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(54) **BAG MADE FROM MEDICAL-GRADE PAPER THAT IS TREATED FOR STERILIZATION, WITH STERILIZATION-PROCESS INDICATORS AND PIGMENTED-ADHESIVE-BASED SAFETY FEATURES, WHICH IS EASY TO HANDLE AND USE**

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(57) **ABSTRACT**

The present invention relates to bags made from medical-grade paper for sterilization, with sterilization-process indicators and pigmented-adhesive-based safety features, which is easy to handle and use and can be used to store materials, more particularly surgical medical material, for sterilization. Such bags are produced using medical-grade paper that is treated on the surface thereof with a microbicide for sterilization, and, owing to the structure and design thereof, allow safe, rapid handling of the sterilized material placed within, since there are visual indicators that guarantee the hermetic closure and sealing thereof. Furthermore, generally, the invention has printed indicators that change colour depending on the sterilization process carried out on the bags and on whether said process was carried out correctly.

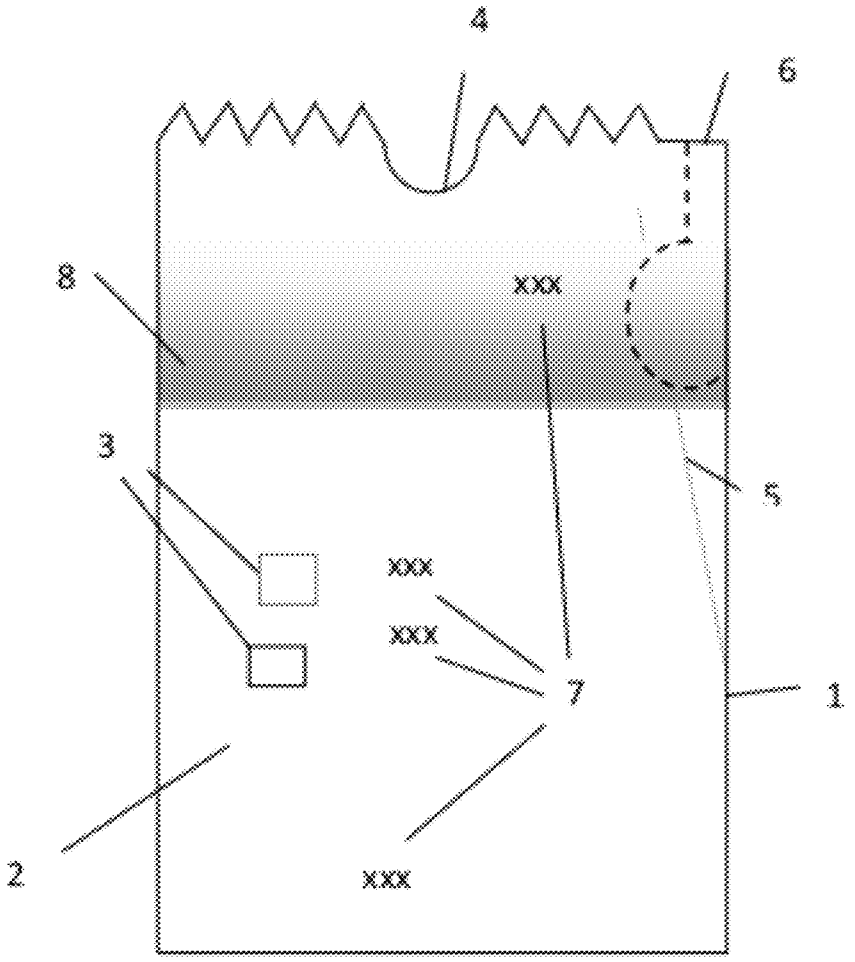

Fig 1

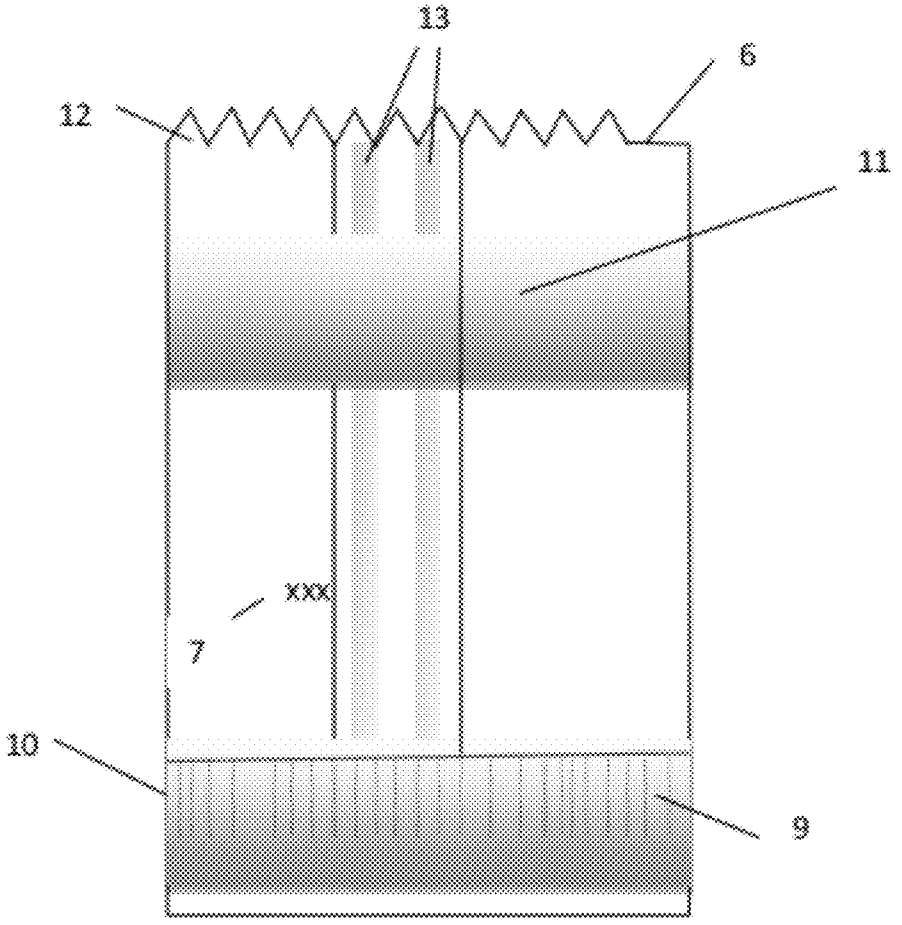

Fig 2

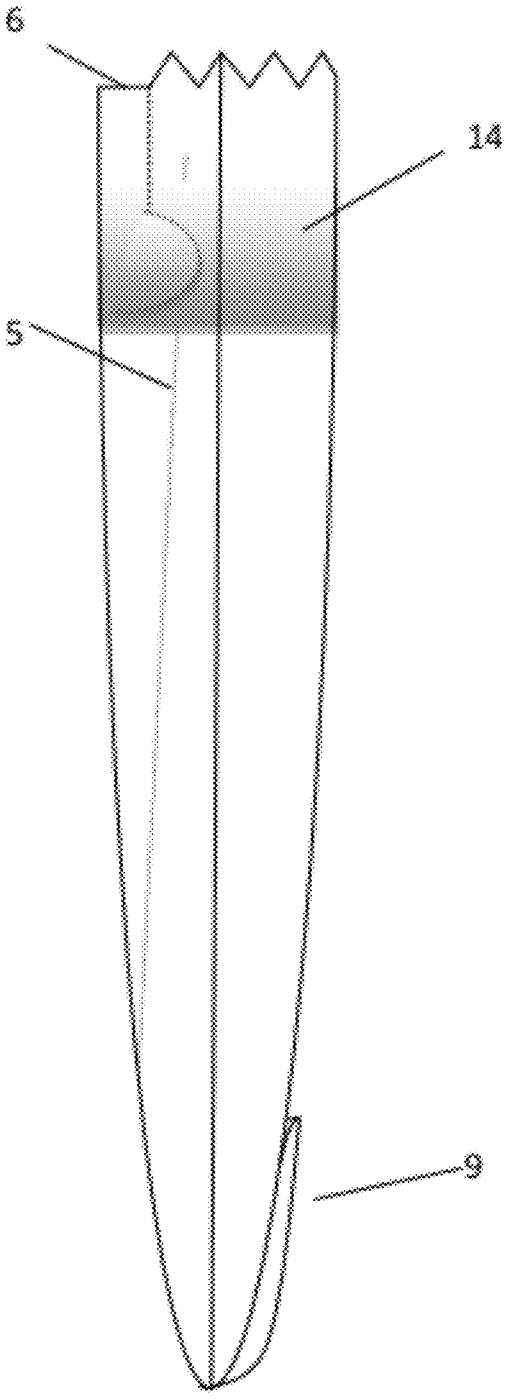

Fig 3a

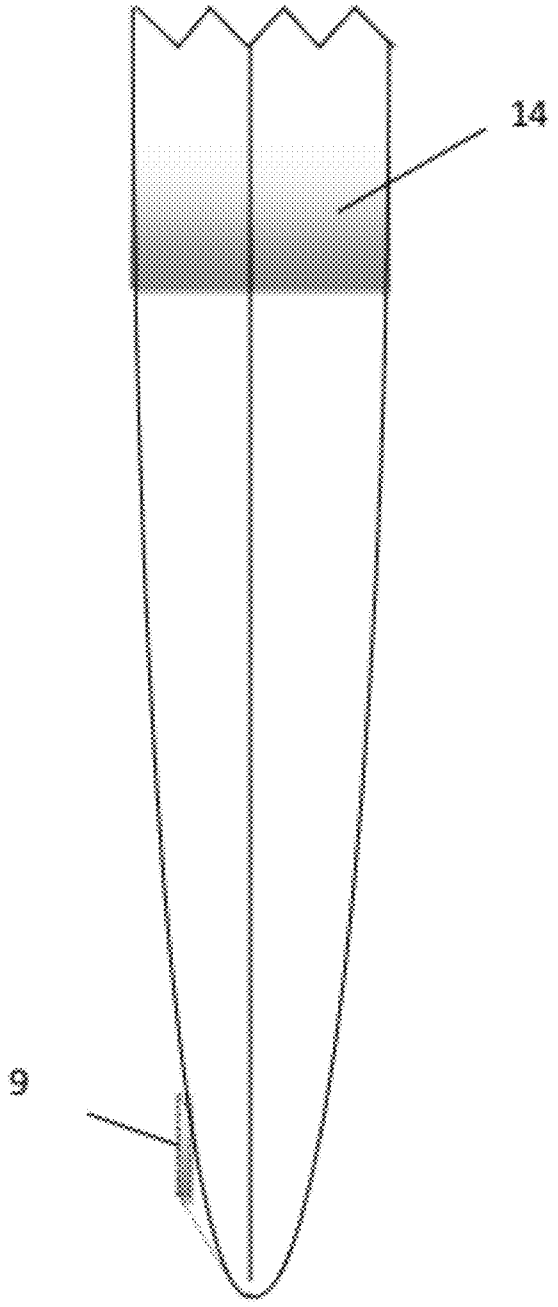

Fig 3b

BAG MADE FROM MEDICAL-GRADE PAPER THAT IS TREATED FOR STERILIZATION, WITH STERILIZATION-PROCESS INDICATORS AND PIGMENTED-ADHESIVE-BASED SAFETY FEATURES, WHICH IS EASY TO HANDLE AND USE

FIELD OF THE INVENTION

[0001] The present invention relates to bags made from medical-grade paper for sterilization with sterilization-process indicators and pigmented-adhesive based safety features, which is easy to handle and use and can be used to the store materials more particularly surgical medical material.

BACKGROUND OF THE INVENTION

[0002] The use of all previous surgical medical material to its use needs to be sterilized. These different types from instruments and mechanical pieces are placed within a sterilization bag that has a region that is permeable to the gas but impermeable to the germs and the bacteria. Later to seal the bag, the sterilization is realized with a method using steam of high temperature, ethylene oxide gas, (EOG) and similar. After the sterilization of the instruments until their use in surgery, the instruments are stored within the bag, and during the surgery or the treatment, the bag is opened and the instruments are used.

[0003] At present the designs of existing bags in the market present some disadvantages as it is the fact that the access to the material sterilized placed inside the bag does not allow being of efficient and fast way because the bag lacks devices and necessary fittings for it. Another disadvantage of the present existing designs is the fact that between the used materials they are tweezers and bistouries of weights and forms that break the bags that lack a sufficiently resistant bottom for these. In addition another disadvantage is the fact that they lack visual indicators that allow to visualize if the bag is perfectly sealed and indicators that allows to distinguish the type of sterilization to that they were put under and if the sterilization were carried out in correct form, to guarantee so much the security in the seal of the bag like in the sterilization process.

[0004] The patent application EP 1550466A relates to a sterilization bag used to store and to sterilize the medical instruments that have acute edges in which the lateral edges and greatest lower bounds are of are of a material of permeable type to the gas and to the steam and of a material adhered to an opening that is in a least upper bound of this, but this is different from the bag of the present invention.

[0005] The Mexican patent No. 178951 protects a bag for sterilization of material, which incorporates a device for fast and safe opening of the bags once the material was sterilized, but also is different from bag of the present invention.

[0006] The Mexican patent application 1998/00678 protects a bag for sterilization and conservation of material, that is similar to bag of the present invention, it is constituted by a piece of flexible material as paper, which presents a rectangular configuration, closed by its greatest lower bound with a double or triple bottom, two lateral sides which present rollings or bellows respectively; a part superior, which constitutes the mouth or entrance to bag to introduce the material to sterilize, in which a cut sawed to all wide it of this can be appreciated, counts in the profile of the rolling with a thread that is hidden by the internal part of this profile to open the bag with greater rapidity and facility, but this bag is different from bag of the present invention because bag of the present invention in its greatest lower bound presents a double bottom, but this double bottom counts at inner thermoweldable pigmented-adhesive sealed for its hermetic closure, this pigmentation of the adhesive allows us to visualize if it is or no perfectly seal, guaranteeing its total hermetic closure, in the frontal superior part in addition counts with one toe (with easy opening with finger) in the central part for easy opening in the filling, in the part frontal superior and reverse account also with a sawed edge to avoid that the personnel who uses them can cut itself, but in addition the part to come off the thread is straight and no sawed consequently the obtaining of the segment of paper is facilitated of surprising way to its opening later to the sterilization, avoiding with this the difficulty in its opening, in addition it counts on an inner thermoweldable pigmented-adhesive for his closing in the superior part, this pigmentation of the adhesive allows us to visualize if he is or not perfectly sealed, guarantee its hermetic closure and sealing thereof, the bag is closed longitudinally with a double line of pigmented adhesive, that guarantees a double security of seal, this pigmentation of adhesive allows us to visualize if it is or not perfectly sealed, it counts in addition on two indicators of sterilization that change of color depending on the sterilization process carried out on the bags, contains legend and instructions of use in ink water based, this ink water based has the purpose of identifying if there is flight of water or steam in the sterilization process if the ink is run, reason why this invention solves problems and has advantages that are not solved with the bag of the patent application 1998/006678, reason why bag of the present invention is new and inventive in the light of the present document.

[0007] The patent Mexican application 1999/001855 protects a procedure to apply to a chemical agent with germicidal characteristics to the medical grade paper for the manufacture of bags of paper, mixed bags, etc., which will avoid that these packages serve like vector or transport of microorganisms present on the environment or by manipulation.

[0008] This procedure comprising the following steps: a) The impregnating on the surface of the medical grade paper of paper weight between 30 up to 100 g/m^2 with an alcoholic solution of triclosan from 0.2% to 3.8% or a chloride aqueous solution of benzalconio from 0.2% to 3.8%, which must still remain after to carry out the sterilization process; b) The impregnating of the step a) is carried out by impression by flexography or by means of photogravure or by covering and c) the drying is realized to a temperature of 30° C. until 190° C. for a chloride aqueous solution of benzalconio and 30° C. until 70° C. for an alcoholic solution of triclosan.

[0009] The bag of the present invention has new characteristics of design and manufacture that contributes to solve the problems that present the used present bags for sterilization of material, reason why in the light of previous documents it is new and inventive.

BRIEF DESCRIPTION OF THE INVENTION

[0010] The present invention relates to bags made form medical grade paper for sterilization with sterilization-process indicators and pigmented-adhesive based safety features, which is to handle and use. The access to the sterilized material used in treatments or surgical procedures must be of fast and safe way. The present invention has like objective the elaboration of a paper bag made form medical grade paper

treated on the surface with a microbicide, for sterilization with new characteristics of design for the seal, handle and easy opening, besides indicators of seal and sterilization.

[0011] One embodiment of the present invention is to provide a bag made from medical-grade paper, treated the paper with a microbicide that allows the sterilization of instruments used in surgical treatments.

[0012] In accordance with another embodiment of the present invention, bag of paper used in the surgical article sterilization allows the express and easy access to the material sterilized placed inside of the bag.

[0013] Another embodiment of the present invention is to provide a bag for sterilization of surgical instruments with a sufficiently resistant bottom to place surgical instruments that by their form and weight bring about the breaking of the bag.

[0014] The invention is in addition directed to the elaboration to a bag of easy opening subsequent to sterilization with a sawed edge that avoids injury of the personnel who makes the filling of the same but in the end it is straight to facilitate it opening.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The FIG. **1** is a schematic form of an embodiment of the bag front of conformity to the present invention in which, **1** represents bag made of medical-grade paper, **2** represents the medical-grade paper treated on the surface thereof with a germicide for sterilization (SUPERANTI®) **3** represents printed indicators that change of color depending on the sterilization process which they are put under, **4** represents the toe for easy opening in the filling, **5** represents a system with thread for his easy opening after the sterilization, **6** represents the part to come off the thread that is straight and is not sawed for the easy obtaining of the paper segment, to open its indicates that the dotted line must be tear and to haul, **7** represents legend and instructions in ink based water and **8** is the thermoweldable adhesive in the superior part of the bag.

[0016] The FIG. **2** is a schematic form of an embodiment of the reverse of the bag of conformity to the present invention in which, **9** represent a double rolling at the bottom of the bag, **10** represents an inner thermoweldable adhesive already pigmented seal for their hermetism, **11** represents an pigmented adhesive for its closing in its superior part, **12** represents a sawed edge to avoid that the personnel that makes the filling injures itself, **6** represents the part of the thread to come off that is straight and is not sawed for the easy obtaining of the paper segment, **7** represents legend and instructions in ink based water, **13** represents a double line of inner pigmented adhesive to close the bag longitudinally to have double security with visual confirmation of continuity.

[0017] The FIG. **3***a* is a schematic form of a right lateral embodiment of the bag in accordance to the present invention in which, **5** represents a system based on thread for its easy opening after the sterilization, **6** represents the part of the thread to come off that is straight and sawed for the easy obtaining of the segment of paper and **9** represents a double rolling on the bottom of the bag, **14** represents a lateral side which presents a rolling or bellows respectively.

[0018] The FIG. **3***b* is a schematic form of a left lateral embodiment of the bag in accordance to the present invention in which, **9** represents a double rolling on the bottom of the bag, **14** represents a lateral side which presents a rolling or bellows respectively.

DESCRIPTION OF THE INVENTION

[0019] The bag of the present invention is a bag made from medical-grade paper treated on the surface with a microbicide for sterilization, and owing to the structure and design thereof, allow safe, rapid handling of the sterilized material placed within, since there are visual indicators that guarantee the hermetic closure and sealing thereof. Furthermore, generally the invention has printed indicators that change color depending on the sterilization process carried out on the bags and on whether said process was carried out correctly.

[0020] The bag of the present invention has the purpose of solving the problems of seal, easy opening and easy handle, in addition with the indicators of sterilization and the legend and instructions in ink based water on which it counts it guarantees that the sterilization process was carried out correctly.

[0021] The bag of the present invention is made by a piece of a flexible material as medical-grade paper treated on the surface for sterilization with germicidal agent (SUPERANTI®), who presents a rectangular or square configuration, closed by its lower bound with a double bottom, this double bottom counts with an inner pigmented thermoweldable adhesive sealed on his bottom for its hermetic closure, this pigmentation of the adhesive allows us to visualize if it is or not perfectly sealed, guaranteeing its hermetic closure; two lateral sides and which present rolling or bellows the bag to introduce the material to sterilize, in addition in the part frontal superior count with one toe in the center for easy opening in the filling, the part frontal superior and reverse count also with a sawed edge to avoid that the personnel that uses them can cut itself, but in addition the part of the thread to give off is straight and not sawed consequently the obtaining of the paper segment for its opening after the sterilization, avoiding with this the difficulty of its opening, in addition it counts on an inner pigmented thermo-weldable adhesive for its closing in the superior part, this pigmentation of the adhesive allows us to visualize if it is or not perfectly sealed, guaranteeing its total hermetic closure; it counts in the profile of the rolling with a thread that is hidden by the internal part of this profile to open the bag with greater rapidity and facility; the bag is closed longitudinally with a double line of pigmented adhesive, that guarantees one double security of seal, this pigmentation of the adhesive allows us to visualize if it is or not perfectly sealed; it has in addition two indicators that change of color depending on the sterilization process that the bags are put under; it contains legend and instructions of use in ink based water, it has indicators in order to identify if there is condensate ○ steam in the sterilization process if the ink is run.

[0022] The dimensions of the bags vary of 5 up to 90 cm in length and 5 up to 90 cm in width, has printed indicators of sterilization that they change of color according to the process which they are put under, for example if the bag becomes sterile in steam the color of the indicator changes to blue-gray, on the contrary if the bag becomes sterile in ethylene oxide gas (O.E.) the indicator changes light brown-blue.

[0023] Because the method stoked in sterilization is realized conventionally with humidity to high temperature, using ethylene oxide gas is necessary that the material of which is elaborated the bag will be an effective material for sterilization that is the reason why the material of which is elaborated

the bag of the present invention is medical-grade paper treated on the surface for sterilization with germicidal agent (SUPERANTI®).

[0024] The bag of paper characteristic of the present invention is elaborated in its interior of a thermo-weldable adhesive already pigmented seal at its bottom for its hermetic closure and an inner pigmented thermo-weldable adhesive for its closing superior.

[0025] The bag is closed longitudinally with one double line of pigmented adhesive to have double security with visual confirmation of continuity.

[0026] The methods of manufacture of the bags of the present invention are the known ones by the experts in the technique, which does not represent a difficulty.

[0027] The adhesives, the indicators of process and the paper medical degree are known by the experts in the technique.

1. A bag made from medical-grade paper for sterilization with sterilization-process indicators and safety with comprising:

a greatest lower bound with a double bottom, this double bottom counts with an inner pigmented thermo-weldable adhesive already pigmented seal on its bottom for its hermetic closure;

two lateral sides and which display rollings or bellows respectively;

a superior part, which constitutes the mouth or entrance to the bag to introduce the material to sterilize, a toe in frontal superior part in the center for easy opening in the filling, in the frontal superior part and reverse it account also with a sawed edge, but in addition the part to give off the thread is straight and not sawed with that the obtaining of the segment of paper for its opening is facilitated after the sterilization, in addition it counts with an inner pigmented thermo-weldable adhesive for its closing in the superior part;

it counts in the profile of the rolling with a thread that is hidden by the internal part of this profile to open the bag with greater rapidity and facility;

the bag is closed longitudinally with a double pigmented adhesive line, that guarantees a double security of seal;

it counts in addition on two indicators of sterilization that change of color according to the sterilization process that the bags are put under, and

it contains legend and instructions of use in ink based water.

2. A bag made from medical-grade paper for sterilization according to claim **1**, characterized with comprising a sawed edge to avoid that the personnel who makes the filling injures, but in addition the part to give off the thread is straight and not sawed with that the obtaining of the segment of paper is facilitated for its opening after the sterilization.

3. A bag made from medical-grade paper for sterilization according to claim **1**, characterized with comprising of an inner pigmented thermo-weldable adhesive seal at the bottom to its hermetic closure, this pigmentation of the adhesive allows us to visualize if it is or not perfectly sealed, guaranteeing its total hermetic closure.

4. A bag made from medical-grade paper for sterilization according to claim **1**, characterized with comprising of an inner pigmented thermo-weldable adhesive for its closing superior, this pigmentation of the adhesive allows us to visualize if it is or not perfectly sealed, guaranteeing its total hermetic closure.

5. A bag made from medical-grade paper for sterilization according to claim **1**, characterized in that the bag is closed longitudinally with a double line of pigmented adhesive, that guarantees a double security of seal, this pigmentation of the adhesive allows us to visualize if it is or not perfectly sealed, guaranteeing its total hermetic closure.

6. A bag made from medical-grade paper for sterilization according to claim **1**, characterized with comprising a system with a thread for its easy opening subsequent to sterilization.

7. A bag made from medical-grade paper for sterilization according to claim **1**, characterized in that the part to give off the thread is straight for the easy obtaining of the paper segment.

8. A bag made from medical-grade paper for sterilization according to claim **1**, characterized in that indicators that change of color according to the sterilization process which its are put under.

9. A bag made from medical-grade paper for sterilization according to claim **1**, characterized with comprising legend and instructions of use in ink based water, it have indicators in order to identify if there is condensate steam in the sterilization process if the ink run.

10. A bag made from medical-grade paper for sterilization according to claim **1**, characterized with comprising dimensions of the bags that vary of 5 up to 90 cm in length and 5 up to 90 cm in width.

11. The use of a bag made from medical-grade paper with sterilization-process indicators and pigmented thermo-weldable adhesive based safety features of easy handle for sterilization according to claim **1**.

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