

Feb. 6, 1968

A. EIZENBERG

3,367,336

DISPOSABLE MEDICAL FORCEPS

Filed July 26, 1965

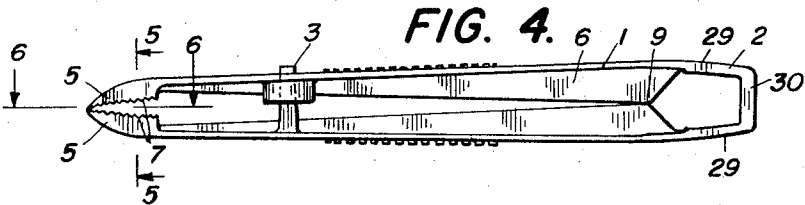
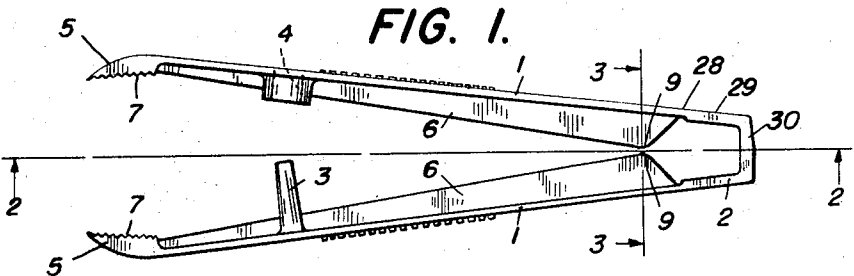


FIG. 5.

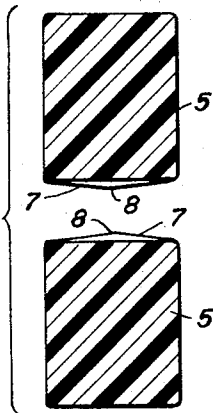


FIG. 7.

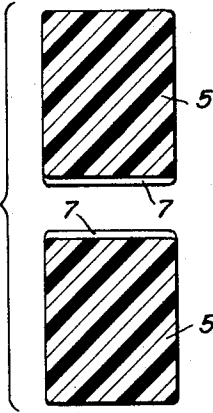


FIG. 3.

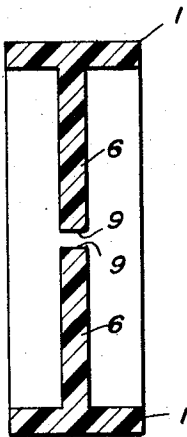


FIG. 6.

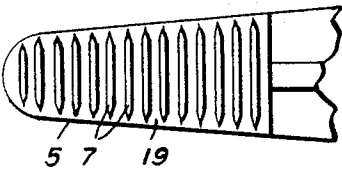
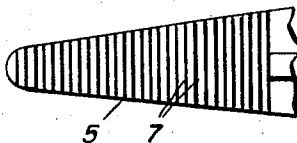


FIG. 8.



INVENTOR

ARTHUR EIZENBERG

BY

Larry N. Barger

ATTORNEY

1

3,367,336

DISPOSABLE MEDICAL FORCEPS

Arthur Eizenberg, Tarzana, Calif., assignor to Pharmaceutical Laboratories, Glendale, Calif., a corporation of California

Filed July 26, 1965, Ser. No. 474,577

5 Claims. (Cl. 128—321)

ABSTRACT OF THE DISCLOSURE

A disposable, one-piece plastic forceps having a longitudinal triangular rib along an inside surface of each clamping arm. These ribs have opposed spaced apart apexes near a U-shaped plastic hinge. The apexes come together upon partially closing of the forceps to spring the U-shaped hinge outwardly and prevent it from breaking.

This invention relates to disposable plastic forceps for medical use.

Sterile medical forceps have a multitude of uses within a hospital or doctor's office. They are used, for instance, to remove sutures, to handle dressings, and to manipulate absorbent cotton balls in swabbing a patient.

It is important to keep the cost of forceps very low so they can be economically marketed as a presterilized item for one-time use.

Plastic forceps meeting this requirement have been made in the past. These forceps in the shape of a V had two serious disadvantages. First, the jaw opening of the forceps was limited because of the limited flexure of the plastic material. Second, many of these forceps would crack in the crotch of the V when closed with a firm force.

An object of this invention is to provide a disposable plastic forceps for medical use with an increased jaw span.

Another object of this invention is to provide a disposable plastic forceps for medical use with an improved hinging action.

These objects can perhaps be better understood with reference to the accompanying drawings, in which:

FIGURE 1 is a side elevational view of the forceps in an open position;

FIGURE 2 is a cross-sectional view taken along line 2—2 of FIGURE 1;

FIGURE 3 is a cross-sectional view taken along line 3—3 of FIGURE 1;

FIGURE 4 is a side elevational view of the forceps in their closed position;

FIGURE 5 is a cross-sectional view taken along line 5—5 of FIGURE 4 showing one version of the jaw teeth structure;

FIGURE 6 is a top view of a jaw of the forceps showing the jaw teeth structure of FIGURE 5;

FIGURE 7 is a cross-sectional view taken along the same line as FIGURE 5 but showing a modified version of the jaw teeth structure; and

FIGURE 8 is a top view of a jaw of the forceps showing the modified jaw teeth structure of FIGURE 7.

As shown in FIGURE 1, the forceps includes a pair of arms 1, each of which has a jaw 5 at one end. An opposite end of each arm joins at 28 to a U-shaped hinge member 2 which includes a pair of sides 29 and a back 30. As best illustrated in FIGURE 2, the back 30 and sides 29 are wide, actually corresponding in width to the arms 1. This keeps the jaws from materially shifting laterally relative to each other before guide means associated with each arm engage. The guide means spoken of includes a guide pin 3 in one arm and a guide hole 4 in an opposite arm for laterally aligning jaws 5 as they close.

2

Narrow ribs 6 extend along inside surfaces of arms 1 and terminate in pivot points 9 adjacent juncture 28 between arms 1 and sides 29 of U-shaped hinge member 2. As shown in FIGURES 3 and 4, these pivot points 9 contact each other as the forceps are closed, thus flexing the sides 29 of U-shaped flexible hinge member outwardly. Previous V-shaped forceps depended solely on an inwardly flexing hinge member at a crotch of the V. This resulted in several breakages of plastic forceps when firmly closed and also limited the amount of jaw opening in the natural or open position of the molded plastic forceps.

In my invention I utilize both an inwardly and an outwardly flexure of the hinge member, particularly in sides 29 of U-shaped hinge member, to overcome these disadvantages. As the arms shown in FIGURE 1 begin to move inwardly when the forceps closes, the sides 29 flex inwardly. Before the breaking point of a plastic material is reached, pivot points 9 of ribs 6 contact each other and force the sides 29 to bow outwardly as the jaws continue to close. By using the double flexure in U-shaped flexible hinge member 2, the forceps can be molded in a natural open position with a very large jaw opening as shown in FIGURE 1.

As the forceps closes, the ribs 6 contact each other at pivot points 9, flexing the U-shaped flexible hinge member as explained above. Continual pressure on the arms 1 brings the jaws closer and closer together until the teeth 7 of the respective jaws 5 mesh together. Preferably, the ribs 6 diminish in height gradually and continuously from the pivot points 9 to the guide pin 3 and guide hole 4. Thus, when firm pressure is applied to arm 1, the ribs will contact each other at pivot points 9 and then upon further closing contact each other along their entire length from guide means to the pivot points 9. This structure limits the degree of pivot and hence the amount the sides 29 of U-shaped hinge member flex outwardly as teeth 7 mesh.

FIGURES 5 through 8 show two versions of meshing teeth 7. In one version, shown in FIGURES 5 and 6, the jaw and tooth structure is well suited for a prep forceps. This forceps is very useful for holding an absorbent cotton ball and swabbing a patient. The inner meshing teeth 7 of this version have a crown or raised central portions 8 which mesh together. These raised central portions feather out to their ends and blend in with the face 19 of the jaws. The lateral teeth 7 of FIGURES 5 and 6 are shorter in length than the width of jaw 5. Thus, the teeth do not extend all the way to the side of jaw 5 and therefore do not present a sharp zig zag edge at the side of the jaw to scratch a patient when a swab is brushed back and forth over his skin.

An alternate jaw and tooth construction is shown in FIGURES 7 and 8. This construction is well adapted for very fine work where a tight grip on an object is required, such as in suture removal. In FIGURE 7 it is noted the teeth run completely to the sides of the jaws, thus giving a complete intermesh of the teeth surfaces. In this alternate jaw version the jaw has a narrow pointed end shown in FIGURE 8 for grasping small sutures.

The simple, one-piece improved forceps of my invention can be made of any stiff plastic material. I have found the forceps of my invention work very well when molded in a general purpose styrene. Also, such plastics as ABS and polycarbonate can be used.

For illustrative purposes, I have used specific examples of my invention. Certain modifications to these examples can be made by persons skilled in the art without departing from the spirit and scope of this invention.

I claim:

1. A disposable plastic forceps for medical use comprising:

(a) a pair of arms having side edges, each having a

3

mating jaw at one end, said arms joined together by an integral U-shaped flexible hinge member at their opposite ends;

(b) guide means associated with the arms between the jaws and U-shaped hinge member for laterally aligning the opposed jaws; and

(c) a longitudinal rib along the inside surface of each arm and spaced inwardly from the side edges of said arm, said ribs being generally triangular-shaped in a longitudinal dimension along the arms, said ribs having apexes adjacent the U-shaped hinge with each rib progressively diminishing in height from its apex toward the guide means, said apexes of the ribs being spaced apart in the normal relaxed open position of the forceps, whereby upon partially closing the forceps the apexes of the ribs are brought into contact with each other.

2. A disposable plastic forceps as set forth in claim 1 wherein the jaws have a series of lateral teeth therein.

3. A disposable plastic forceps as set forth in claim 2

4

wherein said teeth have a greater height at their central portion and feather outwardly to their ends to blend in with a jaw face.

4. A disposable plastic forceps as set forth in claim 2 wherein the lateral teeth are shorter in length than the lateral distance across said jaw face.

5. A disposable plastic forceps as set forth in claim 2 wherein the teeth in each jaw have a crowned center portion for mating with a crowned center portion of teeth in the opposing jaw.

References Cited

UNITED STATES PATENTS

15	2,376,135	5/1945	Frasher	81—43	X
	2,668,538	2/1954	Baker	128—346	X
	3,140,715	7/1964	Whitton et al.	128—321	
	3,265,068	8/1966	Holohan	128—321	

20 DALTON L. TRULUCK, *Primary Examiner.*