

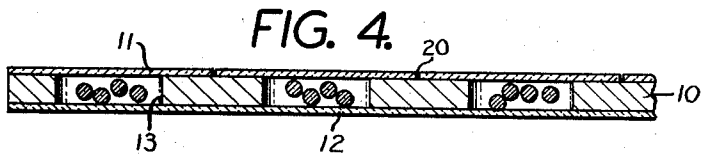
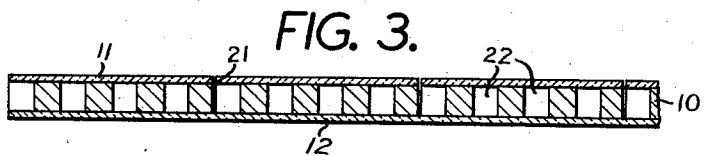
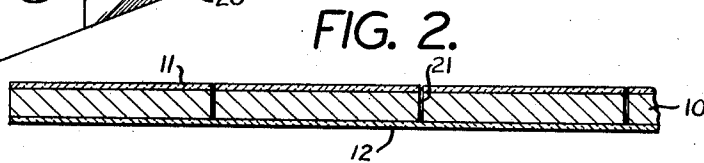
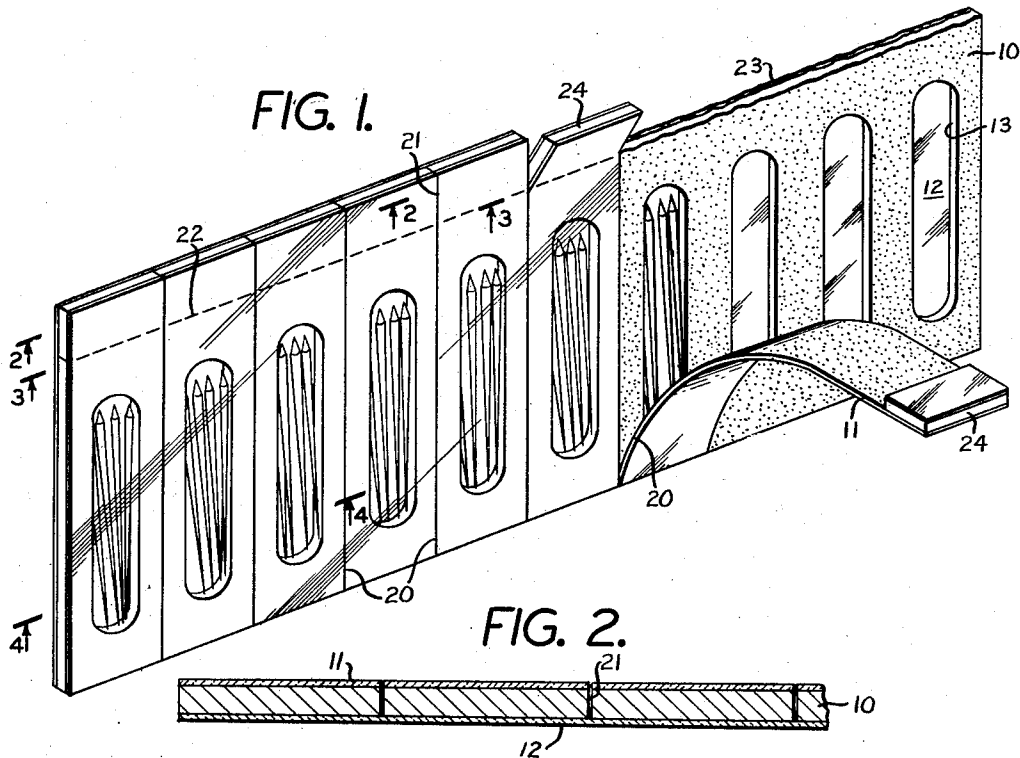
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STERILE PACKAGING

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STERILE PACKAGING

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17 Claims. (Cl. 206—63.5)

This invention relates to packages, and more particularly to packages for holding small articles such as dental points.

It is one object of the invention to provide an inexpensive package affording sufficient protection of the contents to maintain sterility.

A second object is to provide a package permitting effective sterilization of package and contents.

A third object is to provide a package permitting ready inspection of the contents and access thereto, without sacrificing the protective features of the package.

The packaging of dental points illustrates very well the advantages of the present packaging system. These "points" are spills twisted from paper triangles and are used for cleaning or swabbing purposes in root cavity work. The points are typically made in four or five sizes, the dentist selecting the proper size for fitting the bore which has been drilled in the tooth and which may range from a sixteenth inch or so down to the finest bore capable of production by reaming. Since the dental point comes in direct contact with the patient's blood stream, sterility is highly important, and sterility must be maintained over periods of months of storage in the dentist's office. Nevertheless, it has been customary to package the points in units of about 200 points, although it is apparent that once the package is opened to permit removal of one or more points there is no longer any assurance of sterility of the remainder. According to one widely used packaging system, the points have been placed according to size in four or five compartments in a single box, although it is apparent that once a box is opened to remove a point from one of the compartments there can no longer be any assurance of sterility of any of the points in any of the compartments.

In the package of the present invention, the points are contained in compartments, a few points to each compartment, so that once a compartment is opened the points within it may either be used immediately or discarded. Each compartment is covered so that the compartment to be opened may be selected without disturbing the closure, and the closure is so constructed that the opening of a compartment involves the rupture of a substantial element, leaving no doubt as to whether a compartment has been tampered with or not.

Each package preferably includes a number of compartments, making a package of convenient size for ready storage and handling and avoiding the difficulties inherent in the storing, finding and handling of small individual packages. The packages are also so constructed that their general overall dimensions are not greatly altered by removal of some of the contents.

A package embodying the invention will now be described with reference to the accompanying drawing, and the features forming the invention will then be pointed out in the appended claims.

In the drawings:

Fig. 1 is an isometric view of a dental point package embodying the invention in a preferred form; and

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Figs. 2, 3 and 4 are enlarged fragmentary sections on the respective lines 2—2, 3—3 and 4—4 of Fig. 1.

The package consists essentially of a body 10 and outer covering layers 11, 12 formed and inter-related as will now be described. The body 10 is preferably rectangular and formed with one or more apertures 13 forming the contents holding spaces or compartments. The body 10 may be formed of any of a variety of materials or laminations of different materials, but ordinarily will be cardboard or paper board of suitable type and dimensions for the particular class of service which is involved. A good grade of virgin pulp board about one-sixteenth inch thick is suitable for the particular package described herein. The apertures 13 may be of various shapes and dimensions, according to the items to be packaged, but for the packaging of dental tips it is found convenient to make each aperture about a quarter of an inch wide and an inch and a quarter long, the corners being rounded as indicated. The spacing between apertures is preferably made double the spacing between the last aperture of a series and the end of the package, so that the bodies 10 may be die cut out of a roll or large rectangular piece of board with maximum economy.

A front cover 11, preferably of transparent material such as polyester sheet material marketed under the trade-name Mylar, but which may also be composed of cellophane or other transparent sheeting, is adhesively joined to the body 10 all around the apertures or pockets 13 and preferably over the entire surface of the body 10. A back cover 12 which is made of glassine and which may be tinted blue or any other desired colors is applied to the back surface of the body 10 and is again preferably adhesively joined to the entire surface of the body 10. Between the compartments or pockets 13, the front lamination 11 is cut along lines 20 and the cuts 20 may extend slightly into the material of the body 10. Toward the ends of the cuts 20 and along one edge of the package, the cuts are carried all the way through the body 10, as indicated at 21, and along this edge of the blank and in parallelism to it, a line of perforations 22 in the body layer 10 is provided. In Fig. 1, the left hand five compartments are shown in their original condition at the time of completion of manufacture, the sixth compartment is shown as having the upper edge of the board above the perforation line 22 bent slightly forward in preparation for removing the cover section 11 over this compartment. In the case of the seventh compartment, the cover is shown as almost entirely removed and in the case of the eighth, ninth and tenth compartments, these compartments are shown as having had their covers stripped entirely off them and having had their contents removed.

When the upper edge of the board is bent forward as shown in the case of the sixth compartment in Fig. 1, it breaks readily on the perforation line 22, and ruptures the glassine backing along the line 23 and along the lines 21 between compartments, the upper end 24 of the board hinging on the front film 11. The end 24 may now be used to strip the cover 11 off in the manner indicated in the case of the seventh compartment. In general, the surface layer of the board 10 will peel with the cover 11, and the extent to which it does this provides a convenient indication of the completeness and efficiency of the adhesion between the elements 10 and 11.

A convenient method of manufacture for the package, is to coat a piece of board corresponding to the outline of the board 10 in Fig. 1 or a larger piece of board sufficient to make a number of such elements, completely with a heat activated adhesive on both sides and then while the adhesive is in inactive condition, to die cut the apertures 13 and, preferably, also the perforations 22,

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Thereafter, the cover 11 may be applied with a heated die and under suitable pressure so as to join and seal the member 11 to the surface of board 10 over the entire area of the latter apart from the apertures 13. The board 10 and cover 11 may then be die cut to the shape shown in Fig. 1, the cuts 20 and 21 being formed at the same time. Thereafter, the individual pockets 13 are loaded and the glassine layer 12 is applied, the adhesive already on this side of the board 10 being activated and a complete sealing surface adhesion being obtained by the application of suitable pressure with a heated die. The precise type of adhesive to be used is not critical and will vary from application to application. For the application illustrated, an adhesive requiring a temperature up to around 300° F. is desirable, so as to permit subsequent heat sterilization. The completed packages may now be sterilized, using any preferred suitable procedure and equipment and in particular may be sterilized by the use of steam in an autoclave at about 240° F.

What is claimed is:

1. A package comprising a board having an aligned series of spaced apart apertures, front and back cover layers secured to the faces of the board and enclosing the apertures to form article holding pockets, the board having a line of perforations adjacent one edge of the package and being divided along its said edge into sections respectively opposite the apertures, whereby a section of the edge of the package can be broken by bending forward along the said line of perforations, hinging on the front layer, and used for peeling off the front layer over the corresponding aperture.

2. A package according to claim 1, in which the cover layers are adhesively sealed around the apertures to form sterility maintaining closures.

3. A package according to claim 2, in which a cover layer is permeable to sterilizing steam for sterilizing package and contents as a unit.

4. A package according to claim 3, in which the front cover layer is of flexible transparent sheet material and the back layer is glassine.

5. A package according to claim 3, in which the cover layers are adhesively sealed around the apertures by heat-activated adhesive having an activation temperature of about 300° F. whereby the package may be sterilized as a unit by heating in an autoclave to about 240° F. without re-activating the adhesive.

6. A package comprising a board having an aligned series of spaced apart apertures, front and back cover layers secured to the faces of the board and enclosing the apertures to form article holding pockets, the board having a line of perforations adjacent one edge of the package and the board and front cover layers having cuts along lines between apertures, the cuts passing substantially through only the cover layer between apertures and up to about the line of perforations and passing through both cover layer and board thereafter and to the edge, whereby a section of the edge of the package can be broken by bending forward along the said line of perforations, hinging on the front layer, and used for peeling off the front layer over the corresponding apertures.

7. A package according to claim 6, in which the back cover is continuous across said cuts and is rupturable to permit so bending the edge sections of the board.

8. A package according to claim 6, in which the board is composed of cardboard and the front cover layer is secured thereto by adhesive of strength sufficient to peel the surface of the board along with the front cover layer.

9. Method of sterile packaging which comprises applying heat activated adhesive to the front and back surfaces of a board; cooling the board to deactivate the adhesive; cutting article holding apertures in the said board while the adhesive is still in active condition; applying a back cover layer with heat and pressure to activate the adhesive on the back surface of the board while that on the front surface remains inactive and form a sterile sealing

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adhesive joint between the back layer and the board; loading the apertures with the articles and applying a front cover layer with heat and pressure to activate the adhesive on the front surface of the board while that on the back surface now remains inactive and form a sterile sealing adhesive joint between the front layer and the board; cutting through the front cover layer from edge to edge and also through the board adjacent an edge to form separable cover sections with attached edge sections of the board; and sterilizing the thus formed package as a unit.

10. Method according to claim 9, in which the sterilizing is performed by application of steam under predetermined pressure and temperature and the said adhesive is inactive at the said temperature.

11. Method according to claim 10, in which the sterilization is performed at about 240° F.

12. Method according to claim 11, in which the said adhesive is inactive at about 240° F. but active at about 300° F., and is heated to about 300° F. in applying the back and front cover layers.

13. Method of sterile packaging which comprises applying heat activated adhesive to the front and back surfaces of a board; cooling the board to deactivate the adhesive; cutting article holding apertures in the said board while the adhesive is still in active condition; applying a back cover layer with heat and pressure to activate the adhesive on the back surface of the board while that on the front surface remains inactive and form a sterile sealing adhesive joint between the back layer and the board; loading the apertures with the articles and applying a front cover layer with heat and pressure to activate the adhesive on the front surface of the board while that on the back surface now remains inactive and form a sterile sealing adhesive joint between the front layer and the board; cutting through the front cover layer from edge to edge to form separable cover sections; and sterilizing the thus formed package as a unit.

14. Method according to claim 13, in which the sterilizing is performed by application of steam under predetermined pressure and temperature and the said adhesive is inactive at the said temperature.

15. Method according to claim 14, in which the sterilization is performed at about 240° F.

16. Method according to claim 15, in which the said adhesive is inactive at about 240° F. but active at about 300° F., and is heated to about 300° F. in applying the back and front cover layers.

17. A package comprising a board member having an aligned series of spaced apart pocket recesses, the said pocket recesses having openings through one face of the board member, the board member having a line of perforations adjacent one edge, between the said pocket recesses and the said edge, and being divided along its said edge into sections respectively opposite the pocket recesses, and a cover layer comprising a flexible sheet covering and adhesively joined to the said face of the board member enclosing the said pocket recesses, the cover layer continuing across the said line of perforations and being divided in line with the divisions of the said edge of the board, whereby a section of the edge of the package can be broken by bending forward along the said line of perforations, hinging on the cover layer, and used for peeling off the cover layer over the corresponding pocket recess.

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