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(54) **TONSIL FORCEPS**

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(57) **ABSTRACT**

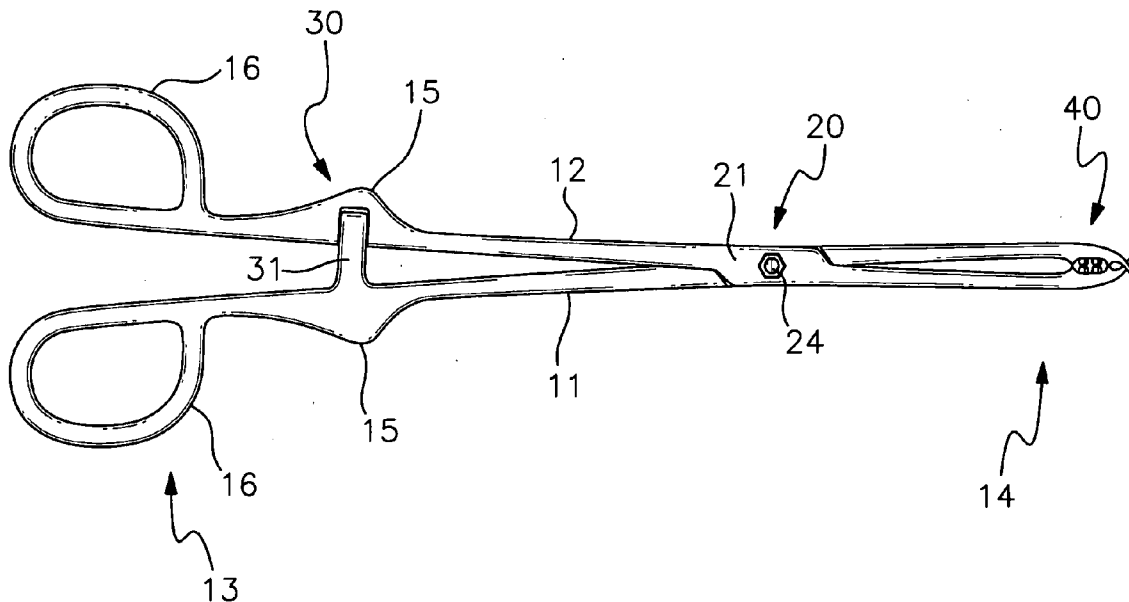
A tonsil forceps having first and second intersecting and pivoting arm members, releasable locking members for securing the forceps in multiple positions and sets of inwardly curved, blunt tipped, finger-like tine members, wherein the sets of tine members do not contact each other when the forceps are closed. In at least one of the locked positions, the tips on one set of the finger-like tines do not cross the tips of the other set of finger-like tines. The finger-like tines extend from a palm-like curved portion of each arm member, and inwardly facing non-sharp projection members, such as raised ridges, blunted teeth or the like are located on the interior sides of the palm-like curved portions. The projecting members are non-contacting with each other even in the maximum closed forceps position.

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**Related U.S. Application Data**

(60) Provisional application No. 61/069,942, filed on Mar. 18, 2008.



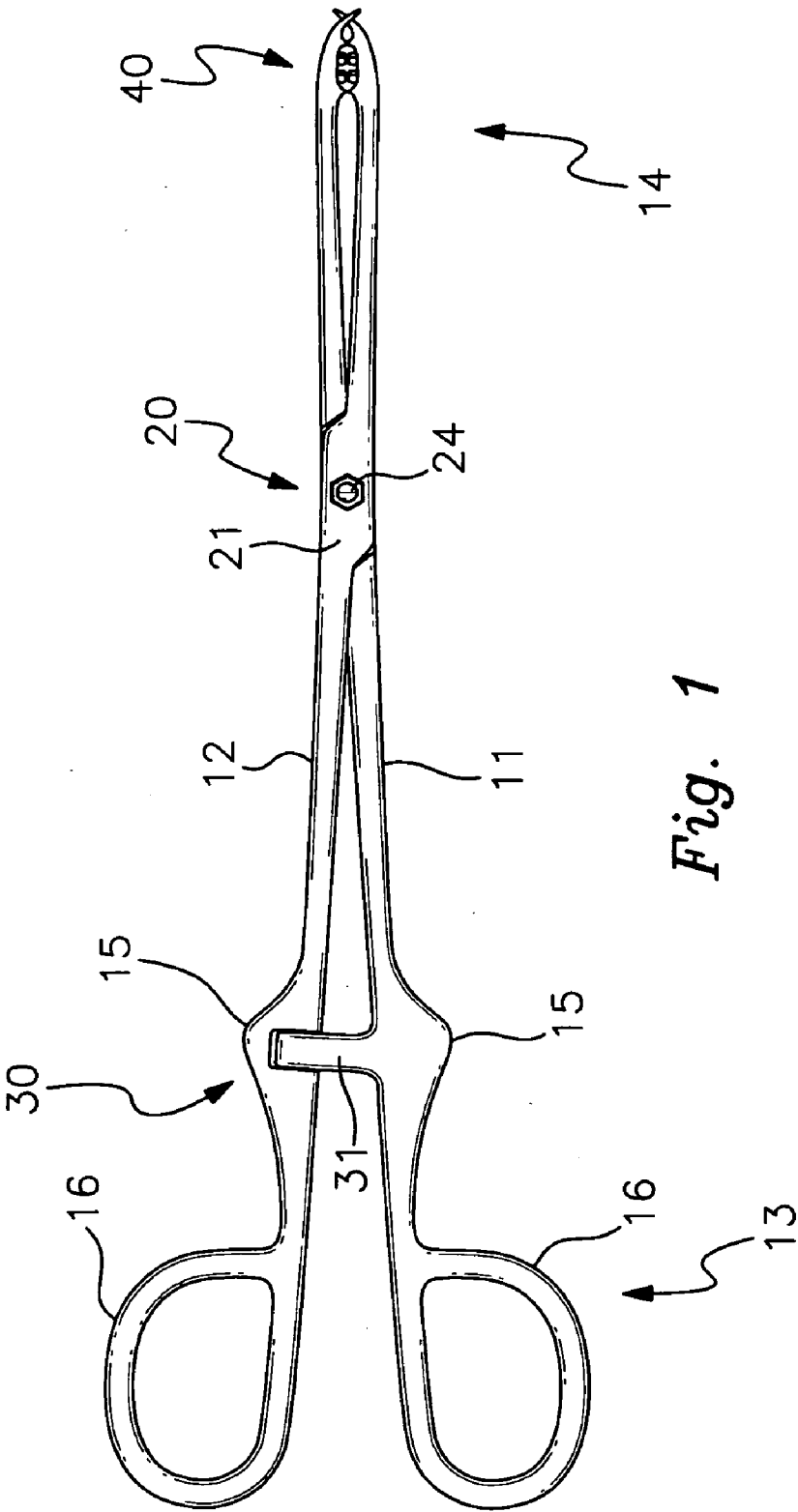


Fig. 1

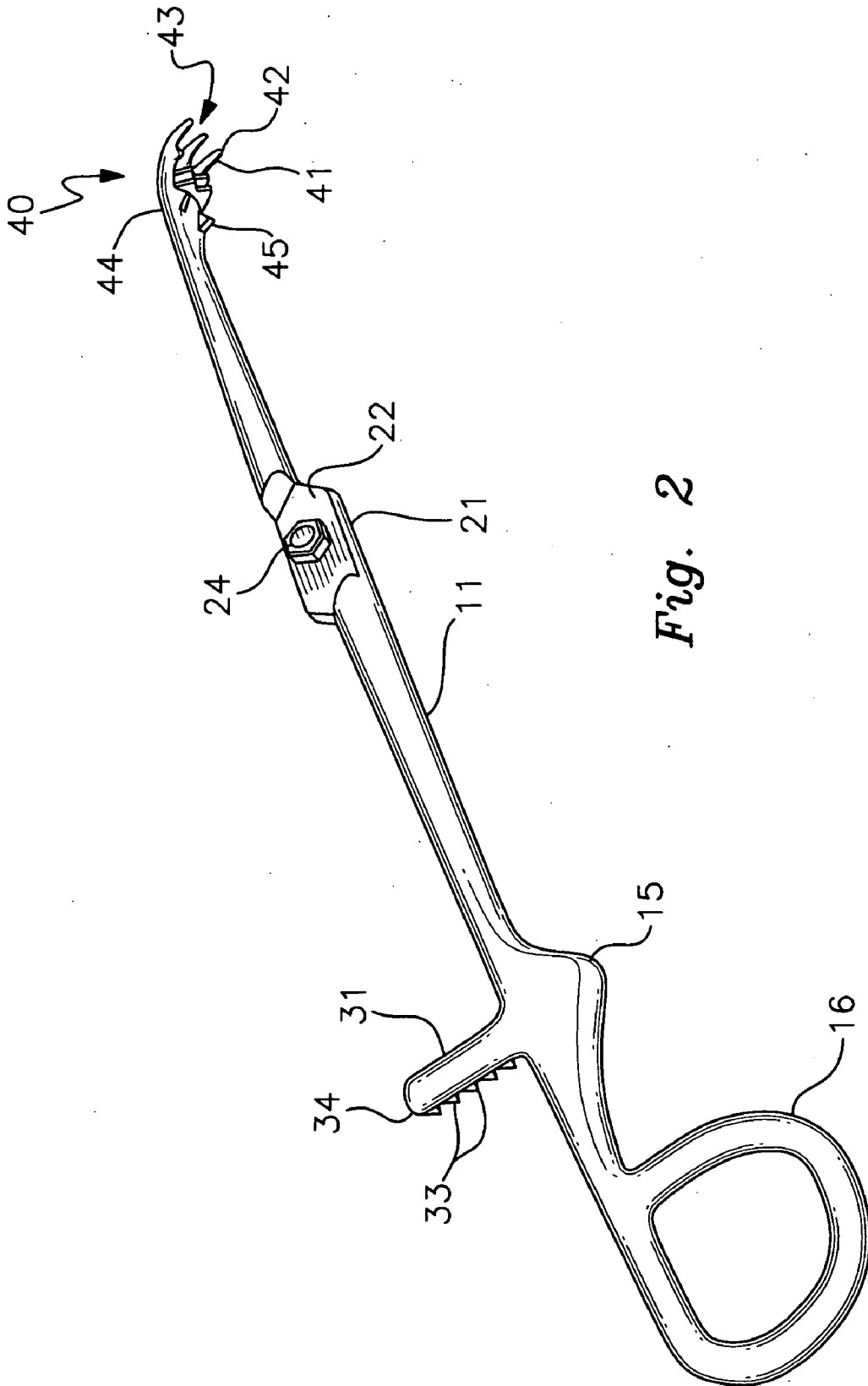


Fig. 2

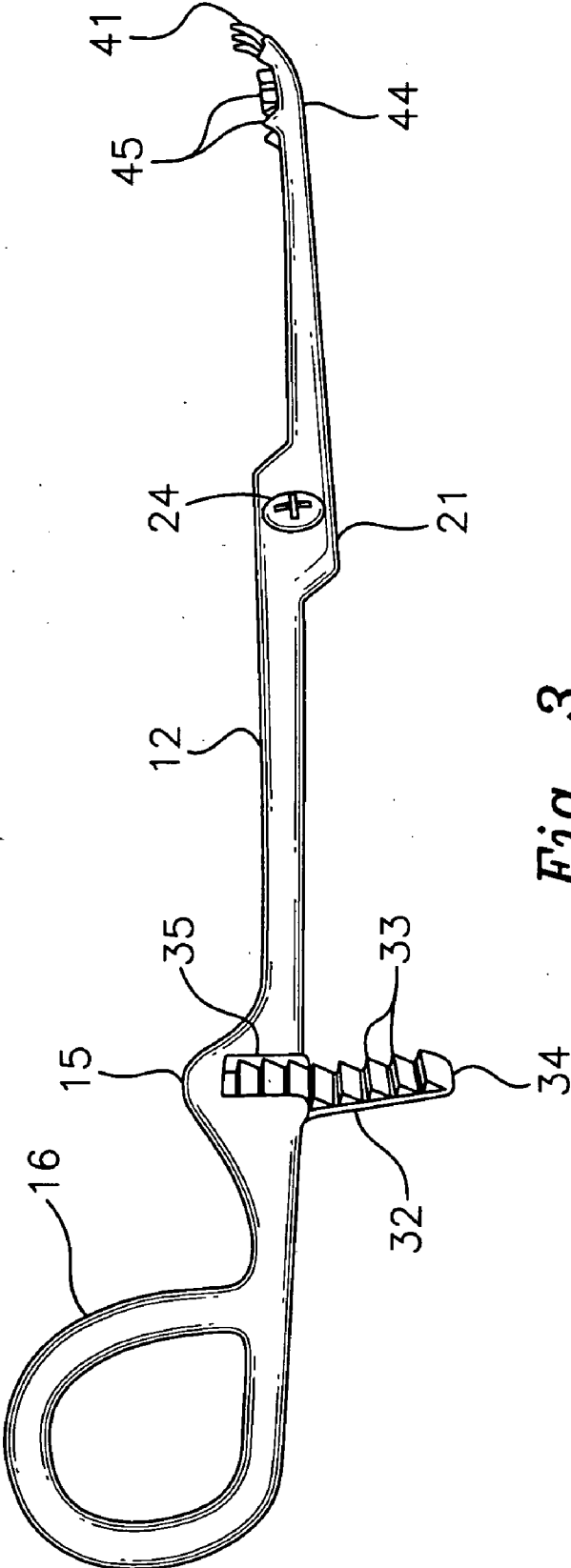
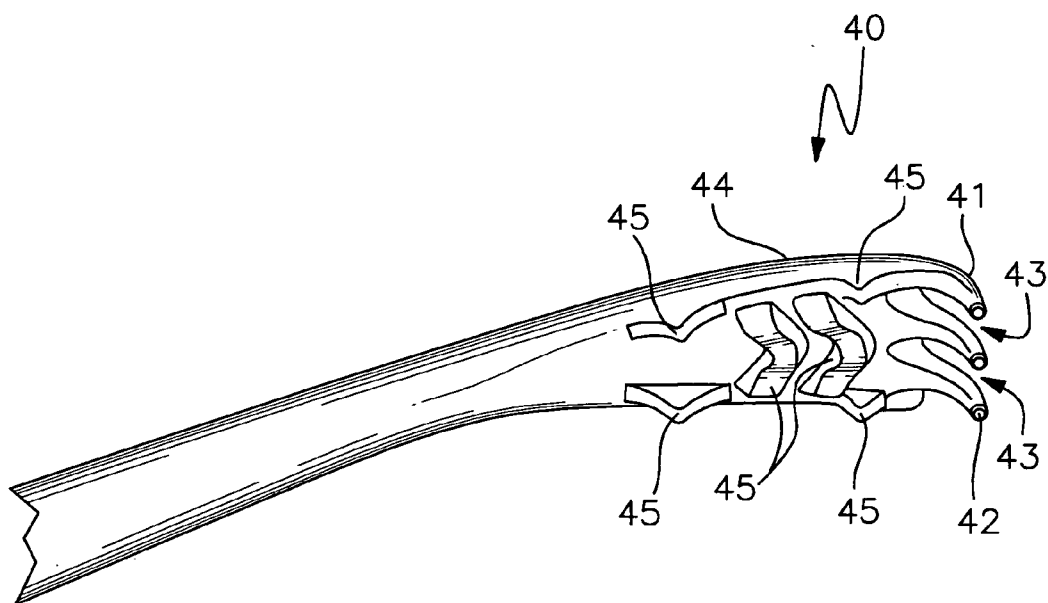


Fig. 3



*Fig. 4*

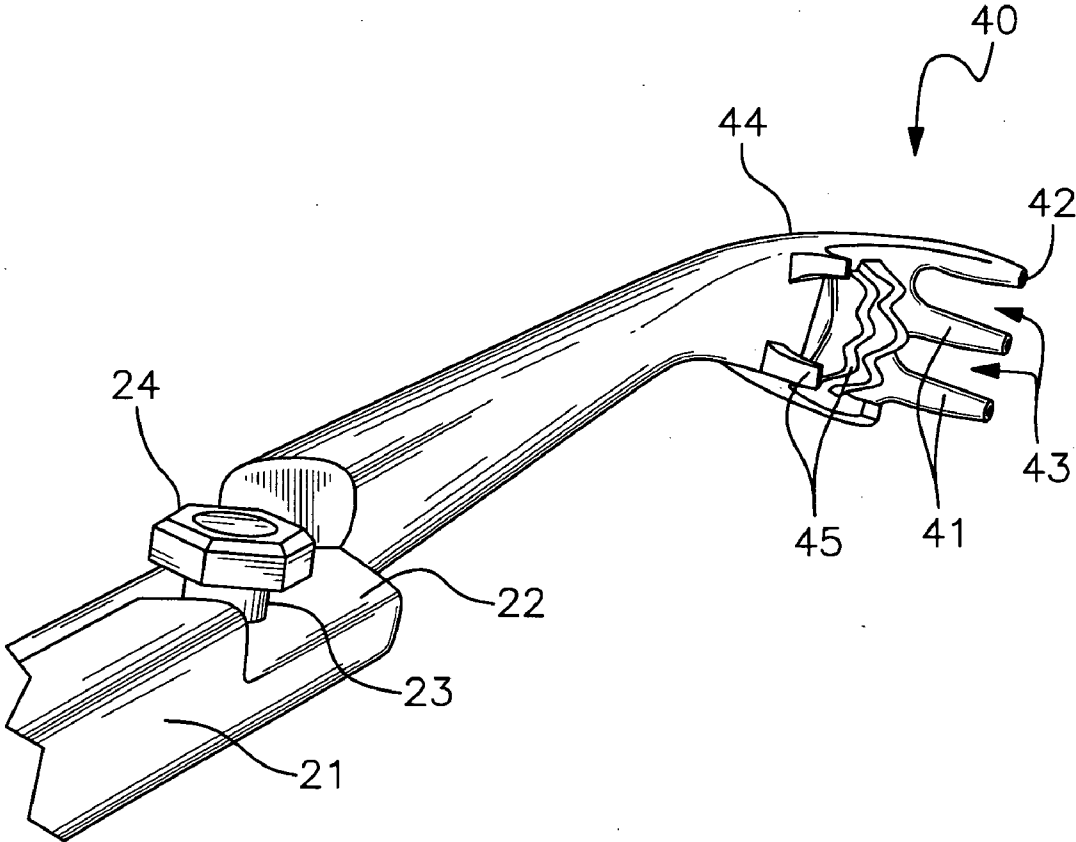
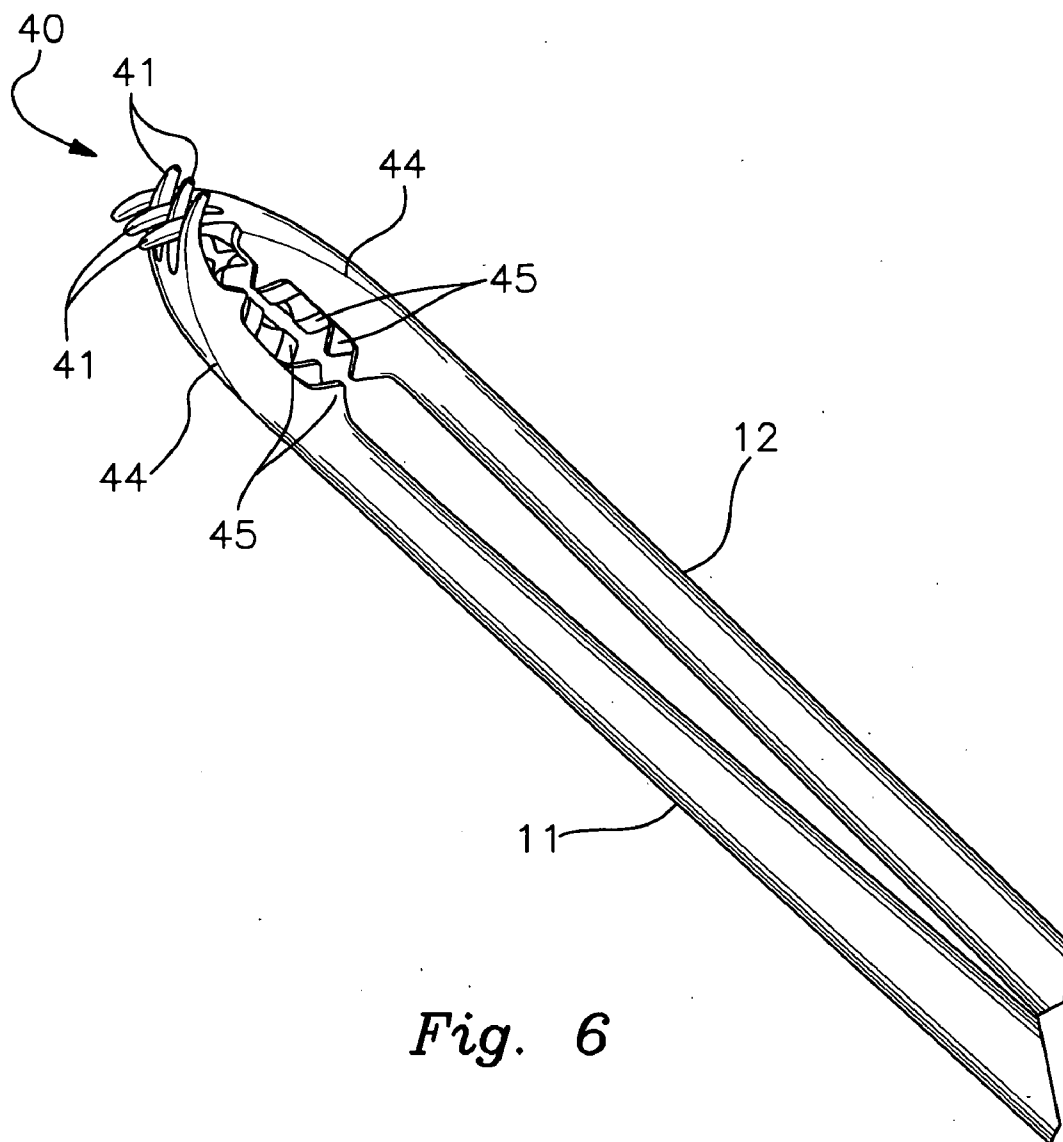


Fig. 5



*Fig. 6*

**TONSIL FORCEPS**

[0001] This application claims the benefit of U.S. Provisional Patent Application Ser. No. 61/069,942, filed Mar. 18, 2008.

**BACKGROUND OF THE INVENTION**

[0002] This invention relates generally to the field of medical forceps, and more particularly to such forceps that are lockable in multiple indexed closure positions and that possess distal end finger-like projections.

[0003] Forceps are handheld instruments in the form of tongs or pincers used to grasp, compress or pull body parts, tissue, organs, teeth, etc. A typical forceps comprises a pair of pivotally joined elongated arm members, the proximal ends of the arms being provided with finger holes for manipulating the instrument and the distal ends being provided with grasping structures suited for particular purposes, such as finger-like extensions, sharp teeth, blades, curved members, concave members, etc. Many forceps are provided with releasable locking means, such as for example a pair of opposing toothed bar members, one mounted on each arm and extending toward each other, that together act in a ratcheting manner, whereby the forceps will remain in a set clamping or spread position without the need for the surgeon physically maintaining a handhold, and whereby the forceps can be released from the locked position by separating the toothed bar members in the directions of the pivot axis.

[0004] In the removal of tonsils, it is necessary to grasp and pull the tonsil in order to separate and resect the tonsil from the surrounding mucosa, muscle and fascia. By pulling on the tonsil the anatomy surrounding the tonsil and the edges of the tonsil itself are better exposed, and the surgeon is able to more carefully cut into the tissue. Often the tonsils are partially embedded within the muscles and fascia, such that grasping the tonsil is difficult. The current style forceps used for this task tend to bite, stab or cut the tonsil during this grasping operation, resulting in undesirable fragmentation of the tonsil during the resection.

[0005] It is an object of this invention to provide tonsil forceps that alleviate the problems encountered with standard forceps such that the tonsil may be grasped and pulled without biting into, cutting, stabbing or otherwise piercing the surface or fragmenting the tonsil during resection. It is an object to provide such tonsil forceps wherein the distal grasping members comprise a pair of curved segments each having finger-like tine members that are interdigitating yet non-contacting and non-shearing when the forceps are closed about the tonsil. It is a further object to provide such tonsil forceps wherein inwardly facing projection members are provided on the interiors of the elongated arm members in order to better grasp the tonsil. It is a further object to provide such tonsil forceps wherein releasable locking means are provided such that the forceps may be locked into at least one position in which the tips of the finger-like tines are not interdigitated.

**SUMMARY OF THE INVENTION**

[0006] The invention is a tonsil forceps comprising first and second intersecting and pivoting arm members, the arm members being joined by pivoting connection means at an intermediate point such that the distal end of the forceps can be closed for grasping and opened for release in a scissoring

manner by relative movement of the proximal ends toward and away from each other, respectively. Releasable locking means for securing the forceps in multiple locked positions are provided, such as for example a ratchet-type mechanism. Finger loops are provided on the proximal ends of the arm members. Each of the distal ends of the arm members comprises grasping means for securing a tonsil, each grasping means comprising a palm-like curved portion and a set of inwardly curved, blunt tipped, finger-like tine members extending generally inwardly from the palm-like curved portions, wherein the sets of finger-like tine members of one distal end pass between but do not contact the finger-like tine members of the other distal end when the forceps are closed. In at least one of the locked positions, the tips on one set of the finger-like tines do not cross the tips of the other set of finger-like tines. The grasping means further comprise inwardly facing projection members, such as raised ridges, blunted teeth, posts, nubs or the like, are located on the interior sides of the palm-like curved portions. The projection members are non-contacting with each other even in the maximum closed forceps position.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0007] FIG. 1 is a plan view of the tonsil forceps shown in the fully closed, locked orientation, wherein the finger-like projection members are interdigitized and pass by each other without contact.

[0008] FIG. 2 is a perspective view of one of the pivoting arm members.

[0009] FIG. 3 is a perspective view of the other arm member.

[0010] FIGS. 4 and 5 are perspective views of the distal end of one of the arm members.

[0011] FIG. 6 is a perspective view of the distal ends of the arm members in the fully closed, locked orientation, wherein the finger-like projection members are interdigitized and pass by each other without contact.

**DETAILED DESCRIPTION OF THE INVENTION**

[0012] With reference to the drawings, the invention will now be described in detail with regard for the best mode and the preferred embodiment. In a most general sense, the invention is a tonsil forceps for grasping or pulling a tonsil so as to separate it from the surrounding mucosa, muscle and fascia, the structure of the grasping means being such that the tonsil is cradled rather than stabbed or cut by the grasping means during removal, and therefore remains intact as opposed to being fragmented during the resection procedure. The tonsil forceps may be realized in various embodiments.

[0013] The tonsil forceps comprise a first intersecting arm member 11 and a second intersecting arm member 12, each having a distal end 13 and a proximal end 14. The arm members 11 and 12 are connected by means 20 for pivoting the arm members 11 and 12, such that the distal ends 13 of the arm members 11 and 12 can be closed and opened by bringing together or spreading apart the arm member proximal ends 14 in scissor-like manner. The pivoting connection means 20 may comprise for example the combination of an intermediate body segment 21 disposed on each arm member 11 and 12, the intermediate body segment 21 having a flat interface surface 22 that promotes rotational sliding movement between the arm members 11 and 12. A bore 23 is provided through the intermediate body segments 21 and a mechanical



fastener **24**, such as a nut and bolt in combination, is positioned in the bore **23**. Preferably, the distal ends **13** of the arm members **11** and **12** are angled slightly, approximately 10 to 30 degrees, out of the plane containing the arm members **11** and **12**.

[0014] The proximal ends **13** of the arm members **11** and **12** comprise or are defined by finger loops **16**. Thumb flanges **15** to aid in releasing the locking means **30** may be disposed on the arm members **11** and **12**. The tonsil forceps are provided with releasable locking means **30** for temporarily locking or securing the forceps in a fixed position such that the locking means **30** must be released in order to open or close the forceps. The releasable locking means **30** may comprise for example a first transverse bar member **31** mounted to the first arm member **11** and a second transverse bar member **32** mounted to the second arm member **12**. The transverse bar members **31** and **32** are inwardly facing and opposing, such that they slidingly engage as the forceps are opened and closed. Opposing ratchet-like teeth or ridge members **33** are positioned on the opposing surfaces of the transverse bar members **31** and **32**, and the transverse bar members **31** and **32** preferably have beveled ends **34** so that they more readily slide across each other at initial closure. The transverse bar members **31** and **32** are preferably located at or near the thumb flanges **15** for ease of disengagement, and the thumb flanges **15** may be provided with slots **35** to receive the transverse bar members **31** and **32** when the forceps are fully closed. Typically, the teeth members **33** are configured with angled surfaces whereby the teeth members **33** present only minimum resistance when the forceps are closed, yet readily retain the forceps in a locked orientation when pressure is no longer applied. To open the forceps, each arm member **11** and **12** is moved in a direction perpendicular to the closure plane, such that the transverse bar members **31** and **32** are spread apart and the teeth **33** no longer are in contact. Such mechanisms are well known in the art.

[0015] The arm member distal ends **14** comprise or define grasping means **40** for grasping, cradling, securing and pulling a tonsil to separate the tonsil from the mucosa, muscle and fascia. The grasping means **40** comprise a set of finger-like tine members **41** extending generally in the distal direction from a relatively broad, palm-like curved portion **44** located on each arm member **11** and **12**, with broad curved portions **44** being inwardly concave. The finger-like tine members **41** are inwardly curved with blunt tips **42** and are separated by gaps **43**, with the tines **41** preferably tapering toward the blunt tips **42**. Each set of the tine members **41** is structured so as to be non-contacting and non-shearing with the other set of tine members **41** when the forceps are closed and the tines **41** are fully interdigitated, i.e., when the two sets of tips **42** intersect and pass by each other and the finger-like tines **41** pass into the gaps **43**. Furthermore, it is most preferable that in at least one locked position, i.e., a first lock or click position, the tine members **41** are not interdigitated or intersecting, i.e., the tips **42** of the two sets of tine members **41** are disposed on opposite sides of an imaginary plane located between the distal ends **14** of the first and second arm members **11** and **12**. As the forceps are more fully closed, the tips **42** will cross the imaginary plane such that the tips **42** extend through the gaps **43** outwardly beyond and away from the opposing set of tine members **41**, as shown in FIG. 6. As previously stated, it is critical that the tine members **41** do not make any contact, such that any scissoring or shearing action is precluded during closure of the forceps.

[0016] Preferably, the inner sides of the palm-like curved portions **44** have inwardly facing projection members **45** located thereon, the projection members **45** being blunt structural features, such as raised ridges, mounds, posts or the like which will abut the sides of the tonsil but not penetrate or cut into its surface when the forceps are closed around the tonsil. The projection members **45** better secure the tonsil during the grasping and pulling motions of the resection, and the surfaces of the projection members **45** may be roughened to provide better traction. The projection members **45** are sized and positioned such the projection members **45** of opposing palm-like curved segments **44** do not touch when the forceps are in the fully closed position.

[0017] In a representative and non-limiting exemplar embodiment of the invention, the following dimensions, all being approximate, are provided as suitable. The forceps may have an overall length of 21.5 cm with the pivoting connection means **20** centered 7 cm from the distal end **14** and the releasable locking means **30** positioned 8 cm from the pivoting connection means **20**. In the first lock position, there is a 1.2 cm gap between the tips **42** of the finger-like tine members **41** and an exterior dimension of 1.7 cm at the widest points on the palm-like curved portions **44**. In the fully closed position, interior sides of the palm-like curved portions **44** are separated 5 mm and the projection members **45** are separated 1.5 mm, with the finger-like tine members **41** overlapped 1.5 mm. Preferably the distal ends **13** of the forceps containing the palm-like curved portions **44** and the finger-like tine members **41** are disposed approximately 22 degrees out of plane from the arm members **11** and **12**, and the overall length of the palm-like curved portions **44** and the finger-like tine members **41** is 1.75 cm, with the finger-like tine members **41** extending 2.5 mm beyond the palm-like curved portions **44**. The maximum height of the projection members **45** is 1.375 mm. As shown in the drawings, the projection members **45** may comprise a plurality of undulating ridge members extending transversely across the palm-like curved portion **44** and a plurality of blunt tooth members positioned adjacent the sides of the palm-like curved portion **44**.

[0018] It is contemplated that equivalents and substitutions for elements set forth above may be obvious to one of ordinary skill in the art, and therefore the true scope and definition of the invention is to be as set forth in the following claims.

I claim:

1. A tonsil forceps comprising:

a first intersecting arm member and a second intersecting arm member, each having a distal end and a proximal end, said arm members joined in pivoting manner, such that said distal ends can be closed and opened by bringing together or spreading apart said arm member proximal ends in scissor-like manner;

each of said distal ends comprising means for grasping a tonsil to separate said tonsil from surrounding mucosa, muscle and fascia, each said grasping means comprising a set of finger-like tine members extending generally in the distal direction from a palm-like curved portion, wherein said finger-like tine members are inwardly curved with blunt tips and are separated by gaps, whereby said tine members of said first arm member are non-contacting with said tine members of said second arm member when said forceps are closed and said tine members are fully interdigitated;

said distal ends of said arm members being angled out of the plane containing said arm members;

a finger loop positioned at said proximal end of each said arm member;

inwardly facing, blunt projection members positioned on each of said palm-like curved portions, wherein said blunt projection members do not contact each other when said forceps is fully closed; and

means for temporarily locking said forceps in a fixed position;

whereby said tonsil forceps do not penetrate or fragment a tonsil when said grasping means are closed about the tonsil.

2. The forceps of claim 1, wherein said locking means comprise a first transverse bar member mounted to said first arm member and a second transverse bar member mounted to said second arm member, said transverse bar members being inwardly facing and opposing, such that said transverse bar members slidingly engage as said forceps are closed, said locking means further comprising opposing teeth members positioned on said transverse bar members;

and further wherein said locking means provides at least one locked position wherein said tine members are not interdigitized.

3. The forceps of claim 1, wherein said blunt projection members comprise at least one ridge extending across said palm-like curved portion.

4. The forceps of claim 1, wherein said blunt projection members comprise a plurality of blunt tooth members positioned adjacent the sides of said palm-like curved portions.

5. The forceps of claim 3, wherein said blunt projection members comprise a plurality of blunt tooth members positioned adjacent the sides of said palm-like curved portions.

6. The forceps of claim 2, wherein said blunt projection members comprise at least one ridge extending across said palm-like curved portion and a plurality of blunt tooth members positioned adjacent the sides of said palm-like curved portions.

7. The forceps of claim 1, further comprising means for pivoting said arm members comprising an intermediate body segment disposed on each said arm member, each said intermediate body segment having a flat interface surface and a bore, and a mechanical fastener positioned in said bore.

8. The forceps of claim 2, further comprising means for pivoting said arm members comprising an intermediate body segment disposed on each said arm member, each said intermediate body segment having a flat interface surface and a bore, and a mechanical fastener positioned in said bore.

9. The forceps of claim 5, further comprising means for pivoting said arm members comprising an intermediate body segment disposed on each said arm member, each said inter-

mediate body segment having a flat interface surface and a bore, and a mechanical fastener positioned in said bore.

10. The forceps of claim 6, further comprising means for pivoting said arm members comprising an intermediate body segment disposed on each said arm member, each said intermediate body segment having a flat interface surface and a bore, and a mechanical fastener positioned in said bore.

11. A tonsil forceps comprising:

means for grasping a tonsil comprising in combination two sets of finger-like tine members extending from broad curved members disposed on pivoting arm members, said individual tine members being separated by gaps such that said sets of tine members are non-contacting with each other when said forceps are fully closed, said tine members having blunt tips, said grasping means further comprising blunt projection members disposed on said broad curved members, wherein said projection members are non-contacting when said forceps are fully closed;

said broad curved members being disposed at an angle from said arm members;

releasable means for locking said forceps in a chosen position, at least one such position being such that said tine members do not intersect.

12. The forceps of claim 11, wherein said locking means comprise a first transverse bar member mounted to said first arm member and a second transverse bar member mounted to said second arm member, said transverse bar members being inwardly facing and opposing, such that said transverse bar members slidingly engage as said forceps are closed, said locking means further comprising opposing teeth members positioned on said transverse bar members.

13. The forceps of claim 11, wherein said blunt projection members comprise at least one ridge extending across said palm-like curved portion and a plurality of blunt tooth members positioned adjacent the sides of said palm-like curved portions.

14. The forceps of claim 11, further comprising means for pivoting said arm members comprising an intermediate body segment disposed on each said arm member, each said intermediate body segment having a flat interface surface and a bore, and a mechanical fastener positioned in said bore.

15. The forceps of claim 11, wherein said broad curved members are disposed at an angle of between 10 and 30 degrees from said arm members.

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