

[54] **DISPOSABLE SCALPEL HANDLE** 1,940,855 12/1933 Friedman..... 30/337 X
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[51] **Int. Cl.** **B26b 5/00**

[58] **Field of Search** 30/337, 339, 329, 338, 30/332, 349, 351, 346.61, 317; 128/305

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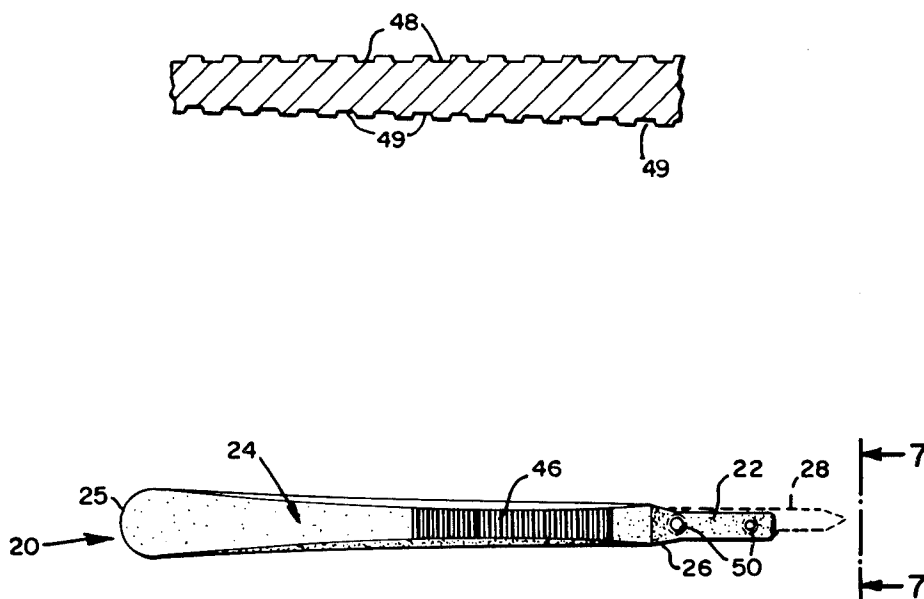
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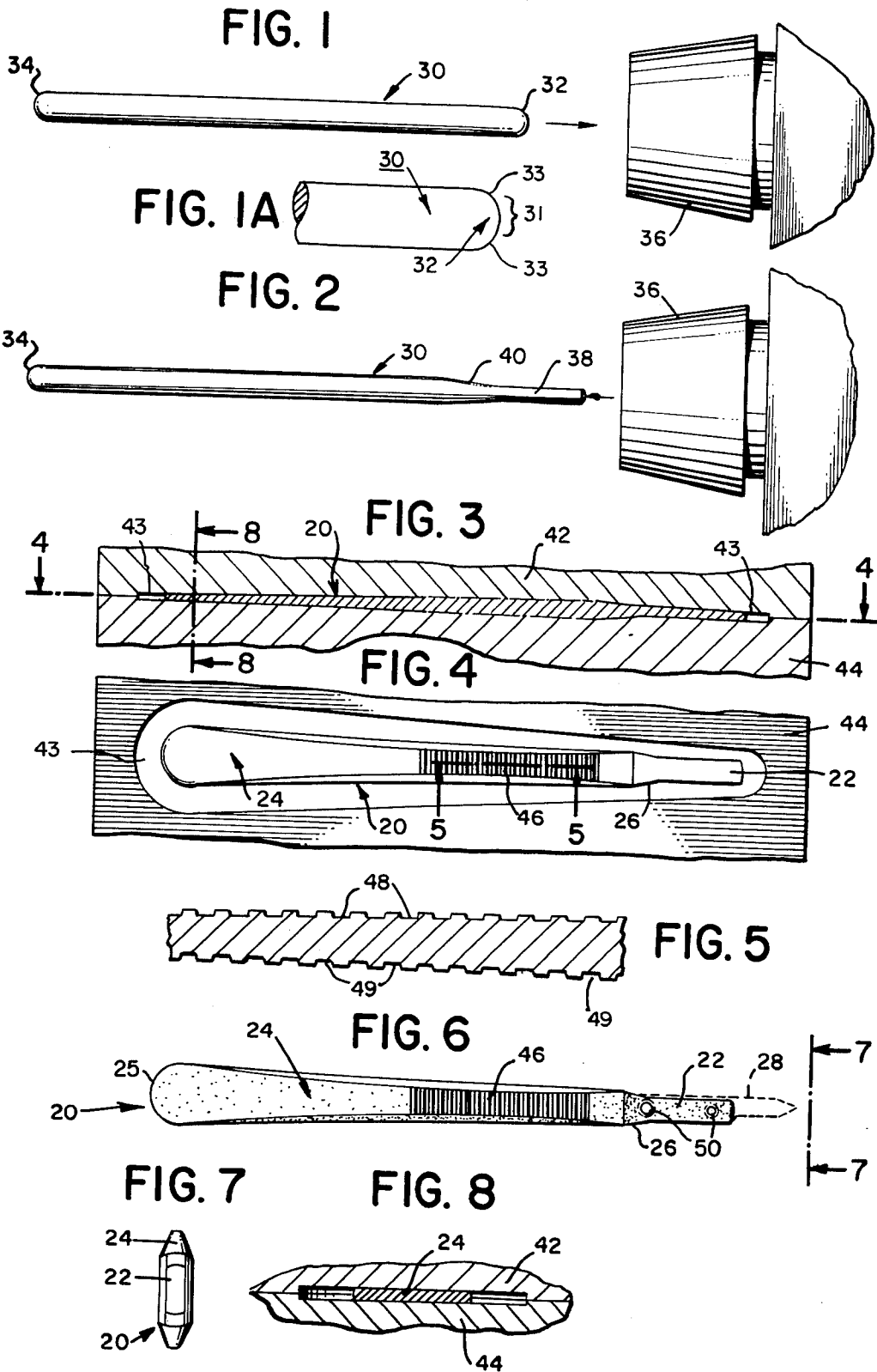
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[57] **ABSTRACT**

A disposable scalpel handle adaptable for use by either right handed or left handed surgeons is produced in a single press swaging operation, in which there is no leftover material or "flash" which has to be removed. Since the disposable scalpel handle produced is perfectly symmetrical about its central axis, a blade can be mounted to either side of the blade holding portion of the scalpel, thereby providing a scalpel adaptable for use by either right handed or left handed surgeons.

4 Claims, 9 Drawing Figures





DISPOSABLE SCALPEL HANDLE

This is a division of application Ser. No. 306,322, filed Nov. 14, 1972, now U.S. Pat. No. 3,817,077 dated June 18, 1974.

BACKGROUND OF THE INVENTION

Most prior art scalpel handles are manufactured with blade holding arms that require the blade to be inserted by bending and snapping the blade in place. As a result, the scalpel handle can only have a blade mounted on one side, and different scalpel handles have to be manufactured for right handed and left handed surgeons. Furthermore, these prior art scalpel handles require somewhat complicated manufacturing processes and are relatively expensive.

In order to reduce the cost of scalpel handles and the need for repeated sterilization, some manufacturers make disposable scalpel handles using plastics. Although the unit cost of each scalpel handle is substantially reduced, the disposable plastic scalpel handles have a tendency to flex more than a metal scalpel handle, and also because of their low weight, are less appealing to many surgeons.

In an attempt to manufacture metal scalpel handles at a reasonable cost, some scalpel handles are being manufactured by a press swaging operation. However, all of these press swaging operations suffer from the common problem of "flash" or leftover material which has to be removed in a separate operation. This additional step is costly, and results in a higher unit cost for the final product.

It is the principal object of this invention to provide a surgical scalpel handle adaptable for use by both right handed and left handed surgeons.

Another object of this invention is to provide a surgical scalpel handle of the above character which is all metal, and is capable of being manufactured in a single press swaging operation that eliminates leftover metal or "flash."

Another object of this invention is to provide a surgical scalpel handle of the above character which weighs substantially the same as expensive, nickel-silver scalpel handles.

Another object of this invention is to provide a surgical scalpel handle of the above character to which all surgical blades can be quickly and easily secured.

A further object of this invention is to provide a surgical scalpel handle of the above character to which the surgical blade can be secured to either side of the scalpel.

Another object of this invention is to provide a surgical scalpel handle of the above character which is inexpensive to manufacture.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

SUMMARY OF THE INVENTION

The surgical scalpel handle of this invention comprises a one piece unit which is completely symmetrical about its central axis, thereby allowing any surgical blade to be secured to a blade mounting portion on either side thereof. Consequently, the scalpel handle can have blades mounted thereon for use by either right handed or left handed surgeons.

A major aspect of this unique scalpel handle is its method of manufacture. Initially, an elongated cylindrical

rod such as used for the axles of toy trucks having specially contoured ends is employed. One end of the cylindrical rod is inserted into a rotary swaging machine which forms and stretches that end of the rod in a single operation into a smaller diameter cylindrical portion and a conical portion interconnecting the smaller diameter cylindrical portion with the larger diameter cylindrical rod. This operation also automatically establishes the final length of the scalpel handle.

The manufacture of the scalpel handle is then substantially completed by a single press swaging operation. In this step, the rotary swaged rod is merely placed in a press die and in a single press operation, the rod is formed into the desired scalpel handle. Preferably, the die incorporates grooves which provide the scalpel handle body with a non-slip gripping surface. The smaller diameter cylindrical portion which is formed in the rotary swaging operation is formed into the blade mounting portion by the press swaging operation. Since this mounting arm is flat on both sides and completely symmetrical about its central axis, the surgical blade can be mounted to either side of the mounting arm by piercing the necessary holes therein.

The larger diameter cylindrical rod forms the scalpel handle portion, while the conical interconnecting portion between the smaller diameter cylindrical portion and the larger diameter cylindrical rod forms the interconnecting zone between the mounting portion and the handle portion. The specially contoured end of the larger diameter cylindrical rod provides the palm end of the scalpel handle with a smooth rounded end, without leaving any "flash."

Since the press die is designed to accommodate all of the material in the cylindrical rod, the resulting scalpel is manufactured in a single press swaging operation without any "flash" resulting from the swaging operation. The elimination of "flash" is a great advantage for ease of manufacture and cost reduction, since there is no leftover flash material which needs to be removed in a separate, costly operation. Consequently, as soon as the press swaging operation is completed and mounting holes are pierced in the blade mounting portion, the scalpel handle is ready to have the blade mounted thereto.

A further advantage of this scalpel and method of manufacture is the high quality product that results. By using a cylindrical rod which comprises a uniform diameter and cross-section throughout its entire length and finish and by using properly designed press dies, the scalpel produced after the press swaging operation also comprises a uniform cross-section incorporating the same quantity of material as in the cylindrical rod, but in a different shape. As a result, the strength and rigidity of the scalpel produced is assured. Consequently, the quality of the scalpel handle of this invention far surpasses plastic scalpel handles and molded type scalpel handles in which air pockets or similar imperfections may be unknowingly incorporated into the final product due to imperfections and the molding operation.

The invention accordingly comprises the several steps and the relation of one or more of such steps with respect to each of the others, and the article possessing the features, properties, and the relation of elements, which are exemplified in the following detailed disclosure, and the scope of the invention will be indicated in the claims.

THE DRAWINGS

For a thorough understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings, in which

FIG. 1 is a plan view of a cylindrical rod with specially contoured ends prior to insertion in a rotary swaging machine;

FIG. 1A is a greatly enlarged plan view of the cylindrical rod of FIG. 1 showing the specially contoured end in greater detail;

FIG. 2 is a plan view of the cylindrical rod of FIG. 1, after being withdrawn from the rotary swaging machine;

FIG. 3 is a cross-sectional, side elevation view of the scalpel handle of this invention in a press swaging die;

FIG. 4 is a top plan view of the scalpel handle of this invention in a press swaging die taken along line 4—4 of FIG. 3;

FIG. 5 is a cross-sectional side elevation view of a portion of the scalpel handle of this invention taken along line 5—5 of FIG. 4;

FIG. 6 is a top plan view of the scalpel handle of this invention;

FIG. 7 is a front end view of the scalpel handle of this invention taken along line 7—7 of FIG. 6; and

FIG. 8 is a cross-sectional side elevation view of a portion of the scalpel handle of this invention in the press swaging die taken along line 8—8 of FIG. 3.

DETAILED DESCRIPTION

Scalpel handle 20 of this invention, best seen in FIG. 6, incorporates a blade mounting portion 22, a handle portion 24, and an intermediate portion 26 which interconnects mounting portion 22 with a handle portion 24. By referring to FIGS. 6 and 7, it can be seen that scalpel handle 20 is completely symmetrical about its central axis. As a result, a surgical blade 28, shown in phantom in FIG. 6, can be mounted to either side of blade mounting portion 22. This allows scalpel handle 20 to have a blade mounted thereto which can be used by either right handed or left handed surgeons.

One of the major advantages of scalpel handle 20 is found in its unique four-step manufacturing process. This process can best be understood by referring to FIGS. 1, 1A and 2—4. In FIG. 1A, a cylindrical rod 30, such as is used as the axle in toy trucks, is shown after the ends 32 and 34 have been specially contoured. Rod 30 preferably comprises an overall length of 4 3/16 inches and a diameter of 0.218 inches. Preferably, the overall length is maintained within 0.010 inches of the preferred length and the diameter is maintained within 0.005 inches of the preferred diameter.

Preferably, specially contoured ends 32 and 34 are not perfectly spherical and, instead, comprise two distinct portions 31 and 33 having different radii. Portions 31, which include the tips of ends 32 and 34, comprise a radius equal to one-half the diameter of rod 30. In the preferred embodiment, this radius is about 0.109 inches. The remaining portions 33 of ends 32 and 34 comprise between one-half and two-thirds the diameter of rod 30, with a radius of 0.125 inches in the preferred embodiment. Therefore, the first step in the manufacturing process of scalpel handle 20 is to contour both ends 32 and 34 of rod 30 into the desired blended, double radius ends. As will be more fully described below,

specially contoured ends 32 and 34 are extremely important in order to provide a rod which is capable of being press swaged into a scalpel handle without leaving any "flash."

Preferably, rod 30 is a low carbon steel rod having a surface finish free from pits and gouges. The rod composition is important since other types of rods tested resulted in cracks at the palm end of the scalpel handle or "flash" after the swage pressing operation. The surface finish of the rod is also important to the production of a smooth scalpel handle since the slightest pit or gouge in the rod is amplified during swage pressing producing a poor surface on the scalpel handle.

The second manufacturing step is the rotary swaging of one end of the rod. In FIG. 1 cylindrical rod 30 with specially contoured ends 32 and 34 is shown prior to insertion in a rotary swaging machine 36. When end 32 of rod 30 is inserted into swaging machine 36, end 32 of rod 30 is stretched and formed, in a single operation, into a smaller diameter cylindrical portion 38 and an intermediate conical-shaped portion 40, as shown in FIG. 2. Conical portion 40 provides a uniform transition from the smaller diameter cylindrical portion 38 to the larger diameter cylindrical body of rod 30, while the stretching operation establishes the overall length of scalpel handle 20.

In the third manufacturing step, scalpel handle 20 is substantially completed in a single operation by swage pressing rod 30 between press swaging dies 42 and 44 into the desired scalpel shape, as shown in FIGS. 3 and 4. Dies 42 and 44 cooperate to form a cavity 43, which defines the desired top and bottom surface shape of scalpel handle 20 while assuring production of scalpel handle 20 with the desired thickness at the various points thereof. Since the vertical dimension of cavity 43 is carefully controlled to assure the desired scalpel handle thickness and the raw material of rod 30 is free to flow laterally, no "flash" or leftover material is produced which needs to be trimmed in a separate operation. Furthermore, the use of rod 30 with its specially contoured, double radius ends 32 and 34, assures that scalpel handle 20 will not contain any "flash" at its terminating ends and instead will be smoothly rounded throughout.

Palm end 25 of handle portion 24, best seen in FIGS. 3, 6 and 8, comprises the thinnest portion of scalpel handle 20. The palm end portion of a scalpel handle is used by the surgeons to spread the skin of the patient after an incision has been made. Consequently, it is extremely important, that the palm end portion be substantially flat, in order to be easily inserted into the incision, while also being smoothly rounded throughout its end, in order to prevent any unwanted cutting or puncturing of the patient's tissue surrounding the incision. Smoothly rounded palm end portion 25 is provided in scalpel handle 20 directly from the press swaging operation due to the unique manufacturing process of scalpel handle 20. The special contouring of end 34, described above, assures that palm end 25 will be smoothly rounded directly after the press swaging operation without any burrs or rough areas which have to be removed. Furthermore, the selection of the material and surface finish of rod 30 provides assurance that there will be no cracks, pits or gouges in palm end 25.

The final step in the manufacturing process of scalpel handle 20 is the piercing of eyelet holes 50, shown in FIG. 6, for the easy mounting of a scalpel blade. Scalpel

handle 20 is now a completed product ready for the mounting of a surgical blade thereto.

Although the production of scalpels is primarily concerned and referred to in this application, the scope and breadth of this manufacturing process is not limited to scalpels, since this "no flash" manufacturing process has applicability to many varied and diversified products, such as knife handles, scissors, etc.

Scalpel 20 is constructed to be well balanced and comfortable in the hands of the surgeon, while also weighing the same as expensive scalpel handles. By using a cylindrical rod, with double radius ends, carefully designed press dies, and a press swaging operation that employs all of the raw material, the peripherally surrounding edges of the handle portion 24 are rounded throughout. This is highly advantageous since it provides a smoothly rounded surface for ease of handling.

Scalpel 20 also has a non-slip gripping surface 46 which incorporates a plurality of grooves 48 and 49. As best seen in FIG. 5, grooves 48 and 49 are 90° out of phase, thereby having each groove 48 juxtaposed to the ridges between groove 49, and vice versa. As will be more fully described below, this arrangement assures that the raw material will not "flow" longitudinally during the pressing operation, which would produce "flash." Another important direct result of the 90° offset of grooves 48 and 49 is the production of handle portion 24 with a substantially constant cross-sectional area throughout substantially its entire length.

Due to the unique manufacturing process described above, scalpel handle 20 is an extremely high quality product. Since scalpel handle 20 is produced in a single press swaging operation from a single rod having two substantially cylindrical portions with different diameters and also because of die shape, scalpel handle 20 comprises a substantially constant cross-sectional area throughout those portions formed from the two cylindrical rod portions. Blade mounting portion 22 comprises a cross-sectional area which is substantially constant throughout its length, and which is also substantially equal to the cross-sectional area of the smaller diameter cylindrical portion 38 of rod 30. Similarly, the cross-sectional area of handle portion 24 is substantially constant throughout substantially the entire length of handle portion 24, and this cross-sectional area is also substantially equal to the cross-sectional area of the larger diameter cylindrical body of rod 30. A cross-section of palm portion 25 is shown in FIG. 8.

The maintenance of a constant cross-sectional area in the production of scalpel handle 20 is extremely important for assuring the use of all of the raw material during the press swaging operation without elongation of the material, thereby preventing any "flash" from being produced. As a result, both handle portion 24 and blade mounting portion 22 have a uniform cross-sectional area throughout the respective lengths and incorporate smooth rounded edges about their entire peripheries without any sharp or inconsistent portions therein. This controlled metal press swaging operation produces a high quality product directly from the die without requiring removal of flash or leftover material. The elimination of the extra step required in prior art

processes for the removal of "flash" makes this process extremely desirable since the product of this process is produced considerably less expensively than prior art products.

In the preferred embodiment of scalpel handle 20, the scalpel handle incorporates a non-glare finish. This is desirable in order to prevent glare which may interfere with the surgeon during the operation. Such a non-glare surface is easily provided by tumbling and shot processes well known in the art. The resulting scalpel handle has a non-glare finish, as represented in FIG. 6.

Although the description above is directed specifically to surgical scalpel handles, manufacturing process described in relation to the scalpel handle can be efficiently employed for the production of any unitarily constructed product. As clearly described above, this process is extremely advantageous since the unitary product can be produced in a single operation without the expensive additional step of "flash" removal.

It will thus be seen that the objects set forth above, among those made apparent from the preceding description, are efficiently attained, and since certain changes may be made in carrying out the above method and in the article set forth without departing from the scope of the invention, it is intended that all matter contained in the above description and shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A scalpel handle comprising:

A. a handle portion completely symmetrical about its longitudinal axis, wherein said handle portion is substantially flat and incorporates a plurality of grooves positioned on both sides of said handle portion with the grooves on one side being offset from the grooves on the other side, and

B. a blade mounting portion,

a. extending from said handle portion,

b. incorporating two substantially flat parallel blade mounting surfaces positioned for securement of a blade on either of said surfaces, and

c. being completely symmetrical about the longitudinal axis of said handle portion,

whereby a surgical blade can be mounted to said mounting portion on either side thereof for use by either right handed or left handed persons.

2. A scalpel handle as defined in claim 1, wherein said handle portion comprises a substantially constant cross-sectional area throughout.

3. The scalpel as defined in claim 1, wherein said blade mounting portion comprises a substantially constant cross-sectional area throughout.

4. A scalpel as defined in claim 1, comprising a substantially unitary structure incorporating substantially rounded peripheral edges throughout.

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