Oct. 11, 1966 C. A. JOHNSON 3,277,895

CLAMP-TYPE SURGICAL INSTRUMENT

Filed Sept. 20, 1963

Fig. 1.

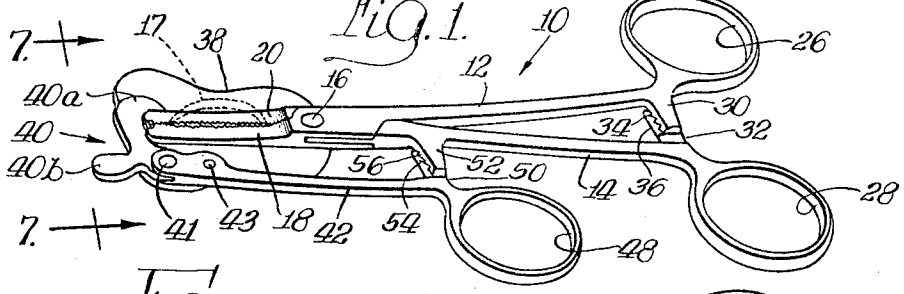


Fig. 2.

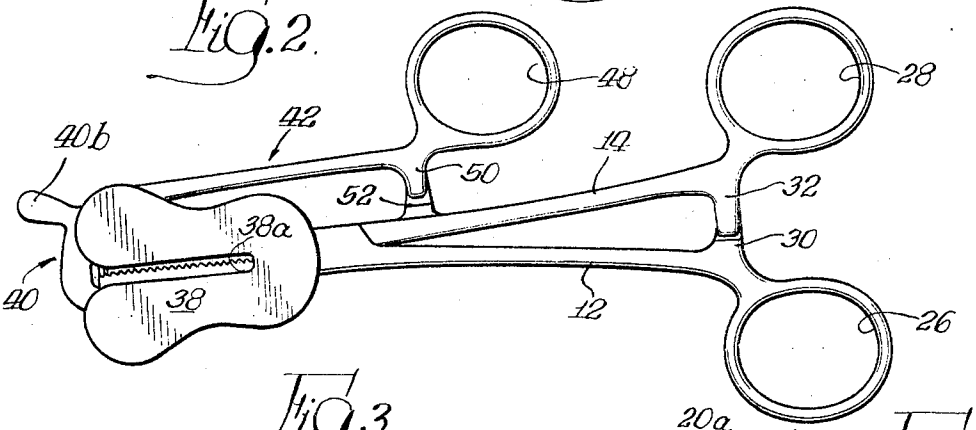


Fig. 3.

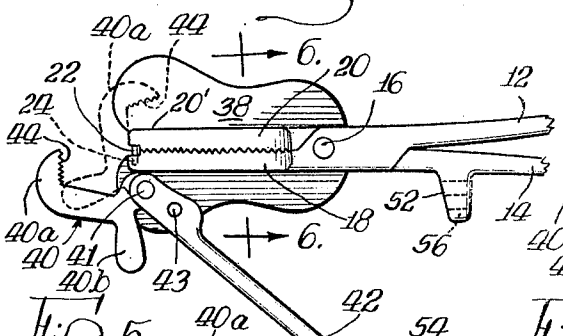


Fig. 4.

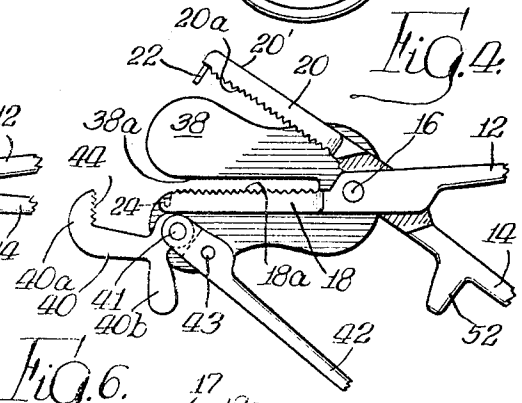


Fig. 5.

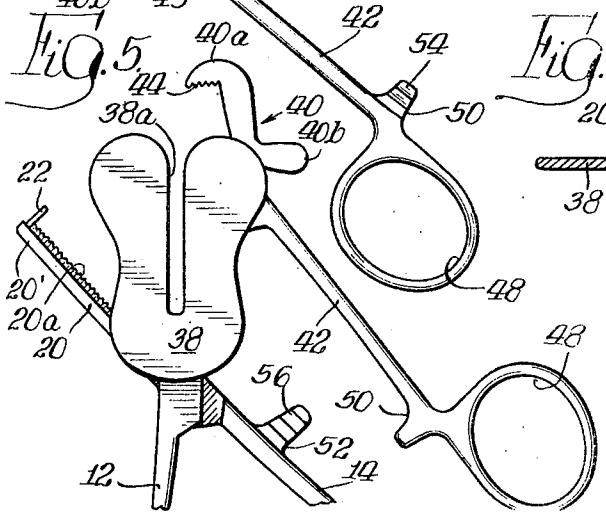


Fig. 6.

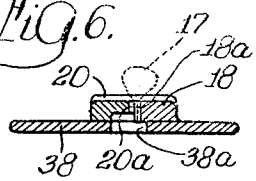
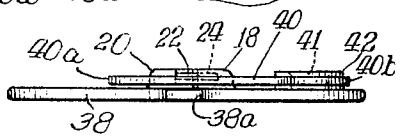


Fig. 7.



INVENTOR.

Charles A. Johnson,

BY

Hofgren, Wegner, Allen, Stellman & McCord Attys.

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CLAMP-TYPE SURGICAL INSTRUMENT

Charles A. Johnson, Box 179, Lemmon, S. Dak.

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3 Claims. (Cl. 128—325)

This invention relates to surgical instruments and more particularly to an end lock for a clamp-type surgical instrument.

The primary object of this invention is to provide a new and improved scissors or clamp-type surgical instrument having means thereon for urging the jaws thereof tightly together.

Another object of this invention is to provide a new and improved surgical instrument wherein there is provided means for urging the gripping jaws thereof tightly together so that tissue held therebetween is squeezed in sealing relation.

A further object of this invention is to provide a locking means for surgical instruments so that skin tissue held between the gripping jaws may be urged tightly together by the jaws to prevent leakage or bleeding.

A still further object of this invention is to provide a positive end lock for a clamp-type surgical instrument for urging the gripping jaws tightly together so that skin tissue held therebetween may be squeezed together in sealing relation to prevent fluid leakage or bleeding and wherein said end lock is provided with a positive locking means for maintaining said end lock in its operable position constantly urging the gripping jaws tightly together to continually maintain tissue held therebetween in sealing relation.

Other objects, features and advantages of the present invention will be apparent from the following description of the preferred embodiment illustrated in the accompanying drawings, in which:

FIGURE 1 is an isometric view of a clamp-type surgical instrument of the hemostat variety with the locking means of this invention mounted thereon;

FIGURE 2 is a bottom plan view of the instrument shown in FIGURE 1;

FIGURE 3 is a fragmentary top plan view of the instrument shown in FIGURE 1 illustrating the position of the locking means of this invention prior to engagement with the gripping jaws of the surgical instrument;

FIGURE 4 is a fragmentary top plan view similar to FIGURE 3 showing the gripping jaws of the surgical instrument opened;

FIGURE 5 is a bottom plan view similar to FIGURE 4;

FIGURE 6 is a section view taken along the line 6—6 of FIGURE 3; and

FIGURE 7 is an end view taken along the line 7—7 of FIGURE 1.

Referring now to the drawings, in FIGURE 1 there is shown a surgical instrument **10** which is basically a hemostat-type instrument having a pair of handles **12** and **14** pivotally secured together as at **16** in scissor-like fashion. The instrument **10** is shown clamping tissue indicated in dotted outline at **17**. The handles are provided with gripping or clamping jaws **18** and **20**, respectively, which have opposed inwardly facing mating serrated surfaces **18***a* and **20***a*, respectively, for positively clamping tissue therebetween when the jaws are brought together in clamping engagement. At the terminal end of one of the clamping jaws, such as **20**, there is a generally perpendicularly extending pin **22** adapted to register in a mating slot **24** in the opposite jaw to aid in the precise registry of the serrated surfaces when the jaws are brought together in clamping engagement.

The opposite ends of the handles **12** and **14** are provided with well known finger loops **26** and **28**, respectively, for aiding in manipulation of the instrument. Each handle

12 and **14** is further provided with inwardly facing projections **30** and **32**, respectively, near the finger loops. These projections are offset in a plane relative to the handles and have inwardly facing ratchets **34** and **36**, respectively, in the form of oppositely inclined teeth so that they engage in locking relation when the handles are brought together to clamp tissue between the clamping jaws.

The embodiment illustrated is provided with a well known circumcision shield **38** which underlies the clamping jaws of the instrument and has a substantially longitudinally extending slot **38***a* therein permitting skin tissue to pass therebetween and be clamped by the clamping jaws. It has been found that the instrument of this invention is particularly useful in preventing bleeding in circumcision operations but it is to be understood that the invention has many other applications with clamp-type surgical instruments used in human and animal surgery where it is desirable to clamp tissue and prevent bleeding or fluid leakage.

The surgical instrument of this invention is provided with first means for urging the jaws together in tightly clamped engagement to effectuate a sealing relation when tissue is held therebetween, and a second means for locking said first means in its urging position to maintain the jaws in tightly clamped engagement to hold tissue therebetween in sealing relation.

The first or urging means includes a generally U-shaped locking jaw **40** which is pivoted at **41** to the free end of an auxiliary or locking handle **42**. The locking handle **42** is, in turn, pivotally mounted at **43** to the instrument **10**, which mounting, in the embodiment illustrated, attaches the handle **42** to the shield **38**. The locking jaw **40** is provided with a serrated surface **44** on the interior of one leg **40***a* thereof. The serrated surface **44** is adapted to engage the outside surface, such as **20'**, of the terminal end of the opposite clamping jaw, such as **20**, when the clamping jaws are brought together with the handles **12** and **14** locked by the ratches **34** and **36**, the locking jaw is pivoted about its mounting to envelope the terminal ends of the clamping jaws therebetween and the handle **42** is drawn toward the handle **14**.

The second or locking means includes the auxiliary or locking handle which is pivoted at **43** to the surgical instrument. The pivot **43** is offset from the pivotal mounting **41** of the jaw **40** to the handle so that as the handle **42** is drawn toward handle **14**, the jaw **40** will be drawn against the outside of the jaw **20**. The locking handle is also provided with a well known finger loop **48** for facilitating the manipulation thereof. Aligned projections **50** and **52** are provided on the auxiliary handle **42** and on the handle **12**, respectively. These projections are also offset relative to the plane of the instrument similar to the projections **30** and **32** and are also provided with ratchets such as **54** and **56**, respectively, having oppositely inclined teeth adapted to engage and lock when the auxiliary handle **42** is brought toward the handle **12**.

In operation, to release the locking means from the position shown in FIGURE 1, the handle **42** is unlocked from the handle **14** by slightly urging the two handles together to permit the ratchet means to unlock in a well known manner. The handle **42** is then swung outward away from the handle **14**, releasing the pressure of the jaw **40** against the jaw **20**. This permits the jaw **40** to be grasped, such as at the projection **40***b*, and swung about its pivotal mounting **41** free and clear of the jaws **18** and **20** as shown in FIGURE 3.

Conversely, to grasp tissue in sealing relation with the instrument, the jaws **18** and **20** are first opened as shown in FIGURE 4 to permit the reception of tissue **17** therebetween. The jaws **18** and **20** are then brought together by swinging the handles **12** and **14** together so that they

are in a position as shown in FIGURE 3. The jaw **40** is then pivoted about the mounting **41** on the handle **42** to a position shown in dotted outline in FIGURE 3 where it envelopes the jaws **18** and **20** therebetween. The handle **42** is then pivoted about its mounting **41** and brought toward the handle **14**. Since the pivotal mounting of the jaw **40** on the handle **42** is beyond the pivotal mounting **43** of the handle, this offset relation causes the jaw **40** to be drawn toward the side of the jaw **20**. As the handle **42** nears a position where the ratches **54** and **56** may be brought together in locking engagement, the serrated surface **44** contacts the side **20'** of the jaw **20** causing it to be urged more tightly against the jaw **18**. Finally, as the handle **42** is locked to the handle **14**, the instrument is in the position shown in FIGURE 1 with the tissue **17** tightly clamped between the jaws **18** and **20** and the jaw **40** urging the jaw **20** against the jaw **18** with a sufficient force such that the tissue **17** is held therebetween in sealing relation so that fluid, such as blood, is prevented from escaping. Upon cutting the protruding portion of the tissue **17**, which is above the jaws **18** and **20**, there will be no bleeding or fluid leakage due to the sealing effect of the uniform crush of the tissue. The surgical instrument may be removed and the crushed tissue may be separated from the healing portion without the loss of blood.

It is to be understood that the locking means of this invention may have numerous other applications for use with various clamp-type surgical instruments in human or animal surgery in addition to the hemostat with a circumcision shield illustrated herein. In general, this locking means has application wherever the locking jaw may be pivoted to the free end of an auxiliary handle which, in turn, is pivoted near the free end of a scissors or clamp-type instrument, providing means for urging the gripping jaws of the instrument tightly together so that tissue held therebetween is uniformly crushed to prevent the leakage of blood or other fluids.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of my invention as set out in the appended claims.

I claim:

1. In a surgical instrument having a pair of intersecting pivotally connected cross handles with clamping jaws at the ends thereof, locking means for locking the jaws in sealing relation comprising: a locking handle pivoted to said instrument near the free ends of said jaws, means for securing said locking handle to said instrument when said handle is swung about its pivotal mounting and drawn toward said cross handles; and a locking jaw pivotally mounted on said locking handle in a position to embrace the free ends of said clamping jaws, said locking jaw pivotal mounting being offset relative to the pivotal mounting of said locking handle so that said locking jaw is urged against one of said clamping jaws to force the clamping jaws together in sealing relation as said locking handle is drawn toward said cross handles to be secured thereto.

2. In a surgical instrument having a pair of intersecting pivotally connected cross handles with clamping jaws at the ends thereof and shield means secured to the underside of one of said jaws and extending radially outwardly therefrom, locking means for locking the jaws in sealing relation comprising: a locking handle pivotally mounted on said shield at a point laterally spaced from the side of one of said jaws and near the free end thereof, means for securing said locking handle to said instrument when said locking handle is swung about its pivotal mounting and drawn toward said cross handles; and a generally U-shaped locking jaw pivotally mounted on the terminal end of said locking handle and inwardly facing in a position to embrace the free ends of said clamping jaws, said locking jaw pivotal mounting being offset relative to the pivotal mounting of the locking handle to permit said locking jaw to be swung about its mounting to substantially embrace the ends of the gripping jaws within the U-shaped opening thereof so that as said locking handle is drawn toward said cross handles to be secured thereto said locking jaw will be moved transversely relative to the length of said gripping jaws to a position where one side of the interior of said U-shaped locking jaw will be urged against the outside of one of said clamping jaws to force the clamping jaws together in sealing relation.

3. In a surgical instrument having a pair of intersecting pivotally connected cross handles with clamping jaws at the ends thereof, locking means for locking the jaws in sealing relation, comprising: a locking handle pivoted in said instrument near the free ends of said jaws for movement between a first and second position; means for securing said locking handle to the instrument when said locking handle is in said second position; a locking jaw having a clamping jaw engaging portion constructed and arranged to urge the clamping jaws together, said locking jaw mounted on the instrument and connected to the locking handle for movement relative to the clamping jaws and to the locking handle, and for movement with the locking handle responsive to movement of the locking handle, said connection being such that when said locking jaw is positioned with its clamping jaw engaging portion adjacent one of the clamping jaws, movement of said locking handle to said locking position causes said locking jaw to tightly urge said clamping jaws together.

References Cited by the Examiner

UNITED STATES PATENTS

385,076 6/1888 Stohlmann ---------- 128—321

FOREIGN PATENTS

869,388 5/1953 Germany.

RICHARD A. GAUDET, *Primary Examiner.*

G. McNEILL, *Assistant Examiner.*