

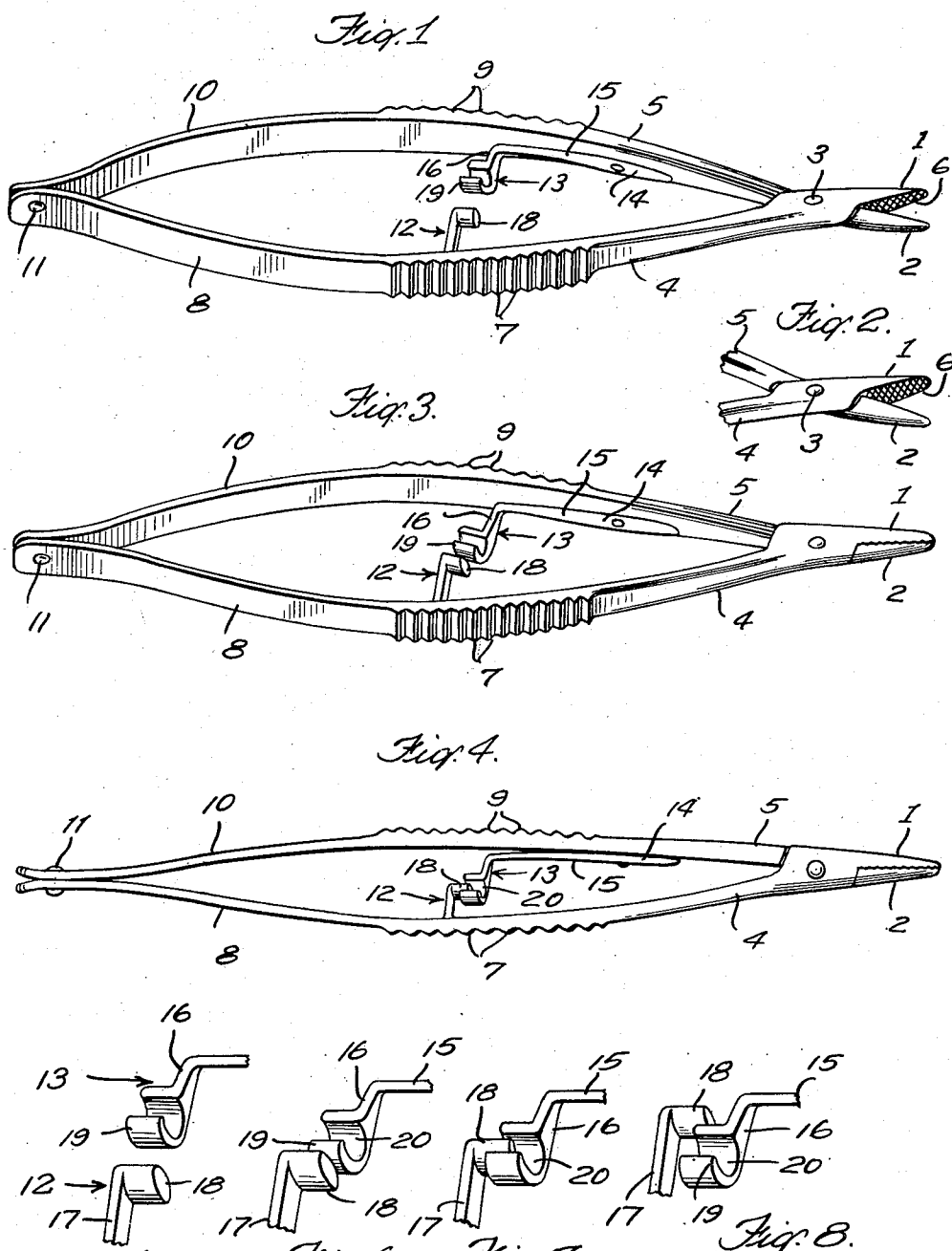
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R. CASTROVIEJO

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NEEDLE HOLDER

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Inventor
RAMON CASTROVIEJO

By *George T. Gill*
Attorney

UNITED STATES PATENT OFFICE

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NEEDLE HOLDER

Ramon Castroviejo, New York, N. Y.

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The invention herein disclosed relates to a surgical needle holder. More particularly, the invention relates to a needle holder that is especially suitable for ophthalmic surgeons.

In intraocular operations, such, for example, as in transplanting a cornea, certain surgeons desire a needle holder with a lock or catch which, when the needle holder grasps the needle, locks in the needle-holding position. This it is claimed, by such surgeons, eliminates tension of the fingers and hands during manipulation of the needle. Other surgeons do not desire such a lock as they maintain it is objectionable, particularly in certain delicate manipulations of the needle during intraocular operations.

By the invention herein disclosed, there is provided a needle holder that may or may not be locked in needle-holding position and thus provides the advantages of having a locked, needle holder or an unlocked, needle holder as the particular surgeon and particular manipulation requires. In addition, the invention provides a needle holder which upon a certain pressure firmly grasps, without locking a needle or a suture, upon further pressure locks on the needle or suture, and upon additional pressure releases the needle or suture. The instrument may be rotated in the fingers or comfortably held in the hand of the surgeon, either as a pencil (for finger manipulation) or as a fork (for wrist manipulation).

In accordance with the invention, there is provided an instrument of the kind mentioned which includes substantially rigid, pivoted, needle-holding jaws. Actuating extensions extend from the jaws on the opposite side of the pivot. The actuating extensions are biased toward the open position of the jaws, and a latch is provided for latching the extensions in the closed position of the jaws. The latch is arranged such that the jaws may be closed without the engagement of the latch. Thus, the needle holder may be manipulated with or without latching the jaws in the needle-holding position.

A needle holder constituting one embodiment of the invention is disclosed in the accompanying drawings and described in detail below, from which description a clearer understanding of the invention may be had.

The drawings include:

Fig. 1 which is an isometric view of the needle holder with the jaws in open or released position;

Fig. 2 which is an enlarged isometric view of the jaws showing the knurling on the needle-engaging surface;

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Fig. 3 which is an isometric view similar to Fig. 1 showing the jaws closed, in needle-gripping position but without the latch being engaged;

Fig. 4 which is a side elevation of the same with the jaws latched in needle-gripping position; and

Figs. 5, 6, 7 and 8 which are fragmentary, isometric views showing the latching elements, respectively, in the separated position, in contact, in latching relation, and released.

The needle holder illustrated in the drawings primarily includes a pair of opposed needle-gripping jaws 1 and 2, pivotally secured together by a pivot 3, and actuating extensions 4 and 5 that are manipulated by the fingers to close and open the jaws. The needle-gripping jaws are substantially rigid, relatively narrow, have a smooth outer surface, and are tapered toward the free end thereof. Desirably, the gripping surfaces of the jaws are knurled as indicated at 6 in Fig. 2.

The actuating extensions 4 and 5 are identical, the actuating extension 4 being formed integral with the needle-gripping jaw 1 and the extension 5 being formed integral with the jaw 2. These extensions extend from the jaws on the opposite side of the pivot so that when they are moved toward each other the jaws are closed. The actuating extension 4 gradually widens from the pivot point to provide a relatively wide, flat section 7 that may desirably be serrated as indicated. From the section 7, there extends a thin, resilient, curved, spring section 8. In like manner, the actuating extension 5 is provided with a flat section 9 and a thin, curved, spring section 10. The spring sections 8 and 10 are bent toward each other and united at their ends by a rivet 11. These spring sections, thus united, form, in effect, a bow spring which biases the actuating extensions to the separated position in which the jaws 1 and 2 are spaced apart. The flat, serrated sections 7 and 9 of the actuating extensions are provided so that the instrument may be conveniently held and manipulated by the surgeon.

Between the actuating extensions, there is a latch that may be used to latch the needle holder in needle-gripping position. The latch includes two cooperating, latching elements 12 and 13 secured respectively to the inner surfaces of the actuating extensions 4 and 5. The latching element 13 is desirably constructed from a single piece of metal and includes a section 14 that is secured to the actuating element 5, a resilient section 15 extending longitudinally of the actuating element, and a lateral latching section 16, extending toward the actuating element 4. Arranged to cooperate with the latching section 16 of the latching element 13 is the latching element

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12 which consists of a rigid post 17 extending perpendicular to the inner surface of the actuating extension 4 and an integral, laterally extending lug or detent 18.

The latching section 16 of the element 13 includes an end section 19 extending longitudinally of the actuating member and having a detent-receiving groove 20 therein. The lower wall of the groove 20 is slightly hook-shaped, extending toward and inclined to the plane of the actuating extension 5, and the outer surface is curved. Cam shaped surfaces are provided on opposite sides of the lug or detent 18 of the latching element 12. In end elevation, the lug 18 appears elliptical, with the major axis thereof inclined toward the plane of the actuating extension 4. The relation of the latching elements is shown in Figs. 5, 6, 7 and 8. In Fig. 5, the latching elements are shown separated; Fig. 6 shows the elements in contact. As the actuating elements are moved close together, the engaging surface of the lug 18 acts as a cam and moves the latching section 16 of the latching element 14 laterally, against the action of the spring section 15. As the edge of the lug 18 reaches the opening to the groove 20, the spring or resilient section 15 of the latching element 14 returns the latching section 16 so that (Fig. 7) the lug 18 enters the groove and the actuating extensions are locked with the jaws in closed, or needle-gripping, position.

To release the latch, the actuating extensions are further pressed toward each other. When this is done, the surface of the lug 18, again acting as a cam and engaging the inner surface of the wall of the groove, again moves the section 16 of the latching element 14 against the action of the resilient section. As the edge of the lug 18 passes the section 15, the section is returned so that the lug extends over the edge of the section 16 (Fig. 8). When in this position, pressure on the actuating extensions is released and the lug passes the section 16 on the side opposite the opening to the groove 20.

The latching elements are so arranged in relation to each other that the jaws 1 and 2 are brought firmly in contact (Fig. 3) before the latch becomes effective. This condition, in the instruments produced, is effected upon slight pressure on the actuating extensions. In this position, the needle holder should hold well an 8-0 silk, thus permitting tying sutures without having to lock the holder. The resiliency of the actuating extensions permits further movement thereof to bring the latch into effect, and to release the latch as above described.

From the foregoing description of the embodiment of the invention, it will be apparent to those skilled in the art of intraocular operations that by this invention there is provided a needle holder that may be used with or without the jaws locked in needle-gripping position; that is simple in construction and reliable in use; that is a streamlined, i. e. has no protruding parts on which sutures may be caught; that is narrow enough so that it may be rotated in the fingers

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and yet of proper size so that it may be comfortably held in the hand and rotated from the wrist; and that eliminates tension on the fingers and hands during manipulation.

It will be obvious that various changes may be made by those skilled in the art in the embodiment of the invention illustrated in the drawings and described above within the principle and scope of the invention as expressed in the appended claims.

I claim:

1. A needle holder of the kind described comprising in combination a pair of opposed, pivoted, needle-gripping jaws, resilient actuating extensions extending from the jaws on the opposite side of the pivot, united at their ends and biased toward the open position of the jaws, a latch between the actuating extensions for latching the extensions in the closed position of the jaws including a latching element secured to one of said actuating extensions and having a slot therein, another latching element secured to the other of said actuating extensions and having a lateral projection thereon with opposite cam faces, one of said elements being resiliently mounted and biased toward latching position, and said elements being positioned such that the jaws are closed before the latch becomes effective.

2. A surgical needle holder of the kind described comprising in combination a pair of opposed, pivoted, needle-gripping jaws, an actuating extension extending from each of the jaws on the opposite side of the pivot, resilient sections extending from the actuating extensions and biasing the jaws away from each other, and a latch between the actuating extensions for latching the jaws in contact, the latch including a latching element secured to one of said actuating extensions and having a slot therein and another latching element secured to the other of said actuating extensions and having a projection thereon engageable in the slot in said first mentioned latching element and opposite cam faces, whereby upon movement of the actuating extensions in a direction to bring the needle-gripping jaws together the projection thereon is positioned to enter the slot in said first mentioned latching element and upon further movement thereof in the same direction the projection thereon is released from the slot and engages the opposite side of the first mentioned latching element so as to be released upon release of the pressure on the actuating extensions.

RAMON CASTROVIEJO.

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