

[54] SUTURING INSTRUMENT ANVIL BUSHING
PART

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[58] Field of Search..... 227/19, 155

[56] References Cited

UNITED STATES PATENTS

2,940,451 6/1960 Vogelfanger et al. 227/19 X

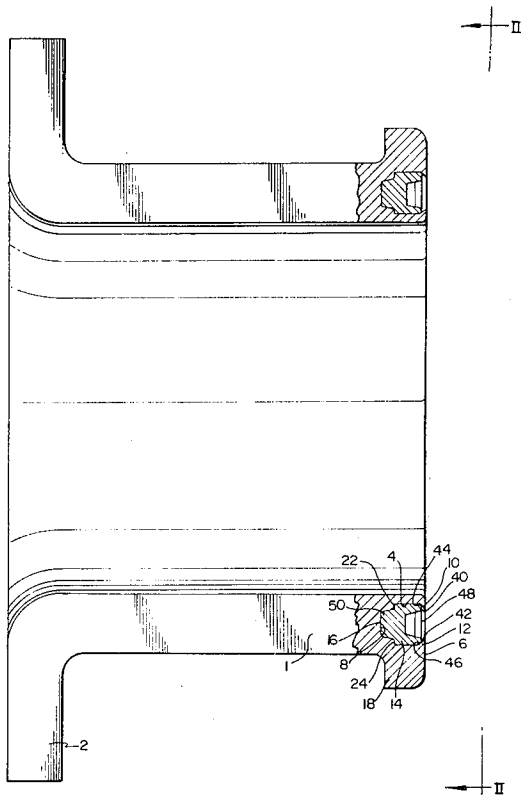
3,144,654 8/1964 Mallina et al. 227/19
3,191,842 6/1965 Fischer et al. 227/19 X
3,366,301 1/1968 Mallina 227/19

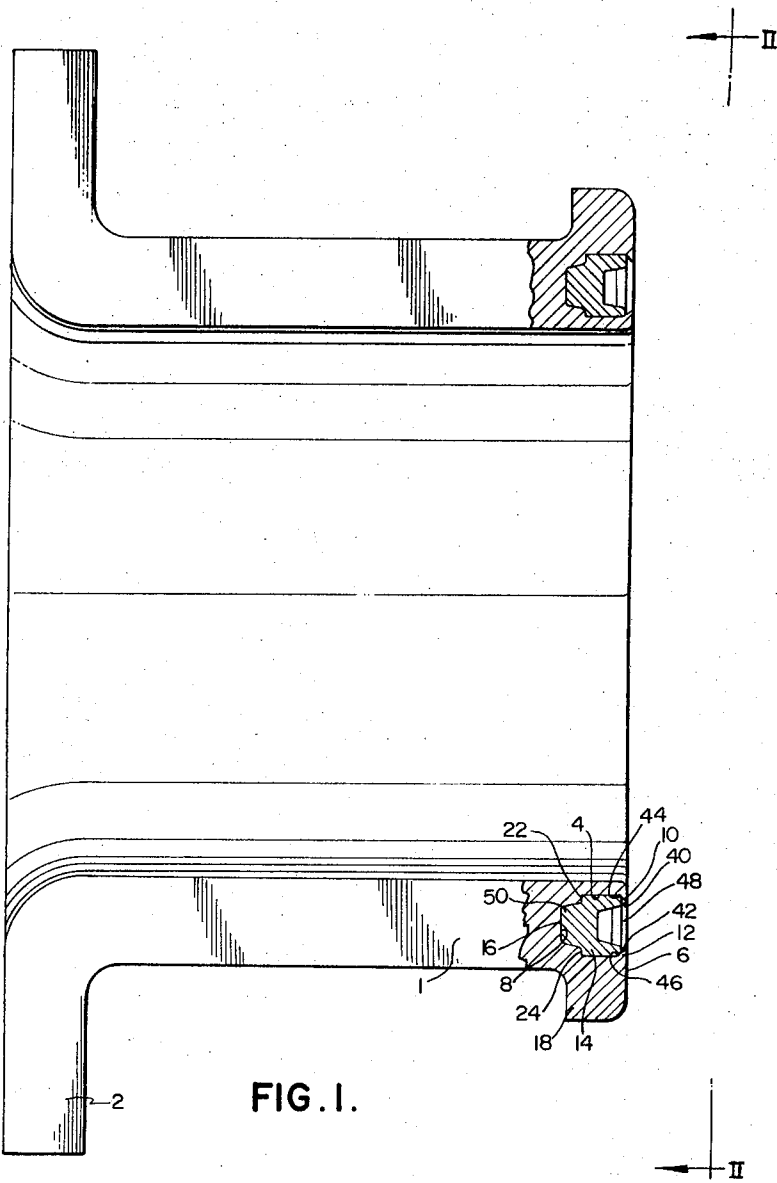
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[57] ABSTRACT

A suturing instrument anvil bushing part which is economical to manufacture and so disposable after use, comprises a semi-cylindrical, plastic body having a suturing tool engaging flange at the rear end and metal anvil retaining groove in the front face with an undulating base for locating a similarly shaped anvil, pressed therein, and retained by inturned, retaining lips on the anvil retaining groove sides. The body is preferably of a phenylene oxide based resin whilst the anvil is preferably of stainless steel.

5 Claims, 3 Drawing Figures





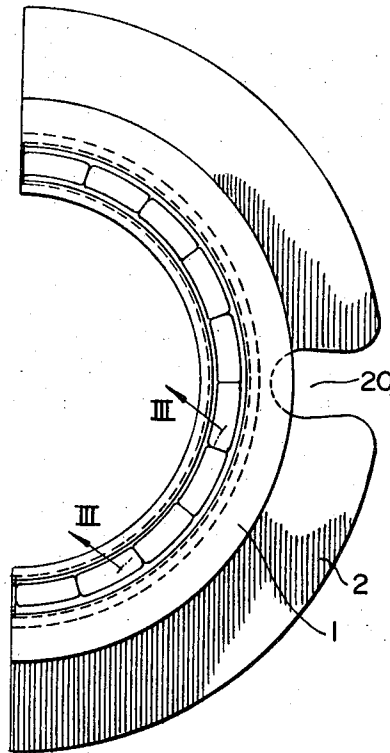


FIG. 2.

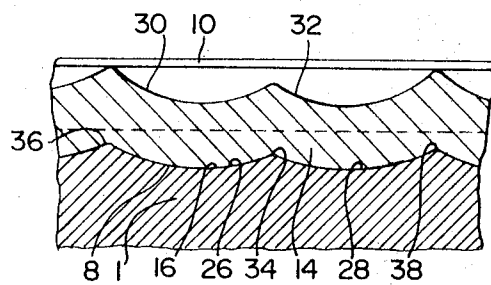


FIG. 3.

SUTURING INSTRUMENT ANVIL BUSHING PART

This invention relates to a suturing instrument anvil bushing part.

In U.S. Pat. No. 2,940,451, dated June 14, 1960, I. J. Vogelfanger et al., "Suturing Apparatus," there is described a suturing apparatus wherein a cylindrical clip-driving assembly and a two part anvil bushing are fitted into the jaws of a scissor-like suturing tool with the ends of a severed blood vessel everted backwardly to overlie facing ends of the cylindrical clip-driving assembly and two part anvil bushing. By urging arms of the scissor-like suturing tool towards one another tantulum clips are urged out of the clip-driving assembly, through the turns of the everted ends of the blood vessel, and then curled rearwardly by the anvil bushing, back through the turned ends to secure the turned ends together. It is stated that the two part anvil bushing may be formed of metal and plastic composition but no mention is made as to how the anvil bushing parts may be constructed economically in this manner with an anvil portion accurately located in a bushing body portion in order that the anvil clip turning surfaces can accurately aligned with the clips in the clip-driving assembly in the scissor-like suturing tool.

It is an object of the present invention to provide a suturing instrument anvil bushing part which may be constructed economically with an anvil portion accurately located in a bushing body portion.

According to the present invention there is provided a suturing instrument anvil bushing part, comprising a semi-cylindrical non-toxic, plastic bushing body having an outwardly extending suturing tool gripping and locating flange integral with the rear end of said body, and an anvil receiving slot extending around a leading end face of the said bushing body, with the base of the anvil receiving slot formed undulatory in a lengthwise direction, intumed, anvil retaining lips around outer edge portions of the anvil receiving slot, and a metal anvil, with a corresponding undulatory base to the base of the anvil receiving slot, pressed into the anvil receiving slot and retained therein by the anvil retaining lips and circumferentially located by the undulatory base of the anvil coinciding with the undulatory base of the anvil receiving slot.

In the accompanying drawings which illustrate, by way of example, an embodiment of the present invention:

FIG. 1 is a partly sectioned side view,
FIG. 2 is an end view along II—II, FIG. 1, and
FIG. 3 is a sectional side view along III—III, FIG. 2 of a portion of the bushing body and anvil.

Referring to FIGS. 1 to 3, there is shown a suturing instrument anvil bushing part, comprising a semi-cylindrical moulded plastic bushing body 1 having a radially outwardly extending, suturing tool gripping and locating flange 2 integral with the rear end of the body 1, and an anvil receiving slot 4 extending around a leading end face 6 of the anvil bushing body 1, with the base 8 of the anvil receiving slot 4 formed undulatory in a lengthwise direction. Intumed, anvil retaining lips 10 and 12 are in the anvil receiving slot 4, and a metal anvil 14, with a corresponding undulatory base 16 to the base 8 of the anvil receiving slot 4 is pressed into the anvil receiving slot, and is retained therein by the anvil retaining lips 10 and 12, and is circumferentially located by the undulatory base 16 of the anvil 14 coin-

ciding with the undulatory base 8 of the anvil receiving slot 4.

The body portion is moulded from a non-toxic phenylene oxide based resin which may be sterilized by gamma irradiation and which is marketed by General Electric Corp. U.S.A. as G.E. Noryl Yellow plastic 731-402 and has an outwardly extending rib 18. The flange 2 has a locating notch 20 for locating the body 1 in a conventional suturing tool (not shown). The sides of the anvil receiving slot 4 are stepped at 22 and 24 to suit the anvil 14, which is correspondingly shaped when it is press-formed and coined from a flat, stainless steel strip in a progressive die.

The undulatory form of the base 8 is similar for each consecutive pair of concavities 26 and 28 (FIG. 3) located beneath two concavities 30 and 32 respectively, of the anvil 14, which curl suture legs (not shown) towards one another. It should be noted that the ridge 34 between the concavities 26 and 28 is of less height than the ridges 36 and 38 at the extremities of the concavities 26 and 28 respectively.

The intumed, anvil retaining lips 10 and 12 have undersides 40 and 42 respectively which are inclined inwardly towards the sides of the slot 4, and the outer edges of the anvil 14 have chamfers 44 and 46 which locate the anvil 14 beneath the undersides 40 and 42 with a space 48 above the anvil 14 in the slot 4.

As stated above the anvil 14 is press-formed and coined from a flat, stainless steel strip in a progressive die, and when the metal is displaced to provide the two concavities 30 and 32 the lower projection 50 is formed with the steps 22 and 24 and undulatory base 8. The anvil 14 is pressed into the anvil receiving slot 4 and is retained therein by the anvil retaining lips 10 and 12 which spring into position on the chamfers 44 and 46.

It will be appreciated that the undulatory form may be different to the form shown in FIG. 3, for example, the undulatory form may be sinuous with curves instead of the ridges 34, 36 and 38. However, the ridges are preferred because they facilitate the accurate location of the anvil 14 in the anvil receiving slot 4.

The anvil 14 may be of any other metal than stainless steel, provided that the metal is compatible with body tissue and is capable of withstanding the pressures of the clips during the formation of the suture.

A primary advantage with suturing instrument anvil bushing parts according to the present invention is the cost-production factor. The productivity is high with low cost involvement. A further advantage is the reduced hazard of blood vessel damage when compared with a suturing instrument anvil bushing part made completely from metal. The absorption reaction to heat and cold by the plastic is considered to be beneficial when compared with anvil bushing parts made completely of metal, and so the plastic assists in reducing factors leading to vessel spasm in a patient. Not the least important advantage of anvil bushing parts according to the present invention is their completely disposable aspect which is not possible with the more expensive, conventional, all metal anvil bushing parts. Disposable anvil bushing parts avoid the necessity of sterilization and cleaning an anvil bushing part, before re-use, in say a hospital where the equipment may not be designed for this specific task in the manner that the sterilization equipment of an anvil bushing part manufacturer may be.

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What I claim is:

1. A suturing instrument anvil bushing part, comprising a semi-cylindrical non-toxic, plastic bushing body having an outwardly extending suturing tool gripping and locating flange integral with the rear end of said body, and an anvil receiving slot extending around a leading end face of the said bushing body, with the base of the anvil receiving slot formed undulatory in a lengthwise direction, intumed, anvil retaining lips in the anvil receiving slot, and a metal anvil with a corresponding undulatory base to the base of the anvil receiving slot, received in the anvil receiving slot and retained therein by the anvil retaining lips and circumferentially located by the undulatory base of the anvil coinciding with the undulatory base of the anvil receiving slot.

2. An anvil bushing part according to claim 1,

wherein the undersides of the anvil retaining lips are inclined inwardly towards the sides of the anvil retaining slot, the outer edges of the anvil have chamfers which locate the anvil beneath the said undersides of the anvil retaining lips, with a space above the anvil in the anvil retaining slot.

3. An anvil bushing part according to claim 1, wherein the sides of the anvil retaining slot are stepped, and the anvil is correspondingly shaped.

4. An anvil bushing according to claim 1, wherein the anvil bushing body is formed from a non-toxic phenylene oxide based resin which may be sterilized by gamma irradiation.

5. An anvil bushing part according to claim 1 wherein the anvil is of stainless steel.

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