Title: SYSTEM FOR COLLECTION OF BIOPSY SPECIMENS

Abstract: A system for collecting biopsy specimens comprises: an upper container (100), wherein said upper container (100) is adapted to contain a liquid (L); a lower container (200), in which said lower container (200) can be sealed in a sealed manner with said upper container (100); first valve means (300, 400) suitable for allowing or interrupting on command the flow of the liquid from said upper container (100) towards and within said lower container (200).
TITLE
"System for Collection of Biopsy Specimens"

Technical Field

The present invention relates to a system for collection and storing biopsy specimens or similar systems.

Background of the Invention

Currently are known systems for the collection and for preservation of biopsy specimens wherein, summarily, their comprise an upper container suitable for containing a preserving liquid in a sealed chamber, a lower container which can be associated in a sealed manner with said upper container, and transfer means, wherein said latter means are able to execute, on command, the flow of said liquid from the upper container towards and within the lower container.

By means of said known systems, a sample is housed in the lower container, then the upper container is associated with the lower container in a sealed watertight manner, and then said lower container is filled with the preserving liquid (formalin or analogous liquid) contained in the upper container, by acting manually on break transfer means.

These known systems have a series of drawbacks.

A first drawback is due to the fact that said system comprise a large number of components in which, furthermore, said components can present problems with reference to their disposal after use.

A second drawback is due to the fact that said system are expensive to carry out.

A third drawback is due to the fact that said systems are difficult to assemble.

A fourth drawback is due to the fact that said systems are difficult to fill with formalin before use.

A fifth drawback is due to the fact that said systems do not allow to determine the amount of liquid to be transferred inside the lower sample collection.
A container, i.e. they do not allow the pouring inside the lower container of a exact desired quantity of the liquid contained in the upper container.

A sixth disadvantage is due to the fact that they do not allow to regulate the flow rate of the transfer flow.

A seventh drawback is due to the fact that after use, the chamber of the upper container in which the preservation liquid was present is no longer sealed and, therefore, fumes due to the presence of residue liquid can escape and/or evaporate from inside said chamber.

**Purpose of the Invention**

The object of the present invention is to solve the above-mentioned drawbacks.

The invention, which is characterized by the claims, solves the problem of creating a system for collecting biopsy samples, in which said system comprises:

an upper container, wherein said upper container is able to contain a liquid;

a lower container, in which said lower container can be associated in a sealed manner with said upper container;

transfer means, in which said transfer means are able to allow the flow of said liquid from the upper container towards and inside said lower container;

in which said system is characterized by the fact that said transfer means comprise first valve means suitable for allowing or interrupting on command the flow of the liquid from said upper container towards and inside said lower container.

**Brief Description of the Figures of the attached Drawings**

The following description of the system and of the method for collecting biopsy specimens is given by way of non-limiting example and, moreover, with reference to the attached illustrations in which:

> Figure 1 is a side view of the system object of the present invention with reference to a first embodiment;

> Figure 2 is a sectional view with respect to the line 2-2 of Figure 1 in a first operating configuration;
Figures 3 and 4 are sectional views similar to figure 2 in a second and in a third operating configuration respectively and with reference to the system of fig. 1 and 2;

Figures 5 to 10 show an upper container regarding the embodiment of figure 1, in which fig. 8 is a sectional view with respect to the line 8_8 of fig. 7;

Figures 11 to 15 show a cover regarding the embodiment of figure 1, in which fig. 14 is a sectional view with respect to the line 14_14 of fig. 12;

Figures 16 to 22 show a tubular shutter slider regarding the embodiment of figure 1, in which fig. 18 is a sectional view with respect to the trace 18_18 of fig. 17;

Figures 23 and 24 are sectional views similar to figures 2 and 3, relative to a second embodiment of the system object of the present invention and, respectively, in a first and a second operating configuration;

Figures 25 to 31 show a tubular shutter slider regarding the embodiment of figures 23 and 24, in which fig. 27 is a sectional view with respect to the trace 27_27 of fig. 26;

Figures 32 and 33 are sectional views similar to Figures 2 and 3, regarding a third embodiment of the system object of the present invention and, respectively, in a first and a second operating configuration;

Figures 34 to 40 illustrate a tubular shutter slider with respect to the embodiment of figures 32 and 33, in which FIG. 37 is a sectional view with respect to the line 37_37 of fig. 36.

Description of a preferred embodiment

With reference to Figures 1, 2, 3 and 4, according to a first embodiment, the system for collecting bioptic samples S comprises: an upper container 100, wherein said upper container 100 is able to contain a preserving liquid L, as for example formalin; a lower container 200, in which said lower container 200 can be associated in a watertight sealed manner with said upper container 100; first valve means 300_400, better described below, for enabling or interrupting, on
command, the flow $F_1$ (FIG. 3) of the liquid $L$ from said upper container 100 towards and inside the lower container 200.

_Said valve means 300_400 may also comprise return means 500, which are able to return said first valve means 300_400 in the operating closure configuration, i.e. in an operating configuration in which said first valve means 300_400 inhibit the flow $F_1$ of the liquid from said upper container 100 towards and within said lower container 200.

_Furthermore, said valve means 300_400 also allow the operator to control the flow rate of liquid $L$ from said upper container 100 towards and inside said lower container 200.

_More particularly, preferably, said first valve means 300_400 can take at least a first operative configuration and a second operative configuration.

_In the first operative configuration, the liquid $L$ contained in the upper container 100 can not freely flow towards and inside the lower container 200, while, in the second operating configuration, the liquid $L$ contained in the upper container 100 can flow $F_1$ towards and inside the lower container 200 and, the operator, by manual action, can perform the passage from said first operative configuration in said second operative configuration, as well, again by manual action, carrying out the passage from said second operative configuration in said first operative configuration, for example in order to interrupt the flow.

_Always said first valve means 300_400, preferably, also comprise the aforementioned return means 500, better described below, which perform automatically, for example by releasing a maneuvering member, for example by releasing of a tubular shutter slider 400, the transition from said second operative configuration in said first operative configuration.

_If desirable, optionally, it is also possible to further provide second valve means 600, which permit an unidirectional flow of air from outside toward and inside said upper container 100, in order to improve and/or speed up the flow of liquid $L$ from the first container 100 towards the second container 200 during the pouring steps, as well as, in order to obviate the escape of liquid or fumes due to
the presence of the same liquid (initial or residual) into the upper container 100.

_Always if desirable, the system can also optionally comprise third filling valve means 700, which are able to allow the filling of the upper container 100 with liquid L (liquid inlet and air outlet) preferably in a sealed watertight manner, in order to obviate and/or limit the diffusion of liquid or fumes in the environment.

First Form of Realization

_With reference to Figures 1 to 23, they illustrate in particular a first embodiment of the system object of the present invention.

_With particular reference to Figures 2, 3 and 4, the system for collecting biopsy samples, as above mentioned comprises an upper container 100, a lower container 200 and first valve means 300-400.

_The first valve means 300-400 comprise a tubular guide structure 320_330, which extends along its own longitudinal axis 300_Y, wherein said tubular guiding structure 320_330 configures a sliding guide comprising a tubular guide shell 321_331, wherein the first portion 320 defined as intermediate portion is positioned within said upper container 100, and wherein the second portion 330 defined as lower portion has an outlet mouth 332 flows inside said lower container 200.

_The aforementioned guiding shell 321_331, for the reasons which will result below, configures at least a first opening A1, positioned near the bottom wall 101 of said first container 100, wherein said first opening A1 can be obtained by means of different constructive solutions without leaving from the inventive concepts protected by the present invention.

_The same first valve means 300-400 also comprise a tubular shutter slider 400, wherein said tubular shutter slider 400 extends along its own axis 400_Y, in which said tubular shutter slider 400 configures a portion 410 defined as upper portion 410 and a portion 420 defined as lower portion 420.

_The tubular shutter slider 400 can move axially and in a watertight manner within and along said tubular guiding structure 320_330 and it comprises a
second tubular shell 411_421 which forms at least one internal transfer duct 430 comprising an outlet mouth 431 opening at the bottom inside the tubular shell 421 or within the second container 200.

The same tubular shutter slider 400 comprises at least a second through opening A2, made in said second shell 421, wherein said second opening A2 communicates with said internal transfer duct 430.

With reference to the above-indicated construction, the tubular slide 400 can take at least a first and a second axial position.

With reference to the first axial position, defined as closed position, see fig. 2 or Fig. 4, the second opening A2 is axially positioned in an upper area and closed by means of the first guide skirt 321, in order to obviate, with reference to Fig. 2, the flow of liquid L from said upper container 100 through said second opening A2, as well as in order to obviate, with reference to fig. 4, the outlet of liquid or fume, with reference to a liquid L remaining or residue into said first container 100 after the execution of the partial or total transfer of said liquid L.

With reference to the second axial position, defined as opened position, see fig. 3, said second opening A2 is axially positioned in correspondence with respect to said first opening A1, in order to allow to the liquid L contained in said upper container 100 to pass through said first opening A1 and, therefore, flow through said second opening A2, and then continue to flow along said transfer duct 430 and flow out from the outlet mouth 431 and inside the lower container 200, as illustrated by the arrow F1.

With reference to the tubular guide structure 320_330, it can further comprise a portion 310 defined as upper portion 310 which forms a tubular guiding structure defined by a shell 311, wherein along the inside of said shell 311 the upper portion 410 of the tubular shutter slider 400 can move axially guided.

Preferably, when said tubular slider 400 is in said axial open position, the second opening A2 of said tubular slider 400 is axially positioned near the lower point of the bottom wall 101 of the tank defined by the upper container 100, in order to draw the liquid L at the lowest point and obtaining, if desirable, the
complete emptying of the liquid L from the same upper container 100.

With reference to the above description, the tubular slide 400 can further assume, with respect to the tubular guide structure 320_330, one or more further axial positions with respect to those previously described and, more particularly, one or more further axial positions in which the second opening A2 of said tubular shutter slider 400 is more or less partially occluded by the first shell 321_331 of the tubular guide structure 330, i.e., more or less axially aligned (superimposed) with respect to the first opening A1, in order to make said second opening A2 partially communicating with the first opening A1 defined by the first shell 321_331 and, therefore, being able to regulate the flow rate F1 of transfer of the liquid L from the upper container 100 towards and into the lower container 200.

With reference to the return means 500, they are adapted to recall the tubular shutter slider 400 in the closed position of fig. 2 and 3 and, summarily, preferably, they comprise elastic means 510, such as for example a helical spring fitted around the upper portion of the tubular slide 400, wherein said elastic means 510 push upwardly said tubular shutter means 400.

With reference to fig. 2 and 4, the system may also comprise first end-of-stroke means 520, adapted to determine the end-of-stroke for said tubular shutter slider 400, wherein said first end-of-stroke means 520 comprise a ring or detent 521 (Fig. 14), supported by an upper tubular guide 310, shell 311, suitable for detecting a mobile abutment ring 522 (Fig. 17, 20), supported by the upper portion 410 of the tubular shutter guide 400.

With reference to fig. 3, the system may also comprise second end-of-stroke means 530, suitable for determining the end-of-stroke downwards for the tubular shutter slider 400, wherein said second end-of-travel means 530 comprise a stop wall 531, supported by said first container 100, suitable for detecting the lower end of a movable abutment stop ring 523 (Fig. 17), supported by the upper portion 410 of the tubular shutter guide 400.

With reference to Figure 2, the tubular guide structure 320_330 has a defined intermediate portion 320, which is positioned within said upper container 100,
which has a lower end 322 which ends before the bottom part 101 of the upper container 100, in order to form an opening A1 between said lower end 322 and said bottom wall 101.

**Upper container**

5. With reference to Figure 2, the first upper container 100 comprises below a third axially extending tubular guide member 330, wherein along said third tubular guiding element 310 is intended to axially move the lower portion 420 of the tubular shutter slider 400.

   Also, preferably, said third tubular guiding element 310 with its outlet mouth 332 extends within the lower container 200.

**Cover**

   Preferably, the system comprises a lid element 800 (Fig. 11) suitable for coupling in a sealed manner with the top of the upper container 100, wherein said lid element 800 supports below a tubular guide element 320 which extends into the upper container 100, wherein along the inside of said tubular guiding element 320 said tubular obturator slider 400 is moved axially.

   The same lid element 800 can also support above a tubular body 310 extending externally with respect to the upper container 100, wherein along said tubular element 310 the upper part 410 of the tubular shutter slider 400 is intended to move axially.

**Sharp Variant**

   With reference to figures 23 to 31, they illustrate a second embodiment of the system object of the present invention, in which the lower end of said third tubular guiding element 310 has a waterproof septum 350, and wherein said tubular shutter 400 has a lower end 432 of the cutting/piercing type.

   By this embodiment, as illustrated in FIG. 24, by moving downwardly said tubular shutter slider 400 downwardly, the cutting/piercing lower end 432 of said tubular shutter slider 400 provides for cutting/piercing said septum 350.

   Preferably, said cutting/piercing end 432 and/or said waterproof septum 350 are made in such a way that when the tubular shutter slider 400 reaches the
lower end position there is a partial break of the septum 350, wherein said septum 350 does not fall down but remains suspended, i.e. after the fracture it remains partially connected to the casing 331 of the tubular body 330.

**Variant With Two Ducts**

_With reference to Figures 32 to 40, they illustrate a third embodiment of the system object of the present invention, wherein said tubular shutter slider 400 comprises at least two transfer ducts 430a 430b, obtained for example by an axial septum 413._

_The first transfer duct 430a is provided with at least one respective first second through opening A2a, made through the shell 421 of the same tubular shutter slider 400, wherein said first second through opening A2a communicates with the same internal transfer duct 430a._

_The second transfer duct 430b is provided with at least a respective second second through opening A2b, made through the shell 421 of the same tubular shutter slider 400, wherein said second second opening A2b communicates with the same internal transfer duct 430b._

_With reference to the second openings A2a and A2b, they may have the same axial position, that is, they can be positioned at the same height, or they may have a different axial position each other, as well as a different width (light) each other, as better described below._

_With reference to Figures 32 and 33, the embodiment in which the second openings A2a and A2b have a different axial position between them, comprises, as for the previous cases, first valve means 300-400, wherein said latter comprise a tubular guide structure 320_330 and a tubular obturator slider 400._

_This embodiment, as in the previous cases, comprises a tubular guide structure 320_330 configured by a guide shell 321_331 but, in this case, said shell 321_331 comprises at least a first first opening (through hole) A1a positioned in a first axial position defined upper position disposed within the upper container 100, and a second first lower opening A1b positioned in a second lower axial position arranged within the same upper container 100._
_Also as in the previous cases, this embodiment comprises a tubular shutter slider 400 axially slidable within said tubular guiding structure 320_330 but, in this case, the shell 421 of the tubular shutter slider 400 comprises an axial septum 413 which configures at least two transfer ducts 430a 430b, wherein the first transfer duct 430a is provided with at least one respective first second opening A2a passing through the shell 421 which communicates with the respective internal transfer duct 430a and wherein the second transfer duct 430b is provided at least one respective second second opening A2a passing through the shell 421 which communicates with the respective transfer conduit 430b.

_With particular reference to figures 32 and 33, said tubular slide 400 can assume at least a first axial position, see fig. 32, defined as closing, and a second axial position, see fig. 33, defined as opening.

_With reference to Figure 32, in said first axial position, defined as closing, the second openings A2a A2b of the tubular shutter slide 400 are axially positioned in an area in which they are blocked by means of the first guide shell 321, in order to obviate the flow of the liquid L from said upper container 100 through said second openings A2a A2b.

_With reference to figure 33, in said second axial position, defined as opening, the second openings A2a A2b of the tubular shutter slider 400 are axially positioned at the first openings A1a A1b of the tubular guide structure 300, in order to allow the liquid L contained in said upper container 100 to flow through said first openings A1a A1b and then to flow through the second openings A2a A2b, and then flow along the respective transfer duct 430a 430b and then flow out from the respective outlet mouth 431a 431b inside the lower container 200.

_With this embodiment, if desirable, it is also possible to use a transfer duct, such as for example conduit 430b, to effect the flow of liquid from top to bottom, and to use the other conduit, the 430a, to implement a flow of air from bottom to top, in order to improve the decanting operations.

_With reference to the described embodiments, the opening A2a of said first
transfer duct 430a may have a different width (greater or lesser) than the opening A2b of the second transfer duct 430b.

General Matter

_With reference to the above embodiments, in which the first upper container 100 comprises a third tubular guide element 330 below, if desirable it is possible to envisage a filtering element 360 at the lower end of said third tubular element 320, for example a filter shaped as a cup with the bottom as a knitted or grid like shape, suitable to allow the passage of the liquid and able to inhibit the passage of the biopsy specimens positioned in the second container 200._

_With reference to the system described above: a)_ it includes a small number of components; _b)_ it includes components that can be made with the same material or with similar materials as waste disposal; _c)_ it includes components that are not expensive to carry out; _d)_ it includes components that are not difficult to assemble; _e)_ the containers in the assembly phases are not difficult to load/fill with the formalin and the diffusion of the relative fumes is obviated; _f)_ the operator can determine the amount of liquid to be transferred from the upper container into the lower container in which the sample is positioned; _g)_ the operator can regulate the transfer flow rate; _h)_ after using the room of the upper container in which the preservation liquid was present, no fumes due to the presence of residual liquid can escape; solving the above problems.

Method

_With reference to the system described above, the present invention also relates to a method for collecting biopsy samples, wherein said method is characterized by the fact that that a desired dose/portion of the amount of liquid L contained in the upper container 100 is poured into the lower container 200, by acting manually on said first valve means 300_400, wherein, more particularly, the operator, acting on the valve means 300_400, can manually allow/stop, one or more times, the flow of pouring and, therefore, chosen whether transfer in the lower container 200 the entire quantity of liquid contained in the upper container 100 or only a desired dose/portion of said quantity._
The present invention further relates to a method for collecting of biopsy samples by means of a system comprising: a top container, wherein said upper container is able to contain a liquid; a lower container, in which said lower container can be connected in a sealed manner with said upper container; transfer means which may be different with respect to the means described above, wherein said transfer means are designed to allow/inhibit on command and in a watertight sealed way the flow of said liquid from the upper container towards and within the lower container; wherein said method is characterized by the fact that a desired dose/portion of the amount of liquid contained in the upper container is transferred into the lower container by manually acting on said transfer means.

In this context, preferably, a quantity of liquid L is transferred into the lower container 200 with reference to the mass of the sample or to the mass of the samples positioned in the lower container 200, and/or a quantity of liquid L is transferred into the lower container 200 with reference to the weight of the sample or to the weight of the samples positioned in the lower container 200, and/or a quantity of liquid L is transferred into the lower container 200 with reference to the exposed surface of the sample or of the of the samples positioned in the lower container 200, and/or a quantity of liquid L is transferred into the lower container 200 according to the type of storage to be carried out for the sample positioned or for the samples positioned in the lower container 200.

The description of the system and of the method for the collection and preservation of biopsy specimens is given purely by ways of non-limiting example and therefore said system and said method can clearly be subjected to all modifications or variations suggested by experience or by its use or application, within the scope of the following claims. The following claims are also an integral part of the present description.
01) System for collecting biopsy samples comprising: an upper container (100), wherein said upper container (100) is able to contain a liquid (L); a lower container (200), in which said lower container (200) can be tightly coupled with said upper container (100); transfer means, in which said transfer means are adapted to allow the flow of said liquid from the upper container (100) towards and into said lower container (200); characterized by the fact that said transfer means comprise first valve means (300, 400) suitable for allowing or interrupting on command the flow of the liquid from said upper container (100) towards and into said lower container (200).

02) System according to claim 1, characterized by the fact that said valve means (300, 400) comprise return means (500) and by the fact that said return means (500) provide to recall said first valve means (300, 400) in an operative configuration in which said first valve means (300, 400) inhibit the flow of liquid (L) from said upper container (100) towards and into said lower container (200).

03) System according to claim 1 or 2, characterized by the fact that said first valve means (300, 400) allow to the operator to control the flow rate of the liquid (L) from said upper container (100) towards and within said lower container (200).

04) System according to anyone of the claims 1 to 3, characterized by the fact that said first valve means (300, 400) can assume a first operating configuration in which the liquid (L) contained in the upper container (100) can not flow within the lower container (200), and characterized by the fact that said first valve means (300, 400) can assume a second operating configuration in which the fluid (L) contained in the upper container (100) can flow into the lower container (200).

05) System according to claim 4, characterized by the fact that by manual action, the operator can perform the transition from said first operating configuration into said second operating configuration.

06) System according to claim 4 or 5, characterized by the fact that by manual action, the operator can perform the passage from said second operating
configuration in said first operating configuration.

07) _System according to one of the claims from 4 to 6, characterized by the fact that_ said first valve means (300, 400) comprise return means (500) and in that said return means (500) provide to perform in automatic switching from said second operating configuration into said first operating configuration.

08) _System according to any one of claims from 1 to 7, characterized by the fact that_ it further comprises second valve means (600) and by the fact that said second valve means (600) allow the flow of air from outside in a unidirectional manner towards and into said upper container (100).

09) _System for collecting biopsy samples comprising: _an upper container (100), wherein said upper container (100) is adapted to contain a liquid (L); _a lower container (200), in which said lower container (200) can be tightly associated with said upper container (100); _transfer means, wherein said transfer means are adapted to allow the flow of said liquid from the upper container towards and into said lower container; characterized by the fact that_ said transferring means comprise first valve means (300-400); characterized by the fact that_ said first valve means (300-400) comprise a tubular guiding structure (320, 330), in which said tubular guiding structure (320, 330) extends along its own longitudinal axis (300_Y), in which said tubular guiding structure (320, 330) configures a sliding guide configured by a first guiding shell (321, 331) of said tubular guiding structure (320, 330), in which said tubular guiding structure (320, 330) comprises a portion defined intermediate (320) positioned within said upper container (100) and a portion defined lower (330) flowing inside said lower container (200), in which said first guiding shell (321, 331) comprises at least a first opening (A1) positioned near the bottom wall of said first container (100); characterized by the fact that_ said first valve means (300-400) comprise a tubular obturator slider (400), in which said tubular shutter slider (400) extends along its own axis, in which said tubular shutter slider (400) configures a defined upper portion (410) and a lower defined portion (420), wherein said tubular shutter slider (400) can move axially within and along said tubular guiding
structure (320, 330), in which said tubular shutter slider (400) is defined by a second shell (411, 421), wherein said tubular shutter slider (400) comprises at least one internal transfer decanter conduit (430) comprising an outlet mouth (431) opening at the bottom, in which said tubular shutter actuator (400) comprises at least a second through opening (A2) made in said second shell (421) which communicates with said internal transfer duct (430); characterized in that said tubular slider (400) can assume at least a first axial position, defined as closure position, wherein said second opening (A2) is axially positioned in an upper region and blocked by means of the first guide shell (321), at the order to obviate the flow of liquid (L) from said upper container (100) through said second opening (A2); and characterized by the fact that said tubular slider (340) can assume at least a second axial position, defined as an opening position, wherein said second opening (A2) is axially positioned at said first opening (A1), in order to allow the liquid (L) contained in said upper container (100) to pass through said first (A1) and then through said second opening (A2), and then flow along said transfer duct (430) then flow out from the outlet (431) within the lower container (200).

10) System according to claim 9, characterized by the fact that said tubular guiding structure further comprises a portion defined upper (310) and in that said upper portion (310) forms a tubular guiding structure for the upper portion (410) of the tubular obturator slider (400).

11) System according to claim 9 or 10, characterized by the fact that when said tubular slider (400) is in said axial opening position, the second opening (A2) of said tubular slider (400) is axially positioned near the lowest point of the tank of the upper container (100).

12) System according to one of the claims from 9 to 10, characterized by the fact that said tubular slider (400) can further assume one or more further axial positions with respect to the tubular guide structure (320, 330) and by the fact that in one or more of said axial positions said second opening (A2) of said tubular shutter slider (400) is more or less partially occluded by the first shell
(321, 331) of the tubular guide structure (330) of the same first shell (321, 331) of the tubular guide structure (300), in order to regulate the flow rate of the transfer liquid (L) from the upper container (100) towards and inside the lower container (200).

13) _System according to one of the preceding claims, characterized by the fact that in that it comprises return means (500) and by the fact that said return means (500) are able to return the tubular obturator slider (400) in the closed position.

14) _System according to claim 13, characterized by the fact said return means (500) comprise elastic means (510) able to push said tubular obturator slide (400) upwardly.

15) _System according to one of the preceding claims, characterized by the fact that it comprises first end-of-stroke means (520, 521, 522) able to determine the end-of-stroke upwards for said tubular obturator (400).

16) _System according to one of the preceding claims, characterized by the fact that it comprises second end-of-stroke means (530) able to determine the end-of-stroke downwards for the tubular shutter slider (400).

17) _System according to one of the claims from 9 to 16, characterized by the fact that said portion defined intermediate (320) positioned within said upper container (100) has a lower end (322) that terminates before the bottom wall (101) of the upper container (100) in order to form an opening (A1) between said lower end (322) and said bottom wall (101).

18) _System according to one of the preceding claims, characterized by the fact that it further comprises second valve means (600) and by the fact that said second valve means (600) allow the flow of air from outside towards inside of said superior container (100) in a unidirectional manner.

19) _System according to one of the previous claims, characterized by the fact that it further comprises third filling valve means (700) and by the fact that said third valve means (700) are able to allow the filling of the top container (100) with the liquid (L).
20) System according to one of the preceding claims, characterized by the fact that said first upper container (100) comprises below a third tubular guide member (330) which extends axially and due to the fact that within said long third tubular guide element (310) the tubular obturator slider (400) also moves axially.

21) System according to one of the preceding claims, characterized by the fact that said first upper container comprises below a third tubular guide element (330) which extends axially and by the fact that said third tubular guiding element (310) extends inside the lower container (200).

22) System according to one of the preceding claims, characterized by the fact to comprise a cover element (800), by the fact that said cover element (800) is able to couple in a sealed watertight manner with the top of the upper container (100), by the fact that said cover element (800) supports a tubular guiding element (320) which extends inside the upper container (100) and by the fact that along and inside said tubular guiding element (320) said tubular obturator shutter (400) is brought to move axially.

23) System according to one of the preceding claims, characterized by the fact that it comprises a cover element (800), by the fact that said cover element (800) is able to couple in a sealed watertight manner with the top of the upper container (100), by the fact that said lid element (800) supports a tubular body (310) extending externally with respect to the upper container (100) and by the fact that said long tubular element (310) is driven to move axially an obturator tubular shutter (400).

24) System according to one of the preceding claims, characterized by the fact that said first upper container (100) comprises below a third axially extending tubular guide member (330), by the fact that this third tubular guiding element (310) extends within the lower container (200), characterized by the fact that the lower end of said third tubular guiding element (310) has a septum (350), characterized by the fact that said first valve means (300-400) comprise a tubular obturator slider (400), characterized by the fact that the lower end
(432) of said tubular obturator slider (400) is of the cutting/piercing type, and characterized by the fact that by moving down said slider tubular obturator (400) the cutting/piercing lower end (432) of said tubular obturator slider (400) provides for cutting/perforating said septum.

25) System according to one of the preceding claims, characterized by the fact that said first valve means (300-400) comprise a tubular obturator slider (400), characterized by the fact that said tubular obturator slider (400) comprises at least two transfer ducts (430a, 430b), by the fact that the first transfer duct (430a) is provided with at least one respective first second through opening (A2a) made in the mantle (421) of the same tubular shutter slider (400), in which said first second opening (A2a) communicates with the same internal transfer duct (430a), and characterized by the fact that the second transfer duct (430b) is provided with at least a respective second second through opening (A2b) carried out in the mantle (421) of the same tubular shutter slider (400), in which said second second opening (A2b) communicates with the same internal transfer duct (430b).

26) System according to one of the preceding claims, characterized in that said first valve means (300-400) comprise a tubular guide structure (320, 330), in which said tubular guiding structure (320, 330) extends along its longitudinal axis (300_Y), in which said tubular guiding structure (320, 330) configures a sliding guide configured by a first guide shell (321, 331) of said tubular guiding structure (320, 330), in which said guiding tubular structure (320, 330) comprises a portion defined intermediate (320) positioned within said upper container (100) and a portion defined lower (330) opening into said lower container (200), in which said first guiding shell (321) configures at least a first first opening (A1a) positioned in a first axial position inside the upper container (100) and a second first opening (A1b) positioned in a second axial position inside the same upper container (100); characterized by the fact that said first valve means (300-400) comprises a tubular obturator slider (400), in which said tubular shutter slider (400) extends along its own axis, in which said tubular shutter slider (400)
configures a portion (410) defined upper and a portion (420) defined lower, wherein said tubular shutter slider (400) can move axially within and along said tubular guiding structure (320, 330), in which said tubular shutter slider (400) is defined by a second shell (411, 421), wherein said tubular shutter slider (400) comprises at least a first (430a) and a second (430b) transfer pipe, in which the first transfer pipe (430a) is provided with at least one first second opening (A2a) passing through the mantle (421) which communicates with said first transfer duct (430a); in which the second transfer duct (430b) is provided with at least a second second opening (A2b) passing through praticated in the mantle (421) which communicates with a respective transfer duct (430b); characterized by the fact that said tubular slider (400) can assume at least a first axial position, defined as closing, wherein said second openings (A2a, A2b) are axially positioned in an area in which they are blocked by means of the first guide shell (321) in order to obviate the flow of liquid (L) from said upper container (100) through said second opening (A2); and characterized by the fact that said tubular slider (400) can assume at least a second axial position, defined as opening, wherein said second openings (A2a, A2b) are axially positioned at said first openings (A1a, A1b) at the end allowing the liquid (L) contained in said upper container (100) to pass through said first openings (A1a, A1b) and then through said second openings (A2a, A2b) and then flow along the respective transfer duct (430a, 430b) and then flow out of the outlet (431a, 431b) into the lower container (200).

27) System according to claim 25 or 26, characterized by the fact that the first second opening (A2a) of said first transfer duct (430a) has a different width with respect to the second second opening (A2b) of the second transfer duct (430b).

28) System according to claim 26 or 27, characterized by the fact that the first first opening (A1a) configured by said tubular guide structure (320, 330) has a different width (light) with respect to the second first opening (A1b) configured by said tubular guiding structure (320, 330).

29) System according to one of the claims from 25 to 28, characterized by the
fact that the first opening (A2a) of said first transfer duct (430a) is positioned at an axial height different from the second second opening (A2b) of the second duct of transfer (430b).

30) System according to one of the preceding claims, characterized by the fact that said first upper container (100) comprises below a third tubular guide element (330) which extends axially, and by the fact that close to the lower end of said third tubular element (320) a filtering element (360) is positioned which is able to allow the passage of the liquid and able to inhibit the passage of the sample positioned in the second container (200).

31) System according to one of the preceding claims and/or as described in the relevant description above meant and/or as illustrated in the accompanying illustrations and/or for the purposes specified above.

32) Method for collecting biopsy samples by the system of one of claims from 1 to 31, characterized by the fact that a desired dose/portion of the amount of liquid (L) contained in the upper container (100) is transferred into the lower container (200) by manually acting on said first valve means (300, 400).

33) Method for collecting biopsy samples by means of a system comprising: _a upper container, wherein said upper container is adapted to contain a liquid; _a lower container, in which said lower container can be connected in a sealed manner with said upper container; _transfer means, in which said transfer means are designed to allow/inhibit the flow of the said liquid from the upper container towards and within the lower container in a watertight manner; characterized by the fact that is transferred into the lower container a desired dose/portion of the amount of liquid contained in the upper container by acting manually on said transfer means.

34) Method according to claim 32 or 33, characterized by the fact that is transferred to the lower container (200) a quantity of liquid (L) according to the mass of the sample or of the samples positioned in the lower container (200).

35) Method according to claim 32 or 33, characterized by the fact that is transferred to the lower container (200) a quantity of liquid (L) according to the
weight of the sample or of the samples positioned in the lower container (200).

36) Method according to claim 32 or 33, characterized by the fact that is transferred to the lower container (200) a quantity of liquid (L) according to the exposed surface of the sample or of the samples positioned in the lower container (200).

37) Method according to claim 32 or 33, characterized by the fact that is transferred to the lower container (200) a quantity of liquid (L) according to the type of desired preservation for the sample or for the samples positioned in the lower container (200).
A. CLASSIFICATION OF SUBJECT MATTER

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

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)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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