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(54) **HANDSWITCH CORD AND CIRCUIT**

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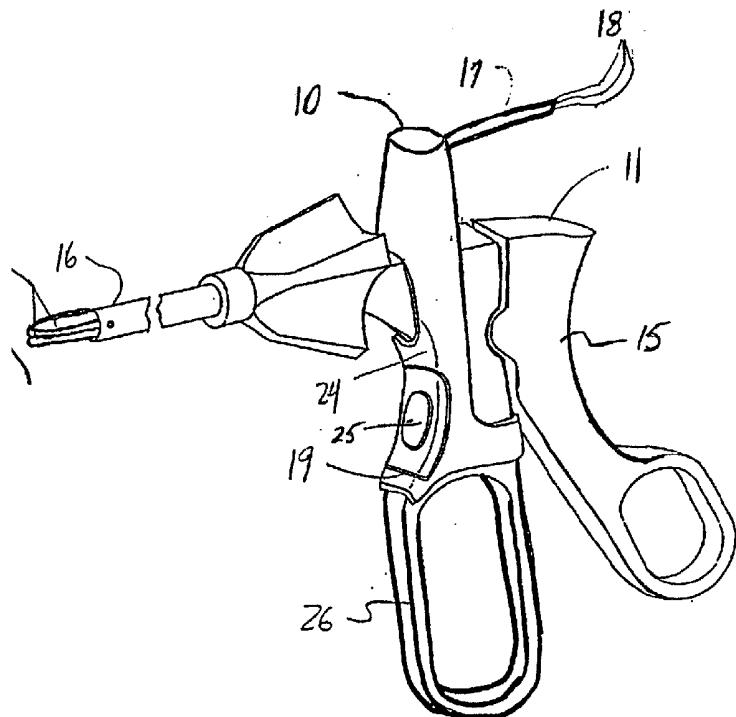
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(57) **ABSTRACT**

A replaceable accessory cord and handswitch set for an electrosurgical instrument that has a proximal end handle for holding by the surgeon and distal end effectors for delivery of electrosurgery to a patient. A cord electrically couples an

electrosurgical generator to the instrument with two or more conductors. A handswitch with normally open contacts is near the proximal end. One of the contacts attaches to an active conductor and another of the conductors connected to the other contact. A receptacle on the handswitch connects electrically to the contact. A terminal on the electrosurgical instrument conjugates with the receptacle in electrical contact with the active conductor. An insulated support on the handswitch engages the instrument preventing relative movement. A button on the support is accessible to the surgeon, but remote from the receptacle and the terminal. The button is electrically isolated from the contacts, the receptacle, the terminal and the conductors. The button moves on the support for closing the contacts and is positioned for control by the surgeon's finger. The handle is insulated and the effectors are located at the distal end and could include scissors, graspers or hooks. The effectors are in a bipolar circuit with a return on one effector connected to one of the return conductors for completing the circuit. The effectors when in a monopolar circuit have a return pad on the patient as a part of the circuit. The support electrically insulates the button and the handswitch preventing leakage to the surgeon. The generator connects to the return conductor coupled to one of the effectors for return of energy. The support may have a pressure sensitive adhesive thereon to secure the button on the handle. A plug removeably connects the conductors to the generator. The handswitch controls delivery a coagulating wave form. The instrument is elongate between the handle and the effectors so that laparoscopic electrosurgery may be performed.



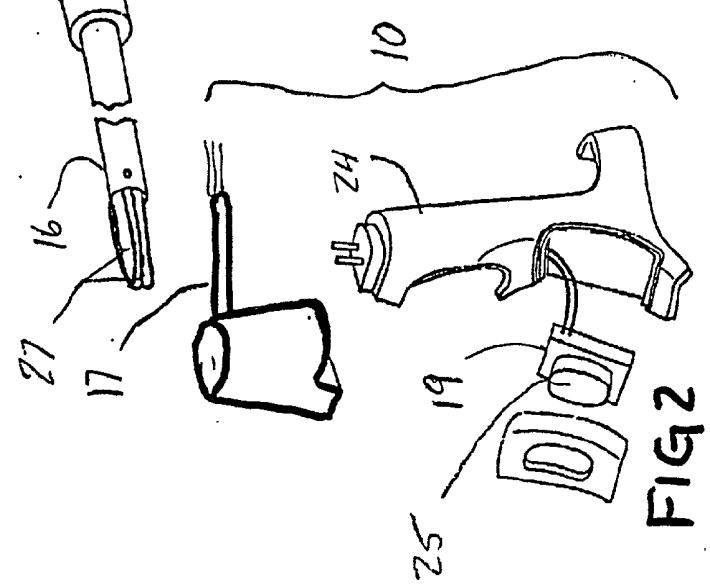
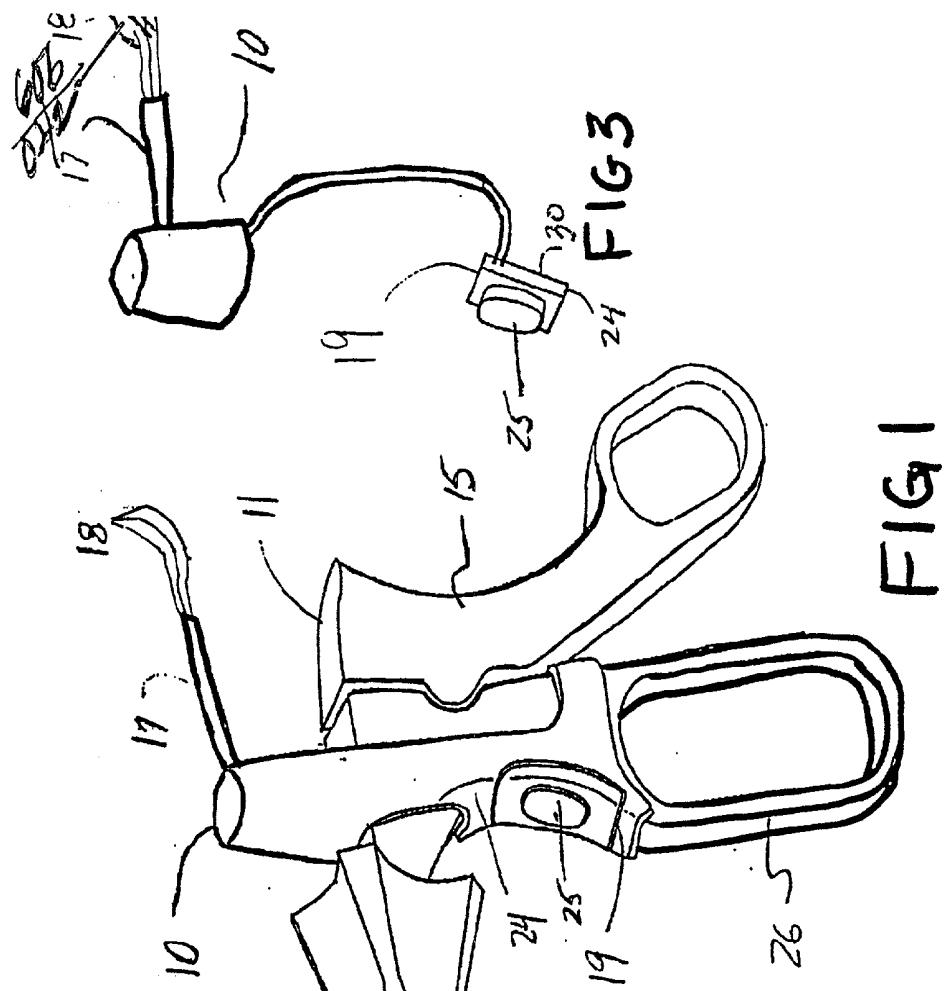


FIG 3

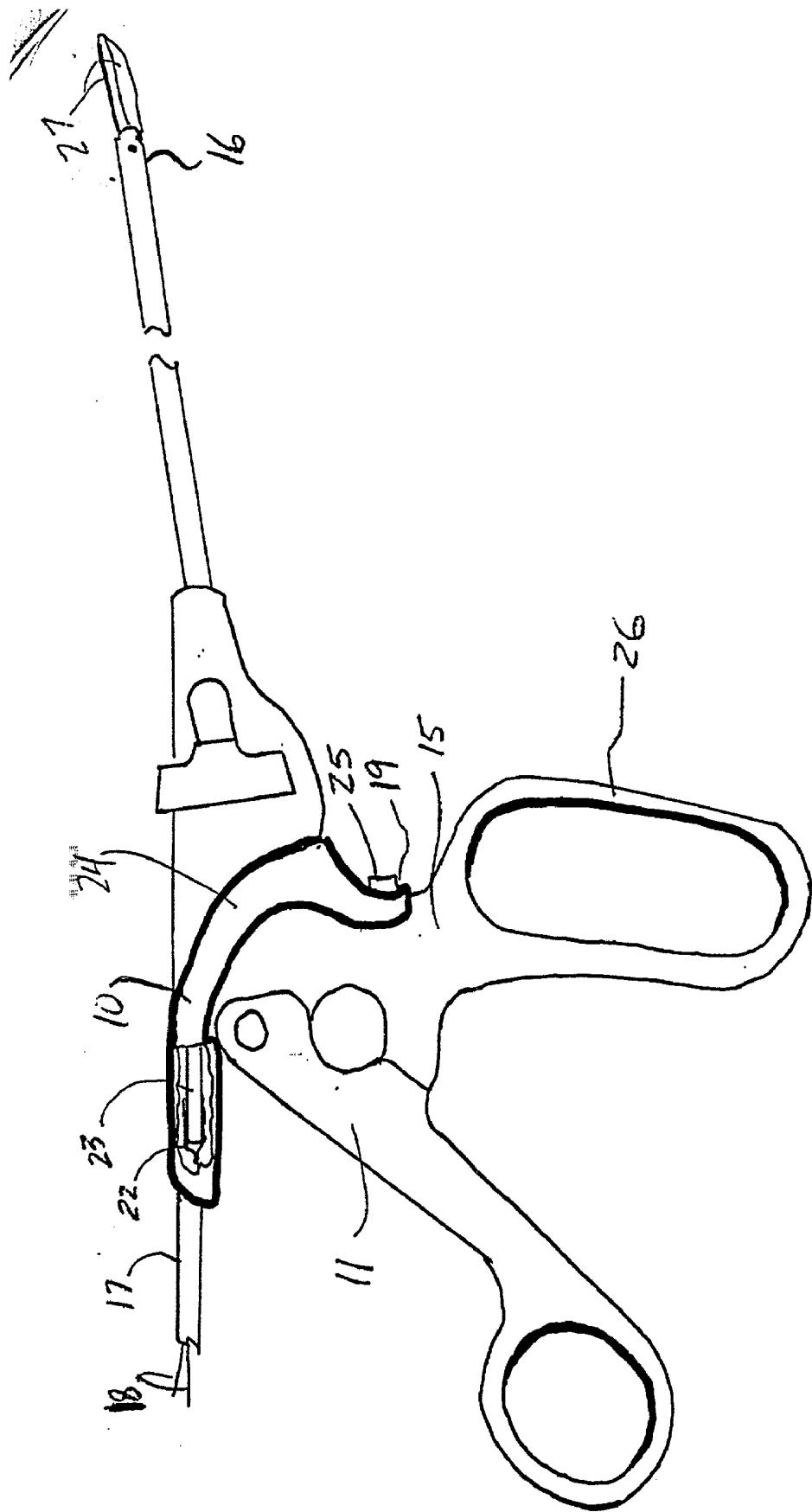


FIG 4

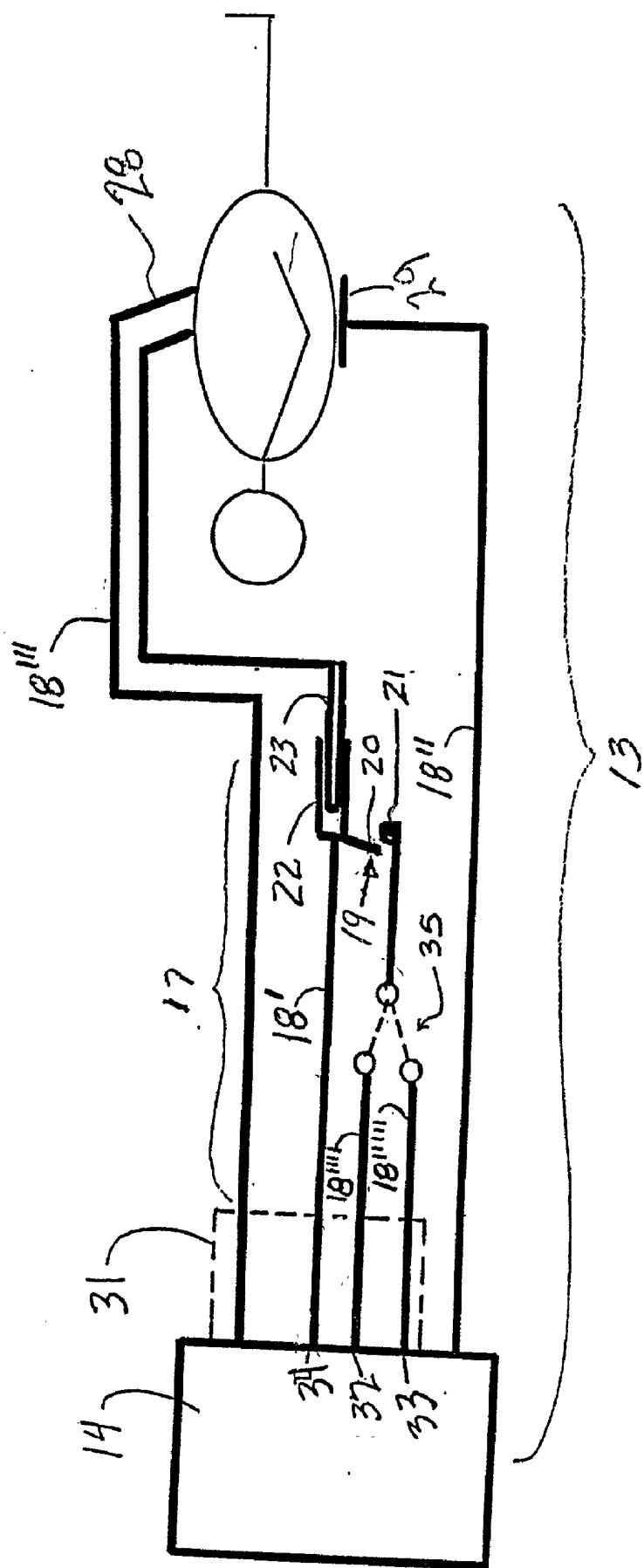


FIG 5

HANDSWITCH CORD AND CIRCUIT

FIELD OF THE INVENTION

[0001] This invention relates to a special replaceable accessory cord and handswitch set for use with an electro-surgical instrument having no handswitch. More particularly, a replaceable accessory cord and handswitch are supported on a terminal of the electro-surgical instrument so the handswitch is accessible to the surgeon controlling the electro-surgical energy delivery to a patient.

BACKGROUND OF THE DISCLOSURE

[0002] Any electro-surgical instrument, such as scissors, graspers, forceps and the like receive electro-surgical energy from an electro-surgical generator. A foot switch or hand switch controls the application of electro-surgical energy to the electro-surgical instrument. Surgeons frequently prefer the convenience of using a hand switch. Since one hand of the surgeon holds the electro-surgical instrument, the finger actuation of a switch on the electro-surgical instrument is convenient.

[0003] To minimize the cost of such electro-surgical instruments, suppliers frequently provide them without an integral handswitch for use by the surgeon. That omission benefits cleanability and sterilization after use, if it is a reusable electro-surgical instrument and minimizes replacement cost if it is disposable. Consideration of the addition of a convenient finger switch may not be worth added expense.

[0004] Control of high frequency electro-surgical energy at the electro-surgical instrument has long been a problem addressed in many ways. The use of fluidic control disclosed in U.S. Pat. No. 3,494,363 teaches squeezing a bulb or closing a vacuum port by the surgeon to control electro-surgical energy delivery to a forceps. U.S. Pat. No. 3,752,160 is a disposable electrode switch attached to a forceps and functional when the tines are squeezed together. In particular, the electro-surgical energy is transmitted in a monopolar application when a terminal on the cord contacts bare metal on the forceps. U.S. Pat. Nos. 4,370,980 and 4,552,143 have removable handswitches for electrocautery instruments. Conductive spring clips attach the handswitches to an electro-surgical instrument such as, scissors or a forceps. The electrically wired handswitch allows energy passage through electrically conductive clips for attachment to the electro-surgical instrument. Cutting or cauterizing electro-surgical energy passing through the handswitch depends on the operation of the button by the surgeon. Insulated handles of the electro-surgical instrument protect the surgeon from the electro-surgical energy but nothing protects the surgeon from the exposed conductive spring clips.

[0005] There has been a need to convert existing standard electro-surgical instruments such as, Endopath instruments by Johnson & Johnson or the Endo products of United States Surgical Corporation to hand switching with a simple and low cost replaceable accessory cord and handswitch set. No combination of a replaceable accessory cord and hand switch set attaches to where the regular cord set connects to afford finger switching. No combination replaceable accessory cord and handswitch set insulates the electrical connection of the connection. No replaceable cord and handswitch set provides a mechanical connection to support remotely disposed switch button. No replaceable cord and

handswitch set provides secure attachment resistant to longitudinal movement and lateral movement relative to the electro-surgical instrument. No replaceable cord and handswitch set provides secure insulated electrical connection and an attachment for finger actuation of the switch button positioned to resist to longitudinal and lateral movement.

SUMMARY OF THE INVENTION

[0006] A replaceable accessory cord and handswitch set for use with an electro-surgical instrument by a surgeon on a patient in an electro-surgical circuit preferably connects between an electro-surgical generator, the electro-surgical instrument. The electro-surgical instrument for electrical connection to the electro-surgical generator in the circuit may have a proximal end for holding by the surgeon and a distal end for delivery therefrom of electro-surgery to the patient. A cord for electrically coupling to the electro-surgical generator most preferably supplies electro-surgery to the electro-surgical instrument with two or more conductors.

[0007] A handswitch electrically and removeably couples to one of the conductors and is preferably located on the replaceable accessory cord near the proximal end of the electro-surgical instrument for access by the surgeon. The handswitch is in the electro-surgical circuit. A pair of normally open contacts in the handswitch may preferably have one of the contacts attached to the active conductor and with either a cut waveform or a coagulation waveform conductor connected to the other contact. A receptacle on the handswitch can connect electrically to the active contact in the preferred embodiment. A terminal on the electro-surgical instrument may be configured to conjugate with the receptacle so the terminal would be in electrical contact with the active conductor.

[0008] A support on the handswitch for engagement with the electro-surgical instrument prevents movement relative theretwixen. The support most preferably is electrically insulated from the pair of contacts, the receptacle, the terminal and the conductors. An operating button on the support may preferably be accessible to the surgeon. The operating button, positioned remotely from the receptacle and the terminal, is most preferably electrically isolated from the pair of contacts, the receptacle, the terminal and the conductors. The operating button mounts for movement relative to the support and for closing the pair of contacts during use of the electro-surgical instrument when applying electro-surgical energy to the patient.

[0009] A handle is on the preferred embodiment of the electro-surgical instrument for use by the surgeon. One or more end effectors on the electro-surgical instrument preferably may apply electro-surgical energy. The support and operating button might be physically located on the handle so when the electro-surgical instrument is grasped by the handle the operating button is positioned for control by the surgeon's finger of electro-surgical energy delivery. The handle is preferably insulated and at the proximal end of the electro-surgical instrument and the one or more electro-surgical effectors may be located opposite the handle at the distal end of the electro-surgical instrument. The one or more end effectors could include scissors, graspers. The one or more end effectors may alternately be a bipolar circuit with a return located on one of the end effectors. The return is connected to a return conductor for completing the electro-

surgical circuit. The one or more end effectors when in a monopolar circuit can have a return pad on the patient as a part of the electrosurgical circuit.

[0010] The terminal most preferably is positioned near the proximal end of the electrosurgical instrument. The electrosurgical circuit for electrosurgical instrument for use by a surgeon on a patient may include one or more end effectors on the electrosurgical instrument for contact with the patient's tissue during application of electrosurgical energy by the surgeon. The handle on the electrosurgical instrument could be at an end thereof opposite the one or more end effectors for positioning the one or more end effectors by the surgeon during the application of electrosurgical energy. The terminal on the electrosurgical instrument near the handle may receive electrosurgical energy for the one or more end effectors and may be electrically insulated from the handle. The handswitch removably, electrically and mechanically can be connected and supported by the terminal. The handswitch is preferably electrically coupled to the terminal and the electrosurgical energy. The cord may detachably and electrically couple to the handswitch with one or more conductors therein for delivery of electrosurgical energy to the one or more end effectors. The electrosurgical generator can connect to the active conductor for supply of electrosurgical energy to the electrosurgical instrument handswitch. The electrosurgical generator connects to the return conductors coupled to one of the end effectors for return of the electrosurgical energy to the electrosurgical generator.

[0011] A button on the handswitch for closing the handswitch may apply electrosurgical energy to the one or more end effectors so as to be accessible to the handle so that electrosurgical energy can be selectively applied by the surgeon to the one or more end effectors. A support for the button may mount the button for finger actuation by the surgeon. The support can carry the button for movement relative thereto during actuation of the handswitch. The support for mechanically connecting to the handle most preferably prevents relative movement therebetween. The support electrically insulates from the button and the handswitch for preferably preventing leakage, stray currents or grounding to the surgeon. The support might include a pressure sensitive adhesive thereon to secure the button on the handle for access by a finger of the surgeon.

[0012] The electrosurgical generator and the cord electrically couple to the handswitch for allowing the selective electrically connection through conductors in the cord to effect the delivery of electrosurgical energy to the one or more end effectors. The cord can include a plug for removably connecting the conductors to the electrosurgical generator. The handswitch may control the electrosurgical generator to cause delivery therefrom of electrosurgical energy with a coagulating wave form to the one or more end effectors.

[0013] The electrosurgical instrument is preferably elongate between the handle and the one or more end effectors so that laparoscopic electrosurgery may be performed by the surgeon with control by the handswitch. A return may be connected to one of the end effectors for bipolar electrosurgery.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. 1 is a perspective view of the replaceable accessory cord and handswitch set of the preferred embodiment shown on endosurgical instrument such as those made by Ethicon Endo-Surgery of Johnson & Johnson.

[0015] FIG. 2 is a perspective exploded view showing a two piece construction of the replaceable accessory cord and handswitch set of FIG. 1.

[0016] FIG. 3 is a perspective view showing a replaceable accessory cord and handswitch set of another alternate embodiment wherein the switch is separate from the receptacle for pressure sensitive application to the handle of any electrosurgical instrument.

[0017] FIG. 4 is a perspective view of the replaceable accessory cord and handswitch set of an alternate embodiment shown on endosurgical instrument such as made by United States Surgical Corporation.

[0018] FIG. 5 is a schematic of a circuit diagram showing the electrosurgical circuit between the electrosurgical generator and the electrosurgical instrument.

DETAILED DESCRIPTION OF THE INVENTION

[0019] A replaceable accessory cord and handswitch set 10 for use with an electrosurgical instrument 11 by a surgeon on a patient 12 in an electrosurgical circuit 13 is shown in FIGS. 1 through 5. The electrosurgical circuit 13 connects between an electrosurgical generator 14 and the electrosurgical instrument 11. The electrosurgical instrument 11 for electrical connection to the electrosurgical generator 14 in the circuit 13 has a proximal end 15 for holding by the surgeon and a distal end 16 for delivery therefrom of electrosurgery to the patient 12. A cord 17 in FIGS. 1 to 5 for electrically coupling to the electrosurgical generator 14 supplies electrosurgery to the electrosurgical instrument 11. The cord 17 has two or more conductors 18. Best shown schematically in FIG. 5 is the active or power conductor 18', the return conductor (monopolar) 18'', the cut signal conductor 18''' and the coagulation signal conductor 18''''.

[0020] A handswitch 19 selectively and electrically in series with one of the signal conductors 18''' or 18'''' and is located on the replaceable accessory cord 17 near the proximal end 15 of the electrosurgical instrument 11 for access by the surgeon.

[0021] The handswitch 19 is in the electrosurgical circuit 13. A pair of normally open contacts 20 and 21 in the handswitch 19 have contact 20 attached to the active conductor 18' and the other of the signal conductors 18''' or 18'''' connected to the other contact 21. A receptacle 22 connects to the active conductor 18'. A terminal 23 on the electrosurgical instrument 11 is configured to conjugate with the receptacle 22 so the terminal 23 would be in electrical contact with the other conductor 18' as best shown in FIGS. 4 and 5.

[0022] A support 24 in FIGS. 1, 2, 3 and 4 on the handswitch 19 for engagement with the electrosurgical instrument 11 prevents movement relative thereto. The support 19 is electrically insulated from the pair of contacts 20 and 21, the receptacle 22, the terminal 23 and the conductors 18. An operating button 25 on the support 24 is accessible to the surgeon. The operating button 25 is electrically isolated from the pair of contacts 20 and 21, the receptacle

22, the terminal **23** and the conductors **18** in **FIG. 4**. The operating button **25** moves relative to on the support **24** for closing the normally open pair of contacts **20** and **21** during use of the electrosurgical instrument **11**. When applying electrosurgical energy to the patient **12**, the surgeon's finger closes contacts **20** and **21**.

[0023] A handle **26** in **FIGS. 1 and 4** is on the proximal end **15** of the electrosurgical instrument **11** for use by the surgeon. One or more end effectors **27** on the electrosurgical instrument **11** distal end **16** apply electrosurgical energy. The support **24** and operating button **25** are physically located on the handle **26** so when the electrosurgical instrument **11** is grasped by the handle **26** the operating button **25** is positioned for control by the surgeon's finger of electrosurgical energy delivery. The handle **26** is insulated and at the proximal end **15** for the electrosurgical instrument **11**. The one or more electrosurgical effectors **27** are located opposite the handle at the distal end **16** of the electrosurgical instrument **11** as seen in **FIGS. 1 and 4**. The one or more end effectors **27** could include scissors **28** as in **FIG. 4** or could have graspers as in **FIG. 1** or hooks (not shown). When one or more end effectors **27** are in a bipolar circuit, there is a return **28** as shown in **FIG. 5**. The end effector for return is connected to the return conductor **18"** for completing the electrosurgical circuit **13**. When one or more end effectors **27** are in a monopolar circuit, there is a return pad **29** on the patient **12** as a part of the electrosurgical circuit **13** through conductor **18"** as in **FIG. 5**. The terminal **23** is positioned near the proximal end **15** of the electrosurgical instrument **11** as seen in **FIGS. 1 and 4**.

[0024] The electrosurgical circuit **13** for the electrosurgical instrument **11** for use by the surgeon on the patient **12** has one or more end effectors **27** on the electrosurgical instrument **11** for contact with the patient's tissue during application of electrosurgical energy by the surgeon. The handle **26** on the electrosurgical instrument **11** is at the proximal end **15** thereof opposite the one or more end effectors **27** for positioning the one or more end effectors **27** by the surgeon during the application of electrosurgical energy. The terminal **23** on the electrosurgical instrument **11** near the handle **26** receives electrosurgical energy for the one or more end effectors **27** and terminal **23** is electrically insulated from the handle **26**. The handswitch **19** removeably, electrically and mechanically is connected and is supported by the terminal **23** as shown in **FIGS. 1 to 4**. The handswitch **19** electrically couples to the terminal **23** and the signal conductor **18""** or **18'''** so that electrosurgical energy can be selectively applied by the surgeon to the one or more end effectors **27**. Cord **17** electrically couples to the handswitch **19** with one or more conductors **18** therein for delivery of electrosurgical energy to the one or more end effectors **27**. Electrosurgical generator **14** connects to the active conductor **18'** for supply of electrosurgical energy to the electrosurgical instrument **11** handswitch **19** as shown schematically in **FIG. 5**. The electrosurgical generator **14** connects to another of the conductors **18"** coupled to one of the end effectors **27** for return of the electrosurgical energy to the electrosurgical generator **14** when use in a bipolar procedure.

[0025] Button **25** on the handswitch **19** for closing the pair of contacts **20** and **21** applies electrosurgical energy to the one or more end effectors **27**. Support **24** for the button **25** mounts the button **25** for finger actuation by the surgeon. The support **24** carries the button **25** allowing movement

relative to the support **24** during actuation of the handswitch **19**. The support **24** mechanically connects to the handle **26** preventing relative movement therebetween. The support **24** in the alternate of **FIG. 3** includes a pressure sensitive adhesive **30** thereon to secure the button **25** on handle **26** for access by a finger of the surgeon. While the cord **17** is shown permanently attached to the handswitch **19** in the **FIGS. 1 to 4**, skilled artisans will know that a connector such as in **FIG. 2** could be used to allow the separation of the cord **17** and the handswitch **19**.

[0026] Electrosurgical generator **14** and cord set **10** electrically couple to the handswitch **19** for allowing the selective electrically connection through conductors **18** in the cord **17** to effect the delivery of electrosurgical energy to the one or more end effectors **27**. The cord **17** has a plug **31** shown schematically in **FIG. 5** as a dashed line for removable connecting the conductors **18', 18""', 18'''** and **18''''** to the electrosurgical generator **14**. The handswitch **19** controls the electrosurgical generator **14** to preferably cause delivery therefrom of electrosurgical energy with a coagulating wave form to the one or more end effectors **27**.

[0027] Although not shown in the **FIGS. 1 and 4**, the electrosurgical instrument **11** is elongate between the handle **26** and the one or more end effectors **27** so that laparoscopic electrosurgery may be performed by the surgeon with control by the handswitch **19**.

[0028] For bipolar surgery, the electrosurgical generator **14** connects to one of the return conductors **18"** in the cord **17** through plug **31**. An active electrosurgical output of the electrosurgical generator **14** supplies the high frequency waveform. Cutting or coagulation waveforms differ in their shapes and tissue effects. Typically the plug **31** and the electrosurgical generator **14** have three conjugating connections, one for a cut signal **32**, one for a coagulation signal **33** and one for the active electrosurgical active output **34**. Handswitch **19** selection could be arranged for coagulation or cutting, two buttons could provide the choice therebetween or a switch **35** could as shown in **FIG. 5** be set to either cutting or coagulation. Selection of cutting or coagulation waveforms is shown schematically in **FIG. 5** with a switch **35** which connects either cut conductor **18""** or coagulation conductor **18''''** to contact **21**. That switch **35** could be on plug **31**, in electrosurgical generator **14**, in the cord **17** or on the handswitch **19**. If on the latter, then the button **25** could be split or a rocker as is common on electrosurgical pencils with integral switching.

[0029] Closure of the handswitch **19** is detected in the electrosurgical generator **14** by monitoring continuity across the pair of contacts **20** and **21** to a reference in the electrosurgical generator **14**. If continuity across the pair of contacts **20** and **21** is detected then electrosurgical energy is delivered through conductor **18'** from the electrosurgical generator active output connection **34**. Another scheme for power control is disclosed in U.S. Pat. No. 3,752,160 and that is incorporated herein by reference.

[0030] While a preferred embodiment and alternatives have been shown in the figures and described in the disclosure, the claims that follow seek to protect replaceable accessory cord set and handswitches for use with electro-surgical instruments.

What is claimed is:

1. A replaceable accessory cord and handswitch set for use with an electrosurgical instrument by a surgeon on a patient in an electrosurgical circuit to connect between an electro-surgical generator, the electrosurgical instrument and the patient, the electrosurgical instrument having a terminal and a proximal end for holding by the surgeon, a distal end on the electrosurgical instrument for delivery therefrom of electrosurgery to the patient, the replaceable accessory cord and handswitch set comprises:
 - a cord for electrically coupling to the electrosurgical generator to supply electrosurgery to the electrosurgical instrument, the cord having two or more conductors;
 - a handswitch electrically coupled to one of the conductors, the handswitch located on the cord for placement near the proximal end of the electrosurgical instrument for access by the surgeon, the handswitch in the electrosurgical circuit;
 - a pair of normally open contacts in the handswitch, one of the contacts attached to one of the conductors and another of the conductors connected to the other contact;
 - a receptacle on the handswitch connected electrically to the other contact, the receptacle configured to conjugate with the terminal on the electrosurgical instrument, the terminal thus in electrical contact with the other conductor;
 - a support on the handswitch for engagement with the electrosurgical instrument to prevent movement relative thereto, the support electrically insulated from the pair of contacts, the receptacle, the terminal and the conductors, and
 - an operating button on the support accessible to the surgeon, the operating button positioned remotely from the receptacle and the terminal so that the operating button is convenient to the surgeon, the operating button electrically isolated from the pair of contacts, the receptacle, the terminal and the conductors, the operating button moveably mounted to the support for closing the pair of contacts during use of the electro-surgical instrument when applying electrosurgical energy to the patient.
2. The replaceable accessory and cord set of claim 1 with a handle on the electrosurgical instrument for use by the surgeon and one or more end effectors on the electrosurgical instrument for application of electrosurgical energy and wherein the support and operating button are physically located on the handle so when the electrosurgical instrument is grasped by the handle the operating button is positioned for control of electrosurgical energy delivery by the surgeon's finger.
3. The replaceable accessory and cord set of claim 2 wherein the handswitch on the handle is insulated and at the proximal end of the electrosurgical instrument and one or more electrosurgical effectors is located opposite the handle at the distal end of the electrosurgical instrument.
4. The replaceable accessory and cord set of claim 2 wherein the handswitch is on the handle and the one or more end effectors include scissors.
5. The replaceable accessory and cord set of claim 2 wherein the handswitch is on the handle and the one or more end effectors include graspers.
6. The replaceable accessory and cord set of claim 2 wherein the handswitch is electrically connected with the one or more end effectors in a bipolar circuit and a return is located on one of the end effectors and is connected to one of the conductors for completing the electrosurgical circuit.
7. The replaceable accessory and cord set of claim 2 wherein the handswitch is electrically connected with the one or more end effectors in a monopolar circuit and a return pad is on the patient in the electrosurgical circuit.
8. The replaceable accessory and cord set of claim 2 wherein the receptacle conjugates with the terminal positioned near the proximal end of the electrosurgical instrument for minimizing the size and bulk of the support.
9. An electrosurgical circuit including an electrosurgical instrument and an electrosurgical generator for use by a surgeon on a patient, comprising:
 - one or more end effectors on the electrosurgical instrument for contact with the patient's tissue during application of electrosurgical energy by the surgeon;
 - a handle on the electrosurgical instrument at an end thereof opposite the one or more end effectors, the handle for positioning the one or more end effectors by the surgeon during the application of electrosurgical energy;
 - a terminal on the electrosurgical instrument near the handle, the terminal for receiving electrosurgical energy for the one or more end effectors, the terminal electrically insulated from the handle;
 - a handswitch removable, electrically and mechanically connected and supported by the terminal, the handswitch electrically coupled to the terminal and the electrosurgical energy, the handswitch accessible to the handle so that electrosurgical energy can be selectively applied by the surgeon to the one or more end effectors;
 - a cord electrically couples to the handswitch with one or more conductors therein for delivery of electrosurgical energy to the one or more end effectors, wherein the electrosurgical generator connects to one of the conductors for supply of electrosurgical energy to the handswitch, the electrosurgical generator connects to another of the conductors coupled to one of the end effectors for return of the electrosurgical energy to the electrosurgical generator;
 - a button on the handswitch for closing the handswitch for applying electrosurgical energy to the one or more end effectors, and
 - a support for the button to mount the button for finger actuation by the surgeon, the support carrying the button for movement relative thereto during actuation of the handswitch the support for mechanically connecting to the handle to prevent relative movement therebetween, the support electrically insulated from the button and the handswitch.
10. The electrosurgical circuit of claim 9 wherein the support includes a pressure sensitive adhesive thereon to secure the button on the handle for access by a finger of the surgeon.

11. The electrosurgical circuit of claim 9 wherein the electrosurgical generator and the cord electrically couple to the handswitch for allowing the selective electrically connection through conductors in the cord to effect the delivery of electrosurgical energy to the one or more end effectors.

12. The electrosurgical circuit of claim 11 wherein the cord includes a plug for removeably connecting the conductors to the electrosurgical generator.

13. The electrosurgical circuit of claim 9 wherein the handswitch controls the electrosurgical generator to cause delivery therefrom of electrosurgical energy with a coagulating wave form to the one or more end effectors.

14. The electrosurgical circuit of claim 9 wherein the electrosurgical instrument is elongate between the handle and the one or more end effectors so that laparoscopic electrosurgery may be performed by the surgeon with control by the handswitch.

15. The electrosurgical circuit of claim 13 wherein a return conductor is connected to one of the end effectors for bipolar electrosurgery.

16. A replaceable handswitch for use with an electrosurgical instrument by a surgeon on a patient in an electrosurgical circuit to connect between an electrosurgical generator, the electrosurgical instrument and the patient, the electrosurgical instrument has a proximal end for holding by the surgeon and a distal end for delivery therefrom of electrosurgery to the patient, the electrosurgical circuit includes a cord for electrically coupling to the electrosurgical generator to supply electrosurgery to the replaceable handswitch, the cord having two or more conductors, the replaceable handswitch comprising:

a pair of normally open contacts in the handswitch so one contact is electrically coupled to the active conductor, the pair of contacts positioned near the proximal end of the electrosurgical instrument for access by the surgeon, the handswitch in the electrosurgical circuit so another conductor from the electrosurgical generator is connected to the other contact;

a receptacle on the handswitch connected electrically to the contact, the receptacle configured to conjugate with a terminal on the electrosurgical instrument, the terminal in electrical contact with the active conductor;

a support on the handswitch for engagement with the electrosurgical instrument to prevent movement relative thereto, the support electrically insulated from the pair of contacts, the receptacle, the terminal and the conductors, and

an operating button on the support accessible to the surgeon, the operating button positioned remotely from the receptacle and the terminal, the operating button electrically isolated from the pair of contacts, the receptacle, the terminal and the conductors, the operating button moveably mounted relative to the support for closing the pair of contacts by the surgeon during use of the electrosurgical instrument when applying electrosurgical energy to the patient.

* * * * *

专利名称(译)	Handswitch线和电路		
公开(公告)号	US20020026189A1	公开(公告)日	2002-02-28
申请号	US09/783048	申请日	2001-02-13
[标]申请(专利权)人(译)	WAYNE LINDEMANN RUSSELL NICHOLS赫德DAVID		
申请(专利权)人(译)	WAYNE LINDEMANN RUSSELL NICHOLS赫德DAVID		
当前申请(专利权)人(译)	COVIDIEN AG		
[标]发明人	WAYNE LINDEMANN RUSSELL NICHOLS HEARD DAVID		
发明人	WAYNE, LINDEMANN RUSSELL NICHOLS, HEARD DAVID		
IPC分类号	A61B18/14 A61B18/18		
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其他公开文献	US6402747		
外部链接	Espacenet USPTO		

摘要(译)

一种用于电外科器械的可更换的附件线和手动开关组件，其具有近端手柄，用于由外科医生和远端执行器保持，用于向患者输送电外科手术。绳索将电外科发生器耦合到具有两个或更多个导体的器械。具有常开触点的手动开关靠近近端。其中一个触点连接到有源导体，另一个连接到另一个触点。手动开关上的插座与触点电连接。电外科器械上的端子与容器共轭，与有源导体电接触。手动开关上的绝缘支撑件与仪器接合，防止相对运动。外科医生可以使用支架上的按钮，但远离插座和终端。按钮与触点，插座，端子和导体电隔离。该按钮在支撑件上移动以关闭触点，并且定位成由外科医生的手指控制。手柄是绝缘的，效应器位于远端，可包括剪刀，抓钳或钩子。效应器位于双极电路中，其中一个是效应器上的返回连接到一个返回导体以完成电路。当处于单极电路中时，效应器在患者身上具有返回垫作为电路的一部分。支撑件使按钮和手动开关电绝缘，防止泄漏给外科医生。发电机连接到耦合到效应器之一的返回导体，用于返回能量。支撑件上可具有压敏粘合剂以将按钮固定在手柄上。插头可拆卸地将导体连接到发电机。手动开关控制输送凝固波形。该器械在手柄和效应器之间伸长，以便可以进行腹腔镜电外科手术执行。

