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Uddenberg

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[54] **INSTRUMENT FOR MAINTAINING BODY CAVITIES IN EXTENDED CONDITION**

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[21] Appl. No.: **266,383**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 77,533, Oct. 2, 1970, abandoned.

[52] **U.S. Cl.** **128/20**

[51] **Int. Cl.** **A61b 1/32**

[58] **Field of Search** 128/3, 12, 13, 14, 20

[56] **References Cited**

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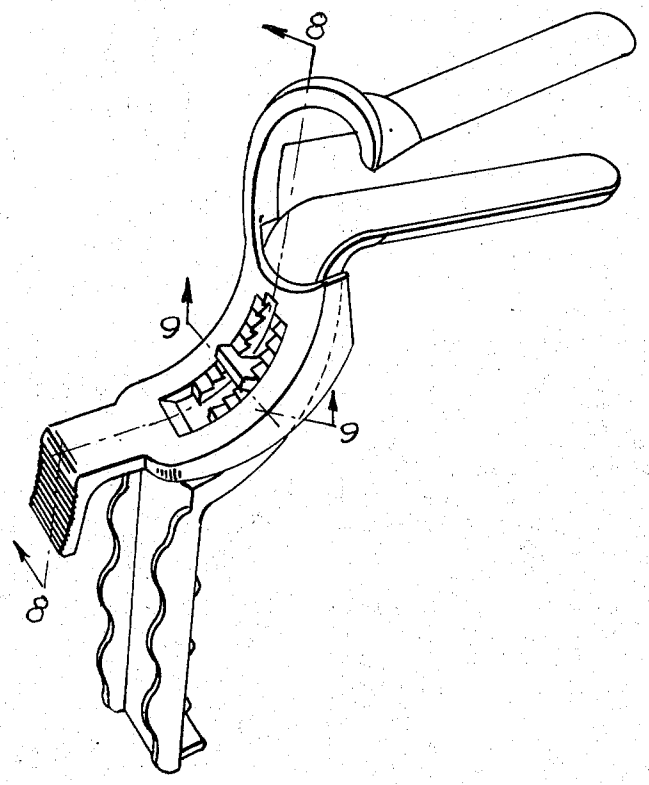
Primary Examiner—Channing L. Pace

[57] **ABSTRACT**

An expandable instrument for maintaining body cavities in an extended condition such as a speculum for vaginal inspection and having a pair of speculum jaws slideably connected at one end for movement along a curved path towards and away from one another whereby the free ends of said jaws open up quicker than their connected ends upon imparting a relative sliding movement to said jaws.

The present invention relates to an instrument for maintaining body cavities in extended condition, said instrument preferably to be used as a speculum for vaginal inspection, and more particularly being of the type comprising two main parts, which can be detachably connected to each other, each part forming a jaw in the assembly, it being possible to move the jaws of the instrument towards and away from each other.

5 Claims, 9 Drawing Figures



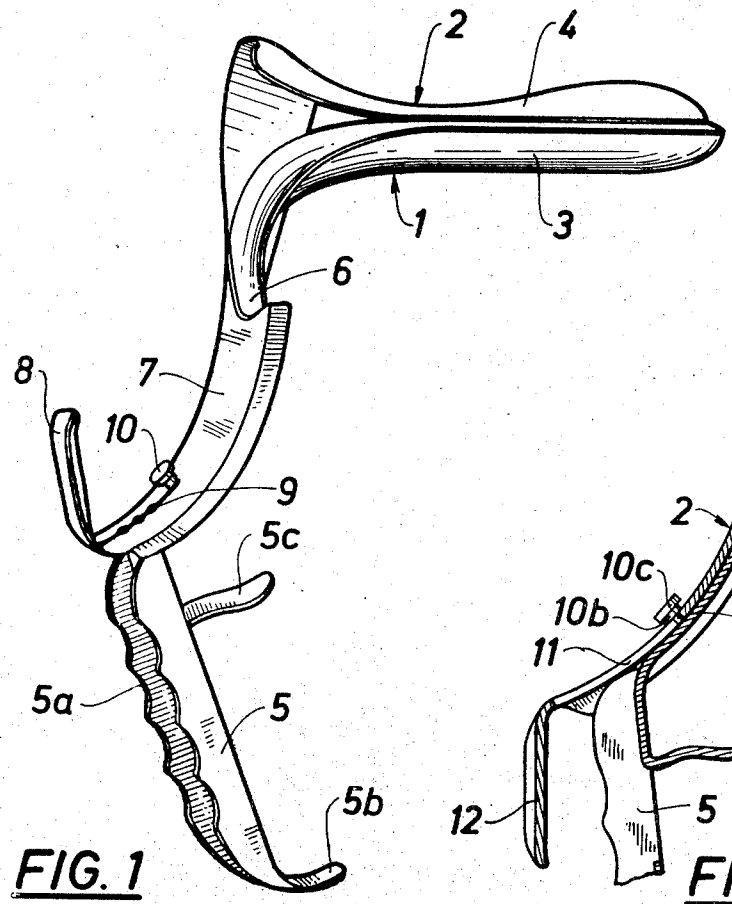


FIG. 1

FIG. 3

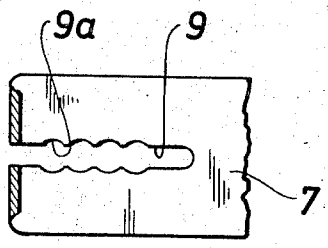


FIG. 5

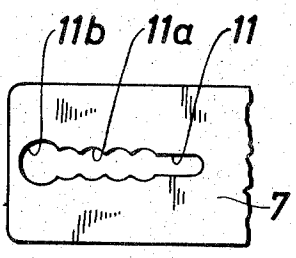


FIG. 6

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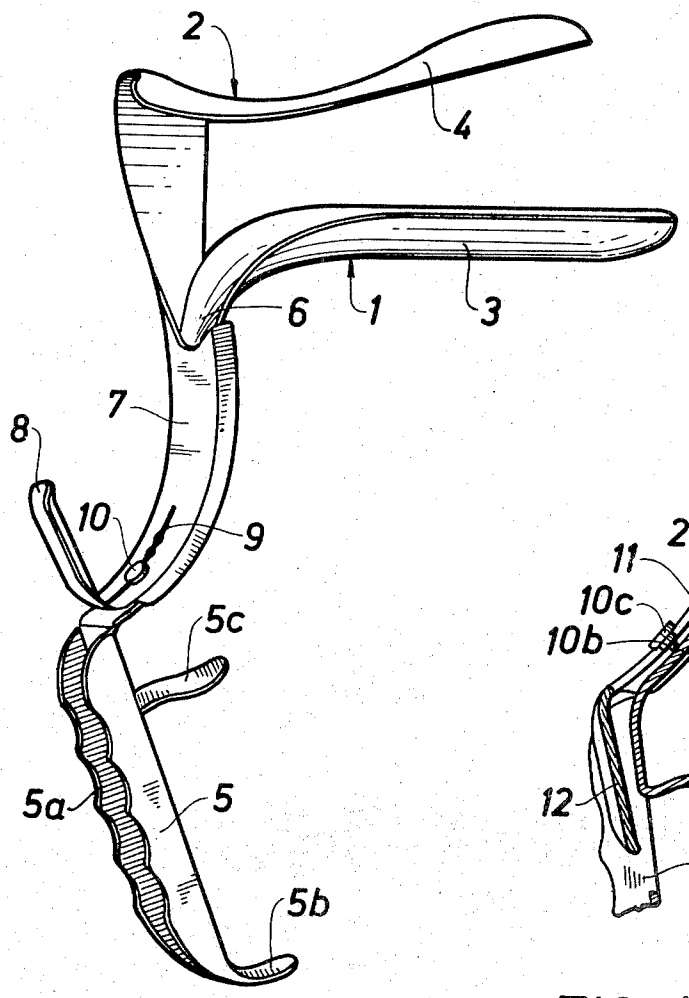


FIG. 2

FIG. 4

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FIG. 7.

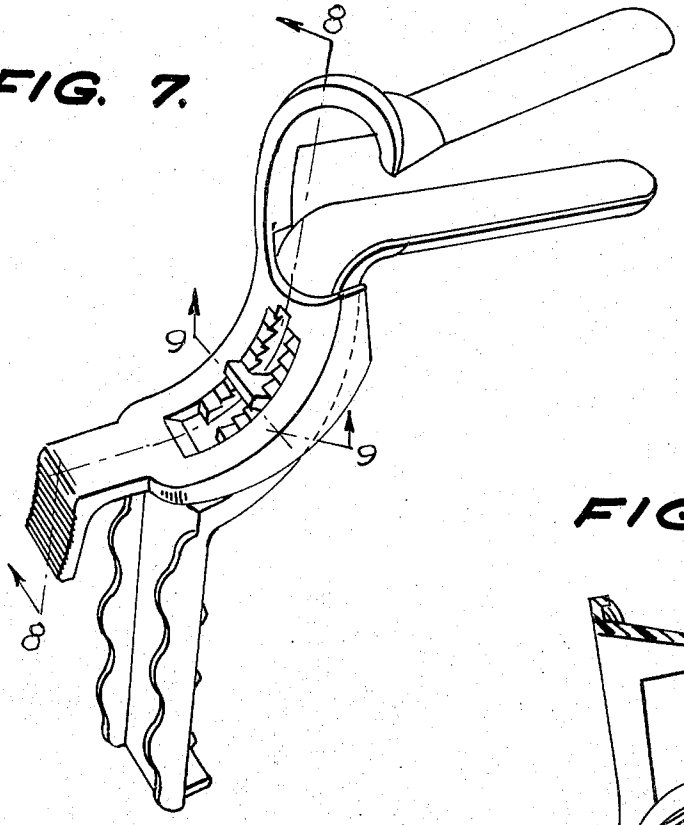
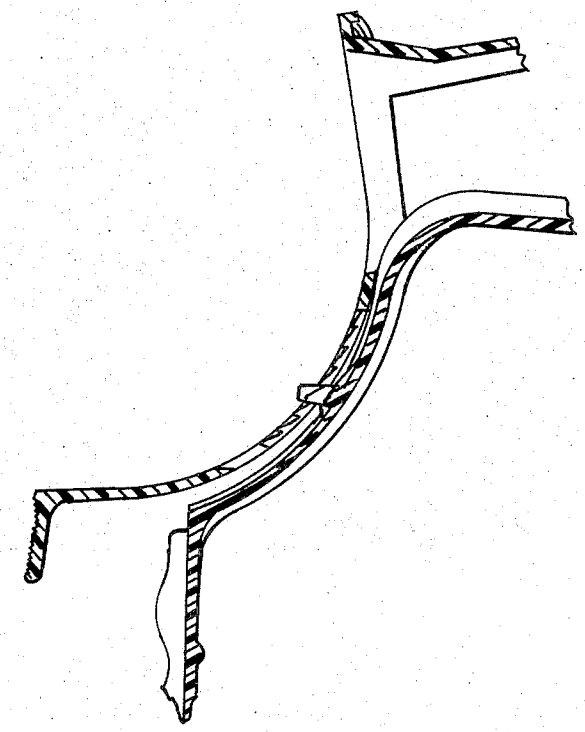


FIG. 8.



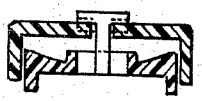


FIG. 9.

INSTRUMENT FOR MAINTAINING BODY CAVITIES IN EXTENDED CONDITION

The present application is a continuation-in-part of my copending application, Ser. No. 77,533, filed Oct. 2, 1970, now abandoned.

Instruments of the kind mentioned are already known, but they are very complicated, as the adjustment of the position of the jaws in between them usually has to be carried out by moving screws or similar connectors. Said instruments are very complicated indeed, when it is desired to obtain a wider opening of the jaws of their extreme free ends than at those ends of the jaws which are connected to the operating mechanism. In addition said instruments are impaired by the drawback of being difficult to take apart and also difficult to keep clean on account of their complicated design offering many hidden places where impurities can accumulate. When an instrument of this kind shall be sterilized it is of great importance that its surfaces are as smooth as possible and that it is easy to take apart.

It is an object of the present invention to provide an instrument of the kind mentioned, where the drawbacks mentioned above are eliminated, i.e. an instrument which is quick to operate, easy to keep clean and easy to take apart.

Said object has been attained by the instrument according to the invention, which is characterized by the portions of said main parts serving the purpose of coupling the parts together being shaped with two sliding surfaces curved in an arch, each one of the sliding parts thus formed at one its extremes being connected to said jaws, the curvature of said sliding paths having such a direction that when the jaws are moved away from each other by displacement of said gliding paths in between them, said jaws are expanding quicker at their free ends than at the ends of them located adjacent to the sliding paths.

An embodiment of the invention will not be described with reference to accompanying drawings, in which:

FIG. 1 is a view of a speculum for vaginal inspection made in accordance to the invention and occupying a certain position,

FIG. 2 is a corresponding view of said speculum in another position,

FIG. 3 is a longitudinal cross section of a portion of a speculum of a somewhat modified embodiment occupying a position corresponding to the one illustrated in FIG. 1,

FIG. 4 is a longitudinal cross section corresponding to FIG. 3, showing a portion of a speculum in a position corresponding to the one in FIG. 2,

FIG. 5 is a top view of a portion of the speculum illustrated in FIGS. 1 and 2,

FIG. 6 is a corresponding top view of the speculum illustrated in the FIGS. 3 and 4, and

FIG. 7 is a perspective view of a modified form of the speculum and FIG. 8 is a cross sectional view taken on line 8—8 of FIG. 7.

As is evident from the drawings a speculum comprises two main portions, which can be detachably connected with each other, one of which in the drawings indicated with 1 hereafter referred to with the professional term "speculum part" and the other in the drawings indicated with 2 hereafter referred to with the professional term "depressor part." The speculum part and the depressor part exhibit each one its jaw 3 and 4 respectively, which together comprise a speculum, and which in the embodiment illustrated in the drawings exhibit a shape like the beak of a duck. The speculum part 1 in addition is provided with a grip 5 having the shape of a chute of U-shaped section. The grip 5 is connected to the jaw 3 via an intermediate portion 6, which is curved in an arch forming a sliding path intended to cooperate with the corresponding sliding path of a corresponding intermediate portion 7 of arch-like curvature on the depressor part 2. The free longitudinal edges of the side walls of the chute forming the grip are shaped with finger grip features 5*a*. Furthermore a tongue 5*b* bent to form a finger support is protruding from the bottom of the chute at its free end, and a tongue 5*c* preferably stamped out from the bottom material of the chute forms a second finger support. The intermediate portion 7 of the depressor part in the embodiment illustrated in FIGS. 1 and 2 is passing into an upwards curved end portion 8, which offers a thumb grip for the separation of the jaws 3 and 4 by relative displacement of the intermediate portions 6 and 7 in their longitudinal direction. In this embodiment the intermediate portion 7 exhibits a slit 9, which is open near the thumb grip 8. The slit 9 is provided with a number of consecutive widened portions 9*a* extending in the longitudinal direction of said slit. At the intermediate portion 6 a pivot 10 is mounted which pivot protrudes upwards into the slit 9 and which exhibits a thickness that increases with increasing distance from the intermediate portion 6. In the embodiment illustrated the thickness of the pivot is increasing stepwise, rabbets (shoulders) thereby being formed at the passages from one portion to another of the pivot. The pivot 10 exhibits three portions of different thickness in between them. The more narrow pivot portion 10*a* located nearest to the intermediate portion 6 of the speculum part, exhibits a thickness, which is somewhat thinner than the narrow portion of the slit, the pivot portion 10*b* exhibits a thickness which is somewhat thinner than the width of the wide portions of the slit, and the outer portion 10*c* of the pivot exhibits a thickness which exceeds the width of the wide portions of the slit. In the embodiment illustrated in FIGS. 1 and 2 the thumb grip 8 at the opening end 9 of the slit is provided with a widened rear portion, which is adjusted in such a way that it permits the end portion 10*c* of the pivot to pass clear past said thumb grip in the longitudinal direction of the slit. Said wide rear portion of the slit 9 is not illustrated in the drawings, but the slit indicated with 11 in FIG. 6 is provided with a corresponding widened portion 11*b*. The other wide portions of the slit 11 indicated with 11*a* correspond to the wide portions 9*a* of the slit 9 illustrated in FIG. 5. The somewhat different shape of the slit illustrated in FIG. 6 depends upon the thumb grip 12 in the embodiment in FIG. 3 being bent downwards in contrast to the thumb grip 8 in FIGS. 1 and 2. To assure rigidity and good guiding quality the intermediate portion 7 exhibits the shape of a chute, the sidewalls of which form guiding means against the longitudinal side edges of the intermediate portion 6 of the speculum part. The sliding paths formed by the intermediate portions 6 and 7 respectively of the speculum part and the depressor part form planes curved in one direction. The sides of the

jaws facing each other are suitably given a mat finish.

In the embodiment illustrated, the passage between the intermediate portion **7** of the depressor part and the jaw **4** of said part is located at one side of the speculum.

The speculum described above and illustrated in the drawings is as mentioned above intended to be used in connection with for example inspections of the uterus in order to keep the vagina open thereby making the uterus entrance accessible. Thereby a speculum is introduced into the vagina in the adjusted position illustrated in FIG. **1** whereafter the jaws **3** and **4** are separated until they reach the position illustrated in FIG. **2** by pressing the thumb against the thumb grip **8, 12** thereby longitudinally displacing the intermediate portion **7** of the depressor part relative to the intermediate portion **6** of the speculum part. Because of the tension created in the vagina tending to close the gap between the jaws **3** and **4** the depressor part tends to pivot relative to the speculum part round a point located between the slit **9, 11** and the jaws, the intermediate portions **6** and **7** thereby tending to be pivoted in direction away from each other at the pivot **10,** whereby the portion **10***b* of the pivot drops into one of the slit portions **9***a*, **11***a* and the intermediate portion **7** is moved in contact with the rabbet (shoulder) of the underside of the pivot portion **10***c*. Thereby the speculum is kept in the adjusted position illustrated in FIG. **2.** The reason of it being desirable to have a larger separation of the body parts located adjacent to the free end of the jaws than the body portions located around the portion of the jaws adjacent to the stem of the instrument is the pubic bone of the patient, which only permits a limited expansion of the vagina, while the soft portions located behind the pubic bone do not offer any such limitation, and it is desirable to have as much free space as possible available around the entrance of the uterus.

The fact that the speculum is open at one side brings with it the very great advantage in comparison to such specula, which are provided for example with links located at both sides, that it is possible to remove such a speculum without previously having to remove other instruments introduced into the uterus or into the vagina. This is of interest for example when using the so called H.S.G.-instrument.

The modified form of speculum as shown in FIGS. **7** and **8** is substantially the same as previously described except that intermediate portion **6** has a T-shaped key **13** integral therewith and extending upwardly therefrom on a slant instead of pivot **10** and intermediate portion **7** has a longitudinally extending T-shaped slot **14** in place of slit **9.** The narrow portion **15** of slot **14** has teeth **16** and **17** provided along side the same with the slanting faces **18** of said teeth slanting towards the wide portion **19** of said slot.

The use of said modified form of speculum is the same as described for the speculum of FIGS. **1–6** except that the head **20** of key **13** is inserted through slot portion **19** and when intermediate portions **6** and **7** slide one on the other as when opening jaws **3** and **4** by pushing on thumb piece **21,** said head **20** will slide over the teeth slanting faces **18** until the desired relative position of said jaws is reached whereupon the user can apply a slight upward pressure on thumb piece **21** pushing the same away from grip **5** so that head **20** will engage back pair of faces **22** of the teeth **16** and **17** facing the same preventing the closing of jaws **3** and **4.** Thereafter by the user pressing thumb piece **21** towards grip **5,** head **20** can slide over teeth **16** and **17** in either direction.

The invention is not limited to the embodiment described above and illustrated in the drawings by way of example only, but it can be modified within the scope of the following claims. By way of example the channel formed by the shape of the jaw **3** may have a continuation in a corresponding channel in the intermediate portion **6** in order to drain off liquid to be removed.

I claim:

1. Expanding instrument for maintaining body cavities in extended condition comprising a speculum part including a first jaw, a hand grip and an intermediate portion connecting said first jaw and said hand grip, said first jaw and said hand grip being angularly disposed relative to said speculum part intermediate portion which has a longitudinal arch-like curvature, a depressor part including a second jaw juxaposed with said first jaw, an intermediate portion having a longitudinal arch-like curvature corresponding to the curvature of and having one face longitudinally slideable on said speculum part intermediate portion between open and closed positions of said first and second jaws and a thumb piece extending laterally of said depressor intermediate portion, said depressor intermediate portion connecting said depressor jaw and said depressor curved end portion and having a slot extending longitudinally of said depressor intermediate portion, a key mounted on and extending laterally of and from said speculum part intermediate portion through said slot, said key having a head which is larger than the width of said slot and positioned above said depressor part one face, said depressor having a opening at one end of said slot capable of receiving said head therethrough, means on said depressor intermediate portion along said slot at times being engaged by said key to prevent closing of said jaws.

2. Expanding instrument as claimed in claim **1** wherein said means consists of teeth in said depressor part one face extending alongside said slot, said teeth each having a front face slanting toward said thumb piece and an upright back face and said key having a T-shaped with the head thereof extending laterally of said slot and said teeth with said lateral head thereof slideable along said teeth, but capable of engaging said upright faces of said teeth whereby closing of said jaws is prevented.

3. Expanding instrument as claimed in claim **2** wherein said slot is of a T-shape in its longitudinal direction with said key head being detachable through the head of said slot.

4. Expanding instrument for maintaining body cavities in extended condition comprising a speculum part including a first jaw, a hand grip and a first intermediate portion connecting said first jaw and said hand grip, said first jaw and said hand grip being angularly disposed relative to said first intermediate portion and extending in the same general direction therefrom, said first intermediate portion having a longitudinal arch-like curvature, a depressor part including a second jaw juxaposed with said first jaw, an intermediate portion having a longitudinal arch-like curvature corresponding to the curvature of and being longitudinally slideable on said first intermediate portion and a curved end portion extending laterally of said depressor intermedi-

ate portion in an opposite direction to said hand grip, said depressor intermediate portion connecting said depressor jaw and said depressor curved end portion and having a longitudinal slit, a pivot mounted on and extending from said speculum part intermediate portion through said slit and having a thickness which increases from said speculum part intermediate portion and said depressor intermediate portion slit having a series of wider portions corresponding to a thicker portion of said pivot and the slit between said wider portions being of a smaller width than said pivot thicker portion, but of a larger width than the narrower portion of said pivot whereby said intermediate portions can be latched against relative longitudinal displacement when the thick portion of said pivot is positioned in one of the wider slit portions while said intermediate portions can be displaced longitudinally relative to each other when the narrow portion of the pivot is positioned in said slit.

5. Expanding instrument as claimed in claim **4** wherein said slit extends through said depressor curved end portion whereby said pivot can be slid from said slit by displacement of said intermediate portions longitudinally relative to one another.

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