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(71) Applicant and

(72) Inventor: **TAKASHIMA, Jiro** [US/US]; 7203 Schiller,
Houston, TX 77055 (US).

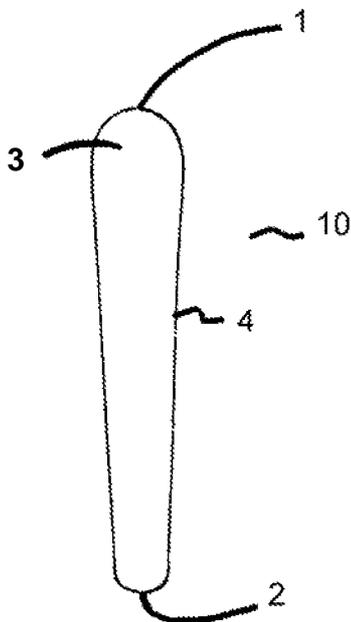
(74) Agent: **CHU, Andrew, W.**; Egbert Law Offices, 412 Main
St., 7th Floor, Houston, TX 77002 (US).

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(54) Title: HEMORRHOID TREATMENT SUPPOSITORY



(57) Abstract: A suppository device (10) has a shaft having a first end (1) and a second end (2). The first end (1) has a bulbous upper portion (3). The shaft has a tapered surface (4) extending toward the second end (2) from the bulbous upper portion (3). The taper angle of the tapered surface (4) is decreasing to virtually zero degrees toward the second end (2). The minimum diameter at the portion of the shaft separated 3cm from the widest section of the bulbous upper portion (3) is approximately one-half of the widest section of the bulbous upper portion (4).

FIGURE 1

WO 2008/109616 A1

HEMORRHOID TREATMENT SUPPOSITORY

FIELD OF THE INVENTION

[0001] The present invention relates to a hemorrhoid treatment device. More particularly, the present invention relates to hemorrhoid suppositories that stay within the anal canal in order to deliver the medication directly to the internal hemorrhoidal area.

BACKGROUND OF THE INVENTION

[0002] Most hemorrhoid suppositories have a bullet shape. Therefore, it is quite difficult for these bullet-shaped suppositories to stay within the anal canal after they are inserted. Additionally, these bullet-shaped suppositories tend to go upward in the rectum before the medication is directly applied to the internal hemorrhoid area

[0003] It is an object of the present invention to provide a suppository with a proper ratio of the surface area and the mass of the shaft in order to movably retain by itself within the anal canal by utilizing the peristaltic motion within the anal canal.

[0004] It is another object of the present invention is to provide a suppository that is easy to use, easy to manufacture and relatively inexpensive.

[0005] These and other objects and advantages of the present invention will become apparent from a reading of the attached specification and appended claims.

BRIEF SUMMARY OF THE INVENTION

[0006] The present invention is a suppository device that comprises a shaft having a first end and a second end. The first end has a bulbous upper portion. The shaft has a tapered surface extending and narrowing from the bulbous upper portion toward the second end. The diameter of the bulbous upper portion is between 6mm and 12mm. The minimum diameter of the shaft is approximately one half the diameter of the wide section of the bulbous upper portion. The average diameter of the shaft has a proper ratio between the surface area per capacity of between 2 to 1 (2mm) and 1 to 2(8mm), and also the average maximum diameter of the shaft is approximately 20 % of the occupied length of the shaft within the anal canal.

-2-

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0007] FIGURE 1 is a side elevational view of the suppository device of the present invention.

[0008] FIGURE 2 is a side elevational view of another embodiment of the suppository device of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0009] FIGURE 1 shows the suppository device 10 in accordance with the teaching of the present invention. The suppository device 10 has a first end 1 and a second end 2. The first end 1 has a bulbous upper portion 3. A tapered surface 4 extends from the bulbous upper portion 3 toward the second end 2.

[0010] A maximum average diameter of the device 10 is approximately 20 % of the occupied length of the shaft within the anal canal. When the shaft has a length through a 4cm length of the anal canal, the average maximum diameter of the shaft is 8mm.

[0011] The maximum diameter of the bulbous upper portion is two times the diameter of the portion of the shaft-separated 3cm from the wide portion of the bulbous upper portion 3. Since the great variation in size of the human organ in individuals, all figures are approximate.

[0012] Those sizes described above are decided by the frictional relationship between the device 10 and the anal canal. The anal canal has a self-cleaning function. When the long cylindrical shaft with an average diameter of more than 10mm enters into the anal canal. The shaft will be immediately pushed out from the anus because the large diameter triggers the involuntary evacuative pressure to the shaft. Also, as the diameter of the shaft increases, the holding capacity of the shaft dramatically decreases. The bigger diameter of the shaft has less surface area per capacity to be maintained in position in the anal canal.

[0013] When the smaller diameter shaft, less than 8mm, enters the anal canal, the anal canal responds to move down the shaft by the peristaltic movement within the anal canal. But when the shaft provides proper taper surface 4 narrowing from bulbous upper portion 3, the taper surface 4 resist the downward peristaltic movement of the anal canal. Those peristaltic movements have variations, moving the shaft up and down inside the anal canal.

[0014] While avoiding evacuative movement to be pushed down and out of the rectal and anal canal,

-3-

the shaft responds to peristaltic movement properly. The shaft must provide a proper ratio of surface area per capacity to be maintained in position in the anal canal. The best surface area per capacity is between two to one and one to two. When the diameter of the shaft is 2mm, surface area per one centimeter is 62.8mm^2 and the volume per one centimeter is 31.4mm^3 . When the diameter of the shaft is 8mm, the surface area per one centimeter is 251.2mm^2 and the volume per one centimeter is 502.4mm^3 . The maximum diameter of the shaft is 20 % of the occupied length of the shaft within the anal canal.

[0015] Figure 2 shows an alternative embodiment of the suppository device 20 of the present invention. The shaft 25 has a bulbous upper portion 21, and a tapered surface 24 extending and narrowing from the bulbous upper portion 23 toward the second end 22. As can be seen from FIGURE 1, the taper angle decreases toward the second end to virtually zero degrees. The diameter of the wide section 26 of the bulbous upper portion 23 is between 6 and 12 millimeters, this being 15% and 30 % of the length of the average length of the human anal canal of approximately 4cm.

[0016] The minimum diameter of the portion of the shaft separated 3cm from the wide section 26 of the bulbous upper portion 23 is 1/2 of the wide section 26 of the bulbous upper portion 23. The advantage of the device 20 over the device 10 is that the inwardly inclined taper surface from bulbous upper portion makes a rapidly increase in holding power toward the bulbous upper portion.

[0017] When the device 10 is inserted into the anal canal, the outward peristaltic motion within the anal canal will start to move down the device to the outside of the anus. Since the device 10 has a slight tapered surface to resist this outward peristaltic motion, the device 10 will stay within the anal canal.

[0018] When the device has an average diameter that is greater than 8 millimeters, the surface area per capacity decreases. Then, the rectal pressure, along with a lateral pressure within the anal canal, will push the device 10 out of the anal canal. Therefore, the average diameter of less than 8 millimeters is imperative to allow the device 10 to be properly retained within the anal canal and create the necessary peristaltic motion within the anal canal.

[0019] The ratio between the surface area and the volume of the device has a functional relationship to allow the device 10 to stay within the anal canal. The best ratio of the surface area to the volume of the device is approximately between 2:1(2mm) and 1:2(8mm), possibly also 5:2(10mm). For

-A-

example, when the diameter of the shaft is 6 millimeters, the unit surface area is 18.84mm^2 . The volume of the device will be 28.26mm^3 . Thus, the ratio is 1:1.5, while the allowable maximum ratio is 5:2.

[0020] The foregoing disclosure and description of the invention is illustrative and explanatory thereof. Various changes in the details of the illustrated construction can be made within the scope of the appended claims without departing from the true spirit of the invention. The present invention should only be limited by the following claims and their legal equivalents.

CLAIMS

I claim:

1. A suppository comprising:

a shaft having a first end and a second end, said first end having a bulbous upper portion and a tapered surface extending and narrowing from said bulbous upper portion toward said second end, said shaft having an average diameter with a surface area per capacity ratio between 2 to 1 and 1 to 2 and a maximum diameter of approximately 20 % of an occupied length of said shaft within an anal canal, said shaft being positioned within the anal canal.

2. A suppository device comprising:

a shaft having a first end and a second end, said first end having a bulbous upper portion, said shaft having a tapered surface extending and narrowing toward said second end from said bulbous upper portion, said tapered surface having an angle of taper decreasing to virtually zero degrees toward said second end, said bulbous upper portion having a widest diameter between 6 and 12 millimeters inclusive, said shaft having a minimum diameter at three centimeters from said widest diameter, said minimum diameter being approximately one half of said widest diameter, said shaft being within the anal canal.

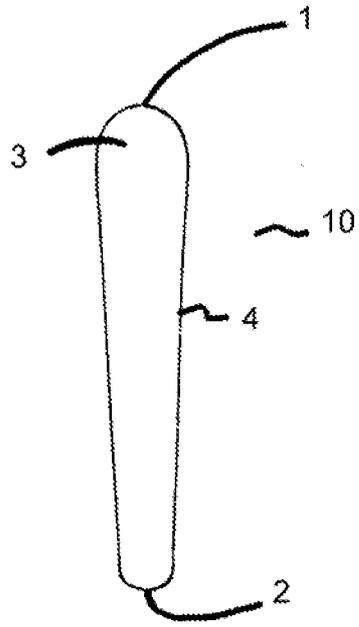


FIGURE 1

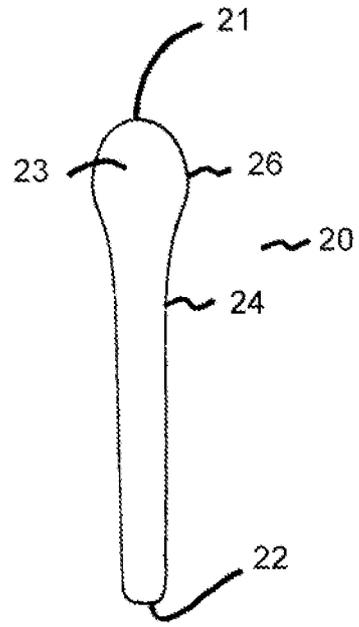


FIGURE 2

A. CLASSIFICATION OF SUBJECT MATTER		
<i>A61K 9/02(2006.01)i, A61J 3/00(2006.01)i, A61K 9/64(2006.01)i</i>		
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) IPC 8 A61K 9/02, A61J 3/00, A61 K31/74, A61K 9/64, A61M 29/00		
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) eKIPASS(KIPO internal), PubMed, JPO, USPTO		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
X	EP 0 094 232 A2 (SALVATORE J DETRANO) 16 NOVEMBER 1983 See Abstract, Claim 1, Figure 1	1-2
A	US 4,263,914 A (EDWARD S PAWLAK) 28 APRIL 1981 See Abstract, Claim 1,5, Figure 1	1-2
A	US 2005/0089556 A1 (L GAYE CARROLL) 28 APRIL 2005 See Abstract, Page 1, Claim 1	1-2
<input type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> 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 "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "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 "X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "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 "&" document member of the same patent family		
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Information on patent family members

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