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54 MULTIPURPOSE CLAMP FOR MEDICAL USE COMPRISING TWO ARTICULATED JAWS

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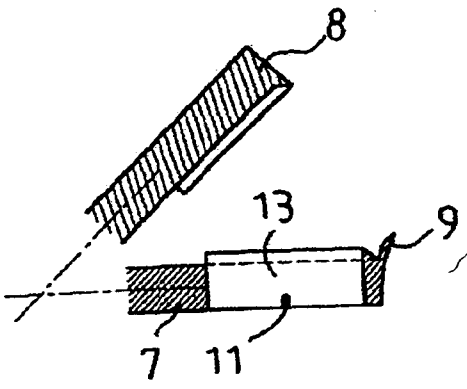
FOR ABSTRACT SEE THE NEXT SHEET

~~22~~ 27



(57) Abstract: The invention concerns a clamp for medical use comprising two pivotably articulated jaws controlled by the practitioner from a gripping zone. The invention is characterised in that one (7) of the jaws (7, 8) comprises means for tacking the patient's tissues projecting outwards of the clamp; one (7) of the jaws (7, 8) has two cutting edges (10) on its periphery to cut the tissues; at least one of the jaws (7, 8) comprises a cavity (13) for receiving the cut tissues.

(57) Abrégé : La présente invention concerne une pince à usage médical comportant deux mâchoires articulées par pivot et commandées par le praticien depuis une zone de préhension. Selon l'invention, l'une (7) des mâchoires (7, 8) comporte des moyens de pointage dans les tissus du patient faisant saillie vers l'extérieur de la pince ; l'une (7) des mâchoires (7, 8) présente deux lames (10) coupantes sur sa périphérie pour sectionner des tissus ; au moins l'une des mâchoires (7, 8) comporte une cavité (13) pour la réception des tissus sectionnés.

MULTIPURPOSE CLAMP FOR MEDICAL USE COMPRISING TWO ARTICULATED JAWS

The present invention relates to a multifunctional clamp for medical use.

It finds application in the field of use and production of clamps for medical use particularly in the gynecological field.

Clamps are commonly provided with two jaws articulated by a pivot and controlled by the practitioner from a gripping region.

In the gynecological field, particularly, there are conventionally used different clamps each fulfilling a specific function. Thus, there are known cotton carrying clamps, whose jaws have internal surfaces substantially flat, and provided with transverse parallel striations so as to permit gripping certain accessories, cotton, or else bandages.

There are also frequently used clamps called neck gripping.

In a way generally identical to the clamps described above, the neck gripping clamps comprise jaws provided with several claws at their end.

One can, with this claw, hold and/or remove the tissues such as those at the neck of the uterus.

Clamps particularly known in this regard are called MUSEUX clamps and POZZI clamps.

There are also commonly used in the gynecological field polyp clamps.

The internal surface of their jaws is excavated forming a reception member like a spoon.

By means of these cavities, it is possible to remove different elements and particularly polyps.

U.S. Patent 5,667,526 discloses a clamp of a very particular shape provided with teeth that are quite prominent. It is usable only for certain limited functions and its complex action renders impossible its low cost production.

There is also known from U.S. Patent 4,597,385 a biopsy clamp provided with a cutting member at the front of one of the jaws and two retention teeth for tissues. This clamp is also of limited interest because it is applicable only to carrying out biopsies. Its shape is also complicated because of the design of the jaws.

These different clamps give individual satisfaction in a general manner.

However, it has been discovered that it is necessary, for each patient, to have recourse to these three clamps in a cumulative manner.

The practitioner is thus obliged to have multiple sets of these different clamps for various successive patients.

In addition to the cost of purchase, such an arrangement imposes substantial costs of sterilization of the clamps.

A sterilization step of the clamps is routine after their use.

However, sterilization installations are generally costly, above all when they are dedicated for individual use of a practitioner in general practice.

Moreover, the sterilization must be carried out by someone having suitable competence, which also gives rise to a substantial cost in terms of labor.

Sterilizations, although very effective, do not always overcome the risk of failure of the obtained sterilization.

There is thus a great need to provide clamps permitting limiting the set of clamps necessary to gynecologists and preferably to avoid recourse to sterilization.

The present invention relates to this field and permits overcoming the drawbacks of clamps at present on the market.

One of the principal objects of the invention is to provide a clamp carrying out several functions from those performed at present by separate clamps.

In this sense, the present clamp has the advantage of fulfilling simultaneously the functions of a cotton carrying clamp, a neck gripping clamp and a polyp clamp.

Moreover, the fact of reducing the number of clamps permits making them disposable.

In this regard, the clamp according to the invention can be produced at least cost because of its design and its configuration and, if desired, of plastic material.

As a result, the invention associates the practical character of use of a single clamp, with the economic aspect of disposable instruments requiring no multiple sterilizations.

Another advantage of the invention is to provide a multifunctional clamp whilst maintaining its full and complete effectiveness for the carrying out of each of its functions, without the loss of time involved in conventional clamps that are not disposable.

According to a preferred modification, the clamp comprises incurved legs so as to exert a supplemental force on the jaws, after their contact, by resilient deformation

of the legs. The forcible pressure is thus greatly promoted.

Other objects and advantages will become apparent from the description which follows, which is however not limiting of the invention.

The present invention relates to a multifunctional clamp for medical use comprising two jaws articulated by a pivot and controlled by the practitioner from a gripping region, characterized by the fact that:

- each jaw comprises, on its internal surface, a recess such that the two recesses form a hollow when the jaws are together,
- each jaw comprises, on its internal surface, at least one series of transverse striations, said series of striations being complementary to interfit when the jaws are together,
- each jaw comprises at least one claw at its distal end, oriented toward the other jaw.

This clamp can be made according to various modifications introduced hereafter:

- the recesses have symmetrical openings whose edges are in contact when the jaws are together, to create a closed hollow if desired with forcible pressure,
- the recesses have an elliptical shape whose major axis is oriented along the longitudinal axis of the jaw,
- each jaw comprises two series of striations formed on opposite sides of the recess along the direction of the longitudinal axis of the jaw,
- each jaw comprises two claws, the claws of the jaws interfitting in the closed position,
- the recesses extend to the distal end of the jaws between the two claws,

- the gripping region is formed by two legs with rings connected by a pivot for the jaws, said jaws being each formed in prolongation of a leg on the side of the pivot opposite the gripping region,

- the posterior region of the legs, located on the side of the pivot opposite the gripping region, is curved convexly and is of material that is resiliently deformable during pressure of the jaws,

- the curvature of the two posterior portions is symmetrical,

- the forward portion of the legs, located on the same side of the pivot as the gripping region, is curved in a convex manner and is of material that is resiliently deformable during pressure of the jaws,

- the curvature of the two front portions is symmetrical,

- the distance between the distal end of the jaws and the pivot is 7 to 9 cm,

- it is made of plastic material.

The accompanying drawings are given by way of indicative example and are not limiting. They show one embodiment. They permit easy comprehension of the invention.

Figure 1 is a fragmentary side view of the end of a clamp in a particular embodiment of the invention.

Figure 2 is an overall view of one embodiment of the multifunctional clamp shown here.

Figure 3 is a fragmentary side view of the jaws of a clamp in the open position.

Figure 4 is view from below of one of the jaws of the clamp according to the invention.

Figure 5 is a view from above of the other jaw according to a possible embodiment.

Figure 6 shows a preferred arrangement of the legs of the clamp, the jaws being open.

Figure 7 is a view with closed jaws of another modified design of the clamp.

Figure 2 show a general view of an embodiment of the clamp disclosed here.

According to this preferred example, the clamp comprises a gripping region 1 substantially at one of its ends, formed by two elongated legs numbered 2a, 2b, and provided with rings at their ends, numbered 3a, 3b.

The rings permit gripping by the practitioner so as to control the opening and closing of the clamp.

In the illustrated embodiment, the legs 2a, 2b are connected by a pivot 6 known in the technical field in question at the present.

Moreover, as shown in Figure 2, the jaws 7, 8 which comprise the clamp are each formed in prolongation of one of the legs 2a, 2b on the other side of the pivot 6 relative to the gripping region 1.

Referring to the relative arrangement of the jaws in Figure 2, we will call the lower jaw the jaw 7 and the upper jaw the jaw 8.

Any other shape of clamp is of course envisagable according to the invention, and the particular arrangement of Figure 2 is given only by way of example.

Similarly, the elbowed portion 4 of the legs 2a, 2b is not necessary, and a clamp could be envisaged whose two legs are substantially straight.

To permit the production of a multifunctional clamp, the jaws 7, 8 have specific means.

Thus, each jaw 7, 8 comprises on its internal surface a recess 11, 12 as shown respectively in Figures 4 and 5.

The formation of such recesses 11, 12 permits creating a hollow within the jaws 7, 8 when these latter are together, if desired forcibly.

By way of example, but preferably, the recesses 11, 8 have an elliptical shape whose major axis is oriented along the longitudinal axis of the jaw 7, 8.

A small spacing between the edge of the recess 11, 12 and the end of the jaw 7, 8 is desirable, for example 1 mm, to facilitate its use.

The length of the major axis of the recesses 11, 12 can be for example 15 mm.

Preferably, the recesses 11, 12 have similar shape and dimensions and are disposed symmetrically on the jaws 7 and 8 so as to face each other.

Thus, their symmetrical openings permit creating a closed hollow when the jaws are together, the edges of the openings of the recesses being in contact in this position.

The edge of the openings can in this case be at mid-height of the striations 13, 14 described hereafter.

The recesses 11, 12 thus formed permit removing tissues or else polyps.

The clamp shown here also permits gripping and manipulation of various accessories such as cotton, coils,…

It also provides a clamp which is commonly called a cotton carrying clamp.

To do this, each jaw 7, 8 comprises on its internal surface at least one series of striations numbered 13 and 14 in Figures 4 and 5.

As shown, these striations are transverse relative to the longitudinal axis 15, 16 of the jaws 7, 8.

Moreover, as can be seen from Figures 2 and 3, the striations 13, 14 disposed on each of the jaws 7, 8 are complementary so as to interfit when the jaws 7, 8 are together as in Figure 1.

Preferably, there will be formed two series of striations 13, 14 on each jaw 7, 8.

More precisely, these two series of striations can be disposed on opposite sides of the recess 11, 12.

This arrangement can be clearly seen in Figures 4 and 5.

It will be noted that such an arrangement is particularly advantageous in terms of size.

Thus, the striations 13, 14 thus provided completely fulfill their functions of grasping the different accessories without at the same time occupying all the width of the internal surface of the jaws 7, 8.

Moreover, an arrangement of the series of striations substantially adjacent the lateral edges of the jaws 7, 8 ensures good gripping in position of the jaws 7, 8 even if they are twisted when together.

Moreover, it will be noted that the elliptical shape preferred for the recesses 11, 12 permits the formation of a hollow of a sufficient volume whilst preserving a lateral space for the formation of the series of striations 13, 14.

The clamp according to the invention also fulfills the function of a neck gripping clamp.

To this end, at least one claw 9, 10 is formed at the distal end of each jaw 7, 8.

In the example shown in the figures, there are provided two claws 9, 10 on each jaw 7, 8.

As can be seen in Figure 3, the claws of each jaw 7, 8 are oriented toward the other jaw.

Moreover, when the jaws 7, 8 are together, the claws 9, 10 of the jaws 7, 8 are such that they interfit. In this way, they do not interfere with the closed position of the jaws 7, 8.

An example of embodiment of the claws 9, 10 interfitting is shown in Figure 1.

For the convenience of the practitioner, the recesses 11, 12 extend preferably to the distal end of the jaws 7, 8 between the claws 9, 10. In this way, the hollow for the reception of a polyp is located adjacent the end of the clamp.

Again for the convenience of use and by way of example, the distance between the distal end of the jaws 7, 8 and the pivot 6 could be from 7 to 9 centimeters.

Moreover, there could be formed closure tongues 5a, 5b in the gripping region 1.

By these means, it is possible to hold the clamp in closed position with if desired a slight restraint for permanent closure.

Closure tongues 5a and 5b as shown in Figure 2 and of the present design could also be used.

It will be seen from the description and the drawings that the clamp according to the invention fulfills several functions in a manner as effective as clamps individually provided to fulfill each of these functions.

Moreover, this creation is effected without having recourse to a complicated design which would increase the cost of production of the clamps.

Still further, the configuration of these clamps is such that they can be made of plastic material and for example, by molding.

In this way, there can be provided low cost clamps which are adapted for single use.

Particularly, for production in plastic material, it is important to preserve the optimum characteristics under pressure, when the jaws 7, 8 are closed.

To do this, it is preferably proposed to give an curved shape to the legs 2a, 2b, permitting resilient deformation of the legs when the jaws are in contact, to increase the applied force.

There will be used a material whose properties of resilient deformation are in accordance with the degree of deformation desired for the legs 2a, 2b.

The curvature given to the legs 2a, 2b is the reverse of that which it has a tendency to adopt when the force is applied to jaws 7, 8.

Referring to Figure 7, there is seen the shape of the posterior portions 18a, 18b of the legs 2a, 2b (these portions are those located on the side opposite the gripping region 1) having a convex curvature, preferably symmetrically.

The black arrows in Figure 7 show the direction of resilient deformation which has a tendency to overcome the convex curvature.

In a supplemental or alternative manner, the rear portions 17a, 17b of the legs 2a, 2b (these portions are on the same side as the gripping region 1) have a concave curvature, as shown in Figure 6.

The production of such a clamp with curved legs as in Figures 6 and 7 is possible moreover with any type and design of jaws.

REFERENCES

1. Gripping region
2a, 2b - Legs
3a, 3b - Rings
4. Elbow
5a, 5b - Closure tongues
6. Pivot
7. Lower jaw
8. Upper jaw
9. Upper claws
10. Lower claws
11. Upper recess
12. Lower recess
13. Upper striations
14. Lower striations
15. Longitudinal axis of the upper jaw
16. Longitudinal axis of the lower jaw
17a, 17b. Rear portion
18a, 18b. Front portion

CLAIMS

1. Multifunctional clamp for medical use comprising two jaws pivotally articulated and operable from a gripping region, characterized

in that

- each jaw comprises, on its internal surface, a recess such that the two recesses form a hollow when the jaws are together,

- each jaw comprises on its internal surface, at least one series of transverse striations, said series of striations being complementary so as to interfit when the jaws are together, and

- each jaw comprises at least one claw at its distal end, oriented toward the other jaw.

2. Multifunctional clamp according to claim 1, characterized

in that the recesses have symmetrical openings with edges which are in contact when the jaws are together, to create a closed hollow.

3. Multifunctional clamp according to any one of claims 1 or 2, characterized

in that the recesses have an elliptical shape with the major axis of the elliptical shape oriented along the longitudinal axis of the jaw.

4. Multifunctional clamp according to any one of claims 1 to 3, characterized

in that each jaw comprises two series of striations formed on opposite sides of the recess in the direction of the longitudinal axis of the jaw.

5. Multifunctional clamp according to any one of claims 1 to 4, characterized

in that each jaw comprises two claws, the claws of the jaws interfitting when the jaws are together.

6. Multifunctional clamp according to claim 5, characterized

in that the recesses extend to the distal end of the jaws between the two claws.

7. Multifunctional clamp according to any one of claims 1 to 6, characterized

in that the gripping region is formed by two legs with rings connected by a pivot forming the pivot of the jaws, said jaws respectively formed in a prolongation of each leg on the side of the pivot opposite the gripping region.

8. Multifunctional clamp according to claim 7, characterized

in that the front portion of the legs, located on the side of the pivot opposite the gripping region, is curved convexly and is of a material that is resiliently deformable.

9. Multifunctional clamp according to claim 8, characterized

in that the curvature of the two front portions is symmetrical.

10. Multifunctional clamp according to any one of claims 7 to 9, characterized

in that the rear portion of the legs, located on the same side of the pivot as the gripping region, is curved in a concave manner and is of a material that is resiliently deformable.

11. Multifunctional clamp according to claim 10, characterized

in that the curvature of the two rear portions is symmetrical.

12. Multifunctional clamp according to any one of claims 7 to 11, characterized

in that the distance between the distal end of the jaws and the pivot is from 7 to 9 cm.

13. Multifunctional clamp according to any one of claims 1 to 12, characterized

in that it is made of plastic material.

14. Multifunctional clamp for medical use substantially as herein described and illustrated with reference to Figures 1 to 5 or Figures 1 and 3 to 7.