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PACKAGE DEVICE AND METHOD OF MAKING THE SAME

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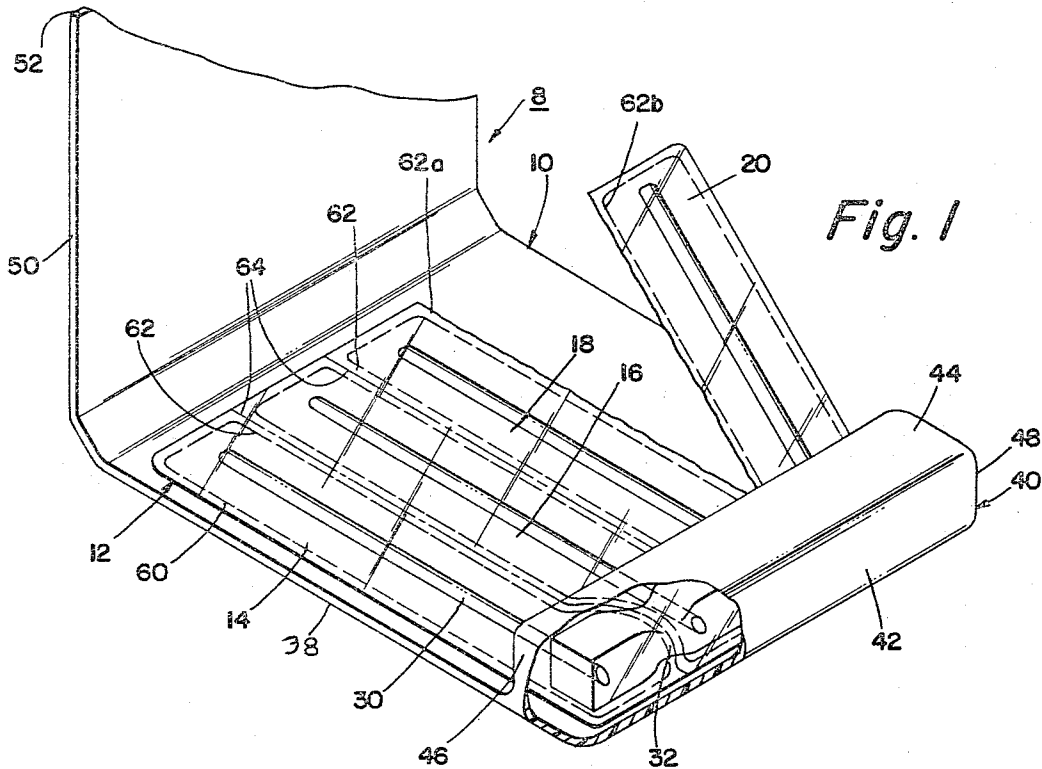


Fig. 1

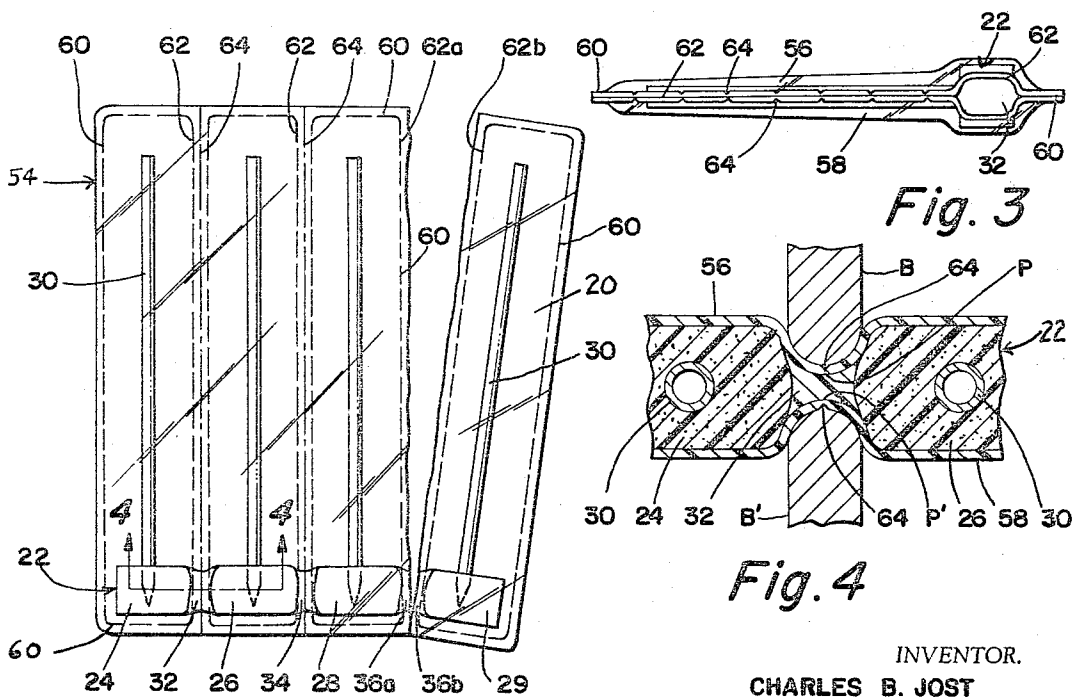


Fig. 3

Fig. 4

Fig. 2

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## 3,331,499 PACKAGE DEVICE AND METHOD OF MAKING THE SAME

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The present invention relates to an article holder and more particularly to an aseptic package device and method of making the same for transporting elongated objects, such as vaccination needles or the like.

It is often necessary to transport or have available for immediate use small applicators or objects which should be sterile when used, but wherein there is neither time, nor facilities for sterilizing the applicators at the place of use. Examples of such applicators are needles for plastic hypodermic syringes, vaccination needles, medicated swabs, and cosmetic and grooming aids. One way of packaging or transporting such presterilized articles in the past has been to place them in a large container having no compartments or compartments in open communication. Upon opening the container to use one of the items, the aseptic character of the remaining items was damaged or destroyed. Another method was to place the articles in a sponge at the bottom of a box which arrangement was difficult and cumbersome. Moreover, each time the box was opened, the medicated or lubricated sponge was exposed to the deleterious effects of the atmosphere, and any foreign matter which it might contain, thereby harming or destroying the aseptic character of the remaining needles. In addition, such containers were often large and difficult to carry conveniently in the pocket or purse.

Accordingly, an object of the present invention is to produce an aseptic device which is sufficiently small and compact in size so as to be readily carried in the pocket, purse or the like with minimum consumption of space.

Another object is to package the applicator so that removal of one will not cause contamination or exposure to the atmosphere of the others.

A further object is to produce a device which prolongs the effective life of an applying medium, such as an antiseptic, which is disposed within the device while still permitting continued removal of objects from the device.

A further object is to produce an aseptic container which is relatively easy and inexpensive to make but which will accomplish the aforesaid objects.

A further object is to provide a device having a plurality of compartments which does not require the insertion of a separate antiseptic base in each compartment, but which will perform as though separate bases had been installed.

Another object is to provide a single base member which can support pointed objects to prevent puncture of a polymeric outer sheath, while at the same time serving as a source of antiseptic and a continuation of the compartmentalization seal for a plurality of compartments.

A still further object of the present invention is to provide a novel method for making the aseptic device of the character heretofore described.

Briefly stated, the foregoing and other related objects are accomplished by the provision of a novel aseptic device which comprises a thin, polymeric sheath which is completely closed and which contains interiorly thereof adjacent one end an antiseptic sponge-like base member. The device is constructed and arranged to provide a plurality of longitudinally extending closed compartments each of which communicates at one end with an adjacent portion of the antiseptic base member, said sponge-like antiseptic base member providing, with the sheath, barrier regions to form continuations of the compart-

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ments to provide a unitary structure, whereby selective of the compartments may be readily moved for individual usage of an applicator.

Other related objects and advantages of the present invention will be apparent from the following description taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a fragmentary, generally perspective view of a complete package device and which shows one of the compartments containing an applicator in the process of being partially removed;

FIG. 2 is a top plan view of the aseptic container insert with one of the aseptic insert compartments in the process of being removed;

FIG. 3 is a longitudinal edge view of one of the insert compartments removed from the device; and

FIG. 4 is an enlarged fragmentary cross-section view taken along the line 4—4 of FIG. 2, and showing one form in which a novel barrier between the compartments may be made in accordance with the present invention.

Referring then again to the drawings, FIG. 1 is a perspective view showing a complete device, designated generally at 8, with one of the applicators in the process of being partially removed therefrom. As shown, the device 8 includes an outer cover 10 and an insert, designated generally at 12, having a plurality of compartments 14, 16, 18 and 20. The device 8 includes a continuous medicated and/or lubricated sponge-like base member 22 which extends transversely thereof and which provides a series of aligned base sections 24, 26, 28 and 29 adapted to receive an antiseptic material. The respective base sections are integrally connected together by a series of barrier regions 32, 34 and 36a, 36b, which function to retain the antiseptic material in each compartment in isolated relationship from one another. As shown, objects 30, such as vaccination needles or the like, may be disposed within each of the respective compartments and inserted at one end into the associated base section of the base member 22 for the purposes and advantages as will hereinafter be more fully described.

In the embodiment shown in FIG. 1, the cover 10 may be of the fold-open type having a back 38 and a stub 40. The stub 40 includes a bottom portion 42 and a front portion 44 with side portions 46 and 48 at the opposed ends thereof. The cover 10 includes a foldable flap 50 having a leading edge 52 adapted to be received between the front portion 44 of the stub 40 and the insert 12 so as to provide a protective cover for the insert 12 in the assembled position thereof. The side portions 46 and 48 may be made integral with back 38 and attached to the bottom 42 and front 44 portions by means of a suitable adhesive. In the assembled arrangement shown in FIG. 1, the insert 12 is disposed so that one end thereof is contained within the stub 40, whereupon, the flap 50 of the cover 10 may thereafter be closed or folded over the same simply by inserting the leading edge 52 between the insert 12 and stub 40, as aforesaid.

The aseptic insert 12 is comprised of a series of compartments 14, 16, 18 and 20, each of which is sealed from the adjacent compartment, and from the outer atmosphere. FIG. 2 shows the insert 12 removed from the outer cover 10. In the illustration, one of the compartments 20 is shown being separated from the remaining compartments. The insert 12 comprises an elongated base member 22 having sponge-like characteristics. The material selected for the base must be non-toxic and one which is capable of forming a seal in cooperation with the outer sheath 54 of the aseptic insert, as hereinafter set forth. A preferred material for the base member 22 is a polyurethane foam. The base member 22 may be saturated with an applying medium, such as an antiseptic, medicant or lubricant material, prior to assembly of the insert 12. An antiseptic

would be used where it is desired to maintain the sterility of the compartments. A medicant would be used where the object 30 is to apply a medication. A lubricant would be used where the purpose is to retain the object 30 in a moist, lubricated state. It is to be understood that the applying medium might be a combination of the aforesaid items. Examples of antiseptics which might be used are sodium hydroxide or hydrochloride.

As shown in FIG. 2, the antiseptic medicant or lubricant impregnated base member 22 receives the pointed end of the objects 30, such as the vaccination needles shown. Preferably, the assembly should be made in the conventional sterilized surroundings in which pharmaceutical devices are packaged.

The objects 30 and the base member 22 may then be surrounded by the flexible polymeric sheath 54. It is preferred that the sheath 54 be non-toxic and moisture resistant with good resistance to heat and cold. The sheath 54 may be transparent or opaque. Where the medicant or objects 30 are subject to deterioration upon exposure to sunlight, it is preferable to utilize a sheath which is opaque, or which is translucent but transmits a minimum amount of ultraviolet ray energy. It is preferred that the sheath have a good tensile strength. A preferred material for the outer sheath 54 is Alathon, a trademarked polyethylene film of the Du Pont company.

In one form of assembly, such as illustrated in FIGS. 3 and 4, the sheath 54 may be made from two thin sheets 56 and 58 of polymeric, film-like material. The sheets 56 and 58 are preferably superimposed on one another with the base member 22 and objects 30 disposed therebetween. As shown in FIG. 2, the sheets 56 and 58 may then be heat-sealed completely around their marginal edges, as at 60, to provide the composite insert 12 shown.

It is preferred that the application of the outer sheath 54 and the heat sealing of the end, be performed in the presence of the atmosphere so that some air remains inside the sheath. The retention of some air facilitates subsequent separation of the compartments 14, 16, 18 and 20 during use and enables the medicant or antiseptic which is in the base member 22 to diffuse throughout each compartment so as to retain the entire compartment in a sterile condition. The presence of the air also facilitates separation of the compartments as it prevents the sheath 54 from collapsing about the objects 30 giving a bodyless, sleazy structure which would otherwise be difficult to separate.

In accordance with the invention, the individually sealed compartments 14, 16, 18 and 20 provided within the insert 12 may be readily accomplished in a single action. As an example, a heated, pressure applying means, as the pair of weld bars B and B' of FIG. 4, may be brought into engagement with the superimposed sheets 56 and 58 of the sheath 54 so as to form intercompartmental heat seals, as at 62. The heat seals 62 extend longitudinally and merge at their opposed ends into the heat seals 60 provided adjacent the top and bottom margins of the sheath 54 so as to provide the completely enclosed, multi-compartment structure shown. Application of heat and pressure to the base member 22 causes a predetermined compressive fusion of the material thereof so as to form the barrier regions 32, 34 and 36a, 36b, which separate the respective base sections 24, 26, 28 and 29, whereby the single base member 22 cooperates with the sheath 54 to provide a plurality of antiseptic compartments each with its own base section for receiving therein one of the objects 30. Sufficient heat and pressure should be applied to the sheets 56 and 58 of sheath 54 in the area of the base member 22 so that the sheets 56 and 58 are fused thereto and provide a seal therewith, whereby the barrier regions 32, 34, and 36a, 36b constitute, in effect, continuations of the longitudinal, intercompartmental seals 62.

It has been found that a contact pressure, such as about 5 p.s.i. at a temperature of about 125° F. is sufficient to

provide the desired seal characteristics when polyurethane foam is employed for the base member and Alathon, a trademark for polyethylene film by the Du Pont company, is employed for the sheets 56 and 58 of the sheath 54. By this arrangement, it is believed that the application of heat and pressure in the manner indicated imparts to the respective barrier regions 32, 34 and 36a, 36b, a solid, rigid and fluid impervious construction so that the antiseptic material contained in the base sections 24, 26, 28 and 29 on opposite sides of the respective barrier regions are effectively prevented from intercompartmental migration.

To facilitate separation of the respective compartments 14, 16 and 18, the longitudinal, intercompartmental seals 62 may each be provided with a central, weakened tear line, as at 64, which lines may be readily formed in the sheets 56 and 58 by the provision of projections P and P' which extend from work engaging surfaces of the respective weakened tear lines 64. Thus one of the compartments, such as the compartment 20 shown in FIG. 2, may be removed from the remaining compartments in its closed condition merely by manually pulling the same laterally in the manner of a tearing action along the respective weakened line 64, whereby the remaining half of the seal 62, as at 62a, maintains the sealed integrity of the adjacent compartment 18 and its associated adjacent barrier region 36a while the remaining other half of the seal, as at 62b, maintains the sealed integrity of the removed compartment and its associated barrier region 36b. The seals 62 should be of a width sufficient to enable separation of the compartments, but without rupture of the seal. It has been found desirable that when the sheath 54 is made of Alathon having a thickness of about 0.0002 inch, that the width of the seals be approximately one-fourth inch.

It is to be understood that instead of having the antiseptic applied as a liquid disposed in the base member 22, it might also be made a part of the foam by a compression and heat-seal process, whereby the medicant or antiseptic is fused to the base member.

It is further to be understood that instead of a heat-seal for forming the compartments, it may be possible to use a cold chemical seal, which is capable of forming barrier regions comparable to the barrier regions described in connection with the heat-seal.

It is believed that as a result of the heat treatment, each barrier region, such as 32, is of higher density than the remainder of the base member 22 so as to become solid as compared to the sponge-like nature of the remainder of the base member. Consequently, the barrier regions are rigid, whereas the sections 24, 26, 28 and 29 of the base member between the barrier regions are elastomeric.

The foregoing structure provides a package for objects which must be kept aseptic, which is readily transportable, and which readily permits the use of one object by opening the package without affecting the aseptic quality of the remaining objects.

The terms and expressions which have been used, are used as terms of description and not of limitation, and there is no intention in the use of such terms and expressions of excluding any equivalents of any of the features shown or described, or portions thereof, but it is recognized that various modifications are possible within the scope of the invention claimed.

I claim:

1. A device for holding and transporting small objects in an aseptic condition including an enclosed sheath member, said sheath member being flexible, fluid impervious, and including at least two compartments having a border therebetween, said compartments being fluid impervious at said border, a unitary base member projecting through each compartment, said base member being fluid porous within each compartment and fluid impervious at the border of each compartment, where-

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by each of said compartments is completely fluid impervious relative to the adjacent compartment and relative to the atmosphere.

2. A device according to claim 1, including at least two objects, each object being disposed in respective of said compartments, whereby the objects are sealed from each other and from the outer atmosphere.

3. A device according to claim 2, wherein a portion of each object is disposed in the base member.

4. A device according to claim 3, including an outer, openable, protective cover at least partially surrounding the sheath member.

5. A device according to claim 3, wherein the base member is polyurethane.

6. A device according to claim 3, wherein the border is heat sealed.

7. A device according to claim 3, wherein the border is chemically sealed.

8. A device according to claim 3, wherein the applying medium is a lubricant.

9. A device according to claim 1, including an applying medium disposed within said base member in the said fluid porous portions, said sheath member and said base member coating at said border to prevent migration of the applying medium from one compartment to another said porous portions permitting migration of the applying medium into the compartment in which each such porous portion is disposed.

10. A device according to claim 9, wherein the applying medium is an antiseptic.

11. A device according to claim 1, wherein the said border adjacent the base member is comprised of a laminate-like structure comprising one layer of the sheath member, a portion of the base member which is of higher density than the adjacent portions of the base member so as to form a barrier region, and an other layer of the sheath member, each of said sheath layers partially circumscribing said higher density portion of said base member and being in abutting engagement on either side of said higher density portion whereby the said layers coact to completely surround said higher density portion of the base member in fluid impervious engagement.

12. A device according to claim 11, wherein the remainder of said border is comprised of a lamination of said one layer and said other layer of the sheath member.

13. A device according to claim 11, wherein the barrier region is sufficiently dense to be impervious to moisture.

14. A device according to claim 1, wherein the unitary base member is elastomeric between the barrier regions and rigid at the barrier regions.

15. A device according to claim 1, wherein said seal between each compartment has a width sufficient to enable a compartment to be detached from an adjacent compartment without destroying the seal between the remaining compartments and the atmosphere.

16. A device according to claim 1, including air disposed within each of said compartments.

17. A device according to claim 1, wherein the sheath member is comprised of a flexible polymeric material.

18. A method of packaging objects for transport in an aseptic condition including the steps of placing an applying medium in a base member, placing at least two spaced objects in position relative to said base member, covering said base member and objects with an outer sheath of polymeric material, sealing the periphery of said outer sheath, transforming a portion of the base member along a line which, when extended lies between

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said objects into a barrier region of sufficiently high density to prevent migration of said applying medium through said barrier region after the said transformation occurs, and sealing the said layers to each other and to the said barrier region along a continuation of said line so that the said barrier region and layers coact to form a unitary fluid-impervious compartment wall.

19. A method according to claim 18, wherein the transforming step includes the application of heat and pressure along the said line.

20. A method of making a compartmentalized package having an applying medium disposed therein including the steps of placing a thin layer of polymeric material on either side of an elongated sponge-like base member having an applying medium disposed therein, sealing the layers of polymeric material at spaced lines transverse of the elongated base member to transform the portion of the base member adjacent said lines into barrier regions of sufficiently high density to prevent migration of said applying medium through said barrier regions after the said transformation occurs, and sealing the said layers to each other and to the said barrier region along said lines so that the said barrier regions and layers coact to form unitary fluid-impervious spaced compartment walls.

21. A multi-compartment package device adapted for holding and/or transporting objects in an aseptic condition comprising, a flexible, relatively thin walled sheath, said sheath being sealed adjacent its marginal edges to provide an enclosed fluid impervious package, a unitary base member disposed in said sheath adjacent one end thereof, a plurality of laterally spaced sealing means extending from one edge of said sheath and transversely of said base member to an opposite edge of said sheath, said sealing means providing with the base member barrier regions which define a plurality of substantially fluid impervious compartments therebetween, a portion of said base member projecting into each of the respective compartments with said projecting portions being structurally fluid porous within said compartments and structurally fluid impervious at said barrier regions.

22. A multi-compartment package device according to claim 21, wherein said sealing means includes weakened tear means so that a selective one of said compartments can be removed, as a unit, from an adjacent compartment without impairment to the substantially fluid impervious character of the removed compartment and to the remaining compartments.

23. A multi-compartment package device according to claim 21 wherein said sheath is comprised of a relatively thin walled polymeric material, and wherein said base member has a substantially greater cross-sectional dimension as compared to the cross-sectional thickness of the respective sheath walls.

24. A multi-compartment package device according to claim 21, wherein the portions of said base member projecting within the respective compartments have a substantially greater cross-sectional dimension as compared to the cross-sectional dimension of the portions at said barrier regions.

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