

[54] **SURGICAL INSTRUMENT WITH TRUNNIONED HINGE MEANS**

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Related U.S. Application Data

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[58] Field of Search.....24/248 R, 249 PR, 284 R;
128/305, 346

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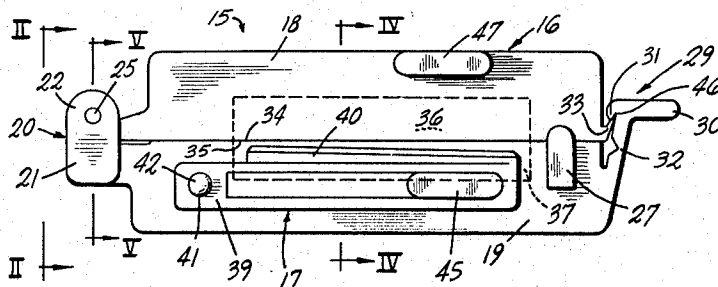
Primary Examiner—Channing L. Pace

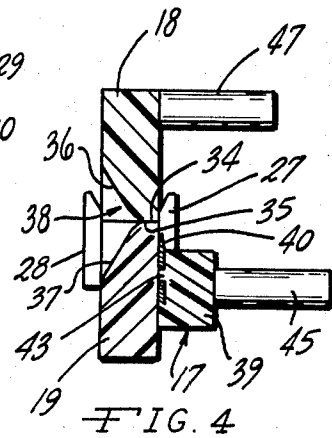
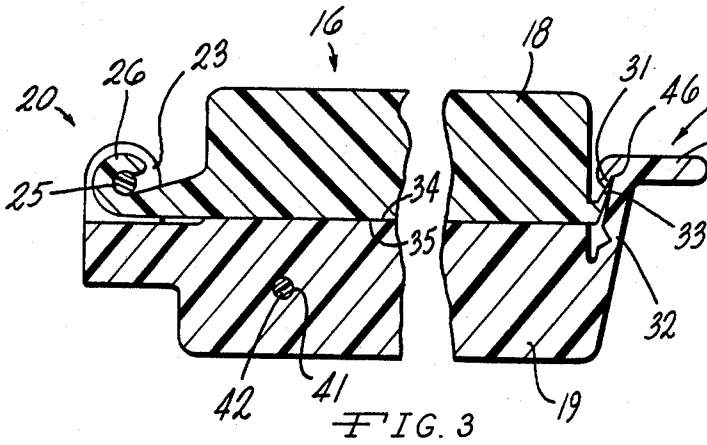
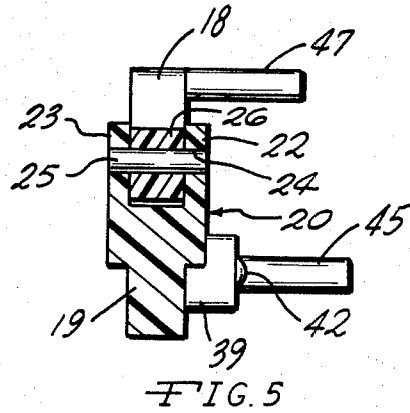
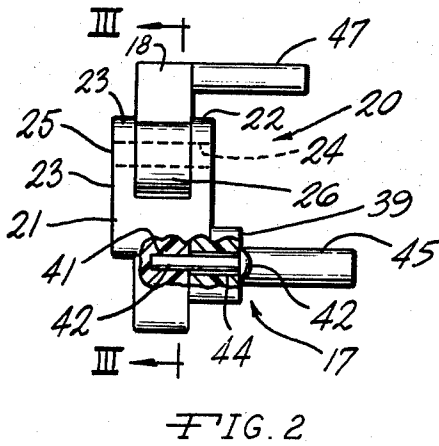
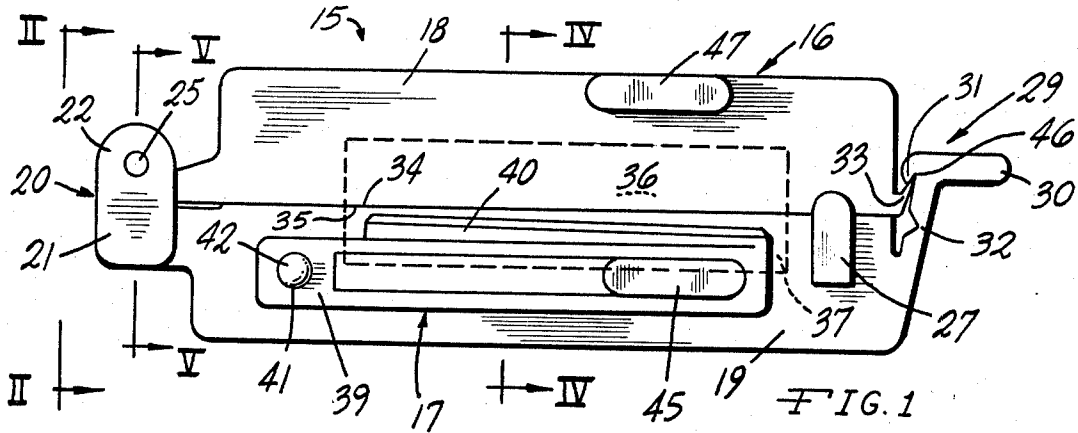
Attorney—Roy A. Plant

[57] **ABSTRACT**

A surgical instrument is provided particularly suited for use in circumcision operations comprising a clamping and holding member adapted to be readily formed of molded plastic material and especially constructed for use in circumcision operations involving the use of conventional hospital instruments such as a probe, scalpel, hemostat, and the clamping and holding member comprising side members pivotally connected at their ends by a novel trunnioned hinge joint. In a preferred form the instrument includes in combination with the clamping and holding member a cutting member pivotally mounted on the clamping and holding member and guided in cooperative operating position, and which instrument is sufficiently inexpensive so that it can be discarded after the end of the operation thereby obviating the need of sterilization for reuse.

2 Claims, 5 Drawing Figures





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SURGICAL INSTRUMENT WITH TRUNNIONED HINGE MEANS

This application is a continuation-in-part of the application Ser. No. 19,329 being filed concurrently herewith entitled "Improved Surgical Instrument," which in turn is a continuation-in-part of copending application Ser. No. 780,463, filed Dec. 2, 1968, now U.S. Pat. No. 3,566,873, dated Mar. 2, 1972, and entitled "Surgical Instrument," all by the present inventor.

The present invention deals broadly with a surgical instrument, and in its more specific phases with a disposable circumcision apparatus which may be in the form of a clamping and holding member alone, or in combination with a cutting member cooperatively and pivotally joined common practice is to use surgical scissors to shorten the boy baby's foreskin, a thing which almost invariably causes not only a rough and crude finished job but often leads to bleeding and the need of stitches along the cut edge. A recognition that this was far from an ideal procedure led to the development of the circumcision instrument covered in U.S. Pat. No. 2,212,133 which was and has been up to the present time the most satisfactory instrument devised, although several other non-disposable steel instruments have been proposed. That instrument, however, was expensive to produce and keeping the blade sharp presented problems. The present invention is an improvement on the noted instrument and was devised with a view to solving the noted circumcision problems as well as others which are well known but for which there have been no instruments providing wholly satisfactory commercial solutions wherein the trimming is perfectly smooth and appears when healed, aside from a shortened foreskin and mucosa, to be the same as though no operation had been performed.

SUMMARY OF THE INVENTION

Accordingly, among the objects of the present invention is the provision of a wholly satisfactory, highly simplified, and easy to use circumcision instrument.

Another object is to produce a circumcision instrument which is capable of being manufactured at such a low cost, and easy initial sterilizability, that same can be used once and then discarded.

Another object is to provide a circumcision instrument with a portion which can be clamped shut to crush the foreskin at the desired point and seal the veins and arteries so as to eliminate bleeding and the need of using stitches, while at the same time the cutting portion, which is preferably part of the instrument, is pivotally mounted on the clamping portion, and is adapted to be rotated with respect to the clamping portion and thereby to sever the foreskin along the adjacent surface of the clamping portion at and upward of the crushed area.

A further object of this invention is to provide breakable latch means for the clamping and holding portion so that removing the instrument at the end of the circumcision operation will preferably require breaking this latch and thus destroying the instrument so that for the next circumcision operation a new and thoroughly sterile instrument assembly will be used, thus doing away with cleaning and re-sterilizing of the used instrument assembly, and wherein the blade of a new instrument assembly will always be unused and sharp.

A further object of the invention is to provide guide means to maintain the cutting portion of the instrument at its end remote from its hinge end in proper cutting position relative to the clamping and holding portion.

A further object is to provide an improved hinge assembly for the clamping and holding member.

A further object of this invention is to provide a cutting portion which is mounted on the clamping and holding member by an individual pivot means, and which is provided with handle means for causing the cutting portion to pivot.

A further object of this invention is to provide the members of the clamping and holding portion with beveled jaws cooperating to form a V-shaped trough-like recess for the reception and positioning of the end of the glans penis while

avoiding any injury to same during the foreskin clamping and holding step.

Still further objects and advantages of the invention will appear as the description proceeds.

BRIEF DESCRIPTION OF DRAWING

To the accomplishment of the foregoing and related ends, the invention, then, consists of the surgical instrument hereinafter fully described and particularly pointed out in the claims, the annexed drawing and the following description setting forth in detail certain illustrative embodiments of the invention, such disclosed embodiments illustrating, however, but several of the various ways in which the principle of the invention may be used.

In the annexed drawing:

FIG. 1 shows a top assembly view of an embodiment of the surgical instrument of the present invention in closed position.

FIG. 2 is an end view of the instrument as taken at the line II—II of FIG. 1, with a portion broken away to show the pivot for the knife and looking in the direction of the arrows.

FIG. 3 is a fragmentary cross sectional view of the clamping portion of the apparatus as taken at the line III—III of FIG. 2, looking in the direction of the arrows.

FIG. 4 is a cross sectional view of the apparatus as taken at the line IV—IV of FIG. 1, looking in the direction of the arrows; and

FIG. 5 is a cross sectional view of the apparatus as taken at the line V—V of FIG. 1, looking in the direction of the arrows.

DESCRIPTION OF THE SPECIFIC EMBODIMENTS

Referring more particularly to FIGS. 1-5, inclusive, a preferred embodiment of the surgical instrument 15 is shown comprising a clamping and holding member 16 having a cutting member 17 mounted on top of same.

Clamping member 16, FIG. 3, has a pair of side members 18 and 19 unit joined together by means of hinge member 20. The hinge member 20 is preferably in the form of a trunnion 21, FIG. 2, mounted on side member 19 and having spaced-apart ears 22 and 23. The ears are provided with a cylindrical channel 24 having a hinge pin 25 positioned therein. The side member 18 is provided at its end with a hook 26, FIG. 3, which engages the hinge pin 25.

Guide ears 27 and 28, FIG. 4, are preferably provided at the end distal to hinge member 20 of the side member 19 to receive the side of member 18 to maintain the clamping jaws 34 and 35, FIG. 3, of the side members 18 and 19 in superposed or aligned clamping registry when the side members are closed.

A positive hooking means is provided at the end of the clamping and holding member 16 distal to the hinge member 20 comprising a hook latch member 29 having a finger engaging tab 30, and a hook 31. The hook latch member 29 is recessed to provide a constriction 32 permitting the latch to be broken open by firmly depressing the tab 30. A cooperating latch member 33 is provided at the end of the side member 18 adapted to engage a shallow groove 46 at the base of hook 31, thereby providing a strong positive lock, as shown in FIGS. 1 and 3.

The clamping jaws 34 and 35, FIGS. 3 and 4, of the side members 18 and 19 are provided at their lower engaging surfaces with beveled edges 36 and 37, FIG. 4, to provide a triangular prismatic shaped recess or trough 38 which serves as a guide for protecting and maintaining the end of the glans penis in the proper position during the circumcision operation, as will be hereinafter described.

The cutting member 17, FIG. 1, comprises a cutting side member 39 having a cutting knife 40 mounted thereon by suitable means such as plastic welding or riveting 43, FIG. 4, or a suitable adhesive. The cutting side member 39, FIG. 1, is pivotally mounted at one end on the side member 19 by means of a pivot pin 42, shown in FIGS. 1 and 3, journaled through a close fitting passageway 44 in the cutting side member 39 and

press-fitted into a passageway 41 in the side member 19. The other end of the cutting side member 39 is provided with a finger grip member or tab 45 for manipulating the cutting member during the operating process. To facilitate safely operating the cutting member 17, it is preferable to use a projecting tab 47 on the top of side member 18, FIG. 1, so that the surgeon can grasp tabs 45 and 47 and by pinching the two move cutting member 17 toward tab 47 in carrying out the circumcision operation, and at the same time tab 47 will act as a stop for cutting knife 40 and protect the surgeon from cutting his fingers due to the knife moving too far over side member 18. Members 18 and 19 may be provided with supporting feet (not shown) as illustrated in the copending continuation-in-part application concurrently filed herewith, to facilitate grasping the instrument under conditions of use.

OPERATION OF THE CIRCUMCISION INSTRUMENT

A disposable paper draping kit (not shown) including an outside protective wrapper is preferably used, with this outside wrapper used to drape the instrument table (not shown) with the sterile inside face of same up. Inside the draping kit is a first sterile sheet (not shown) which is used to drape the baby receiving table (not shown). The baby boy is placed back down on this sheet and is held on the table by the nurse who lightly keeps her elbows on the baby's shoulders with the baby's head between them. Her hands hold the baby's legs down and spread so that the operator can readily perform the circumcision procedure. The hospital circulating nurse adds the "preparation" solution to the disposable medicine cup (not shown), which is part of the draping kit components along with the circumcision instrument. She also supplies the necessary sterilized hospital instruments to the instrument table, namely a probe, a hemostat, and scissors; optionally there may be tissue forceps, and a needle holder, as well as a suture and needle.

The operator then prepares the baby's penis with the sterile solution and drapes the baby using a second sterile circumcision sheet (not shown) having a suitable hole, through which the penis is passed, and the baby is then ready for the actual circumcision operation which is carried on as follows: The operator grasps the penis and with the probe separates the excess prepuce from the glans penis. If necessary, a small dorsal slit is made in the foreskin anteriorly in order to facilitate the separation from the glans and pushing it back over the corona. After this has been done, the foreskin is returned to its previous extended position. A light is preferably used behind the penis so as to reflect the shadow of the glans penis in the foreskin. The foreskin is then grasped at right angles to the penis with a hemostat (not shown) and stretched anteriorly. With the foreskin thus stretched the clamping member 16 is applied with the glans penis fitting into the trough-like recess 38. The side members 18 and 19 are then pushed together until the clamping means comprising latching members 31 and 33 are hooked. The trough-like recess 38 during this process pockets and prevents injury to the glans penis. Subsequently the cutting member 17 is pivoted by means of the finger grip member 45 until the knife passes the juncture of clamping jaws 34 and 35, thereby severing the excess foreskin without injuring the glans penis which safely fits into the recess 38, FIG. 4. After about a minute the clamping member 16 is released, preferably by breaking off the hook latch member 29 at the weakening constriction 32, whereupon the whole surgical instrument assembly 15 is free to be discarded.

In carrying out this procedure the skin, mucous membrane, and all blood vessels of the foreskin over the glans penis have been sealed together by the crushing action of the clamping member, with resultant sealing preventing bleeding. The sealed edge foreskin, after the circumcision instrument has been removed, is then pushed back over the corona by using the index finger and thumb of both hands. It is held in this position for a moment until the mucous membrane swells slightly causing the foreskin to remain in this position.

Whether a circumcision dressing is applied, or a small piece of gauze is placed on the penis on which baciguent, or other sterile ointment, has been applied, is optional. Actually no dressing is required as there is very little, or no, bleeding. However, ointment is desirably used since it prevents the cut edge of the foreskin and the glans penis from adhering to the baby's diaper. Stitches are seldom necessary, and the entire procedure normally takes less than 3 minutes and all materials are disposable except for the sterilizable instruments which have been supplied by the hospital.

By omitting cutting member 17, the clamping and holding member of the present surgical instrument assembly constitutes a marked improvement over previous commercially used devices of the circumcision type in that it utilizes positive hooking of the clamp, provides substantially bloodless operation, is relatively inexpensive, disposable, and permits use of the conventional re-sterilizable hospital scalpel.

Although a large variety of materials may be utilized to fabricate the surgical instrument assembly of the present invention, moldable plastic materials which have the desired strength, impact resistance, dimensional stability and toughness are preferred. The blade utilized for the cutting member may be formed of any suitable material such as surgical steel. Commercial razor blades of the structure shown in the drawing may also be utilized and are entirely satisfactory. They may be affixed to the cutting member by suitable means such as by metal or plastic rivets, plastic welding, or by a suitable heat and cold stable adhesive.

The surgical instrument of the present invention utilizing the improved trunnioned hinge means for pivotally connecting the ends of the side members offers several advantages over related structures. First, the structure provides a very strong hinge which maintains the side members in proper relation to each other, permitting free pivotal motion while preventing any type of twisting or turning which would take the side members out of crushing alignment with each other. Second, the structure permits the two side members to be fabricated individually and to be readily assembled. In the embodiment shown in the drawing and particularly in FIG. 3 the hook 26 and pin 25 are engageable or disengageable in the extended position or when the side members 18 and 19 are positioned at an angle of about 180° to each other. When the side members are pivoted to an angle somewhat less than 180° the hook is engaged and retained by the trunnion structure. Assembly is accomplished by placing the two side members in completely extended position with the end of the hook 26 resting on the side member 19 forward of the hinge pin 25. The two members are then moved in opposite directions until the hook 26 engages the pin. The side member 18 is then swung upward and over the side member 19, in which position the hook 26 is positively retained by the pin 25. Alternatively, a closed loop may be utilized, assembly being accomplished by removal and reinsertion of the hinge pin 25.

While but two forms of the invention have been shown and described, other forms within the spirit and scope of the invention will now be apparent to those skilled in the art. Therefore, the embodiments shown in the drawings are to be considered as merely setting forth the surgical instrument invention for illustrative purposes, and are not intended to limit the scope of the invention herein described, shown and claimed. It is further to be noted that while directional terms have been used, same are not to be construed as a limitation of the invention since such use has been availed of to better describe the invention as used and illustrated in the drawings.

Other modes of applying the principle of my invention may be employed, instead of those explained, change being made as regards the circumcision instrument herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means and features be employed.

I therefore particularly point out and distinctly claim as my invention:

1. A surgical instrument for use in the conducting of circumcision operations, which comprises a clamping member

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having two arms and hinge means pivotally connecting said arms, said arms having complementary clamping faces longitudinally abutting each other when said arms are in the clamped position, said hinge means comprising a trunnion mounted on the end of one arm having laterally spaced-apart ears extending transversely with respect to said arm and a transverse hinge pin supported between said ears, and means provided at the end of said other arm pivotally engaging said hinge pin, latch means provided at the ends of said arms distal from said hinge means for locking said arms together with said clamping faces in engagement, and a cutting member pivotally mounted on said clamping member, the structure being so arranged that said clamping faces may be first clamped together

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and locked about the foreskin to be operated upon, clamping force being provided at one end of said clamping member by engagement of said latch means and at the other end by engagement between said hinge pin and the means at the end of the other arm engaging said hinge pin, and said cutting member subsequently operated to cut said foreskin, the pivot for said cutting member being mounted on one of said arms and being parallel to said hinge pin but spaced laterally from same.

2. A surgical instrument according to claim 1, wherein said cutting member pivot is mounted on said trunnion carrying arm.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,669,115 Dated June 13, 1972

Inventor(s) Frederick J. Melges

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 8, for "1972" read --1971--; line 14, after "joined" insert --to same. In carrying out circumcision operations the--.

Signed and sealed this 29th day of May 1973.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents