

April 4, 1944.

J. J. TIBONE ET AL

2,345,639

SURGICAL INSTRUMENT

Filed Aug. 6, 1941

2 Sheets-Sheet 1

Fig. 1.

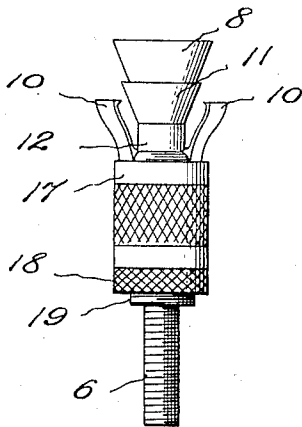


Fig. 2.

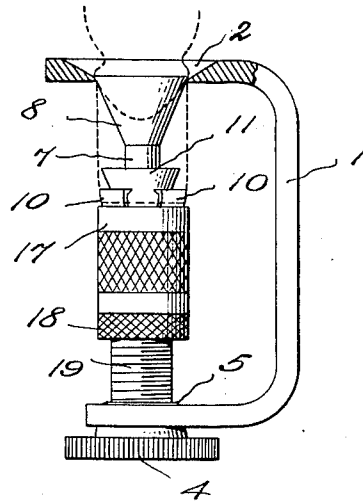


Fig. 3.

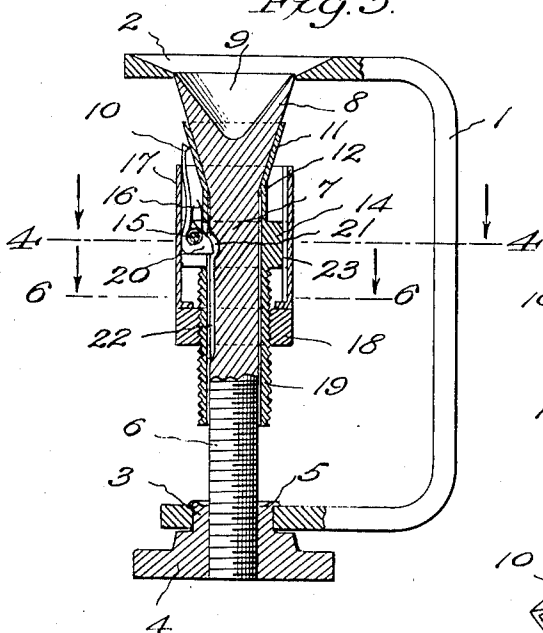


Fig. 4.

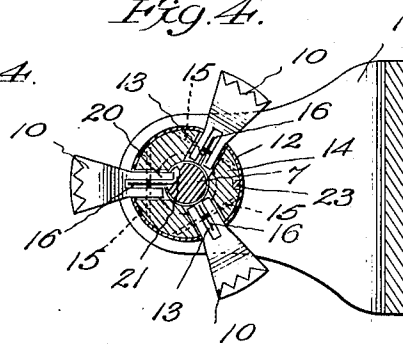
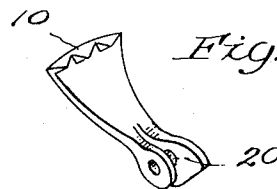


Fig. 5.



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2 Sheets-Sheet 2

Fig. 8.

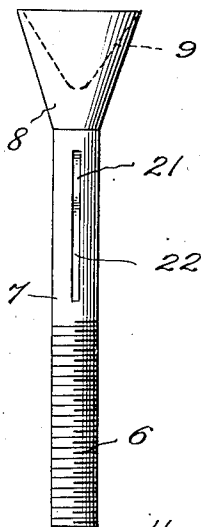


Fig. 5.

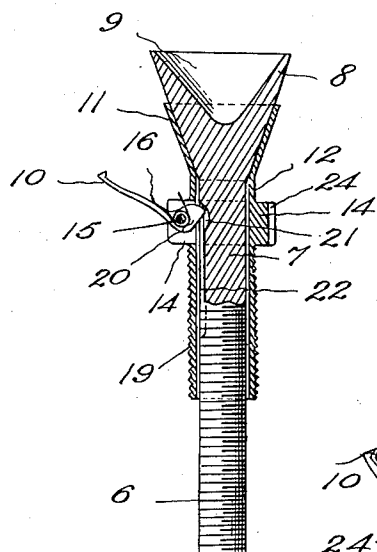


Fig. 6.

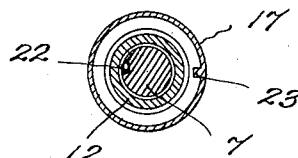


Fig. 9.

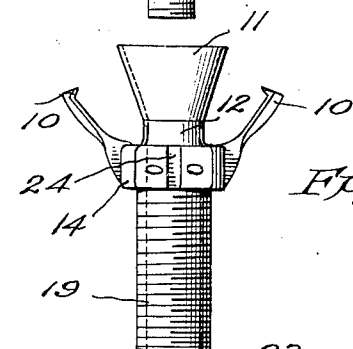


Fig. 10.

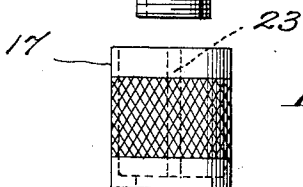


Fig. 11.



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SURGICAL INSTRUMENT

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Application August 6, 1941, Serial No. 405,588

15 Claims. (Cl. 128—346)

This invention relates to a surgical instrument and more particularly, the present invention relates to a surgical instrument especially adapted for use in circumcision operations wherein the foreskin is spread apart and is firmly held during the severing operation in such a manner that it may be stretched to facilitate the severance thereof and at the same time is tightly clamped so that there will be substantially no loss of blood resulting from the incision.

In the past, circumcision operations have been almost universally performed through the use of surgical scissors. The use of the latter ordinarily produced a crude finished job and in addition, caused considerable bleeding during the operation and a wound which took considerable time to heal.

Of late, circumcision operations have been performed with the help of a clamp comprising a frame having a circular opening therein and a mounting member for the foreskin in the shape of a cone the apex of which, is unitary with a stem which is coaxial with the cone. The base of the cone has a diameter slightly larger than the diameter of the opening and is provided with a recess substantially of the same size and shape of the glans penis of the patient to be circumcised. The frame is provided with means adapted to engage the free end-portion of the stem to draw the surface of the cone tightly against the periphery of the circular opening. In operation, the foreskin is spread apart, the cone is inserted within the prepuce base first and is pushed onto the glans until the latter enters the recess in the base of the cone. The cone, with the foreskin embracing the surface thereof, is then inserted into the circular opening and the conical surface of the cone, with the foreskin thereover is then drawn tightly against the periphery of the circular opening to produce hemostasis. The actual severing of the foreskin is then performed with a surgical knife and the incision is made at the line of contact between the conical surface and the periphery of the circular opening.

The difficulty of maintaining the foreskin on the surface of the cone during insertion of the mounting member into the circular opening in the frame has been a source of great annoyance to the surgeon performing the operation. Further, after the conical surface is drawn tightly against the periphery of the circular opening, the foreskin almost invariably folds back onto the line of incision and generally, it becomes necessary for the operator to hold it or stretch

it away therefrom with great inconvenience to himself and consequent loss of time.

According to the present invention, the stem is provided with a holder mechanism with means adapted to grip the foreskin and hold it firmly onto the surface of the cone. After the latter with the foreskin held over the surface thereof, is inserted into the circular opening in the frame and the surface of the cone is drawn tightly against the periphery of the circular opening, the holder may be moved with respect to the cone in order to stretch the foreskin and thereby expose the line of incision.

Also according to the present invention, while the foreskin is being attached to the gripping means of the holder, the latter is locked in a position adjacent the cone; but after the foreskin has been gripped, the holder is released from its locked position and may be moved away from the cone to stretch the foreskin.

In accordance with the present invention, the holder may be conveniently and completely detached from the instrument to permit cleaning, sterilization and examination of the parts of the instrument thus insuring against possible infection of the wound caused by severing the prepuce.

The instrument is comparatively simple and inexpensive to manufacture, easy and convenient to operate, and durable in service. The ease and efficiency of operation should reduce the labor and loss of time of the surgeon performing the operation and shorten the period of inconvenience to the patient.

The preferred embodiment of the invention is shown in the accompanying drawings and will be hereinafter described in detail. However, it is to be understood that the invention is not limited to the precise construction and arrangement shown, as modifications and changes are contemplated and such must be considered to be included within the scope of the claims.

In the drawings:

Fig. 1 is a view of the assembled mounting member and holder of the surgical instrument with the foreskin-gripping means of the holder in open position.

Fig. 2 is a view of the complete surgical instrument with the foreskin-gripping means in closed and operating position.

Fig. 3 represents an enlarged vertical section view of the surgical instrument as shown in Fig. 2, but with the holder moved to a position adjacent the cone element of the mounting member.

Fig. 4 is a horizontal section view taken on

line 4—4 of Fig. 3, but with the gripping means of the holder in open position.

Fig. 5 is a vertical section view of the assembled mounting member and a portion of the holder of the surgical instrument.

Fig. 6 is a partial horizontal section view of the surgical instrument taken on line 6—6 of Fig. 3.

Fig. 7 is a view showing a jaw of the foreskin-gripping means in perspective.

Fig. 8 is a view showing the mounting member of the surgical instrument.

Fig. 9 is a view showing an element of the holder mechanism.

Fig. 10 is a view showing another element of the holder mechanism.

Fig. 11 is a view showing still another element of the holder mechanism.

Preferably and as shown in the drawings, the surgical instrument comprises a channel-like frame 1 having a pair of circular, coaxially positioned openings 2 and 3 in its flanges. The opening 3 carries a thumb-nut 4 rotatably but undetachably mounted therein by means of a collar extending therethrough which is provided with a radially extending annular flange 5 engaging the surface of the flange. The thumb-nut 4 is adapted to engage the threaded portion 6 of a stem 7 of a mounting member which is of sufficient length to bridge the distance between the two flanges of the frame. To separate the foreskin, the stem 7 is unitary with the apex of a cone 8 which is coaxial with the stem 7. The base of the cone 8 is provided with a recess 9 substantially of the same shape and size of the glans penis of the patient, to be circumcised, whereby, when the cone 8 is inserted into the prepuce, the recess 9 encompasses the glans and the foreskin embraces the surface of the cone 8.

The base of the cone 8 has a diameter which is slightly larger than the diameter of the circular opening 2. Thus, by turning the thumb-nut 4, the surface of the cone 8 may be drawn tightly against the periphery of the circular opening 2.

In order to hold the foreskin onto the surface of the cone 8, the stem 7 of the mounting member is provided with a holder mechanism which includes a sleeve 12 slidably mounted about the stem 7 to move toward and away from the cone 8. The extremity of the sleeve 12 nearest the cone 8, is unitary with the apex of a hollow cone 11 which is coaxial with the sleeve 12 and is of such shape and size that when the sleeve 12 is moved against the surface of the cone 8, it will embrace a portion of the surface of the cone 8. The sleeve 12 is provided with a plurality of jaws 10 adapted to cooperate with the surface of the hollow cone 11 to grip the foreskin. The jaws 10 are hingedly mounted by means of pins 15 in recesses 13 in a collar 14 on the sleeve 12, whereby each jaw may oscillate toward and away from the surface of the hollow cone 11. Ordinarily, the business ends of the jaws are urged away from the conical surface 11 by the effort of springs 16 mounted between the forked hinge-portions of each jaw.

To maintain the business ends of the jaws 10 against the surface of the hollow cone 11, the holder mechanism includes another sleeve 17, coaxially mounted about the jaw-carrying sleeve 12 and adapted to slide thereon. The sleeve 17 is adapted to embrace the jaws 10 when moved toward the hollow cone 11 to swing the jaws toward the surface of the hollow cone 11 against

the effort of the springs 16. The jaws may be locked in gripping position by means of a thumb-nut 18 adapted to engage the edge of the sleeve 17 and the screw-threaded portion 19 of the sleeve 12, whereby, rotation of the thumb-nut 18 controls the extent to which the jaws 10 are embraced by the sleeve 17. Thus, the sleeve 17 may be considered a locking sleeve for the jaws.

In operation, the cone 8 with the hollow cone 11 covering a portion of its surface, is inserted into the prepuce so that the foreskin extends to and embraces the surface of the hollow cone 11; the sleeve 17 is then moved toward the hollow cone 11 to swing the business ends of the jaws 10 against the surface of the hollow cone as described hereinbefore, to hold the foreskin firmly thereon.

To facilitate placing the foreskin on the surface of the hollow cone 11 after the cone 8 is inserted into the prepuce, it is desirable that the hollow cone 11 remain adjacent the cone 8 during the gripping operation. With this object in view, a leg of the forked hinge-portion of one of the jaws is unitary with a cam 20, shown in detail in Fig. 7. The cam 20 is adapted to enter into and to be engaged by a recess 21 and a track 22 which is continuous with the recess 21, in the stem 7 of the mounting member. The cam 20 is so designed that it is capable of cooperating with the motion of the jaw with which it is unitary and by which it is actuated; whereby, the cam engages the recess 21 while the business end of the jaw with which it is unitary, is in any position between the gripping position and that which is perpendicular thereto, but when the jaw is in gripping position, the cam 20 can only engage the track 22, as shown in Figs. 5 and 3, respectively. This arrangement permits the sleeve 12 to slide away from the cone 8 when the jaws are in gripping position and at the same time, prevents the sleeve 12 from sliding off the stem 7 of the mounting member during operative manipulations. This is a most desirable feature of the invention as it makes it possible to stretch the foreskin, after mounting, prior to the actual severance thereof.

In order that the sleeve 12 may be completely and conveniently detached from the mounting member for cleaning and sterilization of the parts, the cam 20 is so designed, that when jaw with which it is unitary, is swung to substantially the extreme end of its arc of travel away from the surface of the hollow cone 11, it will not engage or project into the track 22. This may be accomplished by removing the thumb-nut 18 to release the sleeve 17, sliding the latter away from the conical surface 11 until it no longer engages the jaws 10, and finally, swinging the jaw which is unitary with the cam to the extreme end of its arc of travel away from the surface of the hollow cone 11.

To avoid rotation of the mounting member when the surface of the cone 8 is being drawn against the periphery of the circular opening 2, the sleeve 17 is provided with an elongated projection or key 23 projecting from the interior surface of the sleeve 17 and adapted to slidably engage a slot 24 in the collar 14. In operation, when the jaws 10 are in gripping position and the cone 8 is being drawn against the periphery of the circular opening 2, the locking sleeve 17 is held firmly by the operator. Thus, the key 23 and the slot 24 cooperate to prevent the jaw-carrying sleeve 12 from rotating, and the cam 20 and the track 22 or recess 21 in turn, cooperate

to prevent the mounting member from rotating.

In practice, the operation of the instrument is as follows: Assuming that the instrument is assembled as shown in Fig. 2, the mounting member with the holder thereon is separated from the frame 1 of the instrument. The jaw-carrying sleeve 12 is then moved toward the cone 8 as far as it will travel and the thumb-nut 18 is rotated to release the locking sleeve 17 thereby permitting the jaws 10 to swing away from the surface of the hollow cone 11. This will lock the surface of the hollow cone 11 in a position on the stem 7 adjacent the cone 8 as explained hereinbefore. The cone 8 with the hollow cone 11 embracing a portion of the surface thereof, is then inserted into the prepuce and is pressed against the glans until the recess 9 substantially completely encompasses the glans penis of the patient to be circumcised. The foreskin is then in a position embracing the portion of the surface of the cone 8 not covered by the hollow cone 11 and the surface of the hollow cone 11. The locking sleeve 17 is then moved toward the cone 8 to swing the jaws 10 toward the surface of the hollow cone 11 cooperating therewith to grip the foreskin. The thumb-nut 18 is then rotated to hold the sleeve 17 in locking position. The mounting member thus attached to the penis, is then inserted through the circular opening 2 so that the screw-threaded extremity 6 engages the thread of the thumb-nut 4. The locking sleeve 17 is then held firmly by the fingers of the operator while the thumb-nut 4 is rotated to draw the surface of the cone 8 tightly against the periphery of the circular opening 2, to crush the foreskin therebetween to cause hemostatis. The holder is then moved away from the cone 8 to stretch the foreskin thereby exposing the line of incision which is at the line of contact between the surface of the cone 8 and the periphery of the circular opening 2. The tissue may then be severed at the line of incision with a surgical knife. The thumb-nut 4 is then rotated to release the mounting member, thereby detaching the instrument from the penis.

Although the present invention has been described in conjunction with preferred embodiments, it is to be understood that modifications and variations may be resorted to without departing from the spirit and scope of the invention, as those skilled in the art will readily understand. Such variations and modifications are considered to be within the purview and scope of the appended claims.

We claim:

1. A surgical instrument for use in operations involving the severance of tissue, which comprises a frame having an opening therein, a mounting member for the tissue to be severed extending through said opening and adapted to cooperate therewith to produce hemostatis at the line of severance, and a holder mounted on said mounting member and adapted to cooperate therewith to maintain the tissue to be severed on the mounting member, said holder including a sleeve slidably mounted about said mounting member, and means operatively mounted onto said sleeve to cooperate with the surface of the sleeve to hold the tissue to be severed onto the mounting member.

2. A surgical instrument for use in operations involving the severance of tissue, which comprises a frame having an opening therein, a mounting member for the tissue to be severed extending through said opening and adapted to cooperate

therewith to produce hemostatis at the line of severance, and a holder mounted on said mounting member and adapted to cooperate with it to maintain the tissue to be severed on the mounting member, said holder including a sleeve slidably mounted about said mounting member to reciprocate thereon, a plurality of jaws hinged to said sleeve to cooperate with the surface thereof to grip the tissue to be severed, and means to maintain the plurality of jaws in gripping position.

3. A surgical instrument for use in operations involving the severance of tissue, which comprises a frame having an opening therein, a mounting member for the tissue to be severed extending through said opening and adapted to cooperate therewith to produce hemostatis at the line of severance, and a holder mounted on said mounting member and adapted to cooperate therewith to maintain the tissue to be severed on the mounting member, said holder including a sleeve slidably mounted about said mounting member to reciprocate thereon, a plurality of jaws hinged to said sleeve to cooperate with the surface thereof to grip the tissue to be severed, springs urging said jaws to swing away from the surface of said sleeve, a second sleeve mounted about said jaw-carrying sleeve to reciprocate thereon adapted to embrace said jaws to swing the same toward the gripping position against the effort of the springs, and means to lock said second sleeve against movement when the jaws are in gripping position.

4. A surgical instrument for use in operations involving the severance of tissue, which comprises a frame having a circular opening therein, a member for mounting the tissue to be severed extending through said opening including a stem and a cone element the apex of which is unitary and coaxial with said stem, said cone having a base the diameter of which is slightly larger than the diameter of said circular opening, means adapted to engage said stem to draw the surface of said cone element tightly against the periphery of the circular opening to produce hemostatis at the line of severance, and a holder adapted to cooperate with said mounting member to maintain the tissue to be severed on the surface of the cone element, said holder comprising a sleeve slidably mounted about said mounting member to reciprocate thereon, a plurality of jaws hinged to said sleeve to cooperate with the surface thereof to grip the tissue to be severed, and means adapted to limit the amplitude of reciprocation of the jaw-carrying sleeve on the stem of the mounting member, to lock the jaw-carrying sleeve in a position adjacent the cone element of the mounting member when the jaws are not in a gripping position, and to prevent rotation of the sleeve about the stem of the mounting member.

5. A surgical instrument for use in operations involving the severance of tissue, which comprises a frame having a circular opening therein, a member for mounting the tissue to be severed extending through said circular opening including a stem and a cone element the apex of which is unitary and coaxial with said stem, said cone having a base the diameter of which is slightly larger than the diameter of the circular opening in the frame, means adapted to engage said stem to draw the surface of said cone element tightly against the periphery of the circular opening to produce hemostatis at the line of severance, and a holder adapted to cooperate with said mounting member to maintain the tissue to be severed on

the surface of the cone element of the mounting member, said holder comprising a sleeve slidably mounted about the stem of said mounting member to reciprocate thereon, a plurality of jaws hinged to said sleeve to cooperate with the surface thereof to grip the tissue to be severed, a cam unitary with one of said jaws and operable by the swing thereof adapted to engage a recess in the stem of the mounting member when the hinged jaws are not in gripping position to lock the jaw-carrying sleeve in a position adjacent the cone element of the mounting member and also adapted to engage a slot in the stem of the mounting member and continuous with said recess when the jaws are in gripping position to limit the amplitude of reciprocation of the jaw-carrying sleeve on the stem of the mounting member and to prevent rotation of the jaw-carrying sleeve about the stem of the mounting member.

6. A surgical instrument for use in operations involving the severance of tissue which comprises a frame having a circular opening therein, a member for mounting the tissue to be severed extending through said opening including a stem and a cone element the apex of which is unitary and coaxial with said stem, said cone having a base the diameter of which is slightly larger than the diameter of said circular opening, means adapted to engage said stem to draw the surface of said cone element tightly against the periphery of the circular opening to produce hemostasis at the line of severance, and a holder adapted to cooperate with said mounting member to maintain the tissue to be severed on the surface of the cone element, said holder comprising a sleeve slidably mounted about said mounting member to reciprocate thereon, a plurality of jaws hinged to said sleeve to cooperate with the surface thereof to grip the tissue to be severed, means adapted to limit the amplitude of reciprocation of the sleeve on the stem of the mounting member, means to lock the jaw-carrying sleeve in a position adjacent the cone element of the mounting member when the jaws are not in gripping position, and means to prevent rotation of the sleeve about the stem of the mounting member.

7. A surgical instrument for use in operations involving the severance of tissue which comprises a frame having a circular opening therein, a member for mounting the tissue to be severed extending through said circular opening including a stem and a cone element the apex of which is unitary and coaxial with said stem, said cone having a base the diameter of which is slightly larger than the diameter of the circular opening in the frame, means adapted to engage said stem to draw the surface of the cone element tightly against the periphery of the circular opening to produce hemostasis at the line of severance, and a holder adapted to cooperate with said mounting member to maintain the tissue to be severed on the surface of the cone element of the mounting member, said holder comprising a sleeve slidably mounted about the stem of the mounting member to reciprocate thereon, a collar unitary with the exterior surface of said sleeve, a plurality of jaws hinged to said collar to cooperate with the surface of said sleeve to grip the tissue to be severed, springs urging said jaws to swing away from the surface of the sleeve, a locking sleeve mounted about said jaw-carrying sleeve to reciprocate thereon adapted to embrace said jaws to swing the same toward gripping posi-

tion against the effort of the springs, means projecting from the interior surface of the locking sleeve adapted to slidably engage a slot in said collar to prevent rotation of the locking sleeve about the jaw-carrying sleeve, a cam unitary with one of said hinged jaws and operable by the swing thereof adapted to engage a recess in the stem of the mounting member when the jaws are not in gripping position to lock the jaw-carrying sleeve in a position adjacent the cone element of the mounting member and adapted to engage a slot in the stem continuous with said recess when the jaws are in gripping position to limit the amplitude of reciprocation of the jaw-carrying sleeve on the stem of the mounting member and to prevent rotation of the sleeve about the stem, whereby, holding the locking sleeve against rotation will prevent rotation of the mounting member.

8. A surgical instrument for use in operations involving the severance of tissue, which comprises a frame having an opening therein, a mounting member for the tissue to be severed extending through said opening and adapted to cooperate therewith to produce hemostasis at the line of severance, and a holder mounted on said mounting member and adapted to cooperate therewith to maintain the tissue to be severed on the mounting member, said holder including a sleeve mounted about said mounting member, and means operatively mounted onto said sleeve to cooperate with the surface of the sleeve to hold the tissue to be severed onto the mounting member.

9. A surgical instrument for use in operations involving the severance of tissue, which comprises a frame having an opening therein, a mounting member for the tissue to be severed extending through said opening and adapted to cooperate therewith to produce hemostasis at the line of severance, and a holder mounted on said mounting member and adapted to cooperate with it to maintain the tissue to be severed on the mounting member, said holder including a sleeve and a plurality of jaws hinged to said sleeve to cooperate with the surface thereof to grip the tissue to be severed.

10. A surgical instrument for use in operations involving the severance of tissue, which comprises a frame having an opening therein, a mounting member for the tissue to be severed extending through said opening and adapted to cooperate therewith to produce hemostasis at the line of severance, and a holder mounted on said mounting member and adapted to cooperate with it to maintain the tissue to be severed on the mounting member, said holder including a sleeve, a plurality of jaws hinged to said sleeve to cooperate with surface thereof to grip the tissue to be severed, and means to maintain the plurality of jaws in gripping position.

11. A surgical instrument for use in operations involving the severance of tissue, which comprises a frame having an opening therein, a mounting member for the tissue to be severed extending through said opening and adapted to cooperate therewith to produce hemostasis at the line of severance, holding means to maintain the tissue to be severed on the mounting member, said holding means including a plurality of jaws hingedly mounted about said mounting member and adapted to cooperate therewith to grip the tissue to be severed, and springs urging said jaws away from gripping position, and means adapted

to urge said jaws toward the gripping position against the effort of the springs.

12. A surgical instrument for use in operations involving the severance of tissue, which comprises a frame having an opening therein, a mounting member for the tissue to be severed extending through said opening and adapted to cooperate therewith to produce hemostatis at the line of severance, holding means to maintain the tissue to be severed on the mounting member, said holding means including a plurality of jaws hingedly mounted about said mounting member and adapted to cooperate therewith to grip the tissue to be severed, and springs urging said jaws away from gripping position, means adapted to urge said jaws toward the gripping position, and locking means to lock the jaws in gripping position.

13. A surgical instrument for use in hemostatically severing the foreskin of the penis, which comprises in combination, a member having an opening therein adapted to engage the foreskin of said penis, a mounting member for said foreskin having a glans receiving recess extending through said opening, means connecting said members for moving said foreskin mounting member longitudinally of said penis toward the opening of the other member for exerting a radial pressure with respect to said penis upon the foreskin thereby producing hemostatis at the line of severance, and a holder mounted on said mounting member and adapted to cooperate therewith to maintain said foreskin onto the mounting member, said holder including a sleeve, a plurality of jaws hinged to said sleeve to cooperate with the surface thereof to grip the foreskin, springs urging said jaws to swing away from the surface of said sleeve, means adapted to swing said jaws toward gripping position against the effort of the springs, and locking means to lock said jaws in gripping position.

14. A surgical instrument for use in operations involving the severance of tissue, which comprises a frame having an opening therein, a mounting member for the tissue to be severed extending through said opening and adapted to cooperate therewith to produce hemostatis at the line of severance, holding means to maintain the tissue to be severed on the mounting member, said holding means including gripping means operatively mounted about said mounting member and adapted to cooperate therewith to grip the tissue to be severed, and means to lock the gripping means in gripping position, said locking means comprising a sleeve reciprocable about said gripping means and adapted to embrace the same when they are in gripping position, and means to lock said sleeve against reciprocation when said gripping means are in gripping position.

15. A surgical instrument for use in operations involving the severance of tissue, which comprises a frame having an opening therein, a mounting member for the tissue to be severed extending through said opening and adapted to cooperate therewith to produce hemostatis at the line of severance, holding means to maintain the tissue to be severed on the mounting member, said holding means including a plurality of jaws hingedly mounted about said mounting member and adapted to cooperate therewith to grip the tissue to be severed, and means to lock the plurality of jaws in gripping position, said locking means comprising a member reciprocable about said plurality of jaws and adapted to urge the same toward gripping position, and means to lock said reciprocable member against reciprocation when said plurality of jaws are in gripping position.

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