

June 7, 1955

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2,710,096

DISASSEMBLED FIRE-BOMB PACKAGE

Filed Dec. 5, 1951

2 Sheets-Sheet 1

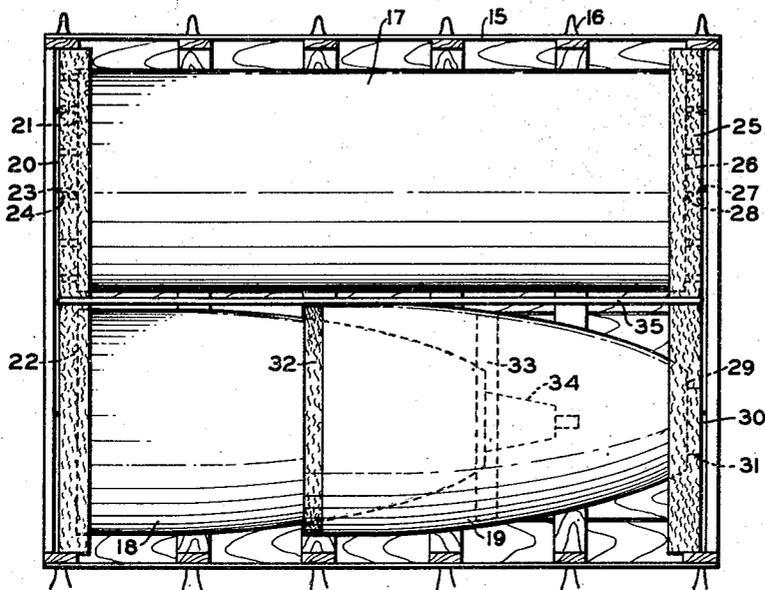


FIG. 1.

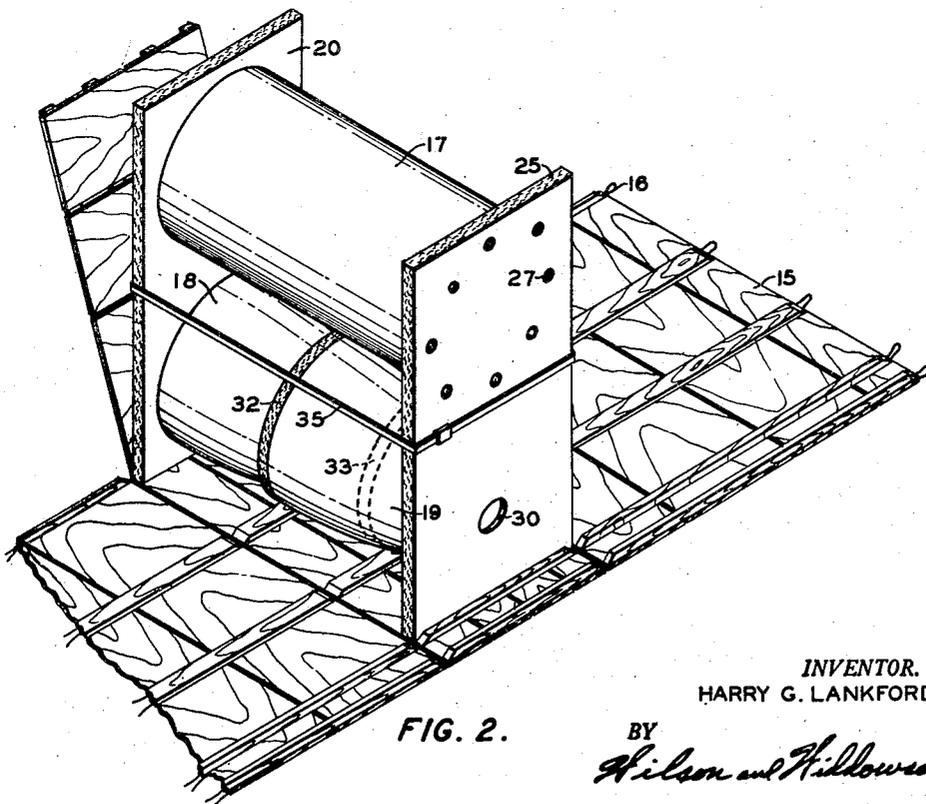


FIG. 2.

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2 Sheets-Sheet 2

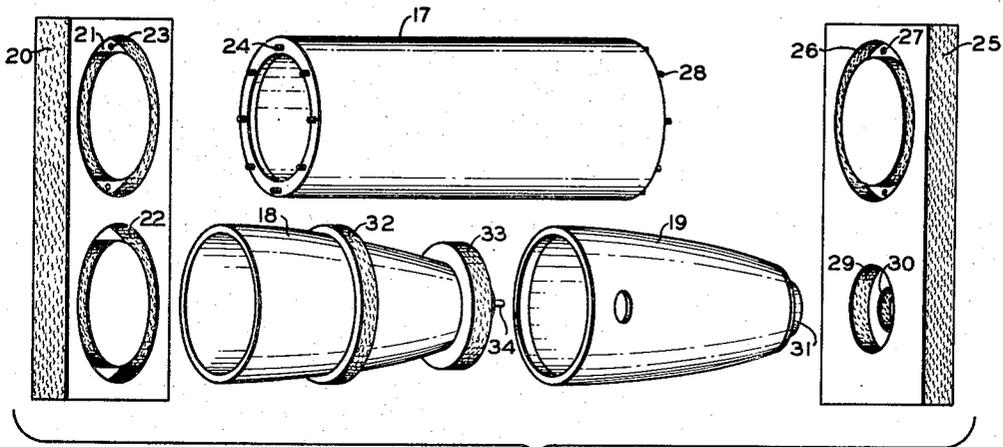


FIG. 3.

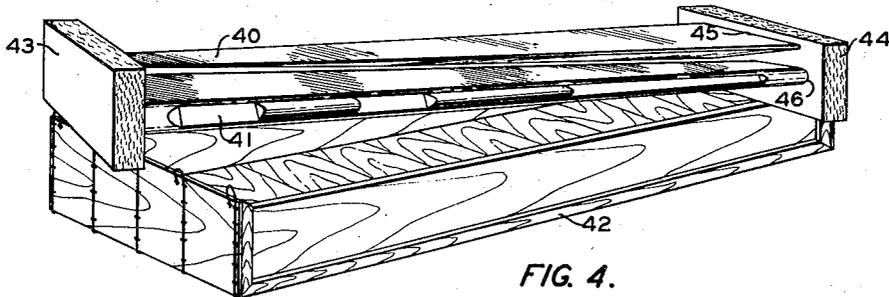


FIG. 4.

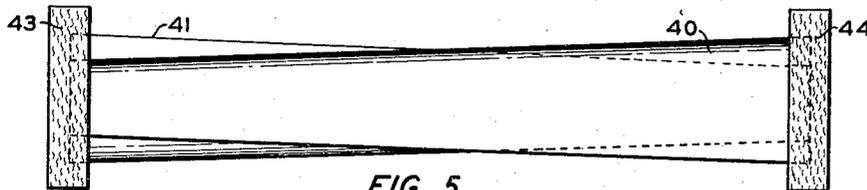


FIG. 5.

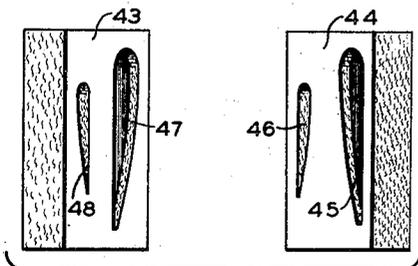


FIG. 6.

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DISASSEMBLED FIRE-BOMB PACKAGE

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6 Claims. (Cl. 206—46)

This invention relates to packaging methods and means. In one aspect, the invention relates to a package wherein the supporting, spacing, and padding functions for an article in the package are performed by one material. In another aspect, the invention relates to a method for constructing an improved package wherein the same material performs the functions of supporting, spacing, and padding the article within the package. In one embodiment, a package is provided wherein fiberboard is shaped to fit an article to be packaged such that the article is supported and spaced from the outer covering of the package and from other articles in the package, the fiberboard also acting as padding for the article to prevent damage thereto from abrasion, blows, or other action which may occur during shipping or storing operations. My invention also contemplates a method for constructing the new package of my invention.

Broadly speaking, a package comprises an outer cover, inner supporting, spacing, and padding means, and the article itself. The term article as used in this application includes articles of manufacture, machines, and articles of nature. In order to protect the article during handling, shipping, and storage, it is necessary to secure the article firmly within the package so as to prevent movement of the article within the outer cover. Another requirement for the protection of the article is that the article must be suspended and free from contact with the sides and bottom of the package and with other articles in the package. Still another requirement is that the article must be padded at points of contact with the supporting and spacing means so as to prevent damage to the article by action of these means on the article.

In order to accomplish these functions of supporting, spacing, and padding of the article, many materials must be used and much effort expended in the construction of present packages. For example, spacing and supporting materials presently used in the art include wood, metal, and the like. Padding materials used to protect the article at points of contact with the supporting and spacing materials include felt, rubber, cloth, hair, paper, etc. Materials utilized to secure these various supporting, spacing, and padding materials to one another and to the outer cover of the package in presently known packages include nails, screws, staples, bolts, rivets, glue, and the like.

Packages containing such a wide variety of materials in the inner supporting, spacing, and padding means are characterized by many difficulties, for example, they are very expensive, difficult to construct, require many man-hours for construction, are not adapted to assembly line production, require a large inventory of many different materials, require a large amount of floor space in construction and assembly, are not usable in all climates, and are not versatile in that each type of article to be packaged requires different types of inner materials and fastening means therefor.

By the practice of my invention, these difficulties are avoided in that the supporting, spacing and padding means are all of the same material, i. e., fiberboard, there-

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by reducing the cost of materials, reducing the man-hours required for construction, providing a simple, sturdy, easy-to-construct package which can be used in all climates and places. The term fiberboard, as used in this application, refers to a block-formed fibrous material in the nature of a construction or insulating board, said fibrous material preferably having a density in the range of 10 to 25 pounds per cubic foot.

Other advantages to be gained by the practice of my invention will be apparent from the discussion and disclosure contained herein.

An object of my invention is to provide an inexpensive, sturdy, light, compact, and easy-to-construct package.

Another object of the invention is to provide a package wherein the supporting, spacing, and padding means for the article in the package comprises one material.

Another object of the invention is to provide a package that can be stored or shipped in any position.

Another object of the invention is to provide a package wherein the inner supporting, spacing, and padding means is non-corrosive, non-abrasive, non-hygroscopic, fungus proof, and mildew proof.

Another object of my invention is to provide a package wherein the supporting, spacing, and padding means for the article in the package comprises a material having a pH in the range of 6.5 to 7.5.

Another object of my invention is to provide a method for constructing a package of the nature described.

Other objects and advantages will be apparent upon reading the following discussion and description.

According to my invention, fiberboard is die-cut, punched, drilled, sawed, routed, scored, or otherwise worked so as to cooperate with the article to be packaged such that the article is supported or suspended in the package and spaced from the outer cover of the package and from other articles that may be in the package. The fiberboard also acts as padding means for the article. Usually I prefer to utilize fiberboard near each end of the article, the fiberboard being worked as described above so that the end of the article fits snugly in a recess or depression in the fiberboard. The recess or depression may be formed by any of the above mentioned methods and is of such size and shape that the article will be firmly secured by cooperation of the fiberboard and the article. The fiberboard and article can be held in close cooperation by the action of the outer cover of the package upon the fiberboard, or tying means may be employed to hold the fiberboard and article in close contact, thereby forming a separate unit within the outer cover of the package.

For the packaging of certain metal articles in the practice of my invention wherein protection of the article from corrosion is an important requirement, fiberboard having a pH in the range of 6.5 to 7.5 is preferred. It is obvious, however, that all packages do not require that materials in contact with the article being packaged be corrosion-resistant; therefore, I do not wish to be limited to fiberboard means having a pH in the above mentioned range. Fiberboard made from wood fibers, sugar cane fibers (bagasse), jute fibers, flax fibers, straw fibers, hemp fibers, or the like, which is felted, produced from a slurry which has been neutralized to a pH of 6.5 to 7.5 with basic material from the usual acidic slurry, containing bitumens to waterproof and enhance wet strength, and usually called "softboards," has been found particularly useful in the practice of my invention.

The size and shape of the fiberboard supporting, spacing, and padding means can vary widely, and depends on such factors as the size, shape, and nature of the article being packaged, and the specifications as to strength and the like which the package must meet. Generally speaking, the fiberboard will be of such dimension so as to

project beyond the article and space the article from the outer cover of the package, and will be of sufficient thickness to support or suspend the article within the outer cover of the package. The required dimensions for any particular case can be readily determined by those skilled in the art after reading the discussion and disclosure herein contained.

My invention can be more clearly understood by reference to the accompanying drawing wherein:

Fig. 1 is a plan view showing a hollow center case element and cone-shaped end case elements of a disassembled casing, in particular a disassembled fire-bomb case, packaged according to my invention. A portion of the outer cover has been broken away to show the arrangement and cooperation of the elements of the bomb case and the fiberboard members.

Fig. 2 is a perspective view of the package of Fig. 1 with the outer cover in position for application.

Fig. 3 is an exploded view of the elements of the bomb case and the fiberboard members.

Fig. 4 is a perspective view of a pair of airplane ailerons being packaged according to my invention.

Fig. 5 is a rear view of the ailerons and fiberboard members of Fig. 4.

Fig. 6 is a perspective view of the fiberboard members of Fig. 4.

Referring now to Figs. 1, 2, and 3, reference number 15 indicates the outer cover of the package. The cover is of wood construction and is closed and fastened by wire bands 16. The disassembled metal fire-bomb case is comprised of center cylinder 17, and cone-shaped end elements 18 and 19. Fiberboard member 20 is provided with grooves 21 and 22 which extend partially therethrough and snugly receive and engage the lip of center cylinder 17 at one end and the lip of end element 18 at the base thereof, respectively. Holes 23 are spaced around the bottom of groove 21 to receive studs 24 on center cylinder 17. Fiberboard member 25 is provided with groove 26 which extends partially therethrough and is adapted to snugly receive and engage the lip of cylinder 17 at the other end, holes 27 being spaced along the bottom of groove 26 so as to receive studs 28 on center cylinder 17. Fiberboard member 25 is further provided with recess 29 which extends partially through member 25 and is adapted to snugly receive and engage the apex end of bomb element 19. Hole 30 in fiberboard member 25 is centrally positioned in recess 29 so as to receive nipple 31 on element 19. End element 18 of the bomb is provided with fiberboard washer 32 and with fiberboard discs 33 which cooperate with the lip at the base, and with the inside of element 19, respectively, such that when element 18 is inserted into element 19, the overall length of the unit thus formed is substantially equal to the length of cylinder 17. The fuse 34 of the bomb projects through an aperture in the middle of disk member 33. The various fiberboard members utilized in this package preferably have a pH in the range of 6.5 to 7.5 so as to prevent corrosion of the metal bomb elements at points of contact with the fiberboard members.

In assembling the disassembled fire-bomb case package illustrated in Figs. 1, 2, and 3, fiberboard washer 32 is passed over the smaller end of element 18 until it tightly engages element 18 as shown. Disc 33 is then placed in position on the end of element 18 and the base of element 18 is placed in groove 22 of fiberboard member 20. Element 19 is then placed over element 18 so that the base lip of element 19 engages washer 32 and the inside of element 19 engages the outer diameter of disc 33 as shown. One end of center cylinder 17 is then inserted into groove 21 with studs 24 extending into holes 23. Fiberboard member 25 is then placed in position so that the other end of cylinder 17 engages groove 26, with studs 28 extending into holes 27, and the apex end of element 19 fits into groove 29, with nipple 31 extending into hole 30. Cooperation between

the various bomb case elements and fiberboard members is maintained by band 35 which is placed about fiberboard members 20 and 25 and drawn tight as shown. The inner element thus formed is placed on outer cover 15 and the cover is closed and secured by wires 16.

From the above description and drawing, it can be seen that the elements of the disassembled fire-bomb case are supported in and spaced from the covering of the package and from each other by fiberboard members 20 and 25, washer 32, and disc 33. Also the bomb elements are padded by these same fiberboard members. Thus I have provided a package structure and a method for constructing same wherein the supporting, spacing, and padding functions for an article in the package are performed by a single material.

For another modification of the packaging means and method of my invention, refer now to Figs. 4, 5, and 6, which illustrate airplane ailerons packaged according to my invention. Numbers 40 and 41 indicate the aileron elements being packaged. The outer cover is referred to by number 42. The supporting, spacing, and padding members are indicated by numbers 43 and 44. Each of these fiberboard members, 43 and 44, is provided with a pair of elongated slots which extend partially through the fiberboard members and which are adapted to snugly receive and engage aileron elements 40 and 41. I prefer to arrange these slots so that each fiberboard member has a long and a short slot which receive the wide and the narrow ends of the ailerons, respectively. This arrangement of the slots can be seen in Fig. 6 wherein member 44 has been provided with a larger slot 45 for receiving and engaging the large end of an aileron, and with a smaller slot 46 for receiving and engaging the small end of the other aileron. Fiberboard member 43 has been provided with a similar set of slots, larger slot 47 being opposite smaller slot 46 so as to engage the large end of that aileron, and smaller slot 48 being opposite larger slot 45 so as to engage the small end of that aileron. This arrangement of the slots in the fiberboard members can be changed so as to have both large slots in the same fiberboard member and both small slots in the same member, however the slot arrangement as shown is preferred. It will be noted that cooperation between the fiberboard members and the ailerons is maintained by the action of the outer cover on fiberboard members 43 and 44.

The following example is included to illustrate some of the advantages and unusual results to be obtained by the practice of my invention.

In the following tabulation, a disassembled fire-bomb case package as presently known to the art is compared to the disassembled fire-bomb case package of my invention in such matters as amount and types of materials used, man-hours required for construction, and the like.

| Item | Present Package, Number of Items | Package of my Invention, Number of Items |
|-------------------------------------|----------------------------------|--|
| 1. Material: | | |
| a. Lumber..... | 12 | 0 |
| b. Rubberized hair..... | 12 | 0 |
| c. Nails (4 types)..... | 108 | 12 (optional) |
| d. Staples..... | 20 | 0 |
| e. Paper (Grade C)..... | 7 | 0 |
| f. Seals..... | 5 | 0 |
| g. 1/2 inch strap..... | 1 | 0 |
| h. Kowflex paper..... | 1 | 0 |
| i. 3/4 inch straps..... | 3 | 1 |
| j. Wirebound cover..... | 1 | 1 |
| k. Vapor-barrier bag..... | 1 | 1 (not shown) |
| l. Fiberboard members..... | 0 | 4 |
| Total Items..... | 171 | 19 |
| 2. Labor requirements: ¹ | | |
| a. Men required/day..... | 54 | 9 |
| b. Man-hours/week..... | 2,784 | 432 |
| c. Man-hours/package..... | 5.8 | 0.888 |

¹ Based on production of 480 packages per week.

From the above example, it can be seen that by the practice of my invention, the number of items required to package a disassembled fire-bomb case can be reduced by 152 (171-19) which represents a reduction of over 88.8 per cent in items required. This reduction in number of items required makes possible many savings in the packaging of fire-bomb cases according to my invention, for example, smaller inventories of fewer materials are required, purchasing and accounting of materials is reduced, labor required to produce the package is reduced thereby permitting the operation to be carried out on less floor space, and others.

Further, the labor requirement has been reduced by 4,942 (5.8-0.858) man-hours per package or by a percentage of over 85.2 per cent. This saving in man-hours results in considerable reduction in expense as well as other savings such as floor space required, and like factors.

It has also been found that the number of disassembled fire-bomb case packages which can be placed in a box car for shipment can be increased by at least 32 when the packages are constructed according to my invention. This increase in the number of packages which can be shipped in a box car is very desirable and results in a substantial saving in freight costs as well as makes available more shipping space for other purposes and thereby helps ease the shortage of box cars.

I have described my invention with particular reference to two specific packages; however, I intend such packages to illustrate the flexibility and adaptability of my packaging method and means rather than to unduly limit my invention, as it will be obvious to those skilled in the art, after reading the discussion and description herein given, that my invention can be advantageously practiced in the packaging of articles other than those specifically referred to herein.

I claim:

1. A package, which comprises, in combination, a disassembled fire-bomb case, said fire-bomb case comprising a center cylinder and a pair of cone-shaped end elements; an outer cover surrounding said fire-bomb and spaced from said fire-bomb; a first fiberboard member disposed in said space having first mounting means therein and one end of said cylinder and the apex end of one of said cone-shaped end elements mounted in said first mounting means; a second fiberboard member disposed in said space having second mounting means therein and the other end of said cylinder and the base end of the other of said cone-shaped end elements mounted in said second mounting means; a fiberboard washer on the outside of said other cone-shaped end element at a point intermediate the apex and base thereof, said fiberboard washer being in contact with and within said first-named cone-shaped end element at the base thereof; and a fiberboard disc disposed near the apex end of said other cone-shaped end element, said disc having third mounting means therein with said other cone-shaped end element mounted therein and said disc in contact with and within said first-named cone-shaped end element at a point intermediate the base and apex ends thereof.

2. A package, which comprises, in combination, an outer cover; a disassembled fire-bomb case disposed inside said outer cover and spaced from said cover, said fire-bomb case comprising a center cylinder, a first cone-shaped end element and a second cone-shaped end element, the apex end of said first cone-shaped end element extending into said second cone-shaped end element from the base thereof; a first fiberboard member having a pH of from 6.5 to 7.5 disposed inside said outer cover near one end thereof communicating with said outer cover, said first fiberboard member having a first recess therein with one end of said center cylinder mounted therein, and having a second recess therein with the lip of said first cone-shaped end element mounted therein at the base thereof; a second fiberboard member having a pH of

from 6.5 to 7.5 disposed inside said outer cover near the other end thereof communicating with said outer cover, said second fiberboard member having a first recess therein with the other end of said center cylinder mounted therein, and having a second recess therein with the apex end of said second cone-shaped end element mounted therein; a fiberboard washer having a pH of from 6.5 to 7.5 on said first cone-shaped end element intermediate the ends thereof, said washer engaging and within said second cone-shaped end element near the base thereof so as to space said first and second cone-shaped end elements and prevent contact therebetween; a fiberboard disc having a pH from 6.5 to 7.5 disposed near the end of said first cone-shaped end element, the outer edge of said disc bearing against the inside of said second cone-shaped end element; and means urging said first and second fiberboard members together so as to insure contact between said fiberboard members and said fire-bomb center cylinder and end elements.

3. A package, which comprises, in combination, an outer cover; a disassembled fire-bomb case disposed inside said outer cover and spaced from the sides and ends of said outer cover, said fire-bomb case comprising a center cylinder, a first cone-shaped end element, a second cone-shaped end element, a nipple extending from the apex end of said second cone-shaped end element, said first and second cone-shaped end elements being spaced from said center cylinder and said outer cover in a coaxial arrangement with the apex end of said first cone-shaped end element extending inside the second cone-shaped end element from the base end thereof; a first fiberboard supporting, spacing, and padding member disposed inside said outer cover at one end thereof bearing against said one end and walls of said outer cover, a first annular recess in one end portion of said first fiberboard member and one end of said center cylinder mounted therein, a second annular recess in the other end portion of said first fiberboard member and the base end of said first cone-shaped end element mounted therein; a second supporting, spacing, and padding fiberboard member disposed inside said outer cover at the other end thereof bearing against said other end and walls of said outer cover, the plane of said second fiberboard member being substantially parallel to the plane of said first fiberboard member, a first annular recess in one end portion of said second fiberboard member and the other end of said center cylinder mounted therein, said first annular recess in said second fiberboard member being substantially coaxial with said first annular recess in said first fiberboard member, a second annular recess in the other end portion of said second fiberboard member and the apex end of said second cone-shaped end element mounted therein, said second annular recess in said second fiberboard member being substantially coaxial with said second annular recess in said first fiberboard member, a hole in said second fiberboard member coaxial with said second annular recess, said nipple on said second cone-shaped end element being mounted in said hole; a fiberboard supporting, spacing, and padding washer disposed on the outside circumference of said first cone-shaped end element intermediate the base and apex ends thereof, the outer circumference of said washer engaging said second cone-shaped end element at the base thereof for spacing said first and second cone-shaped end elements; a fiberboard supporting, spacing, and padding disc disposed on the apex end of said first cone-shaped end element, the outer circumference of said disc bearing against the inner side of said second cone-shaped end element intermediate the ends thereof, said disc further spacing said first and second cone-shaped end elements; and tying means urging said first and second fiberboard members together.

4. A package according to claim 3 wherein said first and second fiberboard supporting, spacing, and padding members, said fiberboard supporting, spacing, and padding washer, and said fiberboard supporting, spacing, and padding disc have a pH in the range of 6.5 to 7.5.

5. A package, which comprises, in combination, outer cover means, a disassembled fire-bomb case comprising hollow conoidal end members and a hollow center member nested within and spaced from said cover means with an apex end portion of one of said end members projecting into one other of said bomb case members, a first end fiberboard member at one end portion of said cover means between the end thereof and said disassembled fire-bomb case members and in contact therewith, and a second end fiberboard member in the other end portion of said cover means between the end thereof and said disassembled fire-bomb case members and in contact therewith, said end fiberboard members having mounting means therein and end portions of said bomb case members mounted in their respective end fiberboard member mounting means, and inner fiberboard means between and in contact with said apex end portion of said one of said end members and said other member into which it projects, said inner fiberboard means having an aperture therethrough and said apex end portion mounted in said aperture, and said fire-bomb case members spaced from each other in said package.

6. A package, which comprises, in combination, outer cover means, disassembled outer housing members comprising hollow conoidal end members and a hollow center member nested within and spaced from said cover means with an apex end portion of one of said end members projecting into one other of said housing members, a first end member at one end portion of said cover means between the end thereof and said housing members and in

contact therewith, and a second end member in the other end portion of said cover means between the end thereof and said housing members and in contact therewith, said end members having portions which support, space and pad said housing members and having mounting means therein and end portions of said housing members mounted in their respective end member mounting means, and inner means between and in contact with said apex end portion of said one of said end members and said other member into which it projects, said inner means having portions which support, space and pad said housing members and having an aperture therethrough and said apex end portion mounted in said aperture, and said housing members spaced from each other in said package.

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