in Figs. 3, 4

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and 5. When the distance between the shoulder 20 and lip 32 becomes less than the diameter of the strand or suture 22, that portion of the strand 22 lying adjacent the shoulder 20 will be squeezed into the recess 31 formed by the lip 32 and the inner surface 26 of the second member or blade 11. After the strand 22 has been squeezed a short distance into the recess 31 (Fig. 5), the cutting edge 21 cooperates with cutting edge 17 of member or blade 11 and severs the strand or suture. Further squeezing of the scissor blades pinches or squeezes the strand between shoulder 20 and element 25 and blade 11, as noted in Fig. 4. Upon almost complete closure, the strand 22 is crushed within the recess 31. The shoulder 20 now seats within the recess 31 and is separated from the recess wall 33 only by the crushed strand 22. When the first and second cutting members or blades 10 and 11 are separated through the spreading of the finger holes 14 and 15, the strand 22 will either fall from the recess 31 due to its own weight, or may easily be shaken or pulled therefrom.

The improved scissors also have another very satisfactory and important use, and that is to cut free ends of sutures or strings close to the knots and move the ends away from the area while they are pinched between the blades of the improved scissor structure herein. This is especially important with free suture ends as they are definitely moved away from the operation area. This important use is noted in Fig. 8 of the drawing.

In particular Fig. 8 shows the invention scissors as used upon suture ends where the suture has just been knotted immediately after a surgical operation. The free ends 35 of the suture 22 remain after the surgeon has tied the knot 36. These free ends 35 must be clipped at a point close to the knot 36, but care must be taken so that the severed free ends do not fall into a crevice of the wound or become lost and cause infection. Upon closure of the members 10 and 11 the free ends 35 will be retained by the invention until the members 10 and 11 are brought into strand-releasing position at a convenient place of disposal and away from the incision.

Thus, it will be seen that the instrument herein disclosed provides a novel and simple means for cutting or severing strands and with the same motion grasping one end of the severed strand. Particularly in the removal of surgical sutures or in the clipping of the free ends of knotted surgical sutures, this invention has far-reaching applicability. Where a surgeon who desires to remove the stitches binding a wound presently must first sever the suture and then use a pair of tweezers or the like for withdrawing the suture, now he will be able to perform these two steps with one movement through

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the use of the improved instrument herein. When a surgeon desires to clip the free ends of a knotted suture, he must presently grasp the tips of the free ends with his hands or a mechanical instrument before he cuts, so that the severed portions of the suture will not be lost. By using this novel invention the surgeon will be able to clip the free ends and retain them for disposal with one instrument.

It will be recognized that the foregoing description and drawings have been set forth merely for the purpose of illustrating the invention. Alterations and modifications of the description and drawings may thus be made within the purview of the invention, which is to be limited only to the scope of the appended claim.

The invention claimed is:

A pair of surgical scissors comprising a first blade having a concave cutting edge on its inner surface near its free end, the portion of the outer surface of said blade adjacent to said cutting edge tapering towards said cutting edge forming a shoulder along said cutting edge increasing in thickness as it recedes therefrom, a second blade pivotally connected to said first blade and having a substantially straight cutting edge on its inner surface to cooperate with said concave cutting edge, a suture-gripping element comprising a body having an inside surface mounted in engagement with the inner surface of the second blade near its free end opposite to said concave cutting edge of the first blade, the side of said body facing said concave cutting edge constituting a recess wall having a convex periphery and shaped to form a V section with said inner surface of the second blade to cooperate with said shoulder of the first blade, the outer surface of said body terminating in a lip spaced from said inner surface and extending beyond its cutting edge, said wall and lip in conjunction with said inner surface forming a recess receiving said concave cutting edge and shoulder of the first blade and the suture to be severed, and means integral with said blades for manually bringing said blades together and separating them, said shoulder of said first blade and said wall and lip of said suture-gripping element cooperating to squeeze a suture between them when said suture and shoulder enter said recess in the course of bringing said blades together to shear said suture, and to retain said suture in said recess until said blades are separated.

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