

# US Patent & Trademark Office

## Patent Public Search | Text View

---

United States Patent Application Publication

20250261938

Kind Code

A1

Publication Date

August 21, 2025

Inventor(s)

Jin; Tingting et al.

---

### STAPLING DEVICE WITH END EFFECTOR HAVING BOTTOM GUIDE MEMBER

---

#### Abstract

A surgical stapling device includes an end effector having a bottom guide member to confine tissue in the path of a cutting member and ensure that tissue is cleanly cut through. The bottom guide member can be supported on an end effector frame and be reusable or supported on the cartridge module and be disposable.

---

**Inventors:** Jin; Tingting (Shanghai, CN), Zhang; Xiliang (Shanghai, CN), Wang; Zhaokai (Shanghai, CN)

**Applicant:** Covidien LP (Mansfield, MA)

**Family ID:** 1000008578378

**Assignee:** Covidien LP (Mansfield, MA)

**Appl. No.:** 19/176285

**Filed:** April 11, 2025

#### Related U.S. Application Data

parent US continuation 18284772 20230928 parent-grant-document US 12295573 WO  
continuation PCT/CN2021/084233 20210331 child US 19176285

---

#### Publication Classification

**Int. Cl.: A61B17/072** (20060101)

**U.S. Cl.:**

**CPC A61B17/072** (20130101); A61B2017/07221 (20130101); A61B2017/07271 (20130101); A61B2017/07285 (20130101)

---

## **Background/Summary**

**CROSS REFERENCE TO RELATED APPLICATIONS [0001]** This application is a continuation of U.S. patent application Ser. No. 18/284,772, filed Sep. 28, 2023, which is a National Stage Application of PCT/CN2021/084233, filed Mar. 31, 2021, the entire contents of which are incorporated by reference herein.

### **FIELD**

[0002] The present technology is generally related to surgical stapling devices and, more particularly, to surgical stapling devices that have U-shaped end effectors for capturing tissue.

### **BACKGROUND**

[0003] Surgical stapling devices are commonly used during a variety of surgical procedures to expedite dissection and suturing of tissue while minimizing trauma to a patient. Typically, the stapling devices include an end effector that has a cartridge assembly and an anvil assembly. The cartridge assembly and the anvil assembly are movable in relation to each other between open and clamped positions to clamp tissue therebetween. When the tissue is clamped between the cartridge and anvil assemblies, the stapling device can be fired to eject staples from the cartridge assembly into a staple forming surface of the anvil assembly to suture the tissue. The stapling devices often include a knife assembly that has a cutting blade that is advanced from within the cartridge assembly into the anvil assembly to cut the tissue clamped between the cartridge and anvil assemblies.

[0004] Surgical stapling devices are available in a variety of types for performing a variety of different surgical procedures. One type of stapling device includes a U-shaped end effector that has a frame having a distal transverse portion, a proximal transverse portion, and a longitudinal portion interconnecting the distal transverse portion and the proximal transverse portion. Each of the distal and proximal transverse portions has a first end coupled to the longitudinal portion and a second end spaced from the longitudinal portion. The second ends of the distal and proximal transverse portions define an opening for receiving tissue. The anvil assembly is supported on the distal transverse portion which extends from the longitudinal portion in cantilevered fashion. The cartridge assembly is supported adjacent the proximal transverse portion and is movable towards the distal transverse portion to move the anvil and cartridge assemblies into juxtaposed alignment and clamp tissue between the anvil and cartridge assemblies.

[0005] Some stapling devices include an alignment pin that is movable from within the cartridge assembly into the anvil assembly to close the opening defined between the second ends of the distal and proximal transverse portions of the frame to trap tissue between the anvil and cartridge assemblies in a position to be transected or resected by the cutting blade. Other stapling devices also include a bottom pin or guide member that is positioned adjacent the first ends of the distal and proximal transverse portions to interface with the cutting blade and improve the cutting capabilities of the stapling device especially at an end or bottom of the cartridge assembly adjacent the longitudinal portion of the frame.

[0006] A continuing need exists in the art for an end effector with improved cutting capabilities along the bottom of the cartridge assembly.

## SUMMARY

[0007] This disclosure is directed to a surgical stapling device that includes an end effector having a bottom guide member to confine tissue in the path of a cutting member to ensure that tissue is cleanly cut through. The bottom guide member can be supported on an end effector frame of the end effector such that the guide member is reusable or supported on the cartridge module of the end effector such that the guide member is disposable with the cartridge module.

[0008] Aspects of this disclosure are directed to a stapling device that includes an elongate body, a clamp slide assembly, a thrust bar, and an end effector including a cartridge module, an anvil, an end effector frame, and a guide assembly. The elongate body has a proximal portion and a distal portion. The clamp slide assembly has a distal portion that defines a pocket and is movable between retracted and advanced positions. The thrust bar has a proximal portion and a distal portion. The cartridge module of the end effector is releasably received within the pocket of the clamp slide assembly and includes a cartridge body, a knife assembly, a pusher, and staples. The cartridge body defines a knife slot and staple receiving slots positioned on each side of the knife slot. Each of the staple receiving slots receives one of the staples. The knife assembly includes a knife holder and a cutting blade. The pusher includes fingers that are received in the staple receiving slots. The knife assembly and the pusher are movable within the cavity of the cartridge body from retracted to advanced positions to eject the staples from the cartridge body and to advance the cutting blade from a position recessed within the cartridge body to a position extending from the knife slot of the cartridge body. The end effector frame has a distal transverse portion, a proximal transverse portion, and a longitudinal portion interconnecting the distal and proximal transverse portions at spaced locations to define a recess that receives the distal portion of the clamp slide assembly and the distal portion of the thrust bar. The longitudinal portion of the end effector frame has an inwardly facing surface that defines a channel that extends longitudinally along the inwardly facing surface. The anvil is supported on the distal transverse portion of the end effector frame. The guide assembly is supported on the longitudinal portion of the end effector frame and includes a guide member having a body. The body includes a lower portion and a guide portion that extends distally of the lower portion. The lower portion is received within the channel of the longitudinal portion of the end effector frame. The body defines a recess that is defined in part by an abutment surface that is aligned with the cutting blade. The guide member is movable from a retracted position to an advanced position in response to movement of the knife assembly from its retracted position to its advanced position.

[0009] Other aspects of this disclosure are directed to an end effector including an end effector frame and a guide assembly. The end effector frame includes a distal transverse portion, a proximal transverse portion, and a longitudinal portion interconnecting the distal and proximal transverse portions at spaced locations to define a recess. The longitudinal portion of the end effector frame has an inwardly facing surface that defines a channel that extends longitudinally along the inwardly facing surface. The guide assembly is supported on the longitudinal portion of the end effector frame and includes a guide member having a body that has a lower portion and a guide portion that extends distally of the lower portion. The lower portion is received within the channel in the longitudinal portion of the end effector frame. The body defines a recess that is defined in part by an abutment surface that is aligned with a cutting blade of a cartridge module. The guide member is movable from a retracted position to an advanced position along the longitudinal portion of the end effector frame.

[0010] In aspects of the disclosure, the guide assembly includes a biasing member that urges the guide member towards its retracted position.

[0011] In some aspects of the disclosure, the distal transverse portion defines a bore that receives the guide portion of the guide member.

[0012] In certain aspects of the disclosure, the biasing member is received within the bore in the distal transverse portion of the end effector frame.

[0013] In aspects of the disclosure, the guide portion of the guide member includes a rectangular portion and a cylindrical portion that extends distally from the rectangular portion, and the biasing member is positioned about the cylindrical portion and is engaged with the rectangular portion.

[0014] In some aspects of the disclosure, the thrust bar is configured to couple to the knife holder when the cartridge module is loaded onto the clamp slide assembly.

[0015] In certain aspects of the disclosure, the cartridge module and the end effector frame have curved configurations.

[0016] In aspects of the disclosure, the lower portion of the guide member defines a longitudinal slot and the longitudinal portion of the end effector frame supports a pin that extends across the channel in the longitudinal portion and through the longitudinal slot in the lower portion of the guide member.

[0017] In some aspects of the disclosure, the stapling device includes a handle assembly, and the elongate body extends distally from the handle assembly.

[0018] Other aspects of this disclosure are directed to a surgical stapling device including an elongate body, a clamp slide assembly, a thrust bar, an end effector frame, an anvil, a reload assembly, and a guide assembly. The elongate body has a proximal portion and a distal portion. The clamp slide assembly has a distal portion that defines a pocket and is movable between retracted and advanced positions. The thrust bar has a proximal portion and a distal portion. The end effector frame has a distal transverse portion, a proximal transverse portion, and a longitudinal portion interconnecting the distal and proximal transverse portions. The distal and proximal transverse portions are spaced from each other to define a recess that receives the distal portion of the clamp slide assembly and the distal portion of the thrust bar. The longitudinal portion of the end effector frame has an inwardly facing surface that defines a distal bore that is defined in part by an angled camming surface. The anvil is supported on the distal transverse portion of the end effector frame. The reload assembly includes a cartridge module and a shipping cap. The cartridge module includes a cartridge body, a knife assembly, a pusher, staples, and a guide assembly. The cartridge body defines a knife slot, staple receiving slots positioned on each side of the knife slot, and a channel. Each of the staple receiving slots receives one of the staples. The knife assembly includes a knife holder and a cutting blade. The pusher includes fingers that are received in the staple receiving slots. The knife assembly and the pusher are movable within the cavity of the cartridge body from retracted to advanced positions to eject the staples from the cartridge body and to advance the cutting blade from a position recessed within the cartridge body to a position extending from the knife slot of the cartridge body. The cartridge module is releasably received within the pocket of the clamp slide assembly. The guide assembly includes a guide member that is received within the channel of the cartridge body and is movable from a retracted position to an advanced position. The guide member includes an elongate body portion and a finger extending downwardly from the elongate body portion. The finger is positioned to engage the angled camming surface on the longitudinal portion of the end effector frame when the cartridge module is loaded onto the clamp slide assembly to move the guide member from its retracted position to its advanced position. The shipping cap is releasably supported on the cartridge module.

[0019] In aspects of the disclosure, the guide assembly includes a biasing member that is positioned to urge the guide member to its retracted position.

[0020] In some aspects of the disclosure, the elongate body portion of the guide member includes an extension that extends downwardly from the elongate body portion and defines an elongate opening, and the shipping cap includes flexible arms.

[0021] In certain aspects of the disclosure, each of the flexible arms includes a protrusion that is received within the opening in the extension to releasably secure the shipping cap to the cartridge module.

[0022] In aspects of the disclosure, the longitudinal portion of the end effector frame defines a proximal bore that receives an insert plate, and the flexible arms are positioned to engage the insert

plate when the cartridge module is loaded onto the clamp slide assembly to cam the flexible arms outwardly and remove the protrusions from the opening in the extension to facilitate removal of the shipping cap from the cartridge module.

[0023] Other features of the disclosure will be appreciated from the following description.

---

## Description

### BRIEF DESCRIPTION OF THE DRAWINGS

[0024] Various aspects of the disclosure are described herein below with reference to the drawings, wherein:

[0025] FIG. 1 is a side perspective view of a stapling device including an end effector according to aspects of the disclosure with the end effector in a pre-fired open position;

[0026] FIG. 2 is side perspective view of an end effector of the stapling device shown in FIG. 1 with a cartridge module of the end effector removed from a clamp slide assembly of the stapling device;

[0027] FIG. 3 is a side perspective exploded view of the end effector of the stapling device shown in FIG. 1;

[0028] FIG. 3A is an enlarged view of the indicated area of detail shown in FIG. 3;

[0029] FIG. 4 is a side perspective view of a thrust bar of the stapling device shown in FIG. 1 and a knife assembly of the cartridge module shown in FIG. 3 with the knife assembly coupled to the thrust bar;

[0030] FIG. 5 is a side perspective view of a guide member of a guide assembly of the end effector shown in FIG. 3;

[0031] FIG. 6 is an enlarged view of the indicated area of detail shown in FIG. 1;

[0032] FIG. 7 is an enlarged view of the indicated area of detail shown in FIG. 2;

[0033] FIG. 8 is a side perspective view of a distal portion of the end effector of the stapling device shown in FIG. 1 with internal components of the end effector and the stapling device shown in phantom and the end effector in a pre-fired open position;

[0034] FIG. 9 is a cross-sectional view taken along section line 9-9 of FIG. 8;

[0035] FIG. 10 is a side perspective view of the distal portion of the end effector of the stapling device shown in FIG. 1 with the end effector in a clamped position;

[0036] FIG. 11 is a cross-sectional view taken along section line 11-11 of FIG. 10;

[0037] FIG. 12 is a side perspective view of the distal portion of the end effector of the stapling device shown in FIG. 1 with the end effector in a clamped and partially fired position;

[0038] FIG. 13 is a side perspective view of the distal portion of the end effector of the stapling device shown in FIG. 1 with the end effector in a clamped and fully fired position;

[0039] FIG. 14 is a side perspective view from the distal end of a reload assembly according to other aspects of the disclosure;

[0040] FIG. 15 is an exploded side perspective view of the reload assembly shown in FIG. 14;

[0041] FIG. 16 is a side perspective view from the distal end of a guide member of the reload assembly shown in FIG. 15 with parts separated;

[0042] FIG. 17 is a side perspective view from the proximal end of the guide member shown in FIG. 16 assembled;

[0043] FIG. 18 is an enlarged view of the indicated area of detail shown in FIG. 14;

[0044] FIG. 19 is a cross-sectional view along section line 19-19 of FIG. 18;

[0045] FIG. 20 is a cross-sectional view along section line 20-20 of FIG. 18;

[0046] FIG. 21 is a cross-sectional view along section line 21-21 of FIG. 18;

[0047] FIG. 22 is a side perspective view from the proximal end of the reload assembly shown in FIG. 14;

[0048] FIG. **23** is a side perspective view of an alternate version of the end effector of the stapling device shown in FIG. **1** with the reload assembly removed from the clamp slide assembly of the stapling device;

[0049] FIG. **24** is a cross-sectional view taken along section line **24-24** of FIG. **23**;

[0050] FIG. **25** is a cross-sectional view taken along section line **25-25** of FIG. **22**;

[0051] FIG. **26** is an enlarged view of the indicated area of detail shown in FIG. **24** as the reload assembly is loaded onto the clamp slide assembly of the stapling device;

[0052] FIG. **27** is an enlarged view of the indicated area of detail shown in FIG. **24** as the reload assembly is loaded further onto the clamp slide assembly of the stapling device;

[0053] FIG. **28** is a cross-sectional view along section line **28-28** of FIG. **26** as the reload assembly is loaded onto the clamp slide assembly of the stapling device;

[0054] FIG. **29** is a cross-sectional view along section line **28-28** of FIG. **26** with the reload assembly loaded onto the clamp slide assembly of the stapling device;

[0055] FIG. **30** is a side perspective view of the end effector of the stapling device shown in FIG. **1** with the cartridge module in an unclamped position;

[0056] FIG. **31** is a cross-sectional view taken along section line **31-31** of FIG. **30**;

[0057] FIG. **32** is an enlarged view of the indicated area of detail shown in FIG. **31**;

[0058] FIG. **33** is an enlarged cross-sectional view of a portion of the end effector shown in FIG. **30** as the stapling device is being fired; and

[0059] FIG. **34** is an enlarged cross-sectional view of a portion of the end effector shown in FIG. **30** after the stapling device has been fired.

#### DETAILED DESCRIPTION

[0060] The disclosed surgical stapling devices will now be described in detail with reference to the drawings in which like reference numerals designate identical or corresponding elements in each of the several views. However, it is to be understood that the aspects of the disclosure are merely exemplary and may be embodied in various forms. Well-known functions or constructions are not described in detail to avoid obscuring the disclosure in unnecessary detail. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the disclosure in virtually any appropriately detailed structure.

[0061] In this description, the term “proximal” is used generally to refer to that portion of the device that is closer to a clinician during use of the device in its customary manner, while the term “distal” is used generally to refer to that portion of the device that is farther from the clinician during use of the device in its customary manner. In addition, the term “clinician” is used generally to refer to medical personnel including doctors, nurses, and support personnel. In addition, directional terms such as front, rear, upper, lower, top, bottom, and similar terms are used to assist in understanding the description and are not intended to limit the disclosure.

[0062] FIG. **1** illustrates the disclosed surgical stapling device shown generally as stapling device **10**. The stapling device **10** includes a handle assembly **12**, an elongate body **14** that extends distally from the handle assembly **12**, and an end effector **16** that is supported on a distal portion of the elongate body **14**. The elongate body **14** defines a longitudinal axis “X”. The handle assembly **12** includes a housing **18** that defines a stationary handle **20** and supports a movable trigger **22**. In aspects of the disclosure, the movable trigger **22** is supported by the housing **18** to pivot in relation to the stationary handle **20** between non-actuated and actuated positions to operate the end effector **16**. The handle assembly **12** also supports buttons **26** (only one is shown) that are positioned on each side of the housing **18** and are movable along the housing **18** to advance and retract an alignment pin pusher **28**. The alignment pin pusher **28** is positioned and configured to engage an alignment pin **30** (FIG. **2**) within the end effector **16** to move the alignment pin **30** between retracted and advanced positions. The handle assembly **12** also includes a release button **32** that can be depressed to move the end effector **16** from a clamped position to an unclamped position. For a

more detailed description of a suitable handle assembly **12**, see, e.g., U.S. Pat. No. 6,817,508 (“the ‘508 Patent”).

[0063] The stapling device **10** includes a frame **34** that extends from within the handle assembly **12** to the end effector **16**. The frame **34** includes a distal portion **36** that supports the end effector **16** and a proximal portion (not shown) that is supported within the housing **18** of the handle assembly **12**. The frame **34** includes a central portion **38** that includes spaced frame members **42** that define an elongate channel **44** that extends between the handle assembly **12** and the end effector **16**. The elongate body **14** includes supports a clamp slide assembly **48** (FIG. 2), a thrust bar **50**, and the alignment pin pusher **28** which are received within the channel **44** defined by the frame members **42** of the stapling device **10** and moved between retracted and advanced positions within the channel **44**.

[0064] FIGS. 2 and 3 illustrate the end effector **16** of the stapling device **10** and includes an end effector frame **52** that has a U-shaped configuration and includes a distal transverse portion **54**, a proximal transverse portion **56**, and a longitudinal portion **58** that interconnects the distal transverse portion **54** and the proximal transverse portion **56**. The distal and proximal transverse portions **54** and **56** are spaced from each other to define a recess **60** that is positioned between the distal and proximal transverse portions **54** and **56**. In some aspects of the disclosure, the distal and proximal transverse portions **54** and **56** are curved along axes transverse to the longitudinal axis “X” of the elongate body **14** of the stapling device **10**. Alternately, the distal and proximal transverse portions may be linear or comprised of a plurality of linear portions that are positioned at angles in relation to each other.

[0065] Each of the distal and proximal transverse portions **54** and **56** has a first end **54a, 56a**, respectively, that is coupled to (e.g., formed with) the longitudinal portion **58** of the end effector frame **52** and a second end **54b, 56b**, respectively, that is spaced from the longitudinal portion **58** of end effector frame **52**. The second end **56b** of the proximal transverse portion **56** of the end effector frame **52** is coupled to the frame **34** of the elongate body **14** of the stapling device **10**. The second end **54b** of the distal transverse portion **54** of the end effector frame **52** is spaced from the longitudinal portion **58** such that the distal transverse portion **54** is supported on the longitudinal portion **58** in cantilevered fashion. The proximal transverse portion **56** defines a transverse slot **62** that facilitates passage of the clamp slide assembly **48** and the thrust bar **50** through the frame **34** into the recess **60**.

[0066] The clamp slide assembly **48** includes a distal portion **64** (FIG. 3) that defines a curved pocket **66** (FIG. 3) that is configured to receive a replaceable cartridge module **70** (FIG. 2). The distal portion **64** of the clamp slide assembly **48** is positioned distally of the proximal transverse portion **56** of the end effector frame **52** within the recess **60** of the end effector frame **52**. The clamp slide assembly **48** is movable between retracted and advanced positions to move the cartridge module **70** within the recess **60** defined by the end effector frame **52** between spaced and clamped positions as described in further detail below.

[0067] The thrust bar **50** includes a distal portion **72** that is positioned within the curved pocket **66** defined by the distal portion **64** of the clamp slide assembly **48**. When the cartridge module **70** (FIG. 2) is inserted into the curved pocket **66** of the clamp slide assembly **48** in the direction indicated by arrow “A” in FIG. 2, the distal portion **72** of the thrust bar **50** engages a knife assembly **130** (FIG. 4) of the cartridge module **70** such that movement of the thrust bar **50** from its retracted position to its advanced position advances the knife assembly **130** and a pusher **131** (FIG. 9) to eject staples from the cartridge module **70** and cut tissue.

[0068] FIG. 3 illustrates the distal transverse portion **54** of the end effector frame **52** which includes a transverse proximal support surface **76**, a shoulder **78** that is positioned about the support surface **76**, and a side wall **80** that extends between the support surface **76** and the shoulder **78**. The side wall **80** defines cutouts **82** and includes tabs **84** positioned within the cutouts **82**. The distal transverse portion **54** defines an alignment pin bore **86** and a bottom guide bore **88** that are

formed in the support surface **76** and includes an alignment protrusion **90** that is positioned adjacent the support surface **76** and the longitudinal portion **58** of the end effector frame **52**. [0069] The longitudinal portion **58** of the end effector frame **52** includes an inner surface **92** that faces the recess **60**. A channel **94** is formed in the longitudinal portion **58** of the end effector frame **52**. The channel **94** extends longitudinally along the inner surface **92** between the distal and proximal transverse portions **54** and **56** of the end effector frame **52**. The longitudinal portion **58** of the end effector frame **52** also defines transverse bores **96** and **98**. The transverse bore **96** extends across the channel **94** and receives a pin **100** and the transverse bore **98** receives a pin **102**. The pin **102** supports a lockout member **103** (FIG. 9) which is described in further detail in the '508 Patent and will not be described in further detail herein.

[0070] The distal transverse portion **54** of the end effector frame **52** supports an anvil assembly **104** that includes an anvil member **106** and a cut plate **108**. The cut plate **108** is received on the support surface **76** (FIG. 3) of the distal transverse portion **54** of the end effector frame **52** and the anvil member **106** is positioned on top of the cut plate **108** to sandwich the cut plate **108** on the distal transverse portion **54** of the end effector frame **52**. The anvil member **106** includes distally extending brackets **110** that extend through openings **111** in the cut plate **108** and are received within the cutouts **82** formed in the side wall **80** of the distal transverse portion **54** of the end effector frame **52**. Each of the brackets **110** defines an opening **112** that receives one of the tabs **84** on the side wall **80** of the distal transverse portion **54** of the end effector frame **52** to secure the anvil member **106** and the cut plate **108** to the distal transverse portion **54** of the end effector frame **52**. Receipt of the brackets **110** through the openings **111** in the cut plate **108** and in the cutouts **82** in the distal transverse portion **52** of the end effector frame **52** properly aligns the anvil assembly **104** on the distal transverse portion **52** of the end effector frame **52**.

[0071] The cut plate **108** defines an alignment pin opening **114** and a guide member opening **116** that are positioned on opposite end portions of the cut plate **108**. The cut plate **108** also includes a proximally extending rib **118**. The anvil member **106** defines staple forming pockets **121**, a knife slot **120**, an alignment pin opening **122**, and a guide member opening **124**. The knife slot **120** receives the proximally extending rib **118** when the anvil assembly **104** is assembled onto the distal transverse portion **54** of the end effector frame **52**.

[0072] FIG. 2 illustrates the cartridge module **70** which includes a module body **132**, an alignment pin assembly **134**, the knife assembly **130** (FIG. 4), the pusher **131**, and staples (not shown). The module body **132** includes a distal surface **136** that is positioned to engage and clamp tissue against the anvil assembly **104** when the cartridge module **70** is moved to its advanced or clamped position within the recess **60** of the end effector frame **52**. The module body **132** defines a knife slot **138**, staple receiving slots **140** that are positioned on opposite sides of the knife slot **138**, and an alignment pin bore **142**. Each of the staple receiving slots **140** receives a staple (not shown). The module body **132** defines a cavity **144** (FIG. 9) that receives the knife assembly **130** and the pusher **131** to allow movement of the knife assembly **130** and pusher **131** between retracted and advanced positions. The pusher **131** defines a knife slot (not shown) and includes fingers **131a** that are received in the staple receiving slots **140** such that movement of the pusher from its retracted position to its advanced position ejects the staples from the module body **132**.

[0073] FIG. 4 illustrates the knife assembly **130** and the distal portion **72** of the thrust bar **50** with the thrust bar **50** coupled to the knife assembly **130**. The knife assembly **130** includes a knife holder **150** and a cutting blade **152** that is secured to and extends distally from the knife holder **150**. The cutting blade **152** includes a cutting edge **152a** that is positioned on the distal end of the cutting blade **152** and wings **156** that are positioned on opposite sides of the cutting blade **152**. The knife holder **150** includes a body **160** that defines a channel **162** that receives the distal portion **72** of the thrust bar **50** when the cartridge module **70** is inserted into the clamp slide assembly **48**. The body **160** includes resilient fingers **164** that extend proximally from the body **160** of the knife holder **150**. Each of the resilient fingers **164** includes a detent **164a** that is received in an opening **166**



defined in the distal portion 72 of the thrust bar 150 in snap-fit fashion when the cartridge module 70 is inserted into the curved pocket 66 (FIG. 2) of the clamp slide assembly 48.

[0074] FIGS. 3 and 5-7 illustrate a cutting blade guide assembly 170 that is supported on the longitudinal portion 54 of the end effector frame 52 and includes a guide member 172 and a biasing member 174. The guide member 172 includes a body 176 having a lower fin 178 and a guide portion 180 that extends distally of the lower fin 178. The lower fin 178 is received within the channel 94 (FIG. 3) formed in the longitudinal portion 58 of the end effector frame 52 and defines a longitudinal slot 182 that receives the pin 100 to secure the guide member 172 to the longitudinal portion 58 of the end effector frame 52. The longitudinal slot 182 in lower fin 178 of the guide member 172 allows the guide member 172 to move between retracted and advanced positions within the channel 94 along the longitudinal portion 58 of the end effector frame 52.

[0075] The body 176 of the guide member 172 defines a recess 184 that extends longitudinally along a portion of the guide member 172 and is defined by a lower guide wall 186 and a distal abutment surface 188. The guide portion 180 includes a pin portion 190 that is received within the bottom guide bore 88 (FIG. 3) of the distal transverse portion 54 of the end effector frame 52. In aspects of the disclosure, the pin portion 190 includes a rectangular portion 190a and a cylindrical portion 190b that extends distally from the rectangular portion 190a.

[0076] FIGS. 6-9 illustrate the end effector 16 with the clamp slide assembly 48 and the thrust bar 50 in their retracted positions and the cartridge module 70 spaced from the anvil assembly 104 in the open position. As illustrated, the guide member bore 88 is stepped and receives the biasing member 174 of the guide assembly 170. In some aspects of the disclosure, the biasing member 174 includes a coil spring that is positioned about the cylindrical portion 190b of the pin portion 190 of the guide member 172 between the rectangular portion 190 of the guide member 172 and a step 198 (FIG. 9) of the guide member bore 88. The biasing member 174 urges the guide member 172 towards its retracted position in which the pin portion 190 of the guide member 172 is received through the guide member openings 116 and 124 of the cut plate 108 and the anvil member 106, respectively, and extends partly into the guide member bore 88 of the distal transverse portion 54 of the end effector frame 52.

[0077] As described above, the knife assembly 130 is coupled to the distal portion 72 of the thrust bar 50. When the thrust bar 50 is in its retracted position, the knife assembly 130 is in its retracted position such that the cutting blade 152 of the knife assembly 130 is aligned with but spaced proximally of the recess 184 in the guide member 172. The lower wing 156 of the cutting blade 152 is spaced proximally of and aligned with the recess 184 in the guide member 172 when the knife assembly is in its retracted position and the cartridge module 70 is in the open position.

[0078] FIGS. 10 and 11 illustrate the end effector 16 as the clamp slide assembly 48 is moved from its retracted position to its advanced position in the direction of arrow "B" in FIG. 10 to move the cartridge module 70 in the direction of arrow "C" in FIG. 10 from the open position to the clamped position. As the cartridge module 70 moves from the open position towards the clamped position, the lower wing 156 of the cutting blade 152 moves into and along the recess 184 of the guide member 172. Since the cutting blade 152 is positioned proximally of the abutment surface 188 of the guide member 172, the guide member 172 remains stationary as the cartridge module 70 moves to the clamped position. The biasing member 174 urges the guide member 172 towards its retracted position.

[0079] FIGS. 12 and 13 illustrate a distal portion of the end effector 16 as the stapling device 10 (FIG. 1) is fired. When the movable trigger 22 is actuated, i.e., compressed towards the stationary handle 20 of the handle assembly 12, the thrust bar 50 (FIG. 4) is advanced from its retracted position to its advanced position to advance the knife assembly 130 in the direction indicated by arrows "D" in FIG. 13 to advance the cutting blade 152 into the cut plate 108 of the anvil assembly 104. When the wing 156 of the cutting blade 152 engages the abutment surface 188, continued advancement of the cutting blade 152 causes the guide member 172 of the guide assembly 170 to

move distally with the cutting blade **152**. As illustrated, the cutting blade **152** extends to a position below the guide member **172**. The guide member **172** engages tissue “T” (FIG. **12**) and prevents the tissue “T” from moving to a position outside of a path of travel of the cutting edge **152a** of the cutting blade **152**. This improves the likelihood that tissue is cleanly cut though even at the bottom end of the cutting blade **152**, i.e., the end of the cutting blade **152** adjacent the longitudinal portion **58** of the end effector frame **52**. The pin **100** which is fixedly secured to the longitudinal portion **58** of the end effector frame **52** and is received in the longitudinal slot **182** of the guide member **172** is positioned in a proximal portion of the longitudinal slot **182** when the knife assembly **130** is in its advanced position. When the knife assembly **130** is returned to its retracted position, the biasing member **174** returns the guide member **172** to its retracted position.

[0080] FIGS. **14-34** illustrate an alternate version of an end effector for a surgical stapling device including a guide assembly for improving the likelihood that tissue is cleanly cut at a bottom end of the end effector. The guide assembly described below differs from the guide assembly **170** (FIG. **3**) described above in that unlike the guide assembly **170** which is secured to the end effector frame **52** (FIG. **3**) and is reusable, the guide assembly described below forms part of a reload assembly and is disposable with the reload assembly.

[0081] FIGS. **14** and **15** illustrate a reload assembly **200** according to aspects of the disclosure that includes a cartridge module **210** and a shipping cap **212**. The shipping cap **212** is releasably coupled to the cartridge module **210** and includes a longitudinal portion **214** and a transverse portion **216**. The longitudinal portion **214** includes a gripping tab **218** and resilient C-clips **220** that are spaced apart from each other on the longitudinal portion **214**. The C-clips **220** receive a portion of the cartridge module **210** to releasably secure the shipping cap **212** to the cartridge module **210**. The transverse portion **216** of the shipping cap **212** extends transversely from a distal end of the longitudinal portion **214** and includes a cover plate **222** and tabs **224**, **226** that extend proximally from the side edges of the cover plate **222**. The tabs **224**, **226** are positioned to engage side walls of the cartridge module **210** to help retain the shipping cap **212** on the cartridge module **210**. The cover plate **222** includes a proximal surface **222a**. The transverse portion **216** of the shipping cap **212** includes a surface **222a** (FIG. **25**) that faces the cartridge module **210**. The transverse portion **216** of the shipping cap **212** includes a box-like housing **228** that is spaced from the longitudinal portion **214** and defines a cavity **228a** that has an open distal end **228b**. The open distal end **228a** is covered by a cover plate **230** that defines a guide member slot **232**.

[0082] The cartridge module **210** includes a cartridge body **236**, an alignment pin assembly **238**, a knife assembly **240**, a pusher **242**, and staples **244**. The cartridge body **236** has a curved configuration and defines a cavity **246** (FIG. **21**) that receives the knife assembly **240** and the pusher **242**. The cartridge body **236** also defines a knife slot **248**, staple receiving slots **250**, an alignment pin opening **254**, and a notch **255** (FIG. **14**). The staple receiving slots **250** are positioned in rows on opposite sides of the knife slot **248** and are covered by the proximal surface **222a** (FIG. **25**) of the shipping cap **212** when the shipping cap **212** is coupled to the cartridge module **210**. The cartridge body **236** includes a longitudinal portion **252** that is positioned on a first side of the cartridge body **236** and defines a bore (not shown) that receives the alignment pin assembly **238** such that an alignment pin **260** of the alignment pin assembly **238** is extensible through the alignment pin opening **254**.

[0083] The alignment pin assembly **238** includes the alignment pin **260**, a coupling member **262** that is secured to a proximal end portion of the alignment pin **260**, and a biasing member **264**. The biasing member **264** is positioned between a portion of the cartridge body **236** and the coupling member **262** to urge the alignment pin **260** to a retracted position recessed within the longitudinal portion **252** of the cartridge body **236**. The longitudinal portion **252** of the cartridge body **236** has an open proximal end that is enclosed by a cover **266**.

[0084] The knife assembly **240** includes a knife holder **268** and a cutting blade **270** that is secured to and extends distally from the knife holder **268**. The knife holder **268** and the cutting blade **270**

have curved configurations that correspond to the configuration of the cartridge body 236.

[0085] The pusher 242 defines a knife slot 242a (FIG. 21) that receives the cutting blade 270 of the knife assembly 240 and includes a plurality of fingers 274. Each of the fingers 274 is received within one of the staple receiving pockets 250 of the cartridge body 236 and supports a staple 244. The proximal portion of the pusher 242 is in abutting relation to the distal portion of the knife holder 268. The knife assembly 240 and the pusher 242 are movable within the cavity 246 of the cartridge body 236 between retracted and advanced positions to eject the staples 244 from the cartridge body 236 and to advance the cutting blade 270 through the knife slot 248 of the cartridge body 236.

[0086] FIGS. 15-17 illustrate a guide member 276 of the cartridge module 210 that includes an elongate body portion 278, a finger 280, and a knife receiving member 282. The elongate body portion 278 and the finger 280 are integrally formed. The elongate body portion 278 has a proximal portion and a distal portion and the finger 280 extends outwardly from the distal portion of the elongate body portion 278. The knife receiving member 282 is formed of a soft material and is secured to and extends inwardly of the elongate body portion 278. In aspects of the disclosure, the knife receiving member 282 is formed of a soft plastic material that is over molded onto the distal portion of the elongate body portion 278 of the guide member 276 and includes an inner surface 284 that is angled inwardly into a path of the cutting blade 270 (FIG. 15). In some aspects of the disclosure, the distal portion of the elongate body portion 278 defines an opening 286 and includes a rib 288. When the knife receiving portion 282 is over molded onto the distal portion of the elongate body portion 278, the knife receiving portion 282 defines a slot 290 that receives the rib 288 and includes a transverse member 292 that is received in the opening 286 to secure the knife receiving portion 282 onto the elongate body portion 278. The distal portion of the elongate body portion 278 of the guide member 276 also defines an elongate through bore 296 and an elongate channel 298. The elongate bore 296 is formed in a downwardly positioned extension 297 of the elongate body portion 278.

[0087] FIGS. 18-22 illustrate the guide member 276 positioned within the cartridge body 236 of the cartridge module 210 and secured to the shipping cap 212. The cartridge module 210 defines a channel 300 that extends longitudinally through a second side of the cartridge body 236 opposite to the longitudinal portion 252 and receives the guide member 276. The channel communicates with the cavity 246 defined by the cartridge body 236. The cartridge body 236 includes a longitudinally extending rib 302 (FIG. 20) that is received within the elongate channel 298 of the guide member 276 when the guide member 276 is received within the channel 300 of the cartridge module 210. In some aspects of the disclosure, the guide member 276 is frictionally retained within the channel 300 of the cartridge body 236.

[0088] As described above, the pusher 242 of the cartridge module 210 is received within the cavity 246 of the cartridge body 236 and is movable between retracted and advanced positions. The pusher 242 includes a longitudinally extending rib 306 (FIG. 21) that is received within the elongate channel 298 of the guide member 276 when the guide member 276 is received within the channel 300 of the cartridge module 210.

[0089] The box-like housing 228 (FIG. 19) of the transverse portion 216 of the shipping cap 212 includes flexible arms 310 that are supported in cantilevered fashion within the cavity 228a of the box-like housing 228. Each of the flexible arms 310 includes a protrusion 312 that is supported on an end portion of the respective flexible arm 310 and extends toward the other of the flexible arms 310. When the shipping cap 212 is coupled to the cartridge module 210, the protrusions 312 engage the guide member 276 and flex outwardly until the protrusions 312 become aligned with the through bore 296 of the extension 297 of the guide member 276. When the protrusions 312 become aligned with the through bore 296 of the guide member 276, the protrusions 312 snap into the through bore 296 to releasably secure the shipping cap 212 to the guide member 276. The protrusions 312 are smaller than the through bore 296 such that the protrusions 312 can move

longitudinally within the through bore **296**. When the shipping cap **212** is coupled to the cartridge module **210**, before the cartridge module **210** is loaded onto a stapling device **10** (FIG. 1), the protrusions **312** are positioned in a distal end of the through bore **196** (FIG. 26).

[0090] FIGS. 23 and 24 illustrate an alternate version of the end effector of the stapling device **10** (FIG. 1) (with the cartridge module **210** removed) shown generally as end effector **320** (FIG. 30). The end effector **320** is like the end effector **16** described above and includes an end effector frame **322** that has a U-shaped configuration and includes a distal transverse portion **324**, a proximal transverse portion **326**, and a longitudinal portion **328** that interconnects the distal transverse portion **324** and the proximal transverse portion **326**. The distal and proximal transverse portions **324** and **326** are spaced from each other to define a recess **330** that is positioned between the distal and proximal transverse portions **324** and **326**. In some aspects of the disclosure, the distal and proximal transverse portions **324** and **326** are curved along axes transverse to the longitudinal axis “X” (FIG. 1) of the elongate body **14** of the stapling device **10**. Alternately, the distal and proximal transverse portions **324** and **326** may be linear or comprised of a plurality of linear portions that are positioned at angles in relation to each other.

[0091] The distal transverse portion **324** of the end effector frame **322** supports an anvil assembly **332** which is like anvil assembly **104** (FIG. 23) described above and will not be described in further detail herein. A clamp slide assembly **336** includes a distal portion **336a** (FIG. 3) that defines a curved pocket **338** (FIG. 23) that is configured to receive the cartridge module **210** (FIG. 22). The distal portion **336a** of the clamp slide assembly **336** is positioned distally of the proximal transverse portion **326** of the end effector frame **322** within the recess **330** of the end effector frame **322** and includes a radially extending tab **340** (FIG. 23). The clamp slide assembly **336** is movable between retracted and advanced positions to move the cartridge module **210** in relation to the anvil assembly **332** within the recess **330** defined by the end effector frame **322** between spaced and clamped positions.

[0092] The thrust bar **342** includes a distal portion **344** (FIG. 24) that is positioned within the curved pocket **338** defined by the distal portion **336a** of the clamp slide assembly **336**. When the cartridge module **210** (FIG. 22) is inserted into the curved pocket **338** of the clamp slide assembly **336**, the distal portion **344** of the thrust bar **342** engages the knife assembly **240** (FIG. 15) of the cartridge module **210** such that movement of the thrust bar **342** from its retracted position to its advanced position advances the knife assembly **240** and the pusher **242** (FIG. 15) to eject the staples **244** from the cartridge module **210** and cut tissue clamped between the anvil assembly **332** and the cartridge module **210**.

[0093] The longitudinal portion **328** of the end effector frame **322** defines a distal bore **348** and a proximal bore **350**. The distal bore **348** defines an angled proximal cam surface **352**. The proximal bore **350** includes an insert plate **356** that is configured to engage the flexible arms **310** of the shipping cap **212** when the reload assembly **200** (FIG. 22) is loaded onto the clamp slide assembly **336** as described in further detail below. In some aspects of the disclosure, the insert plate is U-shaped and includes spaced side walls **356a**.

[0094] FIGS. 25-32 illustrate the reload assembly **200** as the reload assembly **200** is loaded onto the clamp slide assembly **336** of the stapling device. When the reload assembly **200** is slid into the curved pocket **338** of the clamp slide assembly **336** (FIG. 23) in the direction indicated by arrow “E” in FIGS. 26 and 27, the finger **280** of the guide member **276** of the cartridge module **210** engages the angled cam surface **352** that defines the distal bore **348** in the longitudinal portion **328** of the end effector frame **322**. As the finger **280** moves along the angled cam surface **352**, the guide member **276** is cammed distally in the direction of arrow “F” towards and into engagement with the anvil assembly **332**. The protrusions **312** on the flexible arms **310** of the shipping cap **212** move from a distal end of the elongate bore **296** in the extension **297** of the guide member **276** to a proximal end of the elongate bore **296**. When the reload assembly **200** is fully received within the curved pocket **338** in the distal portion **336a** of the clamp slide assembly **336**, the knife receiving

member **282** of the guide member **276** is received within a recess **351** defined in a cut plate **332a** of the anvil assembly **332** (FIG. **32**). In addition, the tab **340** (FIG. **23**) of the clamp slide assembly **336** is received within the notch **255** (FIG. **22**) of the cartridge body **236**.

[0095] As the reload assembly **200** is loaded into the curved pocket **338** (FIG. **23**) of the clamp slide assembly **336**, the extension **297** defining the elongate bore **296** moves into the proximal bore **350** of the longitudinal portion **328** of the end effector frame **322** in the direction indicated by arrows “G” in FIG. **29** such that the flexible arms **310** of the shipping cap **212** engage the insert member **256**. When the flexible arms **310** of the shipping cap **212** engage the insert member **256**, the flexible arms **310** are cammed outwardly in the direction indicated by arrows “H” in FIG. **29** to remove the protrusions **312** from the elongate bore **296** of the shipping cap **212**. When the protrusions **312** of the flexible arms **310** are removed from the elongate bore **296**, the shipping cap **212** can be removed from the cartridge module **210**.

[0096] FIGS. **33** and **34** illustrate a portion of the end effector **320** as the stapling device **10** (FIG. **1**) is fired. When the stapling device **10** is fired, the knife assembly **240** is advanced in the direction indicated by arrows “I” within the cartridge body **236** of the cartridge module **210**. As the knife assembly **240** is advanced within the cartridge body **236**, the lower side edge **270a** of the cutting blade **270**, which may be in the form of a wing, moves along the guide member **276** and eventually cuts through the knife receiving member **282** of the guide member **276**. As described above, the knife receiving member **282** is angled upwardly in the distal direction such that the cutting blade **270** cuts progressively through a greater thickness of the knife receiving member **282** as the cutting blade **270** moves to its fully advanced position. Engagement between the cutting blade **270** and the guide member **276** ensures that tissue “T” clamped between the anvil assembly **232** and the cartridge module **210** remains in the path of the cutting blade **270** and is effectively cut through cleanly.

[0097] Persons skilled in the art will understand that the devices and methods specifically described herein and illustrated in the accompanying drawings are non-limiting exemplary aspects of the disclosure. It is envisioned that the elements and features illustrated or described in connection with one exemplary aspect of the disclosure may be combined with the elements and features of another without departing from the scope of the disclosure. As well, one skilled in the art will appreciate further features and advantages of the disclosure based on the above-described aspects of the disclosure. Accordingly, the disclosure is not to be limited by what has been particularly shown and described, except as indicated by the appended claims.

## Claims

**1.** A stapling device comprising: an elongate body having a proximal portion and a distal portion; a clamp slide assembly having a distal portion that defines a pocket, the clamp slide assembly movable between retracted and advanced positions; a thrust bar having a proximal portion and a distal portion; an end effector including: a cartridge module releasably received within the pocket of the clamp slide assembly, the cartridge module including a cartridge body, a knife assembly, a pusher, and staples, the cartridge body defining a knife slot and staple receiving slots positioned on each side of the knife slot, each of the staple receiving slots receiving one of the staples, the knife assembly including a knife holder and a cutting blade, the pusher including fingers that are received in the staple receiving slots, the knife assembly and the pusher movable within a cavity of the cartridge body from retracted to advanced positions to eject the staples from the cartridge body and to advance the cutting blade from a position recessed within the cartridge body to a position extending from the knife slot of the cartridge body; an end effector frame having a distal transverse portion defining a bore, a proximal transverse portion, and a longitudinal portion interconnecting the distal and proximal transverse portions at spaced locations, the distal and proximal transverse portions defining a recess that receives the distal portion of the clamp slide assembly and the distal

portion of the thrust bar, the longitudinal portion of the end effector frame having an inwardly facing surface that defines a channel that extends longitudinally along the inwardly facing surface; an anvil supported on the distal transverse portion of the end effector frame; and a guide assembly supported on the longitudinal portion of the end effector frame, the guide assembly including a guide member having a body, the body including a lower portion and a guide portion that extends distally of the lower portion and is received by the bore, the lower portion received within the channel, the body defining a recess that is defined in part by an abutment surface that is aligned with the cutting blade, the guide member movable from a retracted position to an advanced position in response to movement of the knife assembly from its retracted position to its advanced position.

2. The stapling device of claim 1, wherein the guide assembly includes a biasing member that urges the guide member towards its retracted position.
3. The stapling device of claim 2, wherein the biasing member is received within the bore in the distal transverse portion of the end effector frame.
4. The stapling device of claim 3, wherein the guide portion of the guide member includes a rectangular portion and a cylindrical portion that extends distally from the rectangular portion, the biasing member positioned about the cylindrical portion and engaged with the rectangular portion.
5. The stapling device of claim 1, wherein the thrust bar is configured to couple to the knife holder when the cartridge module is received within the pocket of the clamp slide assembly.
6. The stapling device of claim 1, wherein the cartridge module and the end effector frame have curved configurations.
7. The stapling device of claim 1, wherein the lower portion of the guide member defines a longitudinal slot.
8. The stapling device of claim 7, wherein the longitudinal portion of the end effector frame supports a pin that extends across the channel in the longitudinal portion and through the longitudinal slot in the lower portion of the guide member.
9. The stapling device of claim 1, further including a handle assembly, the elongate body extending distally from the handle assembly.
10. An end effector comprising: an end effector frame including a distal transverse portion, a proximal transverse portion, and a longitudinal portion interconnecting the distal and proximal transverse portions at spaced locations, the distal and proximal transverse portions defining a recess, the longitudinal portion of the end effector frame having an inwardly facing surface that defines a channel that extends longitudinally along the inwardly facing surface; a pin supported by the end effector frame and extending across the channel; and a guide assembly supported on the longitudinal portion of the end effector frame, the guide assembly including a guide member having a body, the body including a lower portion and a guide portion that extends distally of the lower portion, the lower portion received within the channel in the longitudinal portion of the end effector frame and defining a longitudinal slot through which the pin extends, the body defining a recess that is defined in part by an abutment surface that is aligned with a cutting blade of a cartridge module, the guide member movable from a retracted position to an advanced position along the longitudinal portion of the end effector frame.
11. The end effector of claim 10, wherein the guide assembly includes a biasing member that urges the guide member towards its retracted position.
12. The end effector of claim 11, wherein the distal transverse portion defines a bore that receives the guide portion of the guide member.
13. The end effector of claim 12, wherein the biasing member is received within the bore in the distal transverse portion of the end effector frame.
14. The end effector of claim 13, wherein the guide portion of the guide member includes a rectangular portion and a cylindrical portion that extends distally from the rectangular portion.
15. The end effector of claim 14, wherein the biasing member is positioned about the cylindrical portion and engaged with the rectangular portion.

**16.** The end effector of claim 10, wherein the distal and proximal transverse portions of the end effector frame have curved configurations.

**17.** A surgical stapling device comprising: an elongate body having a proximal portion and a distal portion; a clamp slide assembly having a distal portion that defines a pocket, the clamp slide assembly movable between retracted and advanced positions; a thrust bar having a proximal portion and a distal portion; an end effector frame having a distal transverse portion, a proximal transverse portion, and a longitudinal portion interconnecting the distal and proximal transverse portions, the distal and proximal transverse portions spaced from each other to define a recess that receives the distal portion of the clamp slide assembly and the distal portion of the thrust bar, the longitudinal portion of the end effector frame having an inwardly facing surface that defines a distal bore, the distal bore defined in part by an angled camming surface; an anvil supported on the distal transverse portion of the end effector frame; and a reload assembly including: a cartridge module including a cartridge body, a knife assembly, a pusher, staples, and a guide assembly, the cartridge body defining a knife slot, staple receiving slots positioned on each side of the knife slot, and a channel, each of the staple receiving slots receiving one of the staples, the knife assembly including a knife holder and a cutting blade, the pusher including fingers that are received in the staple receiving slots, the knife assembly and the pusher being movable within a cavity of the cartridge body from retracted to advanced positions to eject the staples from the cartridge body and to advance the cutting blade from a position recessed within the cartridge body to a position extending from the knife slot, the cartridge module releasably received within the pocket of the clamp slide assembly, the guide assembly including a guide member that is received within the channel of the cartridge body and movable from a retracted position to an advanced position, the guide member including an elongate body portion and a finger extending downwardly from the elongate body portion, wherein the finger is positioned to engage the angled camming surface on the longitudinal portion of the end effector frame when the cartridge module is loaded onto the clamp slide assembly, engagement between the finger and the angled camming surface moving the guide member from its retracted position to its advanced position.

**18.** The surgical stapling device of claim 17, wherein the guide assembly includes a biasing member that is positioned to urge the guide member to its retracted position.

**19.** The surgical stapling device of claim 17, the reload assembly including a shipping cap, wherein the elongate body portion of the guide member includes an extension that extends downwardly from the elongate body portion and defines an elongate opening, and the shipping cap includes flexible arms, each of the flexible arms including a protrusion that is received within the opening in the extension to releasably secure the shipping cap to the cartridge module.

**20.** The surgical stapling device of claim 19, wherein the longitudinal portion of the end effector frame defines a proximal bore that receives an insert plate, the flexible arms positioned to engage the insert plate when the cartridge module is loaded onto the clamp slide assembly to cam the flexible arms outwardly and remove the protrusions from the opening in the extension to facilitate removal of the shipping cap from the cartridge module.

---