

March 9, 1943.

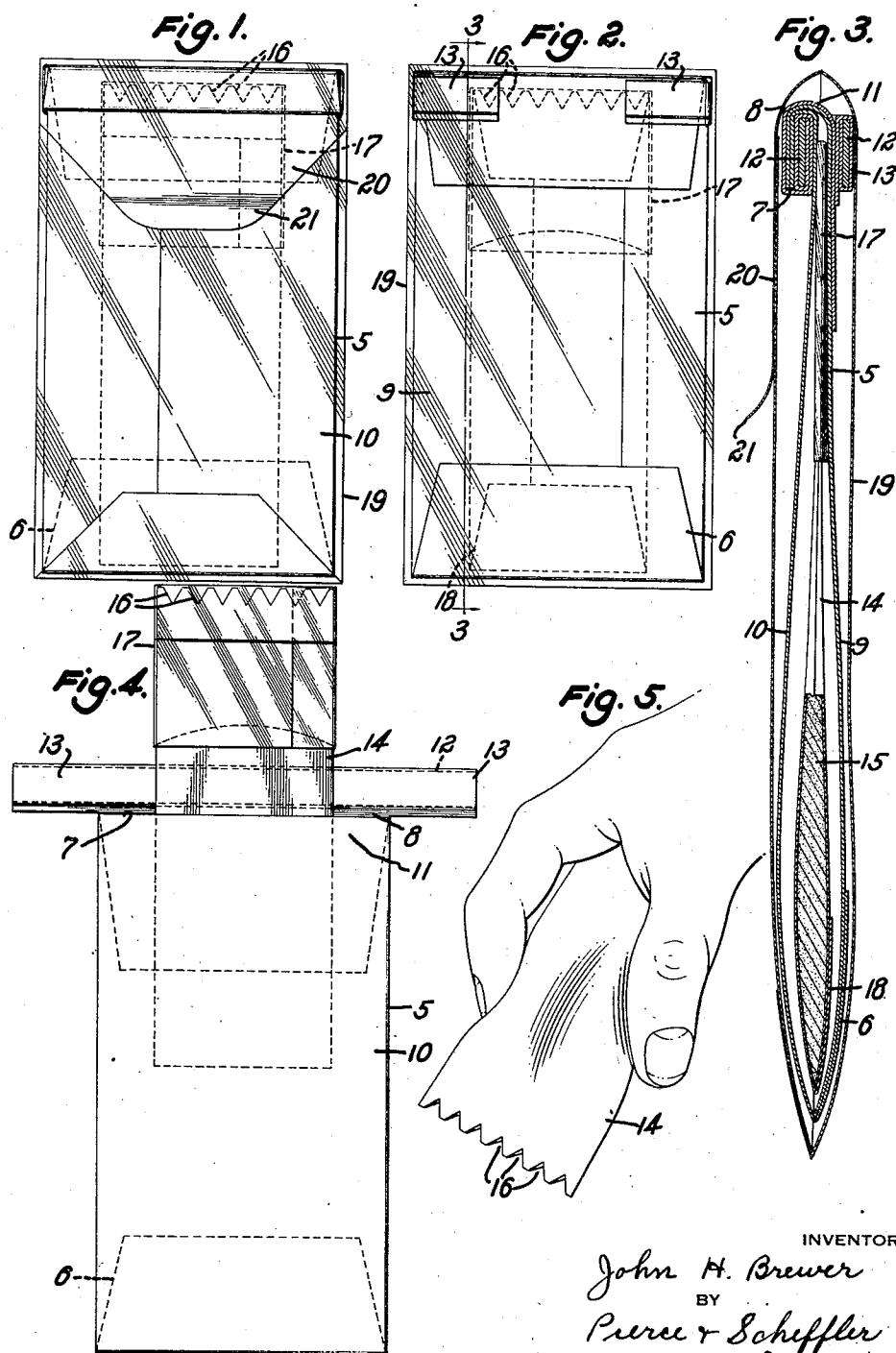
J. H. BREWER

2,313,512

STERILE SURGICAL PACKAGE

Filed Jan. 30, 1942

2 Sheets-Sheet 1



INVENTOR

John H. Brewer
BY
Pierce & Scheffler
his ATTORNEY

March 9, 1943.

J. H. BREWER

2,313,512

STERILE SURGICAL PACKAGE

Filed Jan. 30, 1942

2 Sheets-Sheet 2

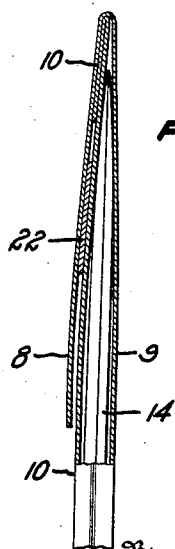
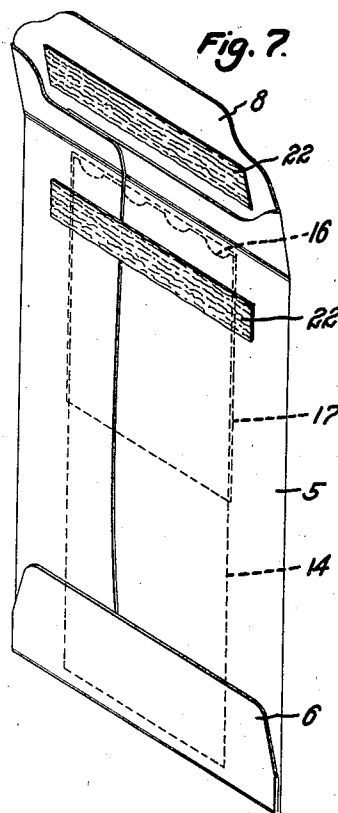
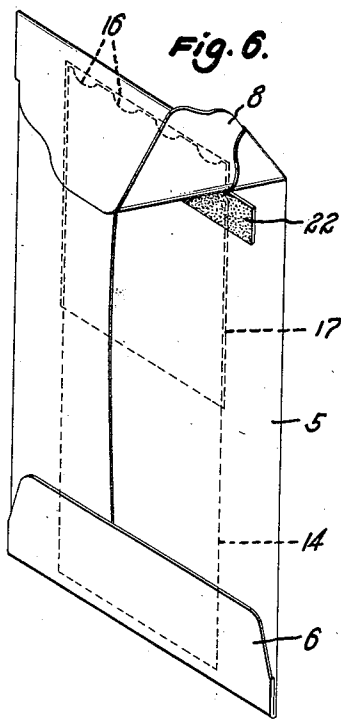


Fig. 8.

Inventor:
John H. Brewer

By Price & Scheffler

his Attorneys.

UNITED STATES PATENT OFFICE

2,313,512

STERILE SURGICAL PACKAGE

John H. Brewer, Baltimore, Md., assignor to
Hynson, Westcott & Dunning, Incorporated,
Baltimore, Md., a corporation of Maryland

Application January 30, 1942, Serial No. 428,967

7 Claims. (Cl. 206—63.2)

The present invention relates to a sterile package for surgical powders, granules, crystals and similar finely divided solid materials.

The primary object of the invention is to provide a sterile package for surgical powder having convenient means for applying the powder directly to a wound or the like, including a sterile inner container for the powder from which it may be dispensed and a protective outer envelope for the inner powder container to preserve it in sterile condition.

Another object of the invention is to provide a sterile package for surgical powder comprising inner and outer envelopes so constructed that the sterile inner envelope containing the powder may be removed from the outer envelope without its dispensing portion being touched by the fingers.

Another object of the invention is to provide a single service sterile package for surgical powder comprising inner and outer envelopes so constructed that the outer envelope may be opened without use of any implements and the closure of the outer envelope serves to close the dispensing openings of the inner envelope.

More specifically an object of the invention is to provide a sterile dispensing package for surgical powder comprising an outer protective envelope having a readily openable end closure capable of sealing the envelope against ingress of contaminating matter, an inner powder-containing envelope having a perforated end or edge for dispensing the powder contained therein, said powder-containing envelope being disposed within said outer protective envelope with the perforated end thereof disposed adjacent the closure end of the outer envelope, and a protective cap of sheet material enclosing the perforated end of said inner powder-containing envelopes whereby the same may be grasped by the fingers and withdrawn from the outer envelope without loss of powder therefrom and without contacting the perforated dispensing end thereof.

Another object of the invention is to provide a waterproof sterile package for surgical powders.

In providing a sterile single service dispensing package for surgical powders I have encountered a number of unforeseen difficulties. Aside from the selection of suitable qualities of paper and adhesive which will withstand the sterilization temperatures necessary to be used I have found that special consideration must be given to the surgical powder. In the case of sulfanilamide for instance, it must not be heated to too high a temperature or it will decompose. Sterilization by

dry heating at about 150° C. for about 1½ hours or for a longer time at a lower temperature has been found to be satisfactory. I have further found in the case of sulfanilamide that in order to prevent caking of the powder it must be freed of dust so that only granular material of about the size of ordinary table salt is used. I have referred to the above mentioned details for the purpose of emphasizing the fact that the production of a satisfactory sterile single service dispensing package of surgical powder involves something more than merely putting the powder in a sterile container.

Other objects and advantages of the invention will be apparent from the following detailed description and upon reference to the accompanying drawings which illustrate a preferred embodiment of the invention and in which

Fig. 1 is a front elevation of a package embodying the invention,

Fig. 2 is a rear elevation thereof,

Fig. 3 is a longitudinal sectional view on the line 3—3 of Fig. 2, with part of the inner container in section,

Fig. 4 is a front elevation showing the package partly assembled,

Fig. 5 is a perspective view showing the manner of using the powder-containing envelope,

Fig. 6 is a perspective front view of a modified form of package with the outer envelope closure partially closed,

Fig. 7 is an enlarged edge view partly in section of the closure end of the outer envelope in closed position and

Fig. 8 is a perspective front view of the package after the outer envelope closure has been opened.

Referring more particularly to Figs. 1 to 5 inclusive of the drawings, the sterile package according to the invention comprises an outer elongated envelope 5 of heavy, relatively stiff paper or other similar material sealed at one end, as by a glued flap 6. The outer envelope 5 is preferably of a type which may readily be opened without instruments and which can exert a slight pressure on the contents thereof adjacent the closure. An envelope of the known type embodying a metal clamping strip in its closure has been found satisfactory and is shown by way of illustration. The mouth end 7 of the envelope 5 is provided with a sealing flap 8 which is carried by, or may be an extension of, the wall 9 of the envelope. The sealing flap 8 extends beyond the other wall 10 of the envelope and at its end is provided with a transverse metal clamp-

ing strip 12, the ends 13 of which extend beyond the side edges of the envelope. The mouth end of the envelope is closed by folding the portion of the flap 8 carrying the metal strip 12 upon itself inwardly over the end portion 11 of the wall 10 and then folding the flap and the upper ends of both walls tightly upon themselves against the envelope and fastening the same against unfolding by bending the ends 13 of the strip 12 around the edges of the envelope into clamping engagement against the back wall 9. An envelope thus constructed may effectively be sealed against contamination of the contents, and can readily be opened for extraction of the contents when desired.

In the modification illustrated in Figs. 6, 7 and 8 the flap 8 instead of carrying the metal clamping strip 12 is provided with a strip 22 such as unsized or weakly sized paper like blotting paper which will pull apart or split readily. This strip 22 is provided with adhesive on both sides for sticking it to the flap 8 and for sticking to the wall 10 of the envelope when the flap is closed. It will be observed that the strip 22 is spaced from the edge of the flap 8 so as to leave a free edge which may be grasped by thumb and finger to pull the flap open and unseal the package. It will be observed further that in this modification as in that illustrated in Figs. 1 to 5 both walls of the outer envelope are folded when the package is closed so as effectively to seal the outer envelope and also to provide a more or less rigid edge which as will be described more fully hereinafter pinches the perforated edge of the inner envelope and holds the perforations closed.

Disposed within the outer protective envelope 5 is an elongated inner envelope 14, slightly smaller in all dimensions than the envelope 5 so as to be readily slidable in and out of the mouth of the latter. The envelope 14 contains a quantity of finely divided surgical material, such as antiseptic powder, indicated at 15, and at the end thereof adjacent the mouth of the outer envelope is provided with a series of perforations 16 through which the powder contained therein may be dusted into a wound. The perforations 16 are preferably formed by notches cut or otherwise provided in the end of the envelope 14 across the connecting fold between the walls thereof.

A removable protective cap or sheath 17 encloses the perforated end of the inner powder envelope. The cap 17 is formed of sheet material, such as transparent Cellophane, and preferably is in the form of a flat tube closed at one end, as by folding the tube on itself along a straight line normal to its axis, so that the perforated end of the envelope 14 will be frictionally gripped by the walls of the sheath when the end is fully inserted into the sheath. Thus a snugly fitting cap or sheath is provided which prevents escape of powder through the perforations 16 during handling of the package and also provides a non-contaminating hand-hold by which the inner envelope may be grasped when withdrawing it from the outer envelope. The protective sheath 17 preferably is not attached to the inner envelope so that it may readily be slid off of the end thereof after the latter is withdrawn from the outer envelope, permitting dispensing of the powder through the perforations 16. It will thus be seen that the perforated end of the powder envelope 14 is protected until the instant of use, against contamination of the contents or any portion of the envelope which will be contacted

by the powder in being dispensed therefrom. The protective sheath 17 may of course be omitted but in that case the inner envelope 14 should be removed from the outer envelope without touching the perforated edge, e. g. by means of sterile tweezers.

In making up the sterile package, the requisite amount of antiseptic powder or other finely divided material required to be maintained in sterile condition until used, is placed in the inner envelope 14, preferably through the bottom end, which is then closed by the sealing flap 18. The protective cap or sheath 17 is placed over the serrated end, as described above, and the filled envelope is inserted into the outer protective envelope 5 which is then closed and sealed by double folding the flap 8 and clamping the ends 13 of the metal strip 12 around the body of the envelope in the modification illustrated in Figs. 1 to 5 or by folding down the flap 8 so as to fold both walls 9 and 10 of the outer envelope and sticking the flap down to the wall 10 by means of the adhesive parting strip 22 in the modification illustrated in Figs. 6 to 8. The assembled package is then subjected to dry heat sterilization.

It will be noted that the inner envelope 14 is made of such a length as to extend from the bottom of the envelope 5 to a point immediately adjacent the other end thereof directly under the folded closure 8, as seen in Figs. 1, 2 and 5. Thus the upper serrated edge of the envelope 14 is gripped or held pressed between the walls of the outer envelope by reason of the meeting of the walls at the end fold in the latter and by the clamping action of the metal closure strip 12. The resultant pressing together of the walls of the inner envelope at the perforated end thereof effectively closes the openings 16 and supplements the action of the sheath 17 in preventing escape of powder from the inner envelope during shipment and handling prior to opening of the package and withdrawal of the same for use of the powder.

In order to protect the package against contamination through the walls of the protective envelope, which might occur if the package became wet or moistened before use, the outer envelope may be made of waterproof paper or paper provided with a waterproof coating. Or the package comprising the assembled inner and outer envelopes may be enclosed in a waterproof sealed jacket envelope 19 of waterproof Cellophane or the like and having all seams thereof sealed with waterproof cement. The sealing flap 20 has a free unsealed tab end 21 for facilitating opening of the same. A package thus sealed is particularly adapted for use in the field since it may actually be immersed in water without affecting the sterile condition of the contents.

Since the inner envelope is protected from contact with the air and cannot be contaminated by handling of the package, it and the surgical powder contained therein will remain sterile until such time as the outer envelope is opened and removed for use, thereby providing a surgeon or other person desiring to use a sterile powder with a ready supply of the powder and a sterile dispensing carrier from which the powder may be sprinkled directly into a wound.

The manner of using the inner envelope for dusting the powder therefrom is shown in Fig. 5. The user grasps the envelope 14 between its ends with the thumb engaging one side edge and the fingers the other side edge. With the envelope

so held, a slight pressure on the sides causes the walls to bulge away from each other, thus opening the perforations 16 to permit the powder to escape through the same;

Although preferred embodiments of the invention have been shown and described by way of illustration, it is to be understood that various modifications in the details of construction and arrangement of parts may be resorted to without departing from the spirit of the invention within the scope of the appended claims.

This application is a continuation-in-part of my application Serial No. 370,394, filed December 16, 1940.

I claim:

1. A sterile package for surgical powders comprising a flat inner envelope having perforations through which the powder may be applied directly into a wound, the openings for the powder which said perforations provide being closed when the inner faces of the envelope adjacent the perforations are held in contact, and an outer flat envelope enclosing said inner envelope and protecting the same against contamination and having a closure adjacent the perforated portion of the inner envelope formed by folding both walls of the outer envelope upon themselves whereby the meeting walls of the outer envelope maintain said inner faces of the inner envelope adjacent said perforations in contact during handling of the package prior to use of the inner envelope in applying the powder, said envelopes being so dimensioned that the perforated portion of the inner envelope is positioned immediately adjacent the fold of the closure of the outer envelope.

2. A sterile package for surgical powders comprising an inner powder-containing flat envelope having a row of perforations along one edge thereof through which the powder contained therein may be applied directly into a wound, and an outer flat protective envelope enclosing said powder-containing envelope, said outer protective envelope having a sealing closure formed by folding both walls of the outer envelope upon themselves, said envelopes being so dimensioned that the perforated edge of the inner envelope is positioned immediately adjacent the closure of the outer envelope whereby the walls adjacent the perforated edge of said inner envelope are held in contact by the walls of the outer envelope adjacent said closure.

3. A sterile package of surgical powders comprising an inner powder-containing flat envelope having a dispensing opening at one edge thereof through which the powder contained therein may be applied directly into a wound, an outer protective envelope enclosing said powder-containing envelope, and means including a closure for the outer envelope formed by folding both walls thereof upon themselves for pressing the walls of said inner envelope together along the edge thereof having the dispensing opening therein to prevent escape of the powder from the inner

envelope until the package is opened for dispensing the powder, said envelopes being so dimensioned as to position said edge of the inner envelope immediately adjacent the closure of the outer envelope.

4. A sterile package for surgical powders comprising an outer protective flat envelope having an opening along one edge and a readily openable closure for said opening comprising a transverse clamping strip carried by one wall of said envelope, said walls being adapted to be folded on each other with said clamping strip enclosed in the fold, an inner sterile flat envelope for the powder disposed within said outer envelope and removable through said opening upon opening the closure, said inner envelope having powder dispensing perforations along one edge thereof and being so dimensioned with respect to the dimensions of the outer envelope that when enclosed in said outer envelope, said perforated edge is disposed in proximity to the line of fold of the outer walls of said outer envelope at said closure, whereby the walls of the inner envelope adjacent said perforated edge are pressed together by the walls of the outer envelope and the perforations are closed against escape of powder therethrough.

5. A sterile package for surgical powders comprising an inner flat envelope having a row of perforations through which the powder may be applied directly into a wound, the openings for the powder which said perforations provide being closed when the inner faces of the envelope adjacent the perforations are in contact, and an outer flat envelope enclosing said inner envelope and protecting the same against contamination and having a closure adjacent the perforated portion of the inner envelope formed by folding both walls of the outer envelope upon themselves whereby the meeting walls of the outer envelope maintain said inner faces of the inner envelope adjacent said perforations in contact during handling of the package prior to use of the inner envelope in applying the powder, said outer and inner envelopes being so dimensioned as to position said perforations immediately adjacent said closure, and a sealed waterproof jacket envelope completely enclosing the assembled inner and outer envelopes.

6. A sterile package as defined in claim 4 in which the clamping strip extends beyond the edges of the envelope and the extended ends thereof are folded back over a wall of the envelope when it is closed.

7. A sterile package as defined in claim 1 in which the closure of the outer envelope comprises a flap adapted to fold down against one wall of the envelope and an adhesive strip adapted to attach said flap to said wall along a line spaced from the free edge of said flap, said strip being of such strength that it will separate when the flap is pulled away from said wall.

JOHN H. BREWER.