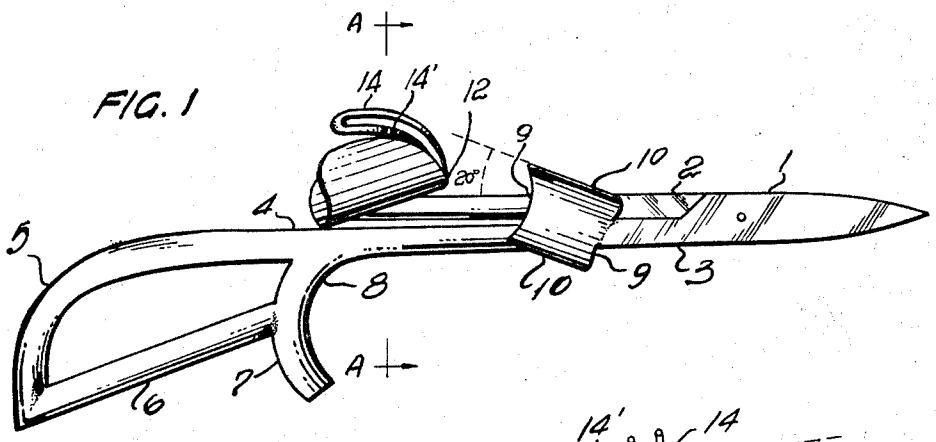
Oct. 29, 1968 P. D. CURUTCHET 3,407,816

SURGICAL INSTRUMENT HANDLE

Filed Feb. 16, 1966

FIG. 1



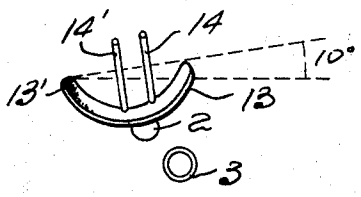


FIG. 2

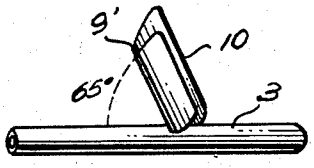


FIG. 3

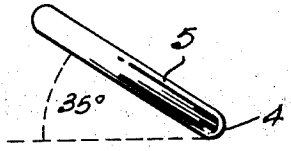
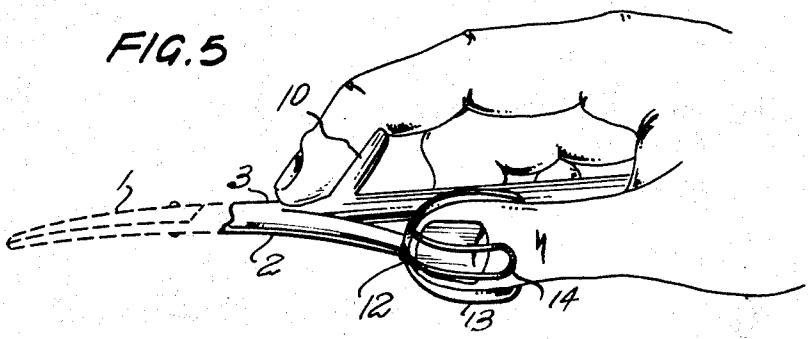


FIG. 4

FIG. 5



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3,407,816

SURGICAL INSTRUMENT HANDLE

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This invention relates to instruments of the pivoted type having two crossed members with handles, one handle fitting in the hand and the other being actuated by the user's thumb.

The handle of this invention is "aximanual," i.e., it is constructed to be held in the direction of the axis of the hand, and is the result of the functional study of the instrument handles made by the applicant, the progress in agility, power and reliability of which can, of course, only be verified by the use thereof.

Surgical instruments have been and are "cross-manual," i.e., with handles designed to be held across the hand. From a surgical point of view, this position is false, as can be shown in the technical and historical aspects. Technically, the operation thereof requires a forced bending of the wrist which becomes greater as the depth of the operating zone increases. Surgical instruments of the ring type are cross-manual because they derive from the cross-manual prehistoric pincers.

According to history itself, the handles of the pincers, or the forceps derived therefrom, were first bent outwardly during the ninth century. The bend was progressively made sharper until four centuries later it was closed into a ring. Actually, forceps (improved pincers) having curved handles were used long before the Christian era. In the museum of Epidaurus, close to the site where the legendary temple of Aesculapius was located, there is a pair of forceps for extracting foreign bodies from war wounds, which has bent handles. The idea was not born in the ninth century.

The most important fact is that the aforesaid bends first and the rings later, were formed following the same cross-manual plane as the primitive blacksmiths' pincers, the aim being, of course, the possibility of a greater agility in operating the pincers with the use of the fingers.

It will be readily understood, therefore, that my aximanual concept will involve a revision of the operating instruments and techniques, since the change from cross-manual to aximanual handling of the instruments will bring about a more efficient way of performing an operation.

For example, the ordinary dissecting instrument restricts the use of the left hand to holding the anatomical element which the right hand dissects or sutures. Blocked by the ancient cross-manual instrument, the left hand is not given the possibility of exercising all of its operating capacity but is prevented from accompanying the right hand as it could.

Besides being aximanual, the surgical instrument handle of this invention is simple in construction and results in a reliable and powerful instrument. An important component thereof is a short curved tube adapted to be engaged by the middle finger. Unlike the ring instruments, only one of the handles is moved during operation, and this is done by the thumb engaging a "capsule" or thumb-piece. Finally, the handle is provided with a "capsule" or finger-piece intended to be engaged by the forefinger and which may be termed "universal" since it is applicable not only to pivoted instruments but also to the surgical knife.

In order that the invention may be more clearly understood and readily carried into practise, a preferred embodiment thereof has been illustrated by way of example in the accompanying drawings, in which:

FIG. 1 is a side view of a surgical instrument handle in accordance with the present invention, as applied to surgical scissors;

FIG. 2 is a sectional view of the thumb capsule, taken along lines A—A in FIG. 1;

FIG. 3 is a side view of a portion of the handle carrying the "universal" capsule or finger-piece.

FIG. 4 is a rear view of the instrument handle; and

FIG. 5 is a perspective view of the instrument, showing the manner in which it is held during operation.

The description of blades and pivoting of the scissors **1** will be omitted not only because they form no part of the present invention but also they are shown by way of example and could equally well be substituted by the jaws of a needle holder, the blade of a surgical knife or the blade of a separator.

The handle of this invention can be considered alone, as in a "Gothic" surgical separator or knife, or combined with a further pivoted member as in needle-holders or scissors.

Inasmuch as scissors have been illustrated as an example of one of the applications of the invention, the reference numeral **2** indicates the upper arm or member terminating in a thumb capsule. The lower arm or member **3** extends into the handle of this invention.

The handle with universal "capsule" comprises three rods or tubes, namely, an elongated tube **4** the rear end **5** of which is curved to about a quarter of a circle, with an external radius of about 30 to 40 millimeters, adapted to fit anatomically in the palmar concavity; a shorter straight tube **6**, and a third tube **7** which transversely closes the window formed in the handle on being fixed to the front end of the tube **6** and to the straight portion of the tube **4**. The upper portion **8** of said tube **7** is curved, the lower portion, which is also curved, projecting from the contour of the handle. The projecting portion of the tube **7** forms with the longer tube **4** a forwardly open angle of about 100 to 85 degrees. This cross tube **7** is adapted to be engaged by the middle finder in order to provide a strong and safe hold of the instrument, as shown in FIG. 5.

The universal "capsule" or finger-piece comprises a quadrangular concave plate having a lower edge **9** fixed to the instrdument arm **3**, a free upper concave edge **9'** raised from the tube **4**, and a pair of straight side edges **10** and **10'**. The capsule is transversely concave in order to favor the retention of the tip of the forefinger. The longitudinal axis of this capsule is oblique and forms with the arm **3** a rearwardly open angle of about 60 to 70 degrees.

The major plane of the handle is rotated about its axis, which is the tube **4**, and consequently forms with the major plane of the instrument, as seen in a plan view, an inwardly open angle of about 30 to 40 degrees, as shown in FIG. 4.

The thumb capsule is formed by a triangular concave plate having a rear base **11** and a front apex **12**. The side faces **13**, **13'** extend the concavity upwardly for a better engagement with the thumb. Extending from the rear portion of the apex **12** are two parallel curved wires **14**, **14'** which are rearwardly directed and curved towards each other so as to become joined together. In this manner, with the back of the nail the thumb can push these wires upwards and with a slight movement it will raise the capsule, thus opening the cutting blades of the scissors. The thumb capsule forms with the arm **2**, to the end of which it is welded, a forwardly opening acute angle of from about 10° to 0°.

As shown in FIG. 2, the thumb capsule is inwardly rotated at an angle of rotation of from 0° to 10°. The mean sagittal plane of the capsule may be parallel to the plane of the instrument arms or form an angle of from 0° to 10° therewith.

While a specific embodiment of the invention has been described and illustrated, it should be understood that many changes, and/or modifications in the shape and details thereof may be made without departing from the principle of the invention. A modification of the thumb capsule would only affect the "Gothic" pivoted instruments, but inasmuch as the "Gothic" instruments are characterized by having an ogival handle, the modifications of such handle is applicable to each and all of the instruments of this type, from the illustrated scissors to the separator or knife. The fact that the thumb has to be moved in the pivoted instruments does not affect the static position of the fingers as shown in FIG. 5. Also, by reversing the position of the elements thereof, the same handle will be useful for the left hand. Finally, handle portions **4**, **5**, **6** and **7** may constitute an integral unit.

What is claimed is:

1. An aximanual handle for a surgical instrument having an active element, which comprises first, second and third rod member sections circumscribing together an irregular window, said first section extending rearwardly from said active element and having a rear anatomical convexity adapted to fit in the palmar concavity, said second section providing a straight edge adapted to be engaged by the ring and little fingers, and said third section having one end joined to said first section, an intermediate portion joined to said second section and a free end portion projecting from the contour of the handle, said third section having a concavity adapted to be engaged by the middle finger; said first section carrying a forwardly concave finger-piece fixed thereto at a position beyond said handle window, the anteroposterior axis of said finger-piece being oblique relative to said first section, forming therewith a rearwardly opening angle of about 60° to 70°:

2. An aximanual handle for a surgical instrument as claimed in claim **1**, wherein said rod member is cylindrical.

3. An aximanual handle for a surgical instrument as claimed in claim **1**, wherein said rod member is a tubular member.

4. An aximanual handle for a surgical instrument as claimed in claim **1**, wherein said rear anatomical convexity of said first section has an exterior radius of about 30 to 40 millimeters.

5. An aximanual handle for a surgical instrument as claimed in claim **1**, wherein said handle is turned about its longitudinal axis at an angle of about 30° to 40° with the horizontal plane.

6. An aximanual handle for a surgical instrument having a pair of active elements pivoted together, which comprises first, second and third rod member sections circumscribing together an irregular window, said first section extending rearwardly from one of said active elements and having a rear anatomical convexity adapted to fit in the palmar concavity, said second section providing a straight edge adapted to be engaged by the ring and little fingers, and said third section having one end joined to said first section, an intermediate portion joined to said second section and a free end section projecting from the contour of the handle, said third section having a concavity adapted to be engaged by the middle finger; said first section carrying a forwardly concave finger-piece fixed thereto at a position beyond said handle window, adapted to be engaged by the tip of the forefinger, the anteroposterior axis of said finger-piece being oblique relative to said first rod section, forming therewith a rearwardly opening angle of about 60° to 70°; an arm extending rearwardly from the other of said active elements, and a thumb capsule fixed to said arm and comprising a plate having a concave thumb-engaging surface and means opposite said surface for retaining the thumb tip thereon, whereby the movement of the thumb tip will cause a corresponding movement of said other active element.

7. An aximanual handle for a surgical instrument as claimed in claim 6, wherein said rod member is cylindrical.

8. An aximanual handle for a surgical instrument as claimed in claim **6**, wherein said rod member is a tubular member.

9. An aximanual handle for a surgical instrument as claimed in claim **6**, wherein said rear anatomical convexity of said first section has an exterior radius of about 30 to 40 millimeters.

10. An aximanual handle for a surgical instrument as claimed in claim **6**, wherein said handle extending from said one active element is turned about its longitudinal axis at an angle of about 30° to 40° with the horizontal plane.

11. An aximanual handle for a surgical instrument as claimed in claim **6**, wherein the sagittal plane of said thumb capsule is parallel to the plane of the instrument arms.

12. An aximanual handle for a surgical instrument as claimed in claim **6**, wherein the sagittal plane of said thumb capsule is positioned at an angle of up to 10° with respect to the plane of said instrument arms.

13. An aximanual handle for a surgical instrument as claimed in claim **6**, wherein said thumb tip retaining means comprises a bent wire fixed to said plate.

14. An aximanual handle for a surgical instrument as claimed in claim **6**, wherein said thumb capsule is turned inwardly about its anteroposterior axis to an angle of rotation of about 5° to 10°, the lower end of said capsule forming an angle of about 3° to about 10° with the respective instrument arm.

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LAWRENCE W. TRAPP, *Primary Examiner.*