United States Patent [19]

Mascetti, Jr.

[11] **3,771,646**

[45] **Nov. 13, 1973**

[54] **SHIPPING HOLDER FOR SPARK PLUGS OR THE LIKE**

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[73] Assignee: **Plastofilm Industries, Inc.**, Wheaton, Ill.

[22] Filed: **June 28, 1972**

[21] Appl. No.: **267,237**

[52] **U.S. Cl.** ..... **206/65 K**, 206/72, 217/26.5, 220/97 C

[51] **Int. Cl.** **B65d 1/34**, B65d 71/00

[58] **Field of Search** ..... 206/45.19, 46 FR, 206/46 H, 65 R, 65 K, 65 Y, 72; 217/26.5; 220/97 C, 97 D; 229/2.5

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Primary Examiner—George E. Lowrance
Assistant Examiner—Steven E. Lipman
Attorney—Howard H. Darbo et al.

[57] **ABSTRACT**

A rectangular plate has four sidewalls projecting therefrom. There is a continuous flange about the distal ends of the sidewalls. The plate has a series of openings arranged in a given pattern as oriented with respect to one of the sidewalls. These openings are large enough to permit the insulator of a spark plug to project therethrough, but sufficiently small so that the plate about the openings will abut the spark plug body. A second set of conformations are positioned in the same pattern as oriented with respect to the opposite sidewall. These second conformations each comprise an annulus extending from the plate in the same direction that the sidewalls extend therefrom and a thimble within the annulus, joined to the distal end of the annulus and extending back beyond the plate in the opposite direction. This thimble is of a size to accept the electrode ends of the spark plugs while contacting the abutment of the plug at the end of the thread. The described structure is vacuum molded from plastic and a plurality of them are stacked to hold a plurality of spark plugs for shipment.

10 Claims, 6 Drawing Figures

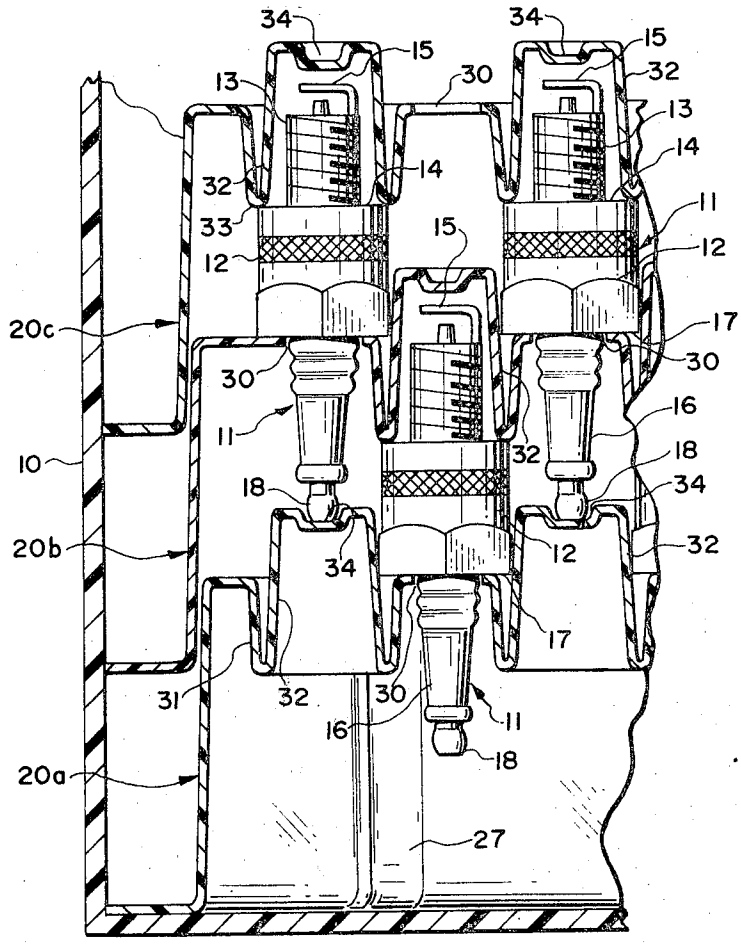
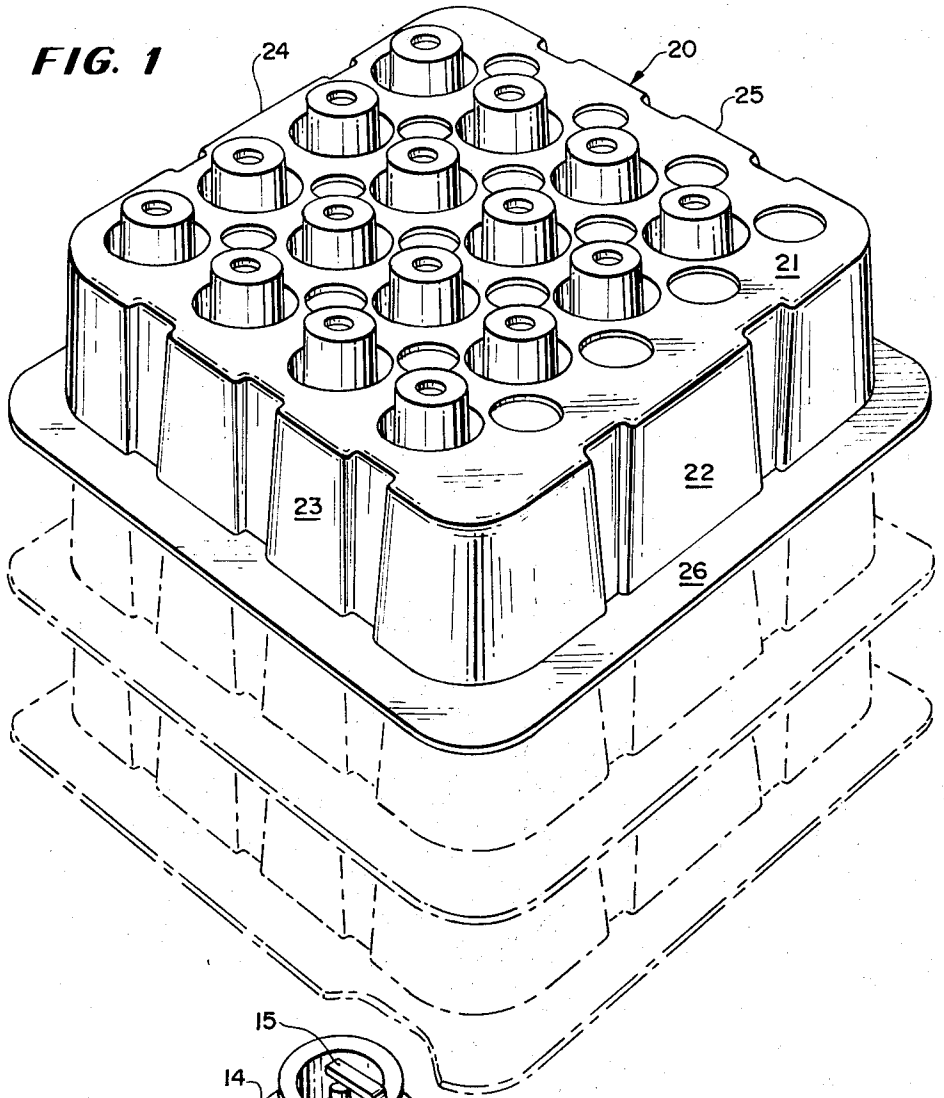


FIG. 1



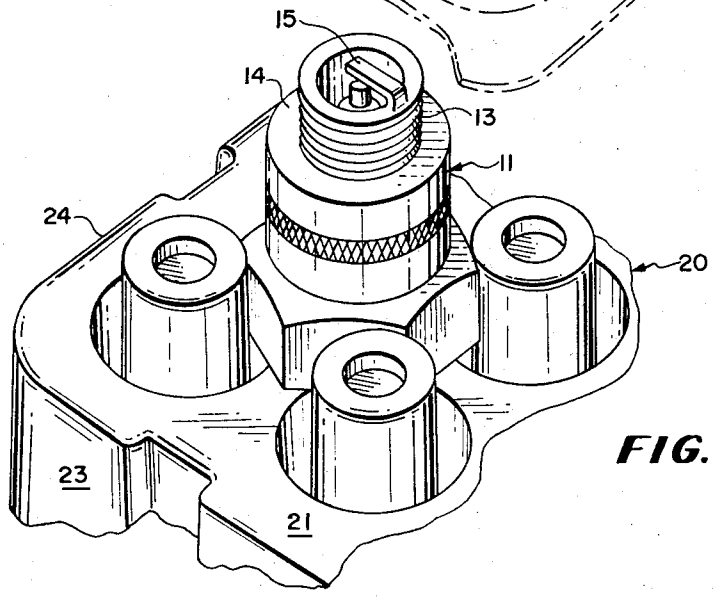


FIG. 2

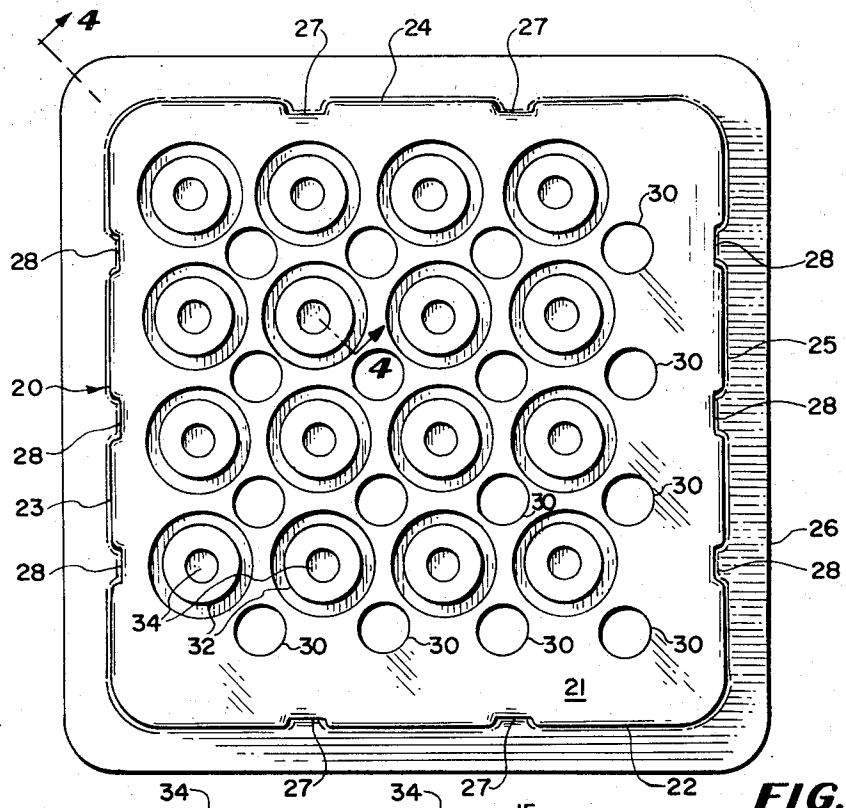

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FIG. 3

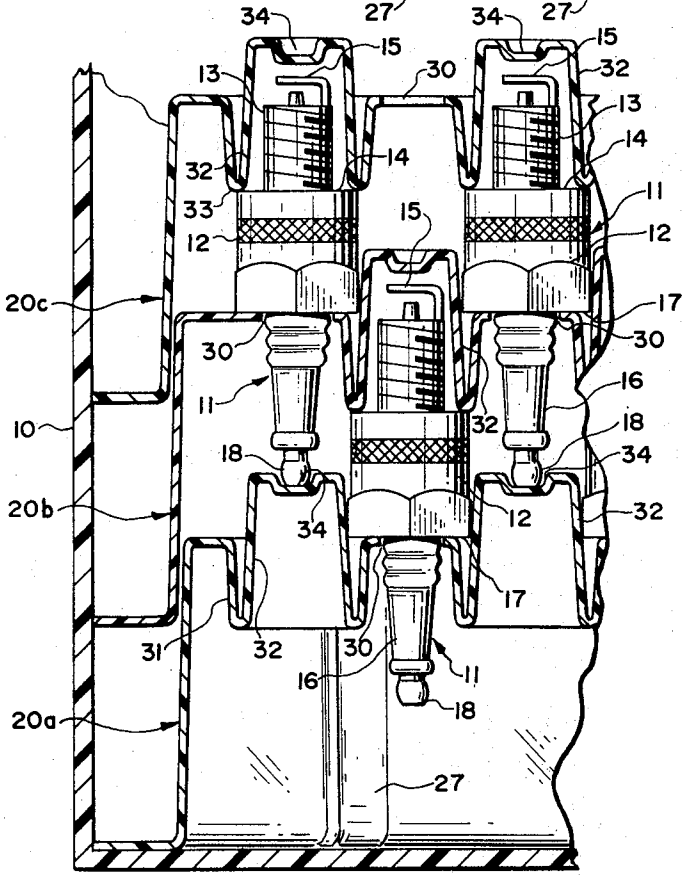

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FIG. 4

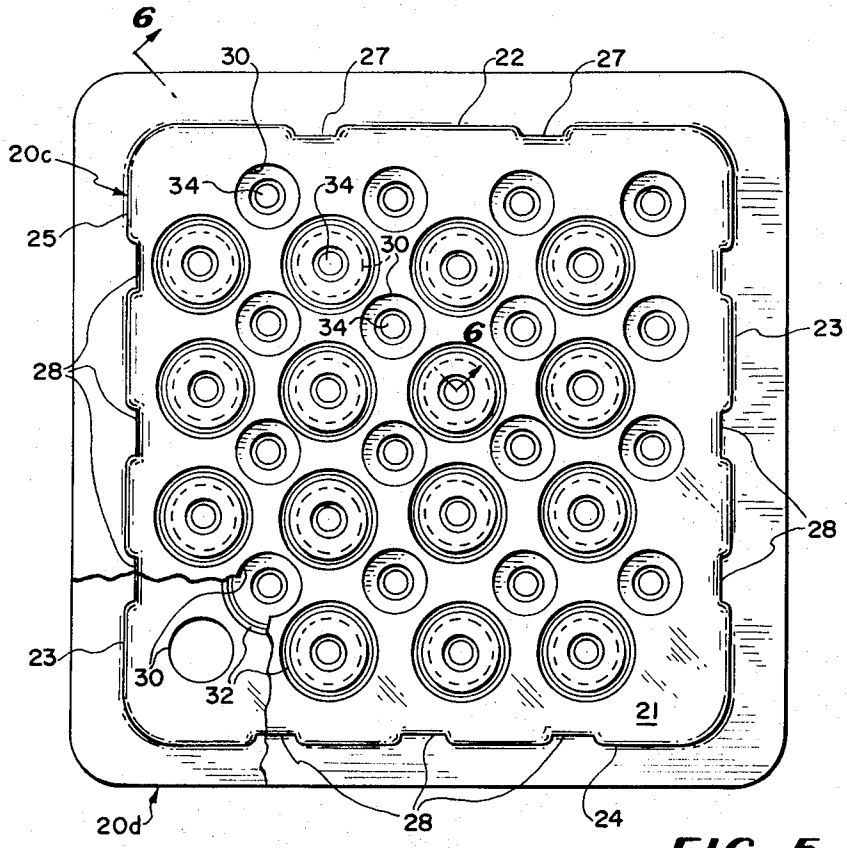

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FIG. 5

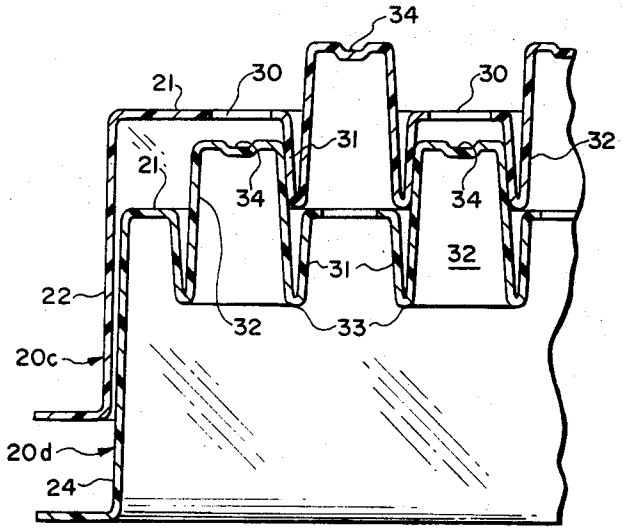

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FIG. 6

SHIPPING HOLDER FOR SPARK PLUGS OR THE LIKE

SUMMARY OF THE INVENTION

The present invention relates to an inexpensive thin plastic support for use within a shipping container for cushioning a plurality of objects, such as spark plugs, within that container.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a unit incorporating the present invention and showing the manner in which it is stacked with other corresponding units;

FIG. 2 is a perspective view of a corner of the unit showing the body of a spark plug supported thereon;

FIG. 3 is a plan view of the unit;

FIG. 4 shows a plurality of stacked units holding spark plugs;

FIG. 5 is a plan view showing two of the units as they are stacked for shipment when not holding spark plugs; and

FIG. 6 is a partial section as seen at line 6—6 of FIG. 5.

DESCRIPTION OF SPECIFIC EMBODIMENT

The following disclosure is offered for public dissemination in return for the grant of a patent. Although it is detailed to ensure adequacy and aid understanding, this is not intended to prejudice that purpose of a patent which is to cover each new inventive concept therein no matter how others may later disguise it by variations in form or additions or further improvements.

The embodiments of the present invention were devised for packaging a plurality of spark plugs for shipment from the place of business of the spark plug manufacturer to an automobile manufacturer where the spark plugs are inserted into an automobile. These embodiments hold a plurality of spark plugs in an outer container **10** in a manner such that the spark plugs are protected against damage. Furthermore, the units protect the spark plugs against dust, both when in the container and outside of the container. The spark plugs, generally **11**, are of a conventional construction and the details form no part of the present invention except insofar as advantages are taken of those details in connection with the packaging using the embodiments of the present invention. The spark plugs have a body **11** having a threaded end **13** which extends outwardly from an abutment or shoulder **14** on the body. At the distal end of the body is one **15** of a pair of electrodes. An insulator **16** extends from the other end of the body which forms a shoulder or abutment **17.** At the distal end of the insulator is a metallic connector **18.**

The present invention is a packaging unit, generally **20,** vacuum formed from a suitable thermoplastic film material such as polyvinyl chloride, polystyrene, polypropylene, etc. It is relatively thin in cross-section. That is, for a unit that is intended for only a single use (e.g. a throwaway unit) the wall thickness would be between about 0.030 and 0.060 inches. If it were to be a reusable unit (that is shipped back and forth numerous times) a slightly thicker wall would be employed, as for example between 0.080 and 0.120 inches.

The unit has a planar plate **21** which is generally rectangular in configuration. Extending in one direction from the plate are four sidewalls **22–25.** About the other end of the sidewalls is a peripheral flange **26.** In the sidewalls **22** and **24** are two offsets **27.** Each of the sidewalls **23** and **25** have three offsets **28.** These offsets form grooves on the outside and projections on the inside. These projections and grooves serve as guides to limit the orientation at which one unit may be telescoped onto another unit. Thus in the embodiments of FIGS. 1 and 3, the units can be telescoped together only in two different orientations which are 180° apart. In the embodiment illustrated in FIG. 5, there are three offsets **28** on the three sides **22, 23** and **25** and only two offsets **27** on one of the sides, namely **24.** Thus, in this embodiment, the units can be telescoped together only in one orientation with respect to each other. When telescoped together, either when loaded with spark plugs or not, the sidewalls of each successive unit overlap the sidewalls of the next lower unit.

Positioned in the plate **21** are two sets of conformations. Each set of conformations is positioned in the same identical pattern, however, one set of conformations is intermixed with the other and oriented with respect to different sides of the plate. A further characteristic is that, in the main, each of one group of conformations is centered between four of the conformations of the other group. The conformations of one group comprise openings **30** extending through the plate **21.** These openings **30** are of a size to permit the insulator **16** of the spark plugs to extend therethrough, while not large enough to permit the shoulder **17** of the body **12** to pass through the opening. Each of the other set of conformations comprises an annular collar **31** whose proximal end is integral with plate **21.** Within collar **31** is a thimble **32.** The proximal end of the thimble is integral with the distal end of the collar as indicated at **33.** The other end of the thimble is closed and has a depression or socket **34** in the outside of the closed end. Approximately one-half of the thimble extends above and below the plate. The internal opening of the thimble is large enough to receive the threaded end **13** of the spark plug, but small enough at **33** so as to seat against the shoulder **14** of the spark plug. The depression **34** is of a size to receive the metallic connector **18** on the insulator end of the spark plug.

It will be noted that one set of conformations is arranged at the same spacing with respect to one of the sides as the other set of conformations is arranged with respect to another of the sides; that is, conformations **30** have the same spacing and arrangements with respect to sides **22** and **25** that the conformations **31-34** have with respect to sides **24** and **23** respectively. Thus, for example, all of the units are made on a single mold and, when they come out of that mold, have the identical orientation with respect to each other. If each successive one is then rotated 180° and they are stacked together, the result will be that the conformations of one type of each successive unit will be immediately over the conformations of the other type. This is illustrated in FIG. 4 where there are three units **20***a*, **20***b* and **20***c* stacked one on top of the other. Before doing so, however, unit **20***b* was rotated 180° with respect to units **20***a* and **20***c*. Thus the openings **30** of unit **20***b* are vertically aligned with the thimbles **32** of units **20***a* and **20***c* and the openings **30** of units **20** *a* and **20***c* are vertically aligned with the thimbles **32** of unit **20***b*.

In actual practice, each unit **20** would be placed upon a table or other support in the manner illustrated in FIG. 3. The openings **30** would be filled with spark

plugs by inserting the insulators **16** of the plugs down through the openings. As each unit was filled it would be stacked on top of a previously filled unit to achieve the arrangement illustrated in FIG. **4**. In doing so, the metallic connectors **18** would be seated in the tops of the thimbles of the preceding layer. The box **10** would be unpacked in a similar, but reverse, operation. It will be readily apparent to those skilled in the art that these loading and unloading operations are ideally suited to being carried out by automatic machinery. This is a desirable characteristic because of the monetary saving that can be achieved by such automatic operation. It will also be apparent from FIG. **4**, that the spark plugs are securely held within the outer carton **10** and cushioned against damage by jolts or jars. Not only are the plugs held against flopping around and banging into each other, but the thin plastic walls of the units provide a shock cushioning and shock absorbing effect. Each succeeding unit, or layer of plugs, is supported in two respects; i.e. (1) the juncture **33** of the collar and thimble rests upon the plugs of the next lower layers, and (2) the metallic connectors **18** rest upon the tops of the thimbles **32** of the next lower layer.

FIGS. **5** and **6** illustrate two corresponding units **20***d* and **20***e*. These figures illustrate the desirable way to nest the units when they are being shipped empty of plugs. In this arrangement the bottoms **33** of the joined thimbles and collars of each successively higher unit rests upon the plate **21** of the unit immediately below it. This prevents the units from telescoping together so far as to obtain a friction fit between the parts, since the plate and the bottom of the thimble serve as stops to prevent it. Note that the sidewalls **22** and **24** of the successive units **20***e* and **20***d* have a clearance between them. Were they to telescope farther together, this clearance would disappear and frictional engagement would occur. FIG. **6** does illustrate a contact between the collars **31** of the unit **20***e* and the thimbles **32** of the unit **20***d*. However, this is just a line contact and does not result in any significant friction that impairs the ability to separate two units. Thus the units may be telescoped together for shipment when empty, reducing the space occupied by a plurality of units, without having the disadvantage normally attendant such telescopic fits.

It also should be noted that while the embodiment illustrated in FIGS. **1** and **3** can be made using a single mold, the embodiments **20***d* and **20***e* illustrated in FIGS. **5** and **6** must be formed on two separate molds, one to produce "lefts" (e.g. unit **20***e*) and the other to produce "rights" (e.g. unit **20***d*).

I claim:

1. A packing unit for use in shipping objects elongated along an axis having two oppositely facing abutments spaced apart along said axis and a projection along the axis extending beyond one of the abutments, said unit comprising:

a plate formed of plastic and having a plurality of sidewalls, said plate having a first set of conformations therein arranged in a given pattern with respect to one of said sidewalls and a second set of conformations therein arranged in said given pattern with respect to a second of said sidewalls, the conformations of the first set being identical to each other, the conformations of the second set being identical to each other and different than the conformations of the first set, whereby when one of said units is placed above a second of said units, both of said units being the same side up, with the one wall of the one unit above the second wall of the second unit, the first set of conformations of the one unit are vertically above the second set of conformations of the second unit,

each conformation of said first set being an opening in said plate of a size large enough to accept said projection, but small enough so that the part of said plate about the opening and at one side of the plate abuts said one abutment,

each conformation of said second set of conformations comprising means on the other side of the plate to connect the other abutment when two of the units are positioned one above the other as described above and means on said one side of the plate defining a socket to receive said projection when a third of said units is placed below the second with said one walls of the first and third units in alignment.

2. A packaging unit as set forth in claim **1**, wherein each of said second set of conformations comprises an annular collar extending in one direction from the plate and generally normal thereto, said collar having a proximal end joined to the plate and a distal end, said distal end forming said abutment and having an opening therein.

3. A packing unit for use in shipping objects elongated along an axis having two oppositely facing abutments spaced apart along said axis and a projection along the axis extending beyond one of the abutments and a second projection along the axis and extending outwardly from the other abutment, said unit comprising:

a plate formed of plastic and having a plurality of sidewalls, said plate having a first set of conformations therein arranged in a given pattern with respect to one of said sidewalls and a second set of conformations therein arranged in said given pattern with respect to a second of said sidewalls, the conformations of the first set being identical to each other, the conformations of the second set being identical to each other and different than the conformations of the first set, whereby when one of said units is placed above a second of said units with the one wall of the one unit above the second wall of the second unit, the first set of conformations of the one unit are vertically above the second set of conformations of the second unit,

each conformation of said first set being an opening in said plate of a size large enough to accept said projection, but small enough so that the plate about the opening abuts said one abutment,

each conformation of said second set of conformations comprising means to contact the other abutment when two of the units are positioned one above the other as described above, each of said second set of conformations comprising an annular collar extending in one direction from the plate and generally normal thereto, said collar having a proximal end joined to the plate and a distal end, said distal end forming said abutment and having an opening therein,

said unit being formed of relatively thin sections of molded plastic, each of said second set of conformations including a thimble having a large end and a small end, the thimble being positioned within

said collar with the large end joined to said distal end, the small end of the thimble being beyond said plate in the direction opposite to said one direction, said thimble being sufficiently long to accept said second projection, said large end being sufficiently small to contact said other abutment.

4. A unit as set forth in claim **3**, wherein the sidewalls project in one of said directions beyond the plane of the plate, including outwardly extending flanges about the distal ends of said sidewalls.

5. A unit as set forth in claim **4**, wherein said plate is rectangular and including indexing means extending parallel to said one direction from the distal end of at least one of the sidewalls to restrict the orientation in which said units may be stacked.

6. A unit as set forth in claim **3**, wherein said thimble has a base with a dimple therein, said dimple being positioned to receive the distal end of the first projection of the object extending through the opening of the adjacent unit.

7. A unit as set forth in claim **1**, wherein said one sidewall is 180° with respect to said second sidewall.

8. A packaging unit for use with other like units in packaging in a container a plurality of objects such as spark plugs having a body threaded at one end with a shoulder at the base of the threads and an insulator projecting from the other end of the body and a metal connector at the distal end of the insulator, each said unit being a thin sheet of thermoplastic having at an opening at each of a plurality of locations therein and having at each of a plurality of other locations therein a collar extending to one side of the sheet, said collar having a proximal end integral with the sheet and a distal end, a thimble having a closed end and an open end, said open end being integral with the distal end of the collar, said thimble extending through the collar with approximately one-half of the collar extending to each side of the sheet, the closed end of the thimble having a dimple therein.

9. A unit as set forth in claim **8**, wherein the openings form one group of conformations and the collars-thimbles form a second group of conformations, in the main each conformation of one group being centered between four conformations of the other group and vice versa.

10. In the combination of a plurality of spark plugs and packaging units therefor to be shipped in an outer container, wherein said spark plugs have a body with two oppositely facing, spaced abutments and an insulator projecting beyond one of said abutments, the improvement comprising:

each of said units including:

a plate formed of plastic and having four sidewalls, said plate having a first set of conformations therein arranged in a given pattern with respect to one of said sidewalls and a second set of conformations therein arranged in said given pattern with respect to a second of said sidewalls, the conformations of the first set being identical to each other, the conformations of the second set being identical to each other and different than the conformations of the first set,

each conformation of said first set being an opening in said plate of a size large enough to receive said insulator, but small enough so that the plate about the opening abuts said one abutment of said spark plug body,

each conformation of said second set of conformations comprising means to contact the other abutment when two of the units are positioned one above the other as described below,

said units being stacked in a plurality of layers with alternate layers being positioned so that the one wall of one is aligned with the second wall of the next, the spark plugs being positioned between each layer with the insulators extending through said openings and the one abutments of the spark plugs against the part of the plate about the opening and the other abutments of the body against the means of the second set of conformations of the unit of the adjacent layer.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,771,646 Dated November 13, 1973

Inventor(s) Joseph A. Mascetti, Jr.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the Abstract, 4th line from end	"of the plug" should be --on the plug--
Col. 4, line 14	"connect" should be --contact--

Signed and sealed this 25th day of June 1974.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
☆ U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334.