

Dec. 18, 1928.

1,695,887

C. T. DAVIS

SURGICAL NEEDLE

Filed April 30, 1927

Fig. 1.

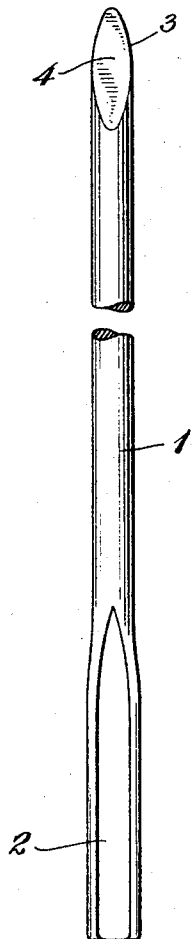


Fig. 2.

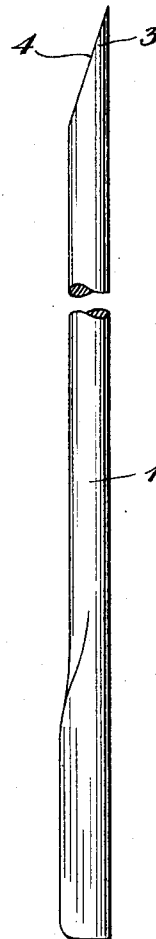


Fig. 5.

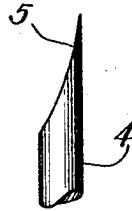


Fig. 4.



Fig. 3.

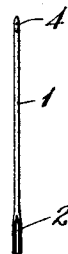
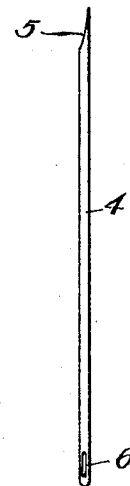


Fig. 6.



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UNITED STATES PATENT OFFICE.

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SURGICAL NEEDLE.

Application filed April 30, 1927. Serial No. 187,839.

This invention is an improvement in needles, and more particularly in those designed for work in relatively resistant tissues.

5 Needles of rounded form, that is of oval or circular cross section are preferable for many reasons. They are easily manufactured, are stronger for the amount of material used, and pass through the material
10 being sewn with a minimum of drag. Needles of this character are also advantageous in surgical work, because they are easily rendered aseptic, and pass through the tissues with a minimum of injury.

15 Such needles are formed from a rod or wire of suitable cross sectional size and shape, as for instance circular or oval, one end being tapered to a point, and the needle is provided with means for engagement by a
20 thread, such as an eye, or a socket.

With needles constructed as above described, the entrance opening is very small, because of the fineness of the point. Hence, the entrance opening must be spread to enable the passage of the needle, and it is the
25 friction due to the necessary spreading which makes difficult the entrance of the needle. Needles of this character will not penetrate heavy fabrics, leather, or dense
30 tissues, such as the skin.

To avoid this difficulty, that is to obtain easy penetration without sacrifice of strength, needles triangular in cross section at the point have been used, but the piercing
35 end of such needles must be relatively wide to obtain sufficient strength, so that increased friction results from the necessity of spreading the opening as the needle passes through, and a relatively great
40 wounding of the tissues is produced by the use of such needles for surgical purposes.

One of the primary objects of the present invention is the provision of a needle of the preferred cross section, that is of rounded
45 form and without angles, with a piercing end of maximum strength, and of a character such that it will not only penetrate the material to be sewn easily, but will pass through the same with a minimum of drag
50 and friction, and with little liability to breakage of the point.

With these and other objects in view the invention consists in the needle and the method of making the same, it being understood that various changes in the form,

proportion, size and minor details of construction of the needle within the scope of the claims may be resorted to without departing from the spirit of the invention.

In the drawings:

Fig. 1 is an enlarged plan view of a needle constructed in accordance with the invention.

Fig. 2 is a view at right angles to Fig. 1.

Fig. 3 is a plan view of the complete
65 needle.

Fig. 4 is a partial plan view of an alternate construction.

Fig. 5 is a cross sectional view.

Fig. 6 is a plan view of the complete
70 needle shown in Figures 4 and 5.

In the embodiment of the invention shown in Figures 1, 2 and 3, the improved needle, which is made from a rod or wire of suitable cross sectional size, and of suitable
75 material, consists of a body 1 having a cross sectional shape free from corners, that is rounded, a thread engaging means 2, in the present instance a socket, although it is obvious that an eye might be provided, and
80 a piercing or cutting end or point 3.

The cutting end is formed by beveling the end of the needle as shown in Fig. 2, so as to provide a plane 4 which intersects the axis of the needle at an acute angle. This
85 may be produced by cutting away the material of the rod in any suitable manner, as for instance by grinding, and the angle of the plane with the needle axis may be varied in accordance with the end sought.

It will be apparent that the more obtuse the angle, the stronger will be the point, and that the surface formed by the grinding is not necessarily a plane, but may be a
90 concave surface in one dimension, as shown in Fig. 5. In this construction the needle 4
95 has the point 5 formed by grinding away the material at one side, and the ground surface is concave in its long dimension as shown, the said long dimension being in the
100 plane of the needle axis.

In this embodiment, the needle is shown as formed with an eye 6 for receiving the thread, and it is oval in cross section as shown in Fig. 4. In both instances how-
105 ever, the body of the needle is of a rounded contour free from edges and angles. The provision of a concave surface, the concavity having its long dimension in the plane of the needle axis provides for a somewhat
110

more acute point. This form is particularly adaptable for some purposes.

The cutting end of the needle is formed by a part of the perimeter of the ground surface, and the said end is rounded from side to side as shown. With this form of piercing end, each part thereof comes successively into engaging position with the material, so that as the needle enters, the opening formed by the needle end is gradually widened to a degree sufficient to permit the entrance of the needle body with a minimum of stretching and drag.

No part of the cutting end extends beyond the circumference or perimeter of the needle body, and the opening eventually formed for the passage of the body is no larger than necessary to enable the passage. This is of particular advantage in needles used for surgical purposes, since it provides for a minimum of wounding of the tissues.

The long axis of the ground surface is in a common plane with the axis of the needle, which provides for a cutting end wherein the two halves of the plane are symmetrical, so that the cutting or spreading action at each side of the ground surface, that is at each side of the cutting edge is the same.

Any suitable means may be provided for engagement by the thread, as for instance an eye, as shown in Fig. 3, or a socket as shown in Fig. 1. The socket is designed to receive the end of the thread and to be closed thereover, with the side edges of the split or slit in the socket in contact throughout.

The improved needle is a departure from the usual construction, wherein the aim has been to produce a fine or attenuated cutting point tapering in all directions from the body. The present method of grinding

produces a true wedge shaped point, but with no part of the wedge of greater width than the diameter of the needle body. In work in dense material, such as heavy fabrics, leather, and dense tissues like the skin and cervix in surgical work, the improved needle is especially efficient as regards the piercing end, and with a minimum sacrifice of strength.

What is claimed as new is:

1. A surgical needle formed from a rounded rod of homogeneous material and of substantially uniform cross section, and provided with a piercing end constituted by the edge of a cutaway surface of oval contour intersecting the needle at an acute angle to the axis thereof.

2. A surgical needle formed from a rounded rod of homogeneous material and of substantially uniform cross section, and provided with a piercing end constituted by the edge of a cutaway surface of oval contour intersecting the needle at an acute angle to the axis thereof, and with the long axis of the surface in a common plane with the axis of the needle.

3. The method of pointing solid rounded surgical needles of homogeneous material and of substantially uniform cross section, which consists in removing the material of the needle at one end to provide a surface of oval outline intersecting the axis of the needle at an acute angle and with the long axis of the surface in a common plane with the axis of the needle.

Signed at Dannemora, in the county of Clinton and State of New York this twenty-second day of April, A. D. 1927.

CHARLES T. DAVIS.