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(54) Title: ARTIFICIAL BOWEL MODEL

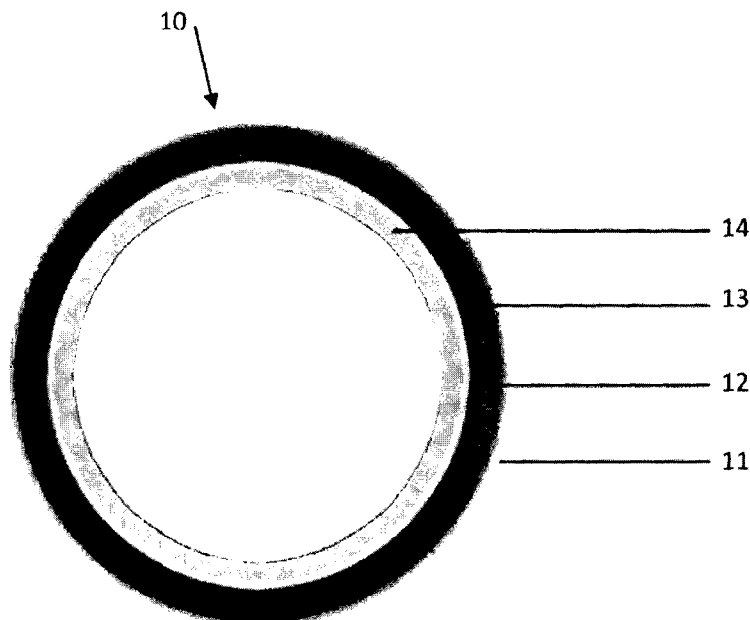


Figure 1

(57) Abstract: A bowel model for use in medical training which has at least four distinct layers. These include an artificial serosal layer, an artificial muscle layer, an artificial submucosal layer; and an artificial mucosal layer. The mucosal layer is relatively more flexible than said muscle layer to mimic the natural mucosal layer of a bowel of a human or animal subject.

Artificial Bowel Model

Cross-Reference to Related Applications

- 5 The present application claims priority from AU 2011901671 the content of which is incorporated herein by reference.

Field of the Invention

- 10 The present invention relates to a model of part of the anatomy of a patient for use in training. Particularly, the anatomical structure is the bowel.

Background

- 15 There is a need to provide trainee doctors and other health care professionals with good models upon which they may practice techniques. In the case of model bowels, the available latex bowel and other models are not accurate in their design and thus do not reflect real bowel - in movement, feel, differing layers etc..
- 20 The model design as described herein addresses the deficiencies of the prior art to provide a realistic and anatomically accurate bowel model.

Summary

- 25 In one aspect, there is provided a bowel model for use in medical training, said bowel model including at least four distinct layers comprising;
- an artificial serosal layer,
 - an artificial muscle layer,
 - an artificial submucosal layer; and
 - 30 an artificial mucosal layer; wherein
- said mucosal layer is relatively more flexible than said muscle layer to thereby substantially mimic the natural mucosal layer of a bowel of a human or animal subject.

Detailed Description

- 35 The abovementioned layers together form a substantially cylindrical structure designed to mimic a real bowel of a patient. The inner layer comprises the mucosal

layer, an inner wall of the mucosal layer defining a lumen. The mucosal layer is substantially surrounded by said submucosal layer, which is substantially surrounded by said muscle layer. The outermost layer is the serosal layer which forms the exterior of the model bowel.

5

Mucosal Layer

In one embodiment, the mucosal layer includes a polymer material. Particularly, the mucosal layer may include at least one silicone. Still further, the mucosal layer may comprise a silicone elastomer.

10

The silicone of the artificial mucosal layer may be platinum (addition) cured. Alternatively, the silicone may be tin cured (condensation).

Preferably the silicone of the artificial mucosal layer has a Shore hardness (ASTM D2240) in the 00 band or in other bands including 000 and A. The Shore hardness may be between 00-01 and 00-10; or between 00-10 and 00-100; or between 00-20 and 00-90; or between 00-30 and 00-80; or between 00-40 and 00-70; or between 00-50 and 00-60. In one specific embodiment, the mucosal layer has a hardness of 00-10. Still, further, the mucosal layer may have a hardness of 00-20. In another embodiment the hardness of the mucosal layer is 00-30. In a further embodiment, the hardness of the mucosal layer is 00-40. In another embodiment the hardness is 00-50.

In one embodiment, the mucosal layer includes the silicone manufactured under the trade name Ecoflex™ 00-10 supersoft silicone (Smooth-On Inc Easton, PA, USA). In a further embodiment, the mucosal layer may include the condensation cured silicone manufactured under the trade name Soft Translucent™ (Barnes Products Pty Ltd NSW Australia).

In a further embodiment, the mucosal layer includes an elastomeric gel. The elastomeric gel typically comprises a blend of oil and gelling agents. The oil may be selected from one or more of the groups including naphthenic or paraffinic processing oil, mineral oil, vegetable oil. Gelling agents include waxes, fatty acid soaps and synthetic thermoplastic rubbers.

The mucosal layer may include further additives including at least one silicone thinning/softening agent. Said silicone thinning/softening agent may comprise any

agent which is a non-reactive silicone agent which will lower the mixed viscosity of silicone products. Examples of suitable agents include polyorganosiloxanes. In one embodiment, the thinner includes dimethylsiloxane. In a further embodiment, the mucosal layer may further include at least one silicone oil.

5

In a particular embodiment, the mucosal layer comprises a silicone and a thinning/softening agent wherein the silicone has a Shore hardness of 00-10. The silicone and the thinning/softening agent are mixed in a ratio of between 1:1.5 and 1:5 of silicone to silicone thinner/softener respectively depending upon the desired replication of region and or pathologies. In a particular embodiment the ratio of silicone to thinning/softening agent is 1:2.6.

10

The abovementioned ratios and those provided below in relation to other layers are proportional to the molecular weight of the thinning/softening agent. If, for example a silicone oil is used as a thinning agent, the ratio may be likely to proportionally change with lower or higher molecular weight oils).

15

The mucosal layer material may further include one or more pigment. Said pigmentation may provide a more realistic look to the mucosa.

20

Structurally, the mucosal layer may define a substantially smooth inner wall which defines a lumen extending through the model bowel. Alternatively, the inner wall of the mucosal layer may comprise an irregular surface and may comprise a series of undulations or folds.

25

The thickness of the mucosal layer is designed to correlate with the natural thickness of the mucosal layer in a patient. As such, the thickness is variable depending upon the component of bowel to be modelled.

30

An outer surface of the mucosal layer may be coated with a film or a powder. Examples include a fine talcum powder or a silicone release spray. The coating in this embodiment tailors the mucosal layer to shear and dissociate from the submucosal layer when varying degrees of force are applied.

35

Furthermore, the composition of the mucosal layer is designed such that it protrudes from a cut edge simulating the behaviour of bowel during an acute breach.

Submucosal Layer

The submucosal layer substantially surrounds the mucosal layer in the model bowel. Typically, the submucosal layer includes a nylon membrane. The nylon membrane may be in the range of 5 Denier to 1000 Denier. Preferably, the nylon member is in the range of 5 to 30 Denier; or 10 to 20 Denier. In one embodiment, the nylon membrane is 8 Denier. In another embodiment, the nylon membrane is 15 Denier.

The submucosal layer may further include a silicone. In this regard, the nylon membrane may be substantially impregnated with said silicone. The silicone of the submucosal layer may be the same or different to the silicone used for the mucosal layer. If the silicone is the same as the submucosal layer it is envisaged that the hardness of the silicones may differ as required for a particular model.

15

Muscle Layer

The muscle layer may comprise the same material or at least one of the same materials as the mucosal layer. As noted in the main aspect, however, it is important that the mucosal layer has a greater flexibility or has a lesser Shore hardness than the muscle layer. This may be achieved in one embodiment by using the same silicone but with either no thinning/softening agent or less agent.

20

In one embodiment, the muscle layer comprises at least one silicone.

As with the mucosal layer, the silicone of the muscle layer may be platinum (addition) cured. Alternatively, the silicone may be tin cured (condensation).

25

The silicone of the muscle layer may also have a Shore hardness (ASTM D2240) in the 00 band, the 000 or the A band. The Shore hardness may be between 00-01 and 00-10; or between 00-10 and 00-100; or between 00-20 and 00-90; or between 00-30 and 00-80; or between 00-40 and 00-70; or between 00-50 and 00-60. In one specific embodiment, the mucosal layer has a hardness of 00-10. Still, further, the mucosal layer may have a hardness of 00-20. In another embodiment the hardness of the mucosal layer is 00-30. In a further embodiment, the hardness of the mucosal layer is 00-40. In another embodiment the hardness is 00-50.

35

The same silicone, with the same Shore hardness may be used for both mucosal and muscle layer but in this embodiment, the mucosal layer silicone would be softened further by adding a softening/thinning agent. Examples of thinning/softening agents are provided above. Alternatively, a thickening agent may be added to the muscle layer.

Alternatively, different materials may be used to achieve the relatively different hardness of the mucosal layers and the muscle layers. In this embodiment, the silicone for the mucosal layer may be selected such that it has a lower Shore hardness than the selected silicone of the muscle layer.

As with the mucosal layer, the muscle layer may include the silicone manufactured under the trade name EcoflexTM 00-10 supersoft silicone (Smooth-On Inc Easton, PA, USA). Alternatively, the muscle layer may include the condensation cured silicone manufactured under the trade name Soft TranslucentTM (Barnes Products Pty Ltd NSW Australia).

In a particular embodiment, the muscle layer comprises a silicone and a thinning/softening agent wherein the silicone has a Shore hardness of 00-10. The silicone and the thinning/softening agent are mixed in a ratio of between 1:1.5 and 1:4.5 of silicone to silicone thinner respectively depending upon the desired replication of region and of pathologies. In a particular embodiment the ratio of silicone to thinning/softening agent is 1:2.4.

Again, as with the mucosal layer, the muscle layer may include an elastomeric gel. The elastomeric gel typically comprises a blend of oil and gelling agents. The oil may be selected from one or more of the groups including napthenic or paraffinic processing oil, mineral oil, vegetable oil. Gelling agents include waxes, fatty acid soaps and synthetic thermoplastic rubbers. In this embodiment, the blend of oil and gelling agent may differ between the mucosal layer and the muscle layer such that the desired difference in hardness/flexibility is achieved.

Serosal Layer

The serosal layer is the outermost layer and may include a nylon membrane. As with the submucosal layer, the serosal layer may be impregnated with a silicone. The nylon membrane may be in the range of 5 Denier to 100 Denier. Preferably, the nylon

member is in the range of 5 to 30 Denier; or 10 to 20 Denier. In one embodiment, the nylon membrane is 8 Denier. In another embodiment, the nylon membrane is 15 Denier.

5 The silicone of the serosal layer is typically the same as the silicone of the submucosal layer or the muscle layer. In this regard, in one embodiment, the silicone is 00-10. The silicone may be further softened by the addition of silicone thinners/softeners as described above.

10 In a further embodiment, the silicone of the serosal layer differs from the silicone of the mucosal layer. In this embodiment, the silicone of the serosal layer may have a hardness in the Shore scale A. The silicone may be in the range of 1A to 100A; or 10A to 90A; or 20A to 80A; or 30A to 70A; or 40A to 60A; or 50A to 60A. In one embodiment the silicone is 10A. In a further embodiment the silicone is 20A and in a
15 still further embodiment the silicone is 30A. An example of a suitable silicone is sold under the trade name Dragon skinTM (Smooth-On Inc, PA, USA).

General structure of the model

Each layer may be pigmented to match the differences in colour perceivable in
20 bowel. Furthermore, the texture, pliability, flexibility, hardness and general consistency of each layer is designed to mimic that of normal or pathologic bowel.

The thickness of each of the four layers is modulated such that they lie within the tolerances acceptable for normal or pathologic human bowel or for people of
25 various racial or genetic backgrounds & subgroups. Furthermore the internal lumen size can be varied to represent various sections of the human bowel namely the Duodenum, Jejunum (small bowel) , Ileum (small bowel) and Colon (large bowel).

The wall thickness including all layers may range from 0.01mm (in cases of a
30 model to replicate severe disease where there is severe distension and stretching and the bowel is almost at a point of rupture) to 6mm (in an embodiment wherein the model represents severe inflammatory process coupled with an empty bowel lumen within the gastro intestinal tract).

35 A stitched seam or pigmented line marking may be included in the model to polarise the device to indicate a mesenteric margin.

A continuous extension of the mesenteric margin can be provided with vascular (arterial and venous structures), nervous and lymphatic structures.

- 5 The construction of the bowel device is such that it elongates in a radial axis and longitudinal axis as per human or animal bowel.

10 The model as herein described may be filled with a gas, liquid, semi-solid or solid substances. This may occur prior to or post surgical intervention for such purposes as evaluating the efficacy of the performed procedure or identifying areas of compromise within the device, or providing a more realistic working environment to train individuals in the appropriate management of faecal or contaminated materials that lie within the bowel lumen.

- 15 The exterior surface of the bowel can be shaped to substantially mimic human or animal bowel. In particular it may include raised areas and projections, which may themselves be pigmented with different colours, to represent underlying vessels and lymph nodes, diverticuli, appendices epiploicae and other anatomical features.

- 20 The bowel model described herein may be used for training in all manner of suturing and surgical techniques including but not limited to the following:

Suturing / Stiches

Single or Double layer

Continuous or Interrupted techniques

- 25 Full thickness stitches

Seromuscular stitch

Mucosal stitch

Serosubmucosal stitch

Gambie stitch

- 30 Lembert stitch

Cushing stitch

Connel stitch

Halsted stitch

Mikulicz stitch

- 35 Parker-kerr basting stitch

Inverting mattress stitches

- Mucosal exclusion stitches
- Stay stitches / sutures
- Ligation of mesenteric & bowel related blood vessels
- Cheatele cut
- 5 Stapled Anastomosis
 - Anastomosis involving linear staplers
 - Anastomosis involving circular staplers
 - Strictureplasties
 - Finney strictureplasty
- 10 Heineke-Mikulicz strictureplasty
 - Stoma formation
 - Colostomy
 - Ileostomy
 - Jejunostomy
- 15 End to end anastomosis
 - End to side anastomosis
 - Lateral or side to side anastomosis
 - Enteroenterostomy
 - Jejunojejunostomy
- 20 Roux-en-Y anastomosis
 - Ileoileostomy
 - Colocolostomy
 - Enterectomy
 - End to end colostomy
- 25 End to end rectal colostomy
 - Management of intussusceptions

- Further, it is envisaged for use in training in part or whole in: laparoscopic surgery, flexible endoscopy, rigid endoscopy, robotic surgery, robotic assisted surgery, single
- 30 incision laparoscopic surgery, single port laparoscopic surgery, Natural Orifice Transluminal Endoscopic Surgery (NOTES) surgery, paediatric surgical procedures, general surgical procedures, training of nurses, allied health personnel and in some cases patients.

35 Examples

Materials

Two Nylon membranes with linear density in the range of 8 and 16 Denier.

00-10 silicone.

Silicone Thinner/Softener

- 5 Silicone pigment

Talcum powder or silicone release spray or Q-Cel, polyethylnene powder (poly fibre), CAB-O-SIL (Fumed silica)

Tools:

- 10 Plastic rods over which the bowel is formed. Rod diameters from 12mm to 40mm (or larger for large animal bowel models) The rods are of either polyethylene, high density polyethylene, polytetrafluoroethylene (PTFE, Teflon) or other non-reactive plastic; or metal rods.

- 15 The rods themselves may be smooth or textured with microscopic and macroscopic surface details such that the silicone of the mucosa will be moulded by these features on the rod.

Example Mix Ratios

- 20 A The nylon membranes for use in the submucosal and the serosal layers are impregnated with 00-10 supersoft silicone.

B The muscle layer for normal (compared to diseased) bowel consists of a mixture in the ratio of 1:2.4 of 00-10 supersoft silicone and silicone thinner/softener respectively.

- 25 C The silicone for the mucosal layer consists of a mixture in the ratio of 1:2.6 of 00-10 supersoft silicone and silicone thinner/softener respectively.

Example of Manufacturing Process

- 30 The bowel model as herein described may be manufactured generally by first creating an air and water tight membrane bladder by impregnating a nylon material, in this example, a nylon stocking, with pigmented undiluted silicone.

- 35 A second layer of nylon material is wrapped onto a plastic rod and this construct is placed within the air tight membrane bladder. The space between the bladder and the second nylon layer is filled with 1:2.4 dilution of pigmented silicone as per B in the above mix ratios.

The nylon and silicone laminate is cured. The construct may be baked while being rotated regularly to enhance uniformity of the layer in the final product. Once cured the laminate is removed from the rod and dusted with talc or talcum powder both
5 internally and externally. The laminate is returned to the rod, which has been either coated in a film of talc or sprayed with silicone release spray, and stretched linearly.

Pigmented liquid silicone dilution of 1:2.6 as in C above is now poured between the second nylon layer and the plastic rod. This is allowed to cure prior to removing the
10 rod once again. During curing, rotation may be employed to ensure uniformity of distribution.

The entire construct including the interior is now lightly dusted with talc and cut to the required length.
15

Brief Description of the Drawings

Figure 1 is a cross-sectional view through part of the model as herein described; and

Figure 2 is a longitudinal sectional view of the model as herein described.
20

Description of Drawings

A bowel model 10 for use in surgical training is depicted as 10 in the accompanying drawings.
25

The bowel model is designed to provide as realistic model as possible for healthcare professionals and is applicable for training surgeons for both human and veterinary purposes. The model is also applicable to the training of nurses and allied health professionals involved in the management of exposed bowel as would occur in
30 the management of stomas.

Further, the model can be produced to represent normal bowel or bowel with a multitude of active or inactive, acute, subacute or chronic pathologies or pathologic processes.
35

The bowel model 10 includes at least 4 distinct layers as shown; the layers comprising: an artificial serosal layer 11, an artificial muscle layer 12, an artificial submucosal layer 13 ; and an artificial mucosal layer 14.

5 It is a feature of this model that the four distinct layers have different properties as is the case in real bowel. Particularly, and an advantage of the present model, the mucosal layer is made to be very soft and more flexible relative to the other layers and in particular the muscle layer. This may be achieved by using a soft silicone in the first place although the present inventor has found that even the softest silicones, 00-10, on
10 the market require softening with a silicone thinner such as a silicone oil.

The mucosal layer 14 comprises an inner wall 15 which may be smooth as shown in the cross section of Figure 1. Alternatively and as shown in Figure 2 the inner wall 15 undulates with a number of folds 16 extending into the lumen. When the
15 model bowel is radially distended, the inner wall may also distend and move from the folded configuration to the smooth surface depicted in Figure 1.

The external surface 16 of the mucosal layer is coated with a film or a powder during manufacture. The coating in this embodiment tailors the mucosal layer to shear and dissociate from the submucosal layer when varying degrees of force are applied.
20 This feature is important as it reflects the real life situation when the bowel is subjected to specific force. This is one area that healthcare professional should be careful and if excessive shearing occurs, this indicates that the technique of the user is not optimal.

25 *Submucosal Layer*

The submucosal layer 13 surrounds the mucosal layer 14 in the model bowel. As depicted, the submucosal membrane is made up of a nylon membrane impregnated with a silicone mix.

30 The muscle layer 12 as noted above is relatively harder than the mucosal layer. The serosal layer 11 is the outermost layer and comprises an elastomeric nylon membrane impregnated with a silicone.

The bowel model 10 maybe manufactured as an elongate cylinder which may
35 then be cut into the desired size.

It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific embodiments without departing from the scope of the invention as broadly described. The present embodiments are, therefore, to be considered in all respects as illustrative
5 and not restrictive.

CLAIMS:

1. A bowel model for use in medical training, said bowel model including at least four distinct layers comprising;
5 an artificial serosal layer,
an artificial muscle layer,
an artificial submucosal layer; and
an artificial mucosal layer; wherein
said mucosal layer is relatively more flexible than said muscle layer to thereby
10 substantially mimic the natural mucosal layer of a bowel of a human or animal subject.
2. The bowel model of claim 1 comprising a substantially cylindrical member.
3. The bowel model of claim 2 wherein an inner surface of the artificial mucosal
15 layer defines a lumen of the substantially cylindrical member.
4. The bowel model of any one of the preceding claims wherein the artificial mucosal layer comprises at least one polymer.
- 20 5. The bowel model of claim 4 wherein the artificial mucosal includes at least one silicone.
6. The bowel model of claim 5 wherein the silicone of the artificial mucosal layer has a Shore hardness (ASTM D2240) in the 00 band.
25
7. The bowel model of any one of the preceding claims wherein the artificial mucosal layer includes an elastomeric gel.
8. The bowel model of claim 7 wherein the elastomeric gel comprises oil and
30 gelling agents wherein said oil is selected from one or more of naphthenic or paraffinic processing oil, mineral oil, vegetable oil and said gelling agent includes waxes, fatty acid soaps and synthetic thermoplastic rubbers.
9. The bowel model of any one of the preceding claims wherein the artificial
35 mucosal layer further includes at least one silicone softening agent.

10. The bowel model of claim 9 wherein said silicone softening agent comprises an agent from the family of polyorganosiloxanes.
11. The bowel model of claim 10 wherein the silicone softening agent comprises dimethylsiloxane.
12. The bowel model of claim 9 wherein the artificial mucosal layer includes at least one silicone oil as a softening agent.
13. The bowel model of any one of the preceding claims wherein an outer surface of the artificial mucosal layer is coated with a fine powder or at least one silicone release spray.
14. The bowel model of any one of the preceding claims wherein said artificial submucosal layer substantially surrounds said artificial mucosal layer.
15. The bowel model of any one of the preceding claims wherein said artificial submucosal layer includes at least one nylon membrane.
16. The bowel model of any one of the preceding claims wherein the artificial submucosal layer includes at least one silicone.
17. The bowel model of any one of the preceding claims wherein said artificial muscle layer includes at least one silicone.
18. The bowel model of claim 17 wherein the muscle layer and the mucosal layer include at least one silicone wherein the artificial mucosal layer further includes at least one silicone softening agent.
19. The bowel model of claim 18 wherein the artificial muscle layer also includes at least one silicone softening agent wherein, said artificial muscle layer includes relatively less silicone softening agent than said artificial mucosal layer.
20. The bowel model of any one of the preceding claims wherein the muscle layer includes an elastomeric gel.

21. The bowel model of claim 20 wherein the elastomeric gel comprises oil and gelling agents wherein said oil is selected from one or more of naphthenic or paraffinic processing oil, mineral oil, vegetable oil and said gelling agent includes waxes, fatty acid soaps and synthetic thermoplastic rubbers.
- 5 22. The bowel model of any one of the preceding claims wherein an outermost layer of the model comprises the artificial serosal layer.
23. The bowel model of claim 22 wherein said artificial serosal layer includes at
10 least one nylon membrane.
24. The bowel model of claim 23 wherein said artificial serosal layer includes at least one silicone.
- 15 25. The bowel model of claim 24 wherein said at least one nylon membrane is substantially impregnated with said at least one silicone.

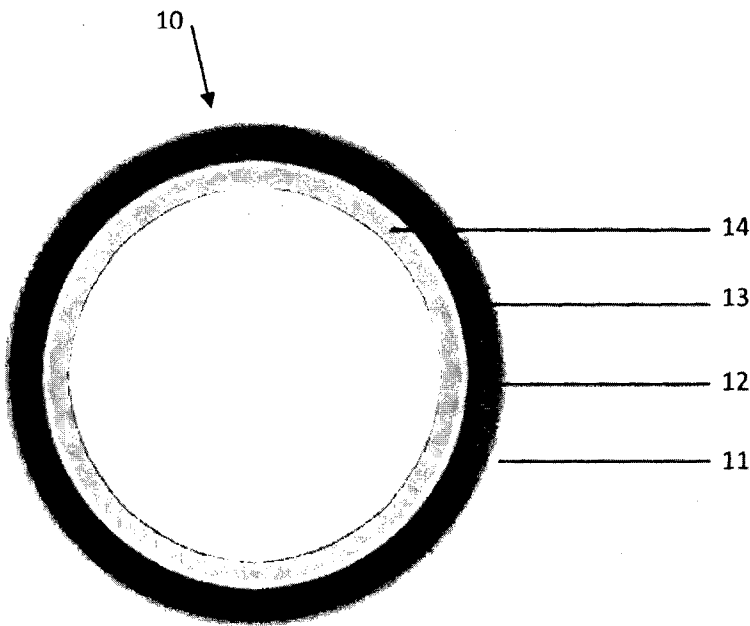


Figure 1

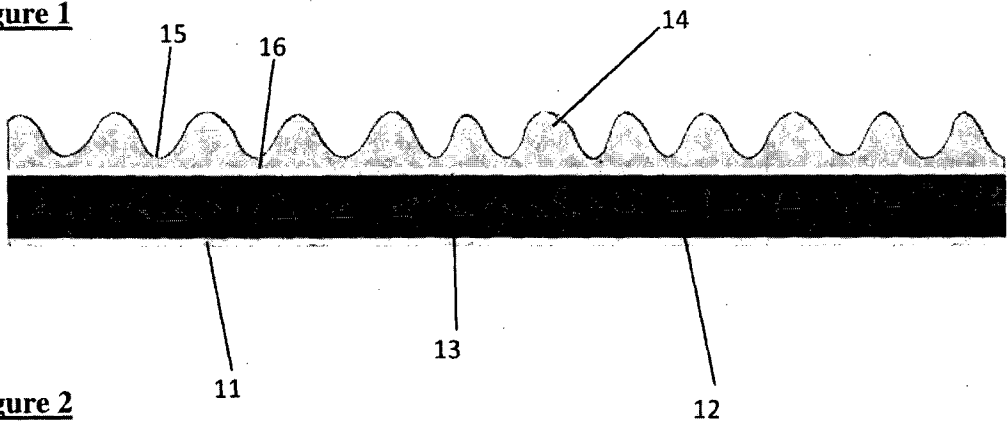


Figure 2

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2012/000472

A. CLASSIFICATION OF SUBJECT MATTER		
Int. Cl.		
G09B 23/28 (2006.01) A61F 2/04 (2006.01)		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
WPI, EPODOC: IPC G09B23/28/ic & Keywords (intestine, bowel, layer, model, anastomosis) and like terms		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	CN 201853413 U (XIAO WANG) 01 June 2011 Abstract, Paragraph 3, 14, and 15, figure 3	1-25
X	CN 2505942 Y (CHENG LIN) 14 August 2002 Abstract and figures 1-4	1-25
X	CN 201725474 U (TIANJIN YIXUETANG SCIENCE AND TECHNOLOGY CO LTD) 26 January 2011 Abstract and figures 1, 2	1-25
X	CN 201477784 U (BEIJING YIMO TECHNOLOGY CO LTD) 19 May 2010 Abstract and figure 1	1-25
☒ Further documents are listed in the continuation of Box C ☒ See patent family annex		
* Special categories of cited documents:		
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	
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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	
"P" document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search 23 May 2012	Date of mailing of the international search report 29 May 2012	
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. +61 2 6283 7999	Authorized officer Ariane Le Guen AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No : +61 2 6283 7971	

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2012/000472

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
L,X	LifeLike BioTissue Products [retrieved on 21 May 2011] Retrieved from internet <URL: http://lifelikebiotissue.com/products > published on 2 February 2011 as per Wayback Engine Whole Document	1-25
L,X	Laparoscopic - Training Aids & Accessories, Suturing & Anastomosis (Bowel Sections) [retrieved on 21 May 2011] Retrieved from internet <URL: http://www.3-dmed.com/Lap_Training_Aids_&_Accessories_Suturing_&_Anastomosis.html > published on 27 November 2009 as per Wayback Engine Whole Document	1-25

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU2012/000472

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member
CN	201853413U	NONE
CN	201725474U	NONE
CN	2505942	NONE
CN	201477784U	NONE
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.		
END OF ANNEX		