Sept. 14, 1954 J. T. LIVOTI 2,688,969

COMBINED CRUSHING AND CUTTING UNITARY CIRCUMCISION APPLIANCE

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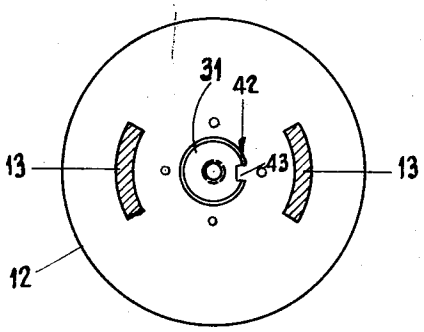


FIG.2

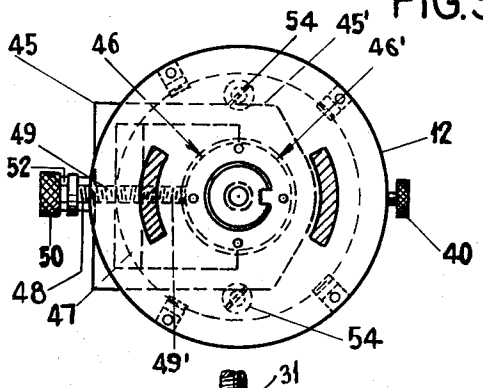


FIG.3

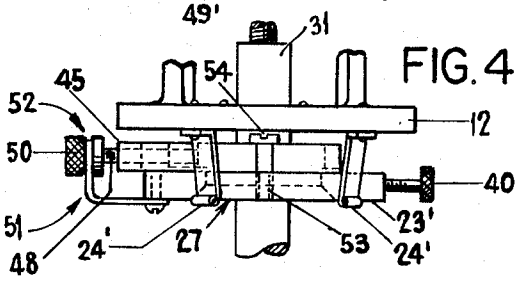


FIG.4

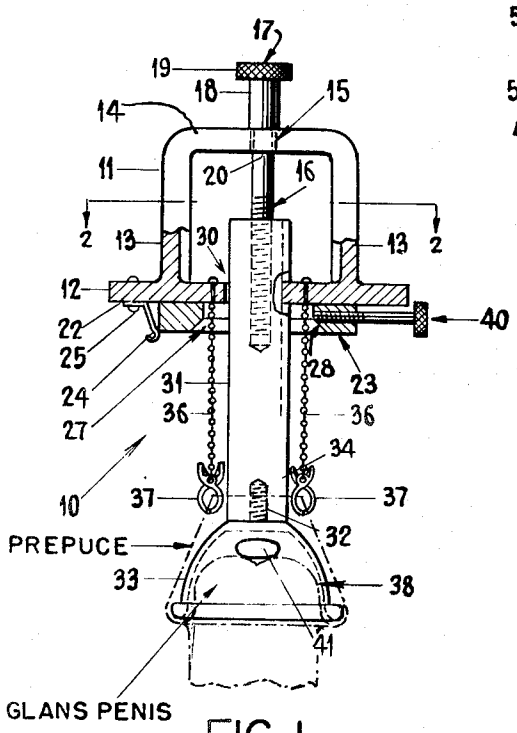


FIG. 1

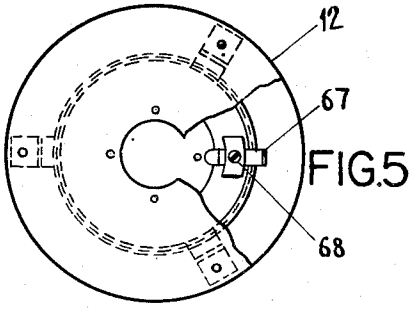


FIG.5

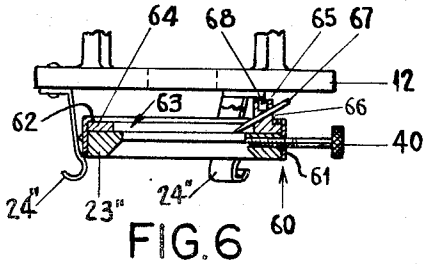


FIG.6

JOSEPH T. LIVOTI
INVENTOR

BY Joseph V. Blaeker

ATTORNEY

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COMBINED CRUSHING AND CUTTING UNITARY CIRCUMCISION APPLIANCE

Joseph T. Livoti, Brooklyn, N. Y.

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3 Claims. (Cl. 128—305)

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This invention relates to surgical instruments and more particularly to a combined crushing and cutting unitary circumcision appliance.

An object of this invention is to provide an instrument for circumferentially clamping the prepuce by exerting a crushing action so that there will be no loss of blood, and to provide a duplex semi-circular knife whereby a neat incision can easily be made.

Another object of this invention is to provide an instrument which not only insures a bloodless operation but also serves to hold the foreskin in fixed circular position to facilitate the cutting operation by a duplex set of semi-circular knives slidably mounted on the clamping portion of the instrument.

Another object of this invention is to mount the duplex knife on the clamping and crushing portion of the device and to use such clamping portion as a cutting guide for the duplex knife so that the prepuce may be cut off flush with the upper surface of the clamping and crushing device.

Another object of this invention is to provide a modified rotary knife mounted on the upper surface of the skin crushing ring and arranged in a manner that the user may rotate this knife around a complete circumference and cut the prepuce flush with the upper surface of the skin crushing ring **23** with precision.

In the use of prior art circumcision devices, it is customary to use a scalpel or the like with which the prepuce is manually cut off flush with the upper surface of a clamping ring, the quality of the cutting operation depending upon the manual skill of the practitioner, no two practitioners having the same mechanical skill.

I propose to provide an instrument whereby a portion of the prepuce or fore-skin is crushed so as to prevent bleeding. The crushing element in my instrument supports a movable knife which may be moved to cut the prepuce by circumscribing cutting means or by cutting means movable around the crushed portion of the prepuce and so that bleeding is avoided after the completed circumcision operation.

With the above and other objects in view, the invention will be hereinafter more particularly described, and the combination and arrangement of parts will be shown in the accompanying drawings and pointed out in the claims which form part of this specification.

Reference will now be had to the drawings, wherein like numerals of reference designate corresponding parts throughout the several views, in which:

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Figure 1 is a front elevation, partly broken away and in cross-section, and on a greatly enlarged scale, showing the appliance assembled.

Figure 2 is a cross-sectional view taken on line 2—2 in Figure 1.

Figure 3 is a cross-sectional plan view similar to that shown in Figure 2, but showing combined skin crushing and slidable cutting mechanism supported below a housing.

Figure 4 is a front elevation partly broken away and in cross-section, of the combined mechanism shown in Figure 3.

Figure 5 is a cross-sectional plan view similar to that shown in Figure 3 and showing a modified combined mechanism having a form of rotary knife.

Figure 6 is a central cross-sectional view of the mechanism shown in Figure 5.

In the illustrated embodiment of the invention, the numeral **10** indicates a combined crushing and cutting unitary circumcision appliance, comprising a housing **11** having a circular plate portion **12** from which extend two upright arms **13** which are joined together by a lateral connecting member **14**, and forming an inverted U-shaped upper portion.

In the connecting member **14** is a clearance aperture **15** serving to receive the threaded body portion **16** of a screw **17**. The screw **17** has an enlarged collar **18** and a head **19**. The collar **18** rests upon the connecting member **14**. A pin **20** passing through the threaded body portion **16** is positioned at the lower surface of the connecting member **14**. The screw **17** is rotatably mounted in the connecting member **14**.

Mounted in contacting relation with the lower surface **22** of the housing **11** is a skin crushing ring **23** which has a circumference considerably smaller than the circumference of the lower plate portion **12** of the housing. A plurality of springs **24** are secured to the lower surface of the plate **12** by screws **25**. The free end lower portions of the springs **24** are slightly curved and are angularly positioned so that the curved portions engage the lower edge of the skin crushing ring and thus support the skin crushing ring below the plate **12** of the housing.

It will be noted that the skin crushing ring **23** has a circular aperture **27** which tapers upwardly at its lower portion. The aperture **27** terminates at its upper end in a blunt skin crushing surface **28**.

An aperture **30** in the plate **12** allows passage

for a rod 31 slidably mounted therein. The upper portion of the rod 31 is threaded to permit the threaded body portion 16 of the screw 17 to be threaded therein. The lower portion of the rod 31 is threaded, the thread 32 serving to secure a hollow bell-shaped body 33 against the said lower surface. The body 33 has a threaded extension 34 threadably mounted in the thread 32. It will be noted that by rotating the head 19 of the screw 17, that the rod 31 may be moved downwardly or upwardly with respect to the housing 11.

Suitably secured to the plate 12 of the housing 11 is a plurality of flexible elongated members 36 preferably of ball type chain. The flexible members 36 depend from the plate and have spring actuated skin clamps 37 extending downwardly at their lower ends. The flexible members 36 are of a length to lower the skin clamps 37 to the upper surface of the hollow bell-shaped body 33.

The prepuce is adapted to be fitted over the outside of the bell-shaped body 33. The skin clamps 37 are manually operable for retaining the prepuce over the bell-shaped body 33.

In operation, the cupped portion 38 of the bell-shaped body 33 is placed over the glans penis. The prepuce is gripped by the skin clamps 37 and by adjusting the screw 17 is securely retained in position. The prepuce is clamped with a skin crushing pressure between the internal surface of the crushing ring 23 and the outer surface of the hollow bell-shaped body 33.

The skin crushing ring 23 is lowered over the bell-shaped body. The ring has a screw 40 threaded therein in a radial direction. The screw 40 is threaded to cause a high pressure and crushing action to be applied over an annular portion of the prepuce. This skin portion is crushed by the applied high pressure and this permits a cutting action of the prepuce without loss of blood.

The hollow bell-shaped body 33 has a number of windows 41 at its upper portion for exposing the glans penis. The glans penis may thus be under observation throughout the entire operation.

As shown in Figure 2, it will be seen that the rod 31 has a keyway 42 lengthwise thereof and that the plate portion 12 has a key 43 which fits into the keyway. This arrangement prevents relative rotation of the parts 12 and 31 during adjustment of the screw 17.

Figures 3 to 6 inclusive show two modified forms of the invention comprising combined skin crushing and cutting circumcision appliance in unitary form.

As shown in Figures 3 and 4, it will be seen the plate 12 has leaf springs 24' which are longer than the springs 24 shown in Figure 1. A modified skin crushing ring 23' is frictionally supported from the lower end portions of the springs 24' in spaced apart relation from the lower surface of the plate 12.

Slidably supported on the upper surface of the skin crushing ring 23' is a duplex set of semicircular knives 45, 45' respectively having semicircular cutting edges 46, 46'. The knife 45 has a rectangular opening 47 in which the knife 45' is slidably mounted. A screw 48 having oppositely directed threads 49, 49' of the same pitch or of the same number of threads per inch, is threaded respectively in the knives 45, 45'. By turning the screw head 50 the knives are made to move equally to or from each other.

The head 50 has a groove 51 in engagement with a bifurcated member 52 which is suitably fixed to the plate 12. The knives are normally set and held in concentric relation with the circular aperture 27 in the ring 23' by rotating the screw 48.

In operation, when using the combined device shown in Figures 3 and 4, the skin crushing ring 23' is applied on the prepuce by rotating the screw 40. The screw 48 is then operated to bring the knives 45 and 45' toward each other to exert a cutting action on the prepuce flush with the upper surface of the skin crushing ring 23'.

It is to be noted that the modified crushing ring 23' has two threaded apertures 53 in which two screws 54 are threadably mounted. The heads of the screws 54 engage and hold the knives 45 and 45' centrally with the rod 31 and with the circular apertures 27 in the skin crushing ring 23'. The screws 54 and the bifurcated member 52 provide three points of support for the knives while the knives are adjusted for cutting the prepuce.

As shown in the modification in Figures 5 and 6, the plate 12 has elongated leaf springs 24''. A modified skin crushing ring 23'' is supported from the lower end portions of the springs 24'' in considerably spaced apart relation from the lower surface of the plate 12.

Mounted on the modified skin crushing ring 23'' is an inverted cup-shaped outer member 60 having an upright flange 61 in contacting relation with the outer surface of the ring. The cup-shaped member 60 has a horizontal flange 62 in spaced-apart relation from the upper surface of the ring 23'', providing a circular cavity 63 in which an annular member 64 is adapted to freely rotate around the entire circumference of the skin crushing ring 23''.

Extending from the upper surface of the annular member 64 is a boss 65 having an inclined slot 66 for a knife 67 which is positioned radially of the crushing ring. The knife 67 is retained in position to contact the outer surface of the cupped portion of the bell-shaped body 33 when the crushing ring is clamped by the screw 40 on the bell-shaped body, thereby cutting a prepuce placed in operating position. A screw 68 threaded in the boss 65 in position for clamping the knife 67 serves for adjusting and holding the knife in operating position.

In operation, when using the combined skin crushing and cutting device shown in Figures 5 and 6, the skin crushing ring 23'' is applied on the prepuce. The ring is clamped in position on the prepuce by turning the screw 40. The user then rotates the knife 67 around the prepuce and cuts the prepuce flush with the upper surface of the skin crushing ring 23''.

It is to be noted that Figures 2, 4 and 6 show the devices in non-operative position with the crushing rings held by the springs.

In operative position, the crushing ring is detached from the springs and drops over or on top of the hollow bell-shaped body 33 into skin crushing position.

In accordance with the patent statutes I have described and illustrated the preferred embodiment of my invention, but it will be understood that various changes and modifications can be made therein without departing from the spirit of the invention as defined by the appended claims.

I claim:

1. In a circumcision appliance of the character

described, a housing having an inverted U-shaped upper portion and a centrally apertured plate, a screw rotatably mounted in said upper portion in a manner as to prevent axial movement of said screw relative to said housing, a rod having a thread for engagement with the threaded portion of said screw, and a female thread at its lower portion, a bell-shaped member having a threaded extension for securing said member to said rod, a plurality of flexible members depending from said plate and having skin clamps extending downwardly to said bell-shaped member, a skin crushing ring, springs secured to the lower surface of said housing plate, and having curved lower ends in engagement with said crushing ring and adapted to be spread apart to release said crushing ring to permit said ring to be lowered over said bell-shaped member, said crushing ring having a screw threaded therein, whereby when said crushing ring is brought down over said bell-shaped body and over a prepuce mounted thereon, said screw may be threaded to cause a crushing action on an annular portion of said prepuce to permit cutting of said prepuce without loss of blood.

2. In a circumcision appliance of the character described, a housing having an inverted U-shaped upper portion and a centrally apertured plate, a screw rotatably mounted in said upper portion in a manner as to prevent axial movement of said screw relative to said housing, a rod having a thread for engagement with the threaded portion of said screw, and a female thread at its lower portion, said rod and said plate having key and keyway connecting means preventing relative rotation of said parts, a bell-shaped member having a threaded extension for securing said member to said rod, a centrally apertured skin crushing ring, a plurality of flexible members depending from said plate and passing through said aperture in said ring and having skin clamps extending downwardly to said bell-shaped member, springs secured to the lower surface of said housing plate, and having lower ends in engagement with said crushing ring and adapted to be spread apart to release said crushing ring to permit said ring to be lowered over said bell-shaped member, said crushing ring having a screw radially threaded therein, whereby when said crushing ring is brought down over said bell-shaped body and over a prepuce mounted thereon, said screw may be threaded to cause a crushing action on an annular portion of said prepuce to permit cutting of said prepuce without loss of blood.

3. In a combined skin crushing and cutting circumcision appliance of the character described, a housing having an inverted U-shaped upper portion and a centrally apertured plate, a screw rotatably mounted in said upper portion in a manner as to prevent axial movement of said screw relative to said housing, a rod having a thread for engagement with the threaded portion of said screw, and a female thread at its lower portion, said rod and said plate having key and keyway connecting means preventing relative rotation of said parts, a bell-shaped member having a threaded extension for securing said member to said rod, a centrally apertured skin crushing ring, a plurality of flexible members depending from said plate and passing through said aperture in said ring and having skin clamps extending downwardly to said bell-shaped member, springs secured to the lower surface of said housing plate, and having lower ends in engagement with said crushing ring and adapted to be spread apart to release said crushing ring to permit said ring to be lowered over said bell-shaped member, said crushing ring having a screw radially threaded therein, whereby when said crushing ring is brought down over said bell-shaped body and over a prepuce mounted thereon, said screw may be threaded to cause a crushing action on an annular portion of said prepuce to permit cutting of said prepuce without loss of blood, and a knife movably mounted on said skin crushing ring and adapted for cutting said prepuce flush with the upper surface of said skin crushing ring.

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