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EP 2594205 A1
EP 1679040 A1
DE 004242153 A1
EP 2353511 A1
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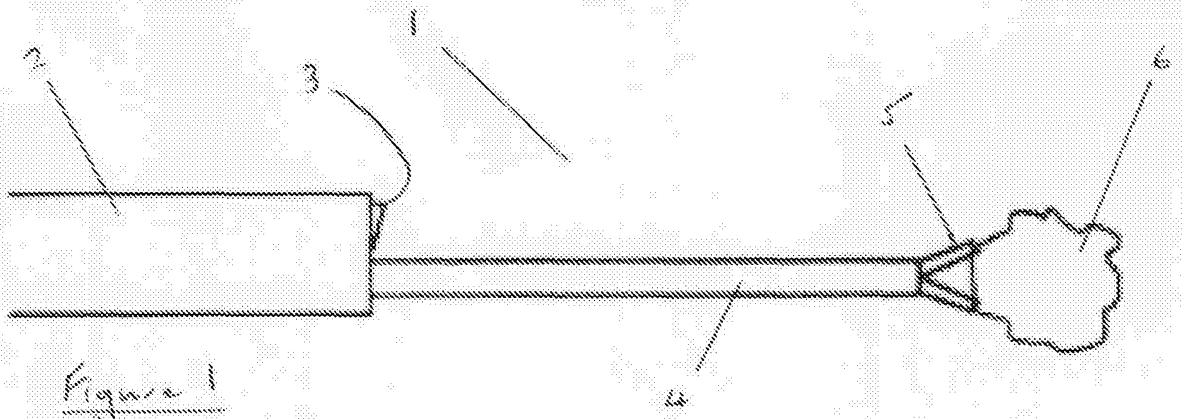

Figure 1

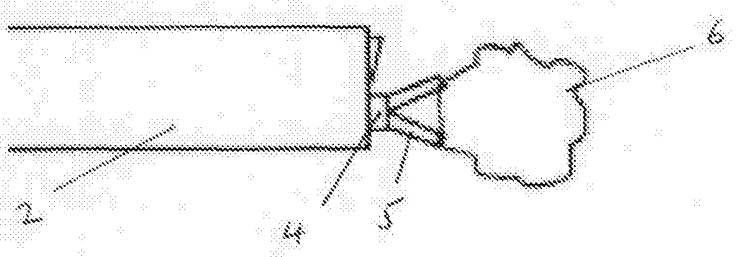

Figure 2

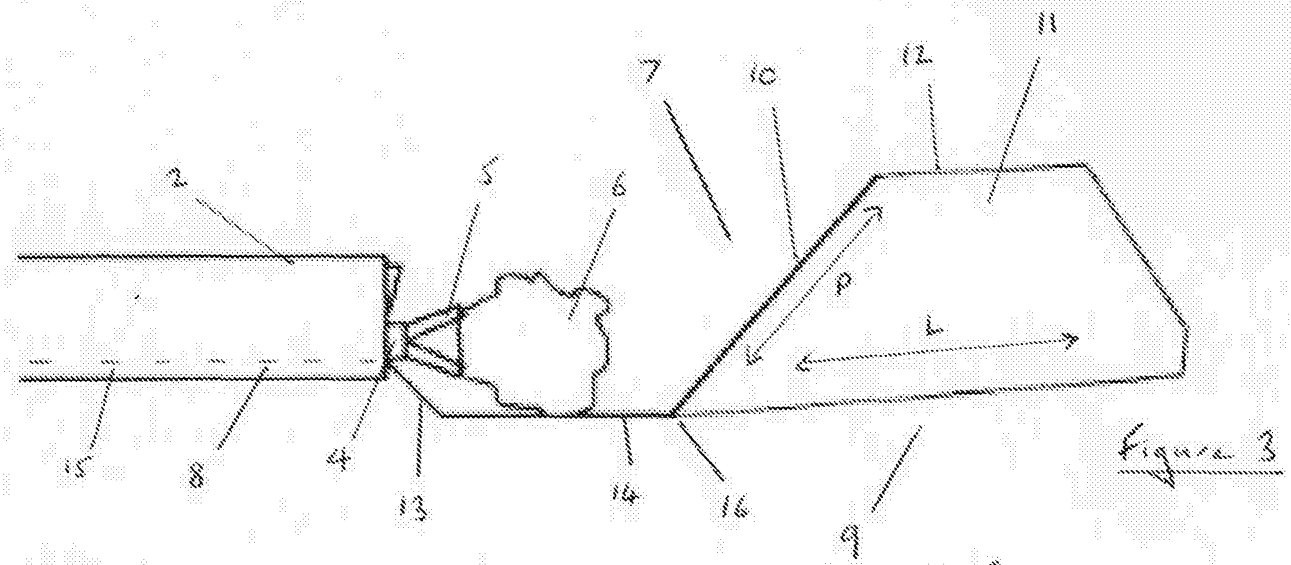

Figure 3

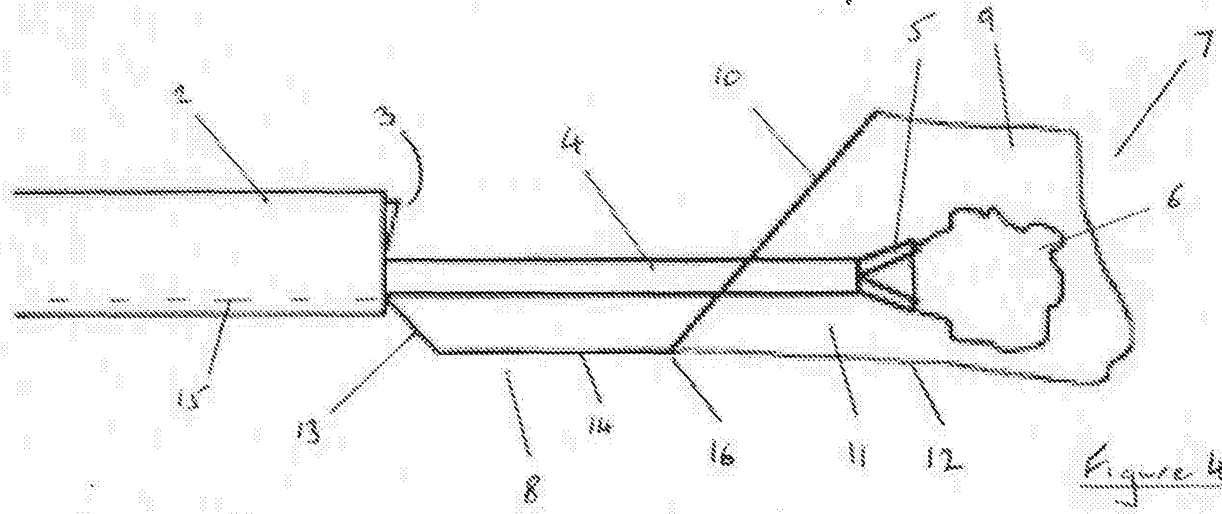

Figure 4

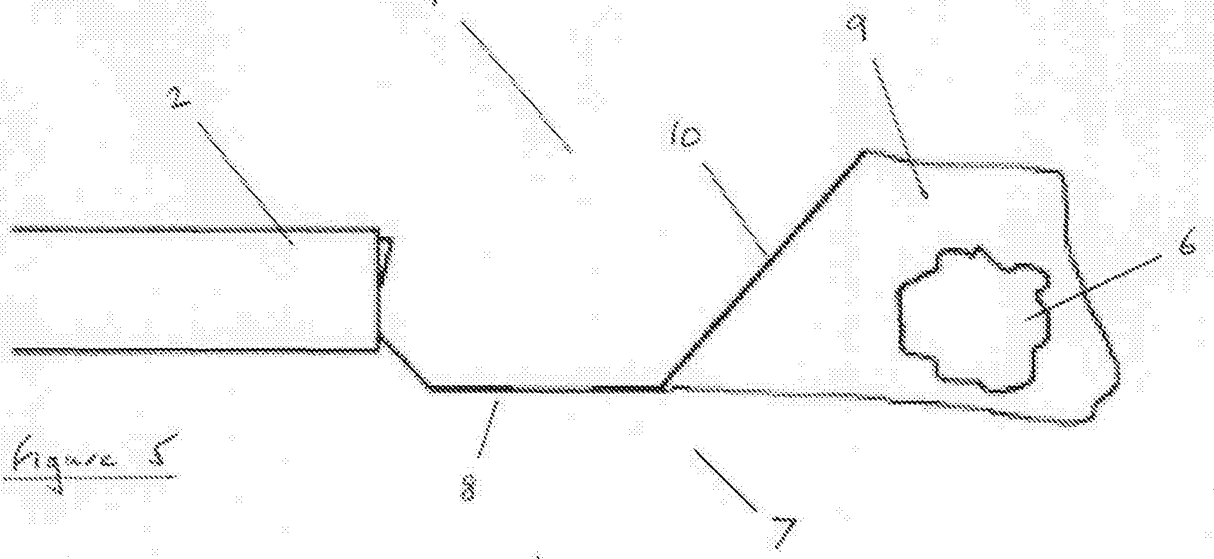

Figure 5

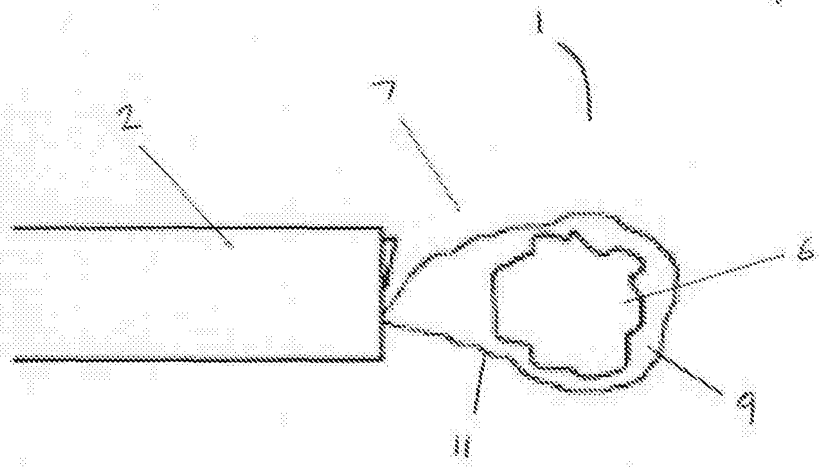

Figure 6

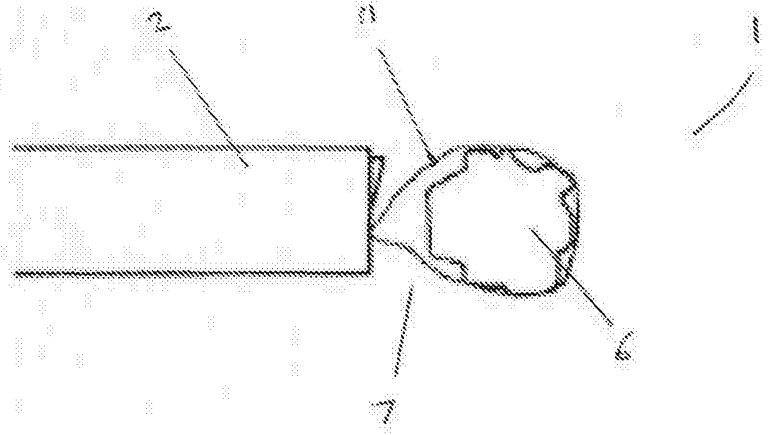

Figure 7

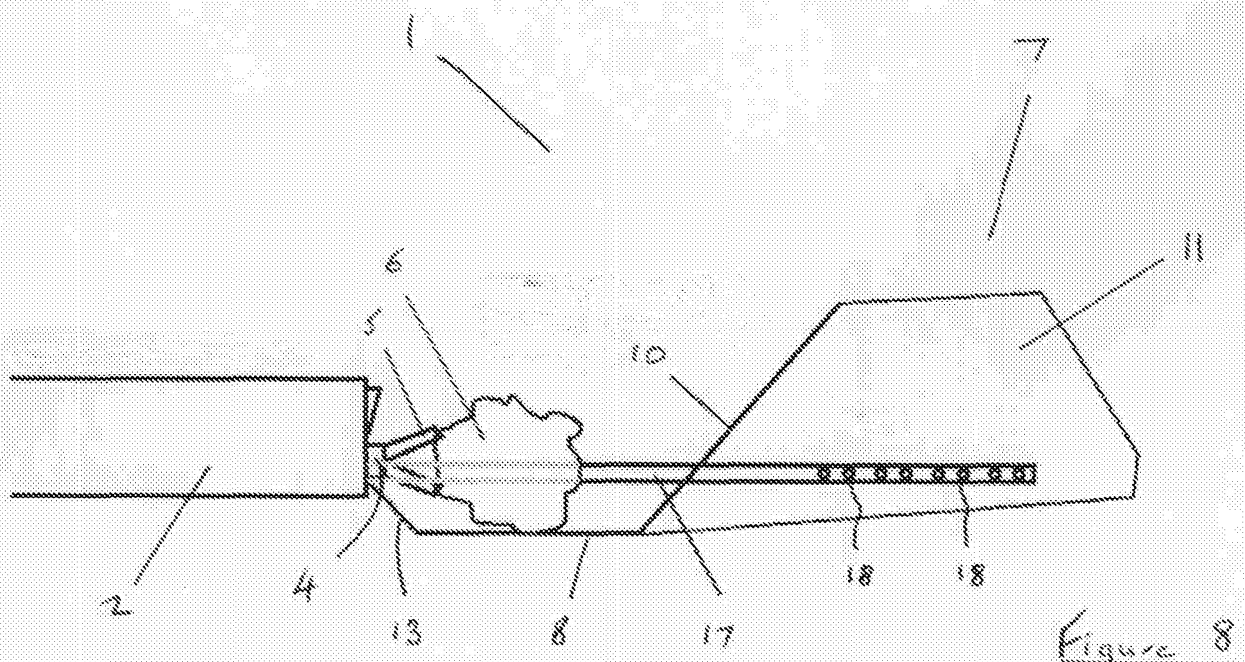

Figure 8

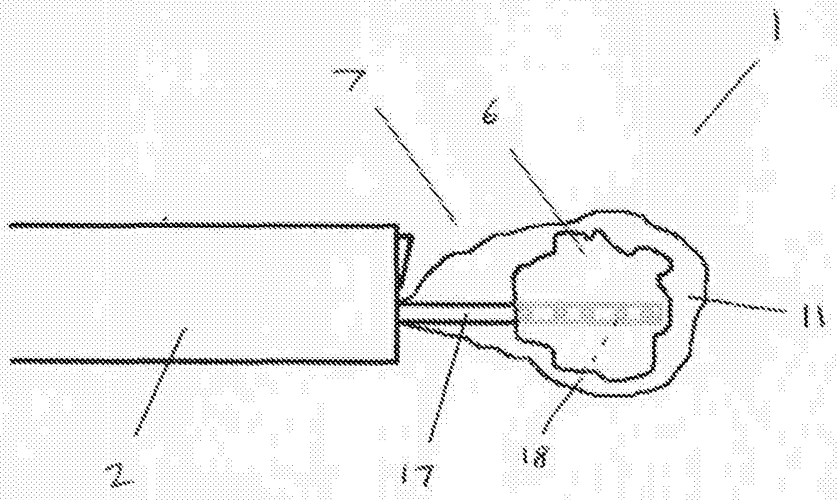

Figure 9

TISSUE BAG

This invention relates to a tissue bag for use in the encapsulation of tissue. Due to the perceived risks associated with the "seeding" of cancerous tissue, the morcellation of tissue is often carried out in a tissue bag surrounding or containing the tissue. An example of such a tissue bag is given in US patent 5,037,379. In the tissue bag of US 5,037,379, a morcellating instrument is introduced into the bag in order to morcellate the tissue into smaller pieces before the bag is removed from the body of the patient. However, a tissue bag is not generally used when resected tissue is being removed from the patient.

The present invention attempts to provide a tissue bag suitable for use when resected tissue is being removed from a patient. Accordingly, a surgical tissue bag for use in the removal of tissue from a surgical site comprises an elongate handle having a proximal portion and a distal portion, and a pouch disposed at the end of the handle, the pouch comprising a flexible ring and a bag portion depending from the ring and forming an enclosure to contain tissue and other fluid material, the proximal portion of handle forming a longitudinal axis, and the ring forming a plane at an angle to the longitudinal axis, the handle including an angled portion such that there is an offset of a discrete amount between the distal portion and the proximal portion, such that the longitudinal axis passes through the ring.

This discrete amount allows for the alignment of the bag opening with a tissue grasper deployed through another working channel of the same endoscope. Conveniently, the discrete amount by which the distal portion is offset from the proximal portion is between 0.1 and 0.5 times the diameter of the ring, and typically by between 0.2 and 0.3 times the diameter of the ring.

Conveniently, the proximal portion of the handle forms a longitudinal axis, and the ring forms a plane at an angle to the longitudinal axis.

The ring preferably forms a plane at an angle of between 30 and 60 degrees to the longitudinal axis of the handle, conveniently between 40 and 50 degrees, and typically approximately 45 degrees to the longitudinal axis of the handle. Conveniently, the bag portion is shaped such that it defines a bag longitudinal axis, the bag longitudinal axis being non-orthogonal to the plane of the ring. Typically, the surgical tissue bag is deployed through the working channel of an endoscope. By making the longitudinal bag axis non-orthogonal to the plane of the ring, it is easier to insert tissue into the bag using a tissue grasper deployed through another working

channel of the same endoscope. To achieve this, the bag longitudinal axis is preferably parallel to the longitudinal axis of the handle.

Preferably, the bag longitudinal axis is coaxial with the longitudinal axis of the handle. This aligns the opening of the tissue bag with the handle such that the bag is in position to receive tissue being moved along the longitudinal axis of the handle. Typically, the bag portion has parallel sides, and conveniently the sides of the bag portion are parallel with the longitudinal axis of the handle.

The handle typically comprises a wire, or alternatively a flexible shaft. Either way, the handle can be used to manoeuvre the tissue bag into position within the patient. The tissue bag can be used to enclose excised tissue which is being removed from a patient, such that it is not exposed to the patient's body during removal. For example, when an excised bladder tumour is being removed through the patient's urethra, it is enclosed within the tissue bag as opposed to being exposed to the walls of the urethra. Conceivably, the tissue bag may also include a suction tube extending into the bag portion, helping to remove fluid material from within the bag portion. The tissue bag may contain fluid and other material that may hinder the collapsing of the bag as it is being withdrawn, and the suction tube evacuates this fluid without allowing it to come into contact with the patient as the endoscope is being withdrawn.

The invention further resides in a combination comprising an endoscope, a tissue grasper and a tissue retrieval bag, the endoscope including at least two working channels, one for the tissue grasper and one for the tissue retrieval bag, the tissue retrieval bag comprising an elongate handle having a proximal portion and a distal portion, and a pouch disposed at the end of the handle, the pouch comprising a flexible ring and a bag portion depending from the ring and forming an enclosure, the proximal portion of the handle forming a longitudinal axis, and the ring forming a plane at an angle to the longitudinal axis, the handle including an angled portion such that there is an offset of a discrete among between the distal portion and the proximal portion, such that the longitudinal axis passes through the ring, such that when the tissue grasper is moved distally within its working channel the distal end of the tissue grasper passes through the ring and is received within the enclosure. The combination conceivably further includes a suction tube extending into the bag portion, helping to remove fluid material from within the bag portion.

The invention will now be further described, by way of example only, with reference to the accompanying drawings, in which

Figure 1 is a schematic side view of an endoscopic tissue grasper being introduced into a surgical site,

Figure 2 is a schematic side view of the tissue grasper of Figure 1 being moved to a position adjacent the endoscope,

Figure 3 is a schematic side view showing a tissue bag in accordance with the present invention being deployed through the endoscope,

Figure 4 is a schematic side view showing the tissue grasper of Figure 1 placing tissue into the tissue bag of Figure 3,

Figure 5 is a schematic side view showing tissue within the tissue bag of Figure 3,

Figure 6 is a schematic side view showing the tissue bag of Figure 3 being moved to a position adjacent the endoscope,

Figure 7 is a schematic side view showing the endoscope being withdrawn from the surgical site,

Figure 8 is a schematic side view of an alternative embodiment of tissue bag in accordance with the present invention being deployed through an endoscope, and

Figure 9 is a schematic side view showing the tissue bag of Figure 8 being moved to a position adjacent the endoscope.

Referring to Figure 1, a surgical site is shown generally at 1, with an endoscope 2 introduced into the surgical site 1. Typically, the surgical site is a human bladder, with the endoscope 2 being introduced into the bladder via the urethra (not shown). The endoscope 2 contains a telescope or camera shown at 3 and a tissue grasper 4 present within one of the working channels (not shown) of the endoscope. The tissue grasper has a pair of jaws 5 which are shown in Figure 1 as grasping tissue 6, such as an excised bladder tumour. The surgical site 1 contains a fluid such as saline (again not shown).

Once the tissue 6 has been grasped by the jaws 5, the tissue grasper 4 is withdrawn so that the tissue 6 is adjacent the distal end of the endoscope 2, as shown in Figure 2. Figure 3 shows a tissue bag 7 being deployed from another working channel of the endoscope 2, the tissue bag comprising a wire handle 8, and a pouch 9 at the distal end of the handle 8. The pouch comprises a wire ring 10, and a bag portion 11 depending from the wire ring 10. The bag portion 11 is formed of an impervious, polymeric material, and comprises a cylindrical sidewall 12 defining a bag longitudinal axis "L". The bag longitudinal axis "L" is non-orthogonal to the plane "P" of the ring

10, such that it defines an angle of 45 degrees thereto.

The handle 8 includes an angled portion 13, such that the distal portion 14 of the handle is offset from the proximal portion 15 of the handle. This offset ensures that when the tissue bag 7 is deployed from the endoscope 2, the lower extremity 16 of the wire ring 10 sits at a position below the endoscope 2. With the offset handle, and the angle of the wire ring 10, the tissue bag is designed such that once it has been deployed, movement of the tissue grasper 4 distally causes the jaws 5 (and hence the tissue 6) to be received within the pouch 9, as shown in Figure 4.

Once the tissue 6 is located within the pouch 9, the tissue grasper is operated to release the tissue, and the tissue grasper 4 is withdrawn through the working channel of the endoscope 2, leaving the tissue 6 within the pouch 9, as shown in Figure 5. The handle 8 is then used to withdraw the tissue bag 7 towards the endoscope 2, as shown in Figure 6. As the tissue bag 7 is withdrawn, the wire ring 10 starts to be received within the working channel of the endoscope, and the bag portion 11 starts to collapse. Any saline or other fluid contained within the bag portion is withdrawn through the working channel of the endoscope, rather than being expelled into the surgical site 1. The working channel of the endoscope 2 may be provided with suction, in order to assist in the evacuation of fluid from within the bag portion 11.

Figure 7 shows the bag portion 11 collapsed around the tissue 6, with the wire ring 10 completely received within the working channel of the endoscope, and with the contents of the bag portion 11 completely sealed from the surgical site 1. When the tissue bag 7 is in this condition, the endoscope 2 can be withdrawn from the surgical site 1, for example through the urethra. While the endoscope 2 is being withdrawn in this way, the bag portion 11 seals the excised tissue 6 and any other contents of the bag portion from contact with the urethra, thereby preventing any seeding or contamination of the patient from the contents of the tissue bag 7.

Figure 8 shows an alternative embodiment of tissue bag 7 deployed from an endoscope 2 in an equivalent position to that of Figure 3. The tissue grasper 4 is grasping tissue 6, and the angled portion 13 of the handle 8 allows the tissue bag to be deployed past the grasper 4. However, in the embodiment of Figure 8, the tissue bag 7 is provided with a suction tube 17 which is deployed with the bag and extends into the bag portion 11. The suction tube 17 has suction apertures 18 towards its distal end, and the proximal end of the suction tube is connected to a source of suction (not shown).

Figure 9 shows the arrangement when the tissue 6 has been placed into the bag portion 11

and the tissue grasper 4 withdrawn through the endoscope 2. In Figure 9 the tissue bag 7 has been withdrawn towards the endoscope 2, similar to the arrangement shown in Figure 6. When the source of suction is activated, fluid material within the bag portion is evacuated through the apertures 18 and along the suction tube 17 to exit the surgical site 1. This assists the bag portion 11 in collapsing around the tissue 6, and ensures that the tissue bag is not kept inflated by fluid within the bag portion 11. The fluid exits through the suction tube 17 as opposed to being expelled back into the surgical site when the bag portion collapses. As before, the endoscope 2 can be withdrawn from the surgical site 1, with the tissue 6 completely encapsulated by the bag portion 11.

Other embodiments will be apparent to those skilled in the art without departing from the scope of the present invention. For example, various shapes of bag portion 11 can be employed, and different angles for the wire ring 10 can be used also. However, the design of the tissue bag is such that it can be deployed past a tissue grasper holding tissue as shown in Figure 3, and that the subsequent longitudinal movement of the tissue grasper places the tissue in the bag as shown in Figure 4. In this way, simple distal/proximal movements of the bag and tissue grasper are all that is required, with complicated lateral movements or other manoeuvring of the grasper or tissue bag being unnecessary.

Claims

1. A surgical tissue bag for use in the removal of tissue from a surgical site, the tissue bag comprising an elongate handle having a proximal portion and a distal portion, and a pouch disposed at the end of the handle, the pouch comprising a flexible ring and a bag portion depending from the ring and forming an enclosure to contain tissue and other fluid material, the proximal portion of the handle forming a longitudinal axis, and the ring forming a plane at an angle to the longitudinal axis, the handle including an angled portion such that there is an offset of a discrete amount between the distal portion and the proximal portion, such that the longitudinal axis passes through the ring.

2. A tissue bag according to claim 1, wherein the discrete amount by which the distal portion is offset from the proximal portion is between 0.1 and 0.5 times the diameter of the ring.

3. A tissue bag according to claim 2, wherein the discrete amount by which the distal portion is offset from the proximal portion is between 0.2 and 0.3 times the diameter of the ring.

4. A tissue bag according to any preceding claim, wherein the ring forms a plane at an angle of between 30 and 60 degrees to the longitudinal axis of the handle.

5. A tissue bag according to claim 4, wherein the ring forms a plane at an angle of between 40 and 50 degrees to the longitudinal axis of the handle.

6. A tissue bag according to claim 5, wherein the ring forms a plane at an angle of approximately 45 degrees to the longitudinal axis of the handle.

7. A tissue bag according to any preceding claim, wherein the bag portion is shaped such that it defines a bag longitudinal axis, the bag longitudinal axis being non-orthogonal to the plane of the ring.

8. A tissue bag according to claim 7, wherein the bag longitudinal axis is parallel to the

longitudinal axis of the handle.

9. A tissue bag according to claim 8, wherein the bag longitudinal axis is coaxial with the longitudinal axis of the handle.

10. A tissue bag according to any preceding claim, wherein the bag portion has parallel sides.

11. A tissue bag according to claim 10, wherein the sides of the bag portion are parallel with the longitudinal axis of the handle.

12. A tissue bag according to any preceding claim, wherein the handle comprises a wire.

13. A tissue bag according to any preceding claim, including a suction tube extending into the bag portion helping to remove fluid material from within the bag portion.

14. In combination, an endoscope, a tissue grasper and a tissue retrieval bag, the endoscope including at least two working channels, one for the tissue grasper and one for the tissue retrieval bag, the tissue retrieval bag comprising an elongate handle having a proximal portion and a distal portion and a pouch disposed at the end of the handle, the pouch comprising a flexible ring and a bag portion depending from the ring and forming an enclosure, the proximal portion of the handle forming a longitudinal axis and the ring forming a plane at an angle to the longitudinal axis, the handle including an angled portion such that there is an offset of a discrete amount between the distal portion and the proximal portion such that the longitudinal axis passes through the ring, such that when the tissue grasper is moved distally within its working channel along the longitudinal axis the distal end of the tissue grasper passes through the ring and is received within the enclosure.

15. A combination according to claim 14, the combination further including a suction tube extending into the bag portion helping to remove fluid material from within the bag portion.