

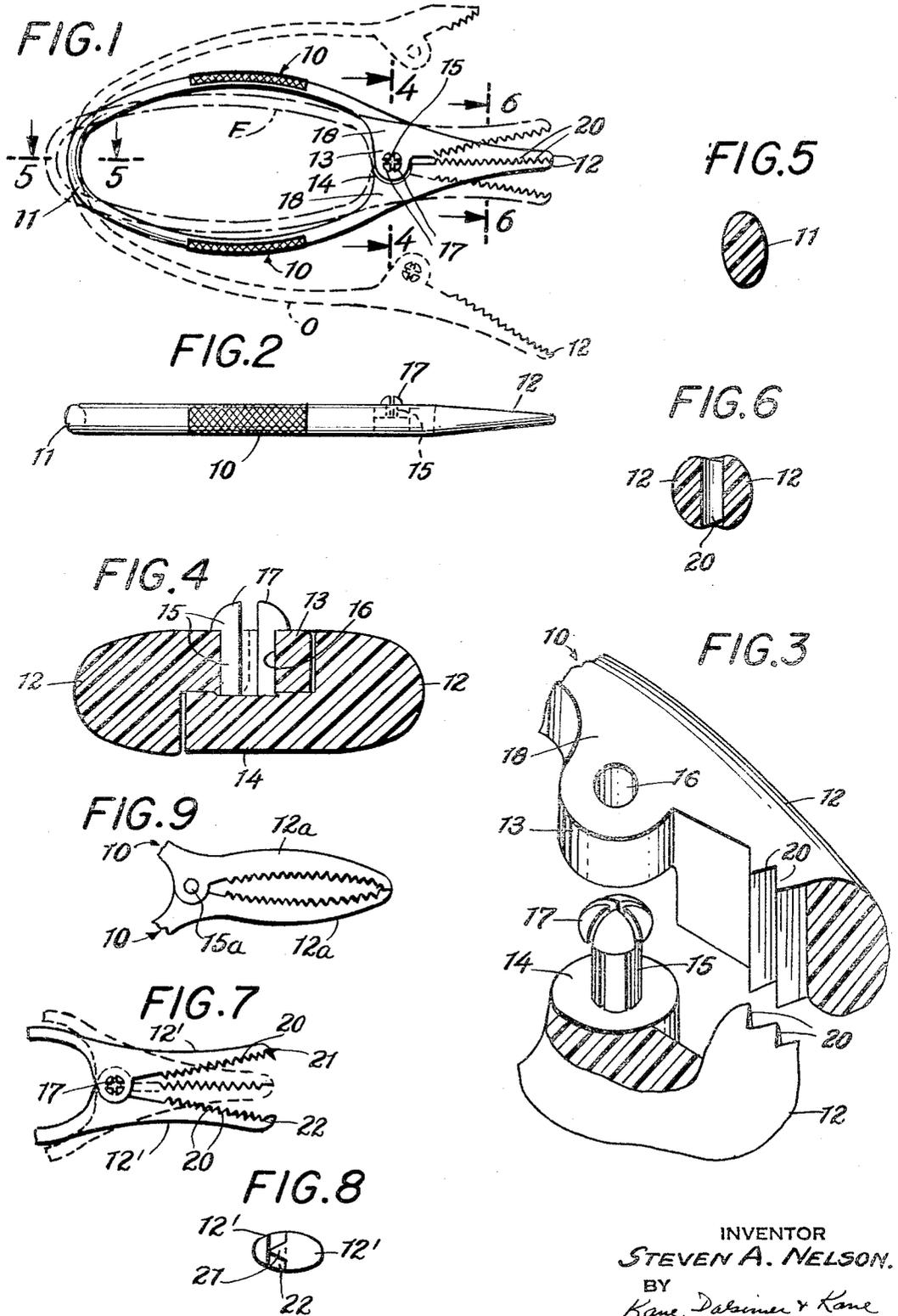
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CLAMPING IMPLEMENT

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CLAMPING IMPLEMENT

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1 Claim. (Cl. 128—325)

This invention relates to an improved clamping implement.

It is a particular object of a present invention to provide an improved clamping implement which is useful as a hemostatic clamp; which is relatively simple and inexpensive to manufacture and can therefore be treated as a disposable clamp suitable for one time use; and which is arranged so that the jaws are normally biased to closed position but may be readily opened so that a blood vessel or similar article may be effectively clamped therebetween.

My invention contemplates a clamp made in one piece from an elongated flexible resilient member having jaws formed at one end and which is arranged in a closed loop from which the jaws project. The two ends of the loop are pivoted together adjacent the clamping jaws and the loop is biased toward an expanded condition so as to urge the jaws into clamping relationship. By exerting a compressive force against opposite sides of the loop the jaws can be opened so that the blood vessel or other article may be inserted therebetween. When the compressive force on the loop is released the jaws effectively clamp the article therebetween. I found that my clamping implement may be effectively made by injection-molding from a flexible resilient synthetic resin plastic material.

Other objects and advantages will become apparent in the ensuing specification and appended drawing in which:

FIG. 1 is a plan view of a hemostatic clamp embodying the invention;

FIG. 2 is a side view of the same;

FIG. 3 is an exploded fragmentary view thereof, illustrating the pivot;

FIG. 4 is a transverse sectional view through the pivot, taken on the line 4—4 of FIG. 1;

FIG. 5 is a transverse sectional view through the body loop bight, taken on the line 5—5 of FIG. 1;

FIG. 6 is a transverse sectional view through the jaws, taken on the line 6—6 of FIG. 1;

FIG. 7 is a fragmentary view of the clamp embodying a modified form of the invention;

FIG. 8 is a transverse sectional view of the jaws of the clamp shown in FIG. 7; and

FIG. 9 shows a modified jaw form.

Referring now to the drawings in detail, I have shown in FIGS. 1—6, an example of one form in which the invention may be embodied, a hemostatic clamp comprising, in general, a pair of handle levers 10 integrally joined by a bight 11 at one end, a pair of jaws 12 formed as integral extensions of the other ends thereof, and a pivot comprising a pair of overlapping circular pivot ears 13 and 14, the ear 14 having an integral pivot stud 15 of quartered or 3-prong segmental structure, pivotally received in a cylindrical eye 16 in ear 13. The segments of stud 15 have respective segments of a tapered rounded head 17 which overhangs the outer face of ear 13 and secures the overlapping ears in coupled relation. The ears 13, 14 are joined to the respective ends of levers 10 by shoulders 18 constituting widened base portions of jaws 12 which are tapered and approximately triangular in plan.

The levers 10, bight 11, shoulders 18 and pivot 13—15 collectively constitute a body loop of elongated oval form, functioning as a handle. The jaws project from one end of the body loop, beyond pivot 13—15 away from the body loop.

The clamp is fabricated as an integral single injection-

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molded part, of flexible, resilient synthetic resin plastic material. A high-impact polystyrene material, moderately plasticized for resiliency, is suitable. The part as molded has an open shape indicated by dotted lines at 0.

The clamp is completed simply by squeezing the levers 10 toward one another until the pivot ears 13, 14 are coaxial, then inserting the head 17 of pivot stud 15 into eye 16 of ear 13, and then pressing the ears 13, 14 together, causing the head 17 to be contracted to a sufficiently small diameter to pass through eye 16, closing the gaps between the head segments. The head 17 will snap through the eye 16 and will then expand to its normal diameter, overhanging the outer face of ear 13 as shown in FIG. 4 and thus securing the ears 13, 14 together.

The pivot stud 15 is preferably formed as a molded integral part of ear 14, although, as an alternative, it can be a separate stud or rivet (e.g. of metal) inserted through both of the ears 14, 13.

In squeezing the levers 10 together to establish registration of the pivot elements, the levers 10 and the bight 11 will be flexed to bowed condition in which resilient, spreading-stain preload will be imparted to the body loop. When the squeezing pressure on levers 10 is released, the body loop will expand laterally under this preload, from approximately the flattened oval shape shown in dash lines at F to the expanded oval shape shown in full lines. This expansion causes the end portions of levers 10, converging toward pivot 13—16, to spread to increased angle of convergence, resulting in the engagement of jaws against one another with clamping pressure.

Jaws 12 can be opened by squeezing levers 10 so as to flatten the body loop as at F.

Jaws 12, as shown in FIGS. 1 and 2, may be of alligator type, having teeth 20 as shown in FIG. 3. Alternatively, they may be of a modified alligator type shown at 12' in FIG. 7, having a row of teeth 20 similar to those of FIGS. 1—3 and in addition a longer tooth 21 at the tip of one jaw, arranged to be received between a pair of laterally-spaced teeth 22 on the tip of the other jaw (FIG. 8).

As in FIG. 1, the jaws 12 may be straight on their inner sides as defined by their rows of teeth, or they may be bowed so as to define a flat oval, with the preload pressure being concentrated at their contacting tips, as shown at 12a in FIG. 9.

In using my improved clamping implement the jaws may be readily opened by squeezing the handle levers together. The open jaws can then be placed around a blood vessel or other article and the force released from the handle levers with the result that the jaws will engage and clamp the blood vessel or other article.

It will thus be seen that I have provided an improved clamping implement suitable for use as a hemostatic clamp which is relatively simple and inexpensive to manufacture and therefore can be disposable and which is arranged so that the jaws are biased to normally exert a clamping force upon the article inserted therebetween.

Modifications may be made in the illustrated and described embodiment of my invention without departing from the invention as set forth in the accompanying claim.

I claim:

A clamping implement suitable for use as a hemostatic clamp comprising an elongated unitary loop-shaped body forming a pair of handle levers laterally spaced from each other at one end and smoothly converging toward each other and integrally connected at the other end by an arcuate bight portion, said levers terminating at the one end in a pair of confronting jaws including an inner complementary serrated portion adapted to grip tissue therebetween when the jaws close upon themselves, interengageable shoulder portions including ears of complementary design formed on the levers in the region adjacent

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the respective jaws to form a pivot interconnecting the levers, one of said ears having an aperture, the other ear being formed with integral segmental pivot pin means, said pin having an enlarged segmental head larger than said aperture when in normal position but smaller than said aperture when said segmental pin and head are compressed together, said loop-shaped body being made of resilient flexible material so that said pivoted levers are preloaded and normally placed in spreading tension such as to cause said jaws to press toward one another for gripping said tissue whereby the jaws may be opened by shifting the handle levers toward each other.

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