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2,883,262

METHOD FOR STERILIZING INSTRUMENTS

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Fig. 1

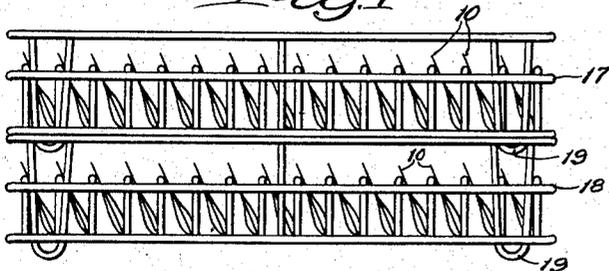


Fig. 2

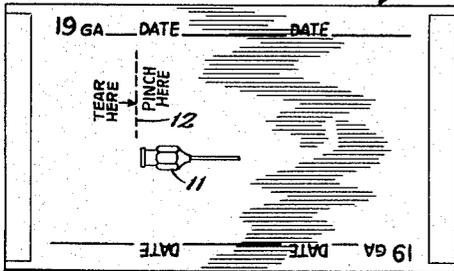


Fig. 3

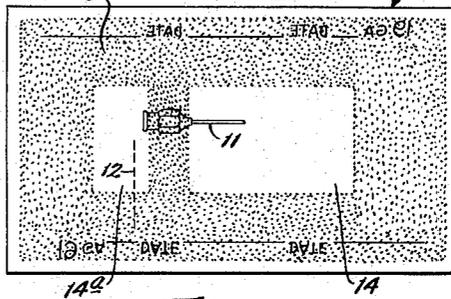


Fig. 4

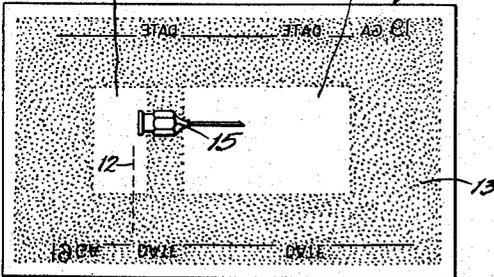


Fig. 5

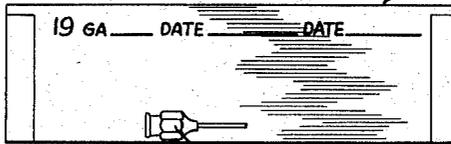


Fig. 6

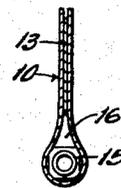


Fig. 7

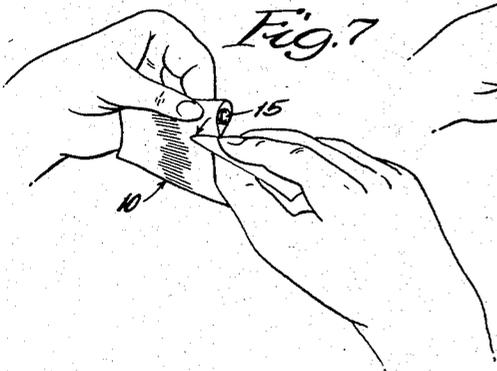
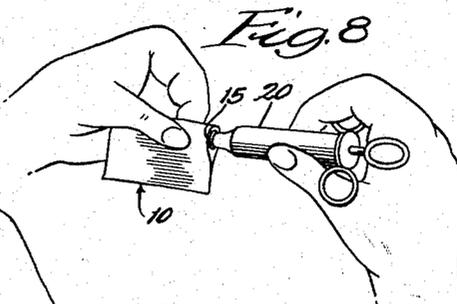


Fig. 8



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METHOD FOR STERILIZING INSTRUMENTS

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3 Claims. (Cl. 21—56)

This invention relates to a method and means for sterilizing instruments. The invention is particularly useful for the storing and sterilizing of instruments such as hypodermic needles, syringes, surgical instruments, and a number of other products for which there is a need for sterilization and maintenance in sterilized condition.

An object of the invention is to provide a method and means for sterilizing and preserving in sterilized condition instruments which may at some later time be quickly made available for use, means being provided for identifying the sterilized product. A further object is to provide effective means for identifying, sterilizing, and preserving in sterilized condition various types of instruments which may be stored and made available for instant use. Yet another object is to provide a means and method whereby instruments may be quickly and accurately suspended within a wrapper for sterilization while at the same time providing means for opening the wrapper to expose selected parts of the instrument so that sterilized portions of the instrument are kept free from contact with human hands. A still further object is to provide a wrapper structure which may be manipulated for suspending an instrument within the wrapper and sealed in a sealed enclosure thereof while the sterilized instrument is centered within the enclosure and protected therein against contamination. Other specific objects and advantages will appear as the specification proceeds.

The invention is shown, in an illustrative embodiment, by the accompanying drawing, in which—

Figure 1 is a side view in elevation of trays receiving wrappers containing instruments, the trays being ready for introduction to an autoclave or other sterilizing chamber; Fig. 2, a front view in elevation of a wrapper sheet which may be employed in the practice of my invention; Fig. 3, a rear view of the sheet shown in Fig. 2 and showing the adhesive areas thereon; Fig. 4, a view similar to Fig. 3 but showing a hypodermic needle within the adhesive area; Fig. 5, a plan view of the transparent wrapper sheet in folded relation about the hypodermic needle; Fig. 6, a transverse sectional view, the section being taken as indicated at line 6—6 of Fig. 5; Fig. 7, a perspective view of the wrapper being torn adjacent the hub portion of the hypodermic needle; and Fig. 8, a perspective view illustrating the attachment of a syringe to the hub portion of a hypodermic needle prior to the complete removal of the hypodermic needle from the wrapper.

In the illustration given, 10 designates a wrapper sheet formed of glassine, paper, or any other suitable material effective for excluding air under normal conditions from the sterilized instrument. When steam is employed in the sterilizing procedure, I prefer to employ a steam permeable paper or sheet. However, when the sterilization is accomplished by dry heat, the sheet may be formed of material which is impervious to steam. The sheet should be of a material which will prevent contamination of the sterilized instrument, and I find that glassine paper and similar treated papers are effective in excluding air

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under normal conditions and thus preserving the instrument, after sterilization, in sterilized condition.

On the outside of the sheet illustrated in Fig. 2, I prefer to provide certain imprinting to facilitate the securing of the instrument within the wrapper. For example, I imprint upon sheet 2 an outline 11 of the hypodermic needle, syringe, or other instrument which is to be secured within the wrapper. The outline 11 shows the user where to place the hypodermic needle in the wrapping operation. Also, upon the wrapper I imprint a tear-line 12 and the same line may also be used as a means for indicating where the wrapper is to be pinched to secure the wrapper tightly about one end portion of the instrument. Also imprinted upon the outside of the sheet 10 are data lines such as lines for indicating the date of sterilization, the gauge number, and various other information desired.

On the inner side of the sheet, I provide a permanently sensitive adhesive 13 which is spread rather uniformly over the sheet, leaving, however, an inner ungummed area 14 which will receive the needle portion or cannula of the hypodermic needle and another ungummed area 14a at the other end of the instrument. A hypodermic needle 15 is placed over the outline 11, as illustrated in Fig. 4, and the marginal portions of the wrapper are then brought together to effect a complete seal on all sides. The folded wrapper with the instrument 15 visible therein through the transparent walls of the wrapper, is shown in Figs. 5 and 6. It will be noted that the gummed area 13 extends about the hub portion of the hypodermic needle 15, and by pinching the wrapper about the hub 15, the hub is securely anchored within the walls of the wrapper while the needle itself extends forwardly in centered position within the space 16 formed by the hub within the wrapper, as illustrated in Fig. 6. Thus the needle itself is supported out of contact with the side walls of the wrapper and in suspended and centered position within the space 16. Further, the cannula of the hypodermic needle is enclosed within the ungummed area 14 of the wrapper.

After the hypodermic needle has been thus sealed within the wrapper, it, along with other needles or instruments, is placed within trays 17 and 18, as shown more clearly in Fig. 1. The trays are provided with partitions for receiving the envelopes or wrappers 10, and are provided with depending legs 19 of tapered construction which are effective in forming an interlock between the trays when the same are stacked as shown in Fig. 1. If desired, a single wrapped needle may be stored within each of the partitions of the racks 17 and 18, or a plurality of wrappers may be secured within each compartment.

The individually wrapped instruments, after being placed within the trays, and the trays secured in stacked relation, may be sterilized by placing the stack of trays within an autoclave or heat chamber where drying heat or steam may be employed to effect the desired sterilization. After the sterilizing operation, the trays may be removed, separated, and stored until they are to be used. If desired, the wrapped instruments may be resterilized after the lapse of a period of time following the date of first sterilization.

When it is desired to use the instrument, the wrapper may be removed and torn transversely along one side, as, for example, along line 12, to expose one end of the instrument. For example, if a hypodermic needle is being used and it is desired to connect one end of a syringe to the hypodermic needle, the wrapper may be grasped, as shown in Fig. 7, and the tearing may proceed along line 12 to remove one end portion of the wrapper. The other end of the wrapper, which is still held between the thumb and fingers of the nurse, may be grasped so as to support the hub 15 of the needle in position to receive the tip or forward end portion of the syringe 20, as shown more

clearly in Fig. 8. After the syringe has been firmly secured to the hub of the needle, the forward end of the wrapper 10 may then be removed, thus leaving the hypodermic needle firmly secured to the end of the syringe. It will be understood that the process is applicable to various types of instruments and by the method shown, it is possible to expose only one end of an instrument so that the other end thereof which is to be used for surgical purposes is never brought into contact with the hands.

Summarizing, with respect to a specific operation of the device, the wrapper 10 may be laid upon a flat surface with the gummed side 13 uppermost. The hypodermic needle is then placed upon the reproduction 11 of the needle. The long side of the wrapper 10 is then folded over so that its surface touches the corresponding side all at the same time, and the edges are sealed. Since the adhesive 13 is pressure-sensitive adhesive, it is desirable to have all the border portions of the sheet brought into engagement at the same time and pressed to effect a complete seal of the wrapper. If desired, the finger may be first pressed from the center top edge of the wrapper, left and right respectively, so as to seal the wrap along the top and then the fingers may be moved down each side to seal each side and thus form a complete enclosure for the needle.

It is next desired to anchor the hypodermic needle firmly within the wrapper so as to suspend the cannula of the needle. This may be done by simply pressing the wrapper walls together at the point indicated by the words "Pinch Here" located between the ungummed areas 14 and 14a. It is desired not to press too hard and close to the hypodermic needle, since this might puncture the wrapper. By thus locking the hub portion 15 of the needle firmly within the wrapper, a shown in Fig. 6, the needle portion is suspended freely within the open space 16 formed within the wrapper and between the ungummed wall portions 14 of the wrapper.

After the sterilization step, the trays containing the envelopes may be placed upon shelves or other storage areas to await use. At the time of use, the tearing may be accomplished along line 12 or any other selected line which will expose one portion of the instrument, one hand being employed in the tearing operation, as illustrated in Fig. 6, while the other hand holds the instrument still within the container. The instrument may then be used by grasping the exposed end or by affixing to the exposed end of the instrument another instrument such as a syringe, etc.

The wrappers are preferably imprinted in different colors as a means for indicating the gauge or type of needle or other instrument. Also, the shape and size of the wrapper may be modified to take care of instruments of different types. The imprinting upon the outside of the wrapper will also be varied depending upon the type of instrument being treated.

In the foregoing operation, it is found that a minimum

of time is required. For example, in the treatment of hypodermic needles, a needle is first cleaned, then placed upon the outline of the wrapper, the wrapper quickly sealed, and the needle anchored in suspended position by pinching the sides of the wrapper against the hub. A large number of needles may thus be quickly assembled, and placed within the racks. Any suitable adhesive effective for forming the seal may be employed. I prefer to employ a pressure-sensitive adhesive which facilitates the sealing of the wrapper. Heat-resistant adhesives are necessary where dry heat sterilization is employed and where the temperatures are high.

While, in the foregoing specification, I have set forth a specific process and structure in considerable detail for the purpose of illustrating the invention, it will be understood that such details of steps and structure may be varied widely by those skilled in the art without departing from the spirit of my invention.

I claim:

1. In a method for sterilizing an instrument having an enlarged portion, the steps of enclosing the instrument within a substantially air-impermeable, flexible wrapper, sealing the wrapper about the instrument, sealing the wrapper walls about the enlarged portion of the instrument so as to suspend the remainder of the instrument freely within said wrapper, and heating the wrapped instrument to sterilize the same.

2. In a method for sterilizing a hypodermic needle, the steps of enclosing the needle within a substantially air-impermeable, flexible wrapper, sealing the wrapper about the needle, securing the wrapper walls about the hub of the needle to suspend the needle portion freely within said wrapper, and subjecting the wrapped instrument to steam sterilization.

3. In a method for sterilizing an instrument having an enlarged end portion, the steps of enclosing the instrument within a substantially air-impermeable, flexible wrapper, securing the walls of the wrapper to the enlarged end portion of the instrument to suspend a free end portion of the instrument between the wrapper walls, sealing the wrapper about the instrument to provide a chamber about the suspended free end portion thereof, and heating the wrapped instrument to sterilize the same.

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