March 26, 1968 A. EIZENBERG 3,374,694

METHOD OF MAKING SCISSORS

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FIG. 1.

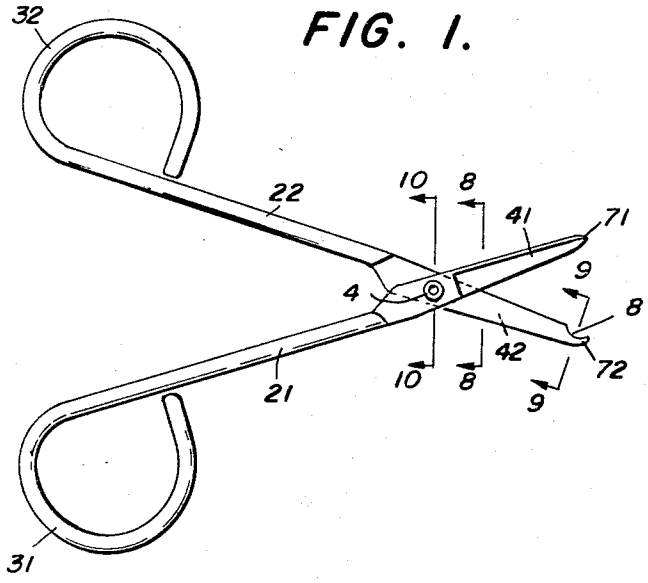


FIG. 9.

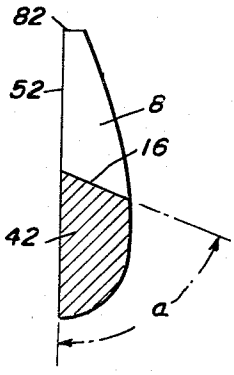


FIG. 8.

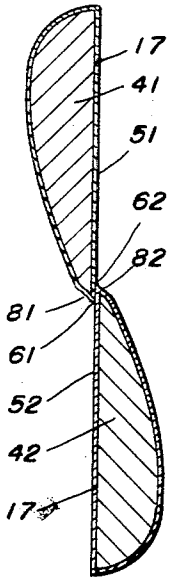
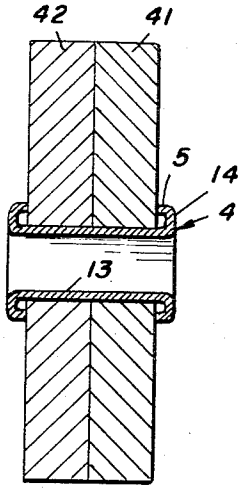


FIG. 10.



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FIG. 2.

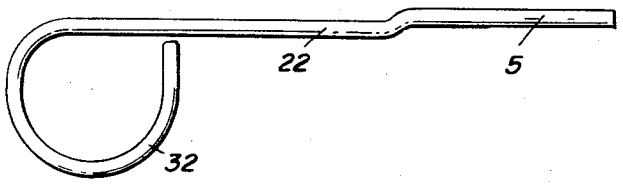


FIG. 3.

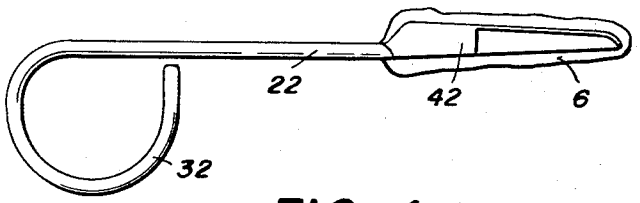


FIG. 4.

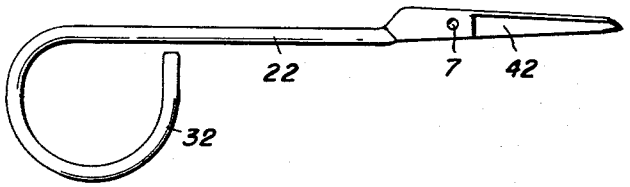


FIG. 5.

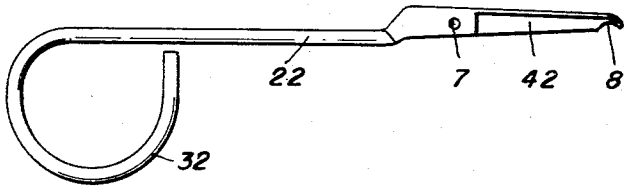
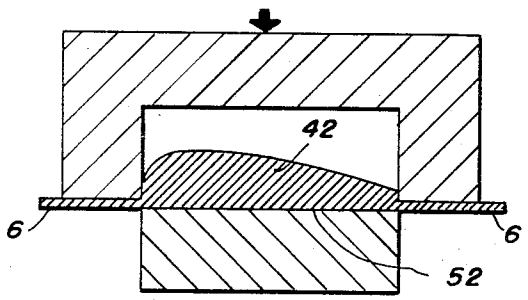


FIG. 6.



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FIG. 7.

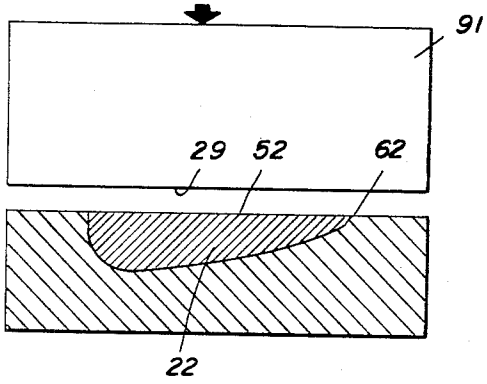


FIG. 13.

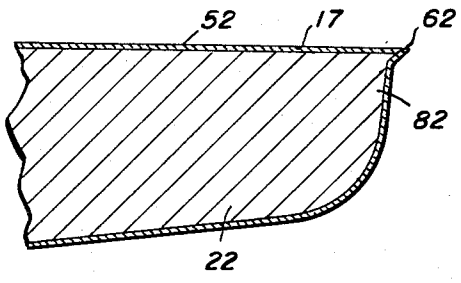


FIG. 11.

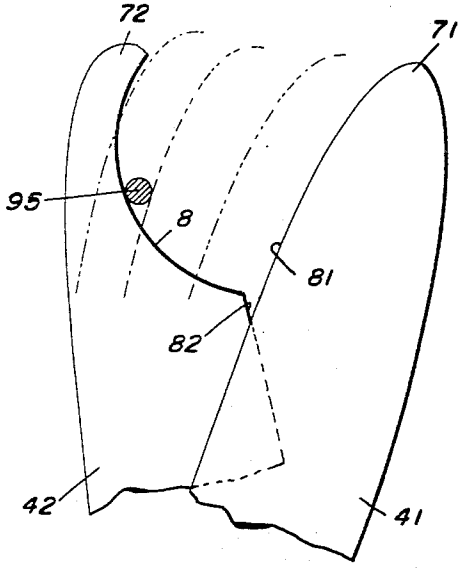
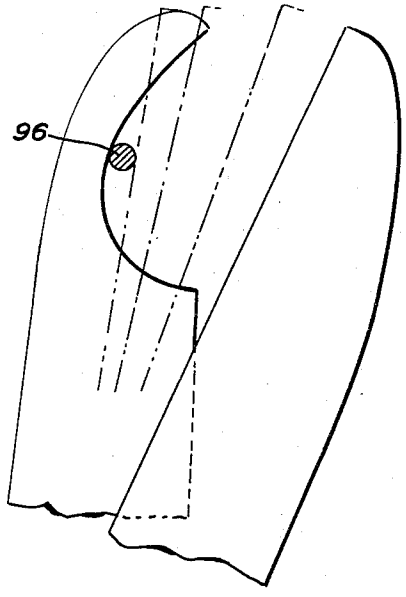


FIG. 12.



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METHOD OF MAKING SCISSORS

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Filed Oct. 22, 1965, Ser. No. 500,707
5 Claims. (Cl. 76—104)

ABSTRACT OF THE DISCLOSURE

A method of making a pair of disposable suture scissors from wire stock. This method includes coining a blade section and forming a finger loop section in a piece of wire, trimming the coined blade section to form a sharp burr, and restriking a face of this blade to make this sharp burr flush with the blade face. Finally, the scissor members are plated and assembled to give a pair of disposable suture scissors in which grinding is not necessary to create sharp cutting edges.

This invention relates to an improved medical scissors particularly adapted to cut sutures, gauze, bandages, and also to a method of making these scissors from wire stock.

Previously, hospital and medical scissors were hand made, requiring intricate hand fitting, bending, and grinding to get a particular pair of scissors to cut properly. All of this hand work on the scissors, which were usually of a very expensive grade of stainless steel, made them very expensive. Therefore, they could not economically be discarded after a single use but had to be rewashed, resterilized and used again several times.

Inexpensive scissors have been made in the past but these were generally along the lines of toy paper cutting scissors and did not have sharp cutting edges that were reliable for medical uses.

The purpose of this invention is to provide an improved hospital and medical scissors that has reliable sharp cutting edges and which can be economically discarded after a single use. This one-time use avoids any possibility of cross-contamination between patients.

It is an object of this invention to provide an improved scissors for hospital and medical use with reliable sharp cutting edges.

Another object of this invention is to provide a tubular spring biased fastening means for urging two scissor halves together with proper force despite variances in thickness of the scissors.

It is another object of this invention to provide a method of making a hospital and medical scissors from wire, which scissors have reliable sharp cutting edges.

Still another object of this invention is to provide a disposable suture scissors with blades adapted to be coined from a common coining die.

Other objects of my invention will become apparent upon further explanation with reference to the following drawings, in which:

FIGURE 1 is a top plan view of the scissors of my invention;

FIGURES 2 through 7 show the various steps of the process for making each scissor member from wire stock;

FIGURE 8 is a section taken along line 8—8 of FIGURE 1;

FIGURE 9 is a section taken along line 9—9 of FIGURE 1;

FIGURE 10 is a sectional view taken along line 10—10 of FIGURE 1;

FIGURE 11 is an enlarged fragmentary view of the scissor blades of my invention showing them cutting a suture;

FIGURE 12 is an enlarged fragmentary view of scissor blades of unreliable suture scissors showing why they do not always cut the suture; and

FIGURE 13 is a fragmentary sectional view of a scissor blade showing my novel cutting burr.

Referring to the drawings, the same numerals are used throughout to represent the same element in the various views. The assembled pair of scissors shown in FIGURE 1 comprises two members 21 and 22 pivotally mounted together by pivot means 4. These members terminate at one end in finger loops 31 and 32 and terminate at an opposite end in blades 41 and 42. For removing sutures a notch 8 is provided in one of the blades to hook under a suture to pull it taut for cutting.

FIGURE 8 shows a cross-section through the scissor blades as they are cutting. Blades 41 and 42 have cutting faces 51 and 52 which are opposed to each other when the scissors are closed. However, it should be realized that scissors in order to cut properly have a slight inward bow in their cutting blades from their pivot point to the tip ends 71 and 72. This is to assure that each blade will be forced against the other as the scissor blades are closed. Thus, there would be a slight gap between the cutting faces 51 and 52 intermediate this pivot point and tip ends 71 and 72 when the scissors were completely closed.

Cutting edges 81 and 82 are substantially perpendicular to and intersect cutting faces 51 and 52. At these intersections are cutting burrs 61 and 62 which are extensions of cutting faces 51 and 52 being flush with them and extending .0002 to .004 inch laterally outwardly as sharp overhanging ledges from cutting edges 81 and 82.

On an exterior of each blade is a plating 17 sufficiently thin to follow the contour of cutting burrs 61 and 62 leaving them sharp and knife-like. This plating 17 is from .0001 to .0003 inch thick and its configuration around cutting burrs 61 and 62 is best shown in the enlarged view of FIGURE 13.

In very inexpensive scissors the fastening means is a critical element and often holds the two blades together either too tightly or too loosely. I have overcome this disadvantage by providing a spring action in the fastening means as shown in FIGURE 10. Fastening means 4 includes a thin tubular portion 13 which extends through the pivot holes in each blade. At the ends of the tubular portion 13 are annular spring sections 14 which outwardly fold over to form a skirt 15 pressing against blades 41 and 42. The spring portions 14 exert a spring force on skirts 15, urging them against the two blades. Thus, the blades are held under proper tension even though in production these blades may vary in thickness.

The method of making the novel scissors of FIGURE 1 from wire is shown in the sequence of steps in FIGURES 2–7. Since members 21 and 22 are made in identically the same way except for suture notch 8, the steps in making these members will be described relative to just one member, i.e. member 22. First a finger loop 32 is formed in one end of a length of wire and an offset portion 5 is formed at an opposite end. Offset portion 5 insures the metal in the blade section will properly flow into the blade form as shown in FIGURE 3. The blade is then coined to a shape as shown in FIGURE 3, leaving a thin metal portion 6 about the periphery of the blade. This peripheral metal portion 6 is trimmed off as shown in FIGURE 6 by a shearing action that proceeds from a back of the blade toward the cutting face 51 perpendicularly to cutting face 51. During this step a pivot hole 7 is also punched, leaving member 22 in the form as shown in FIGURE 4.

Next, a suture notch is punched in one half of the members if a suture scissors is desired, leaving a member 22 as shown in FIGURE 5. Preferably, this cup-shaped suture notch is defined by a surface 16 forming an acute angle "a" between 70° and 85° with the cutting face 52, as shown in FIGURE 9. This surface 16 is formed

by punching out a chunk of metal at an angle to cutting face **52** to form notch **8**.

The formed member **22** in FIGURE 5 (and also member **21**) is then subjected to a restrike operation as shown in FIGURE 7 to force cutting burr **62** into a configuration shown in FIGURE 8. Now cutting burr **62** is flush with cutting face **52** and extends as a sharp overhanging ledge from cutting edge **82**. In the previous step of shearing off the metal portion **6** perpendicularly to and in a direction from the back of the blade toward the cutting face **52**, the cutting burr **62** was forced to protrude from the plane of cutting face **52**. Such burrs overlap and grind against each other, flaking off as the scissors were closed. To overcome this, the restrike step forms the cutting burr **62** flush with cutting face **52**. The restrike step of FIGURE 7 is carried out by fitting the blade **52** in a die conforming precisely to the back surface of the blade and even to the slight inward bow of the blade from its pivot hole to its tip **72**. The restrike means **91** has a surface **29** corresponding to the surface of cutting face **52** and upon the impact of surface **29** against cutting face **52**, burr **62** is formed as in FIGURE 13.

After restriking, members **21** and **22** are plated with a plating sufficiently thin to follow the contour of cutting burrs **61** and **62**, as shown in FIGURE 13. The members **21** and **22** are next assembled by pivot means **4**. Now the cutting burrs **61** and **62** themselves form very sharp knife-like edges which shear against each other to cut and no expensive grinding operation is needed to insure this.

FIGURE 11 is an enlarged view of the tips of the cutting blades **41** and **42** showing how these two blades cut a suture **95** in suture notch **8**. The scissors have two convex cutting edges **81** and **82** engaging each other to cut continuously and progressively toward the blade tips as the scissors close. As shown in FIGURE 11, the two blades **41** and **42** always meet at a V even in suture notch **8** to slice off suture **95**.

The relationship between the two blades shown in FIGURE 11 gives a clean smooth cut to the suture and I have found it to be far superior than the relationship in some previous suture scissors as shown in FIGURE 12. Here in FIGURE 12 the suture **96** can get into a pocket in the suture notch **98**. As shown by dotted lines, the two blade tips can overlap before suture **96** is cut. As is usually the case, the blades are slightly bowed inwardly towards their tip to insure that each blade will be urged against the other at the tip. When the two tips engage and overlap, as shown in FIGURE 12, this springs the blades slightly apart at the suture notch, and suture **96** is merely kinked and slips between the two blades without being cut. Such does not happen in my suture scissors in FIGURE 11 because the suture **95** must be cut before the blade tips can overlap.

Another feature of the scissor blade tips is also shown in FIGURE 11. This is the configuration of the blades **41** and **42** that allows each blade to be coined from a piece of wire into the blade shape in a common coining die. In the past, each blade of a suture scissors had different and individual contours in addition to the suture notch.

I have found that a scissor blade with convex cutting edges **81** and **82** adjacent the blade tips will give excellent cutting results across a concave suture notch **8** in one of the blades near its tip. Since both of these blades in FIGURE 11 are identical except for the suture notch, they can be coined in a common die, thus greatly reducing the manufacturing costs and sorting and control problems.

In the foregoing specification I have used specific examples to describe my novel disposable medical scissors and the method for making them. It is understood that persons skilled in the art can make modifications to these specific examples without departing from the spirit and scope of this invention.

I claim:

1. A method of making disposable medical scissors of wire comprising: making each of a plurality of scissor members by forming in a length of wire a finger loop at one end and an offset kink at an opposite end; coining a scissor blade from the offset portion of the wire length, leaving a thin portion of metal extending outwardly about the periphery of the face; removing the thin metal portion from the periphery by severing it perpendicularly to the blade face and in the direction from a back of the blade toward the blade face, thereby leaving a small burr about the blade face periphery protruding through a plane of the blade face; deforming the burr into the same plane of the blade face by restriking the blade face with means having a surface corresponding to the blade face, thereby forcing the cutting burr into a laterally extending sharp ledge flush with the blade face; forming a pivot hole in each blade; and assembling two members together by pivot means, whereby the cutting burrs shear against each other to cut as the blades are pivoted about said pivot element.

2. A method of making disposable medical scissors of wire comprising: making each of a plurality of scissor members by forming in a length of wire a finger loop at one end and an offset kink at an opposite end; coining a scissor blade from the offset portion of the wire length, leaving a thin portion of metal extending outwardly about a periphery of a face of the blade; removing the thin metal portion from the periphery by severing it perpendicularly to the blade face and in the direction from a back of the blade toward the blade face, thereby leaving a small burr about the blade face periphery protruding through a plane of the blade face; deforming the burr into the same plane of the blade face by restriking the blade face with means having a surface corresponding to the blade face, thereby forcing the cutting burr into a laterally extending sharp ledge flush with the blade face; forming a pivot hole in each blade; plating the members with a plating sufficiently thin to follow the burr contour; and assembling two members at their pivot holes by a pivot means whereby the cutting burrs shear against each other to cut as the blades are pivoted about said pivot element.

3. A method of making disposable medical scissors from wire as set forth in claim **1** wherein the deforming step leaves a cutting burr that extends laterally between .0002 and .004 inch.

4. In a method of making a scissor blade for a disposable medical scissors the improvement of: coining an end portion of a length of wire into a blade having a face with a thin portion of metal extending outwardly about the periphery of the face; removing the thin metal portion from the periphery by severing it perpendicularly to the face and in the direction from a back of the blade toward the blade face to give a small burr about the blade face periphery protruding through a plane of the blade face; and deforming the burr into the same plane of the blade face by restriking the blade face with means having a surface corresponding to the blade face, thereby forcing the cutting burr into a small laterally extending sharp ledge which is flush with the blade face, said laterally extending sharp ledge adapted to engage a similar ledge of another scissor blade in a shearing action.

5. A method of making suture scissors comprising: making first and second scissor members by forming in each of two lengths of metal wire a finger loop at one end and an offset portion at an opposite end; coining a scissor blade in each of said offset portions, leaving a thin portion of the metal extending outwardly about a periphery of a face of the blade, the blade of the first scissor member having a convex cutting edge near a tip of this blade and the blade of the second scissor member having a convex cutting edge near its tip identical in configuration with the convex cutting edge of the blade of the

first scissor member, both of the blades adapted to be coined from a common coining die; removing the thin metal portion from the periphery of each blade by severing it perpendicularly to the blade face and in a direction from a back of the blade toward the blade face, thereby leaving a small burr about the blade periphery protruding through a plane of the blade face; cutting a concave suture notch in one of the blades near its tip; deforming the burr of each blade into the same plane as the blade face by restriking the blade face with means having a surface corresponding to the blade face, thereby forcing the burr into a laterally extending sharp ledge flush with the blade face; and pivotally fastening the two blades together so the convex cutting edges will engage each

other to cut continuously and progressively forward across the concave suture notch toward the tips of the scissor blades as these blades close.

References Cited

UNITED STATES PATENTS

1,565,340	12/1925	Treiber	76—104
1,768,462	6/1930	Dixon et al.	76—104
1,900,413	8/1933	Carpenter	76—104

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