US008016279B1

(12) **United States Patent**
Su

(10) **Patent No.: US 8,016,279 B1**
(45) **Date of Patent: Sep. 13, 2011**

(54) **JAW ASSEMBLY**

(76) Inventor: **Yunghsien Vincent Su**, Thornton, CO (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 593 days.

(21) Appl. No.: **12/238,240**

(22) Filed: **Sep. 25, 2008**

Related U.S. Application Data

(60) Provisional application No. 60/995,123, filed on Sep. 25, 2007.

(51) **Int. Cl.**

B25B 1/00	(2006.01)
B23Q 3/02	(2006.01)
A44B 6/00	(2006.01)
B25B 5/00	(2006.01)

(52) **U.S. Cl.** **269/157**; 269/89; 269/138; 24/1

(58) **Field of Classification Search** 269/157, 269/16, 48.4, 50, 87.2, 89, 97, 138, 145, 269/178; 24/1

See application file for complete search history.

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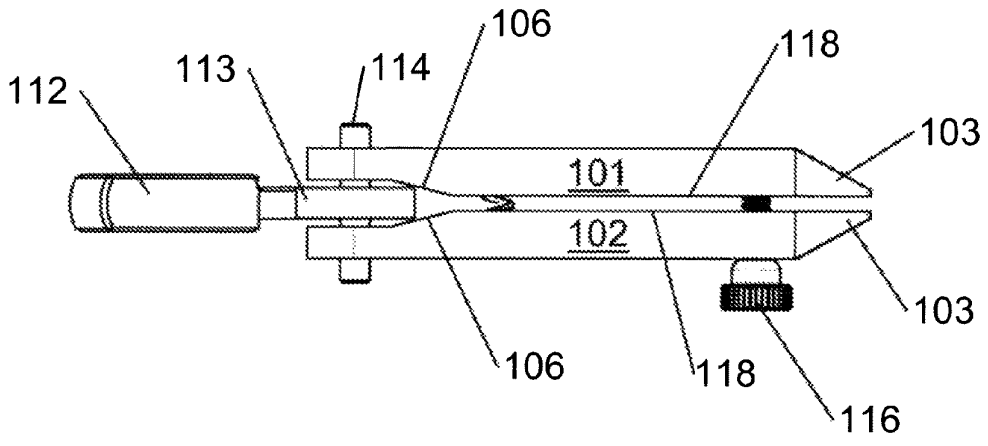
Primary Examiner — Alvin Grant

(74) *Attorney, Agent, or Firm* — Margaret Polson; Abigail Smith; Oppedahl Patent Law Firm LLC

(57) **ABSTRACT**

A jaw assembly to hold hooks when tying artificial lures and flies for fishing is disclosed. The jaw assembly utilizes jaw members with angled surfaces and a cam with an off-center pivot pin to open and close the jaws. A tension spring may be used to lessen the clamping force so that the angle of the hook shank can be adjusted before clamping it securely.

12 Claims, 5 Drawing Sheets



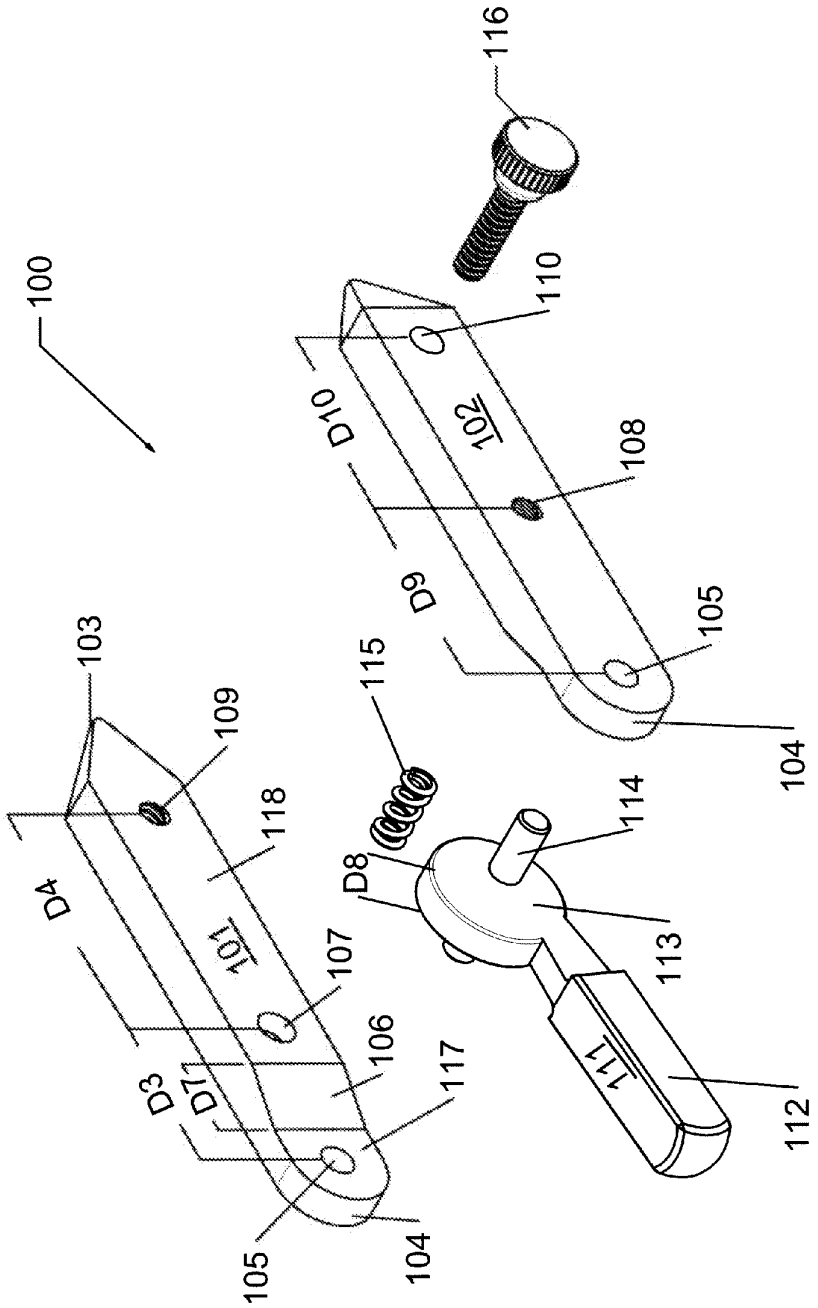

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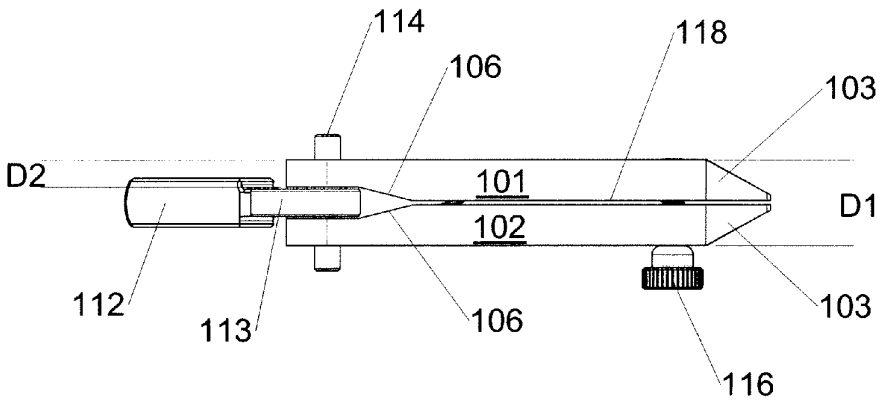
FIG. 1


114
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D2
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FIG. 2

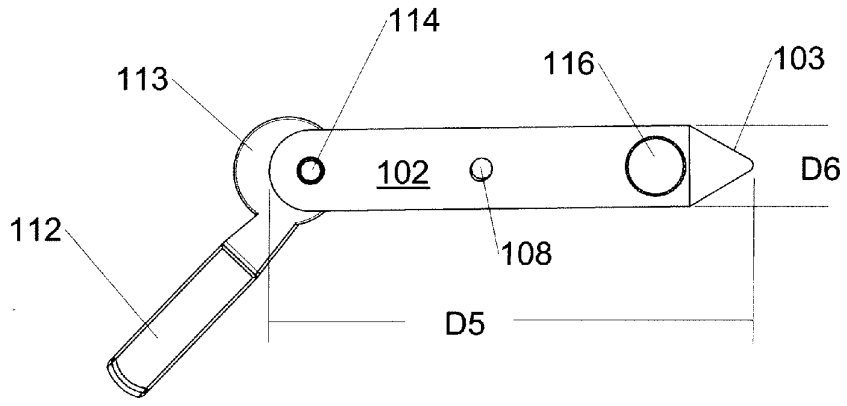
114
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FIG. 3

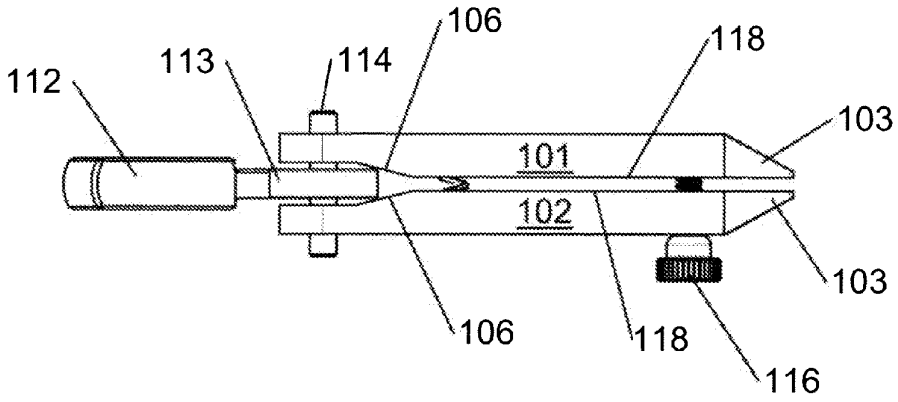
112
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FIG. 4

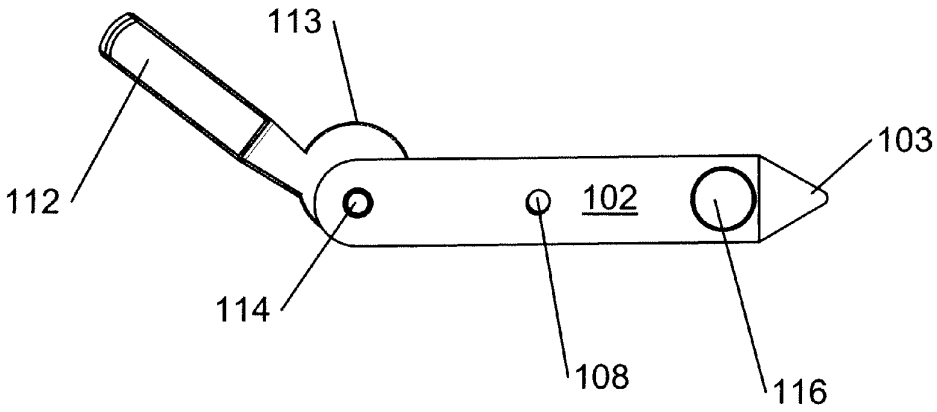
113
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FIG. 5

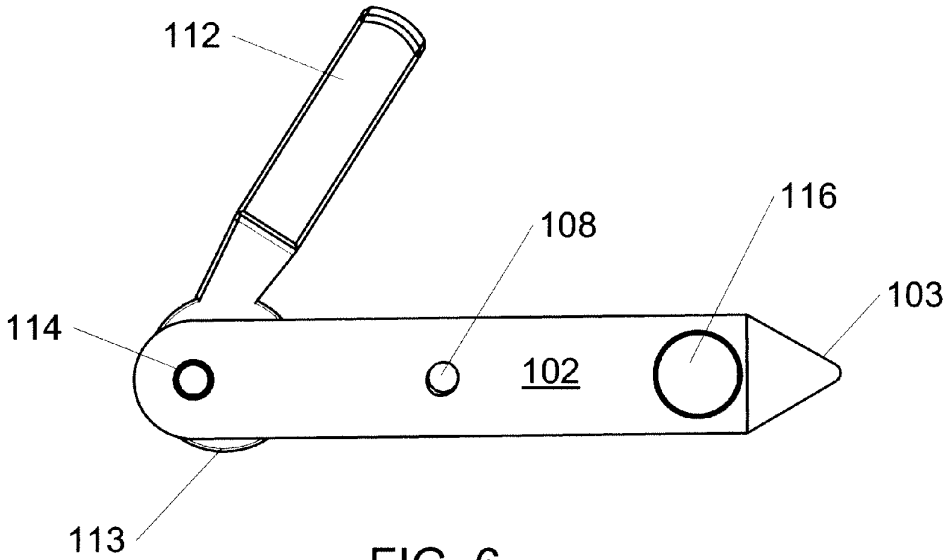
112
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FIG. 6

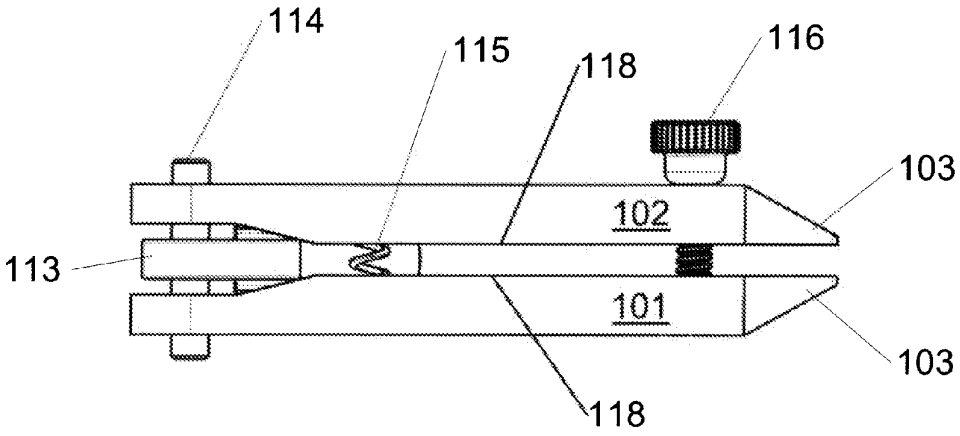
114
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FIG. 7

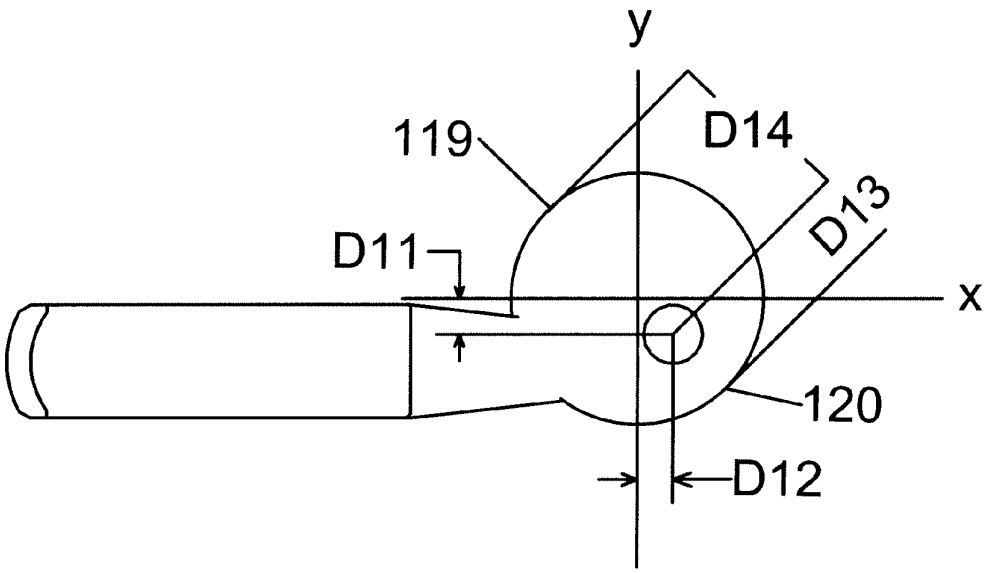

FIG. 8

JAW ASSEMBLY

CROSS REFERENCE APPLICATIONS

This application is a non-provisional application claiming the benefits of provisional application No. 60/995,123 filed Sep. 25, 2007.

BACKGROUND

Jaw assemblies for clamping fishing hooks, particularly during fly tying, are well known. These are often used with fly tying vises, such as that disclosed in U.S. application Ser. No. 11/974,622. However, difficulties exist in clamping a fishing hook and holding the hook in place for tying artificial lures and flies for fishing. In particular, it is difficult to generate the proper amount of force such that the hook is securely clamped, but the angle of the hook in the clamp can still be adjusted. Further, current clamping devices can be expensive to manufacture.

The foregoing example of the related art and limitations related therewith are intended to be illustrative and not exclusive. Other limitations of the related art will become apparent to those of skill in the art upon a reading of the specification and a study of the drawings.

SUMMARY

An aspect of the present invention is to securely hold a hook such that the angle of the hook can be adjusted.

Another aspect of the present invention is to provide a device which is more economical to make than currently available devices.

The following embodiments and aspects thereof are described and illustrated in conjunction with systems, tool and methods which are meant to be exemplary and illustrative, not limiting in scope. In various embodiments, one or more of the above described problems have been reduced or eliminated, while other embodiments are directed to other improvements.

A jaw assembly to hold hooks when tying artificial lures and flies for fishing is disclosed. The jaw assembly utilizes jaw members with angled surfaces and a cam with an off-center pivot pin to open and close the jaws. A tension spring may be used to lessen the clamping force so that the angle of the hook shank can be adjusted before clamping it securely.

In addition to the exemplary aspects and embodiments described above, further aspects and embodiments will become apparent by reference to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an exploded view of a jaw assembly.

FIG. **2** is a top plan view of a jaw assembly.

FIG. **3** is a side elevation view of the jaw member of FIG. **2**.

FIG. **4** is a top plan view of the jaw assembly of FIGS. **2** and **3** with cam rotated.

FIG. **5** is a side elevation view of the jaw member of FIG. **4**.

FIG. **6** is a side elevation view of the jaw member of FIG. **7**.

FIG. **7** is a bottom plan view of the jaw assembly of FIGS. **2** and **3** with cam rotated.

FIG. **8** is a side elevation view of the cam.

Before explaining the disclosed embodiment of the present invention in detail, it is to be understood that the invention is not limited in its application to the details of the particular arrangement shown, since the invention is capable of other embodiments. Exemplary embodiments are illustrated in referenced figures of the drawings. It is intended that the embodiments and figures disclosed herein are to be considered illustrative rather than limiting. Also, the terminology used herein is for the purpose of description and not of limitation.

DETAILED DESCRIPTION OF THE DRAWINGS

Referring first to FIG. **1**, a jaw assembly **100** is shown. The jaw assembly **100** has first jaw member **101** and second jaw member **102**. Jaw members **101**, **102** have a length D_5 and a height D_6. Jaw members **101**, **102** each have an inward tapered tip **103**. The majority of the length of jaw members **101**, **102** is flat along inner surface **118** such that the two jaw members **101**, **102** can be substantially parallel as seen in FIG. **2**. Jaw members **101**, **102** have a width D_1 along the majority of their length. The base **104** of jaw members **101**, **102** has a bore through-hole **105** in flat space **117**. The width of jaw members **101**, **102** at flat space **117** is D_2. The rear interior portion of jaw members **101**, **102** has an angled surface **106** from flat space **117** to inner surface **118**. Angled surface **106** has a length D_7. When jaw members **101**, **102** are connected to form the jaw assembly **100**, angled surfaces **106** form a V shape when seen from above where the base of the V points toward the inward tapered tips **103** of jaw members **101**, **102** as shown in FIGS. **2**, **4**, and **7**. When jaw members **101**, **102** are connected to form jaw assembly **100**, inner surfaces **118** are aligned and the distance between flat spaces **117** is at least slightly greater than D_8.

Jaw member **101** has a hole **107** adjacent to the angled surface **106** on inner surface **118**. Distance D_3 separates hole **107** and bore through-hole **105**. Jaw member **101** has a threaded hole **109** adjacent to tapered tip **103**. Distance D_4 separates threaded hole **109** and hole **107**.

Jaw member **102** has a threaded hole **108** adjacent to angled surface **106**. Distance D_9 separates threaded hole **108** and bore through-hole **105**. Jaw member **102** has a hole **110** adjacent to tapered tip **103**. Distance D_{10} separates hole **110** and threaded hole **108**.

Cam **111** is comprised of a lever **112** and a disc **113**. Disc **113** has a perimeter surface with a substantially uniform width of D_8. Lever **112** extends radially from the perimeter surface of disc **113**. Pivot pin **114** transverses disc **113** and extends perpendicular thereto. Pivot pin **114** is mounted off center of both the x and y axes of disc **113** as shown in FIG. **8**. The longitudinal axis of lever **112** is substantially parallel to the x axis of disc **113**. Pivot pin **114** is located on the opposing side of the y axis from the lever **112** and on the same side of the x axis as lever **112**. The distance the pivot pin is off set from the center of the disc **113**, also the intersection of the x and y axes, is D_{11} and D_{12}. In the depicted embodiment D_{11} equals D_{12}, but this is not required. The pivot pin is distance D_{13} from the perimeter at its closest point **120** and distance D_{14} at its farthest point **119**. The length L of a line from the center of pivot pin to any point on the perimeter continuously increases from **120** to **119**.

Pivot pin **114** is inserted in bore through-holes **105** of jaw members **101**, **102**. The thickness of disc **113** and the depth of the surfaces are chosen such that disc **113** fits in the space between flat spaces **117** when the jaw members **101**, **102** are together. One end of tension spring **115** is inserted in hole **107** of jaw member **101** and the other end of tension spring **115** is

inserted in hole **107** (not shown) of inner surface **118** of jaw member **102**. Screw **116** is inserted through hole **110** in jaw member **102** and screws into threaded hole **109** in jaw member **101** as seen in FIGS. **2**, **4** and **7**.

The offset of pivot pin **114** on disc **113** and the location of lever **112** on disc **113** are such that when lever **112** is in position **1**, depicted in FIGS. **2** and **3**, disc **113** does not intrude into the V formed by angled surfaces **106** when jaw members **101**, **102** are together. As lever **112** is moved to position **2**, depicted in FIGS. **4**, **5**, **6** and **7**, disc **113** is rotated. The offset of pivot pin **114** causes an increasing portion of disc **113** to travel into the V formed by angled surfaces **106** when jaw members **101**, **102** are together, forcing jaw members **101**, **102** apart at base **104**. Since jaw members **101**, **102** are pinned together, forcing bases **104** apart causes a clamping force on ends **103**.

Referring next to FIGS. **2** and **3**, jaw members **101**, **102** are shown with lever **112** rotated below the plane of jaw assembly **100**. In this position, disc **113** of cam **112** remains near the tip of the V shape formed by the intersection of angled intercuts **106**, thus keeping tapered tips **103** of jaw members **101**, **102** apart.

Referring next to FIGS. **4**, **5**, **6** and **7**, jaw members **101**, **102** are shown with lever **112** rotated above the plane of jaw assembly **100**. In this position, disc **113** of cam **112** moves into the V shape formed by the intersection of angled intercuts **106**, thus moving tapered tips **103** of jaw members **101**, **102** together. The length of the V shape is determined by the distance D_7. The distance D_{14} from the pivot pin **114** to the farthest point on the perimeter of the disc **119** is equal to or less than the distance D_7, otherwise the disc **113** will push past the shape of V shape, which would cause a sudden change in the clamping force, as opposed to the smooth increase desired.

Screw **116** can then be used to further adjust the distance between tapered tips **103** of jaw members **101**, **102**. Tension spring **115** keeps tapered tips of jaw members **101**, **102** closed with a minimum of clamping force. Less clamping force allows jaw assembly **100** to hold a fishing hook loosely so that the angle of the hook shank can be adjusted before it is clamped securely between tapered tips **103** of jaw members **101**, **102**.

The nominal dimensions for the depicted embodiment are: D_5 is approximately 5.6 cm, D_6 is approximately 0.9 cm, D_1 is approximately 0.41 cm, D_2 is approximately 0.3 cm, D_7 is approximately 0.71 cm, D_8 is approximately 0.3 cm, D_3 is approximately 1.5 cm, D_4 is approximately 2.6 cm, D_9 is approximately 2.05 cm and D_{10} is approximately 2.05 cm. D_{11} and D_{12} are approximately 0.18 cm. D_{13} is approximately 0.38 cm and D_{14} is approximately 0.89 cm. It should be understood that different ratios and dimensions than those disclosed could be used other than where the specification specifically states otherwise.

While a number of exemplary aspects and embodiments have been discussed above, those of skill in the art will recognize certain modifications, permutations, additions and sub-combinations therefore. It is therefore intended that the following appended claims hereinafter introduced are interpreted to include all such modifications, permutations, additions and sub-combinations are within their true sprit and scope. Each apparatus embodiment described herein has numerous equivalents.

I claim:

1. A jaw assembly comprising:

two jaw members;

said jaw members having a length D_5, a height D_6 and a width D_1 along the majority of the length of said jaw member;

each of said jaw members having a base end with a flat space on facing surfaces of the jaw members, said flat surface having a width of D_2, D_2 being less than D_1, an angled surface extending from D_1 to D_2, said angled surface having a length D_7 such that a first open space is formed between the flat surfaces and a second generally V shaped open space is formed between the angled surfaces when the facing surfaces are aligned;

a cam; said cam comprising a disc having an x and a y axis that intersect at a center point of the disc, said axes being horizontal and vertical respectively, two side surfaces, and a perimeter surface with a width D_8, a lever extending radially from the perimeter surface of the disc such that the longitudinal axis of the lever is substantially parallel to the x axis, and a pivot pin transversing the disc and extending substantially perpendicular to the side surfaces of the disc;

said pivot pin being located off set from both the x and y axes, and located on the opposing side of the y axis from the lever and on the same side of the x axis as the lever;

said cam pivotally mounted via the pivot pin between the jaw members at the flat surface in said first open space; and

wherein the off set of the pivot pin is configured such that a progressively increasing portion of the disc is rotated into the V shaped open space as the lever is moved from a first position to a second position.

2. The jaw assembly of claim **1** wherein a tips of said jaw members are tapered.

3. The jaw assembly of claim **1** wherein a tension spring is mounted between said facing surfaces of said jaw members.

4. The jaw assembly of claim **3** wherein said tension spring is adjacent to said angled surface in said jaw members.

5. The jaw assembly of claim **1** wherein a screw connects said jaw members.

6. The jaw assembly of claim **4** wherein said screw is adjacent to the tip of said jaw members.

7. A jaw assembly comprising:

two jaw members;

said jaw members having a length D_5, a height D_6 and a width D_1 along majority of the length of said jaw member;

each of said jaw members having a base end with a flat space on facing surfaces of the jaw members, said flat surface having a width of D_2, D_2 being less than D_1, an angled surface extending from D_1 to D_2, said angled surface having a length D_7 such that a first open space is formed between the flat surfaces and a second generally V shaped open space is formed between the angled surfaces when the facing surfaces are aligned;

a cam; said cam comprising a disc having an x and a y axis that intersect at a center point of the disc, said axes being horizontal and vertical respectively, two side surfaces, and a perimeter surface with a width D_8, a lever extending radially from the perimeter surface of the disc such that the longitudinal axis of the lever is substantially parallel to the x axis, and a pivot pin transversing the disc and extending substantially perpendicular to the side surfaces of the disc;

said pivot pin being located off set from both the x and y axes, and located on the opposing side of the y axis from the lever and on the same side of the x axis as the lever

said cam pivotally mounted via the pivot pin between the jaw members at the flat surface in said first open space; and

a plurality of lines extending from the pivot pin to the side surface, the pin mounted such that progressively increasing lines are moved between the angled surfaces as the lever is rotated from a first position to a second position.

8. The jaw assembly of claim **7** wherein a tips of said jaw members are tapered.

9. The jaw assembly of claim **7** wherein a tension spring is mounted between said facing surfaces of said jaw members.

10. The jaw assembly of claim **9** wherein said tension spring is adjacent to said angled surface in said jaw members.

11. The jaw assembly of claim **7** wherein a screw connects said jaw members.

12. The jaw assembly of claim **11** wherein said screw is adjacent to the tip of said jaw members.

* * * * *