This invention relates generally to containers of the type which are commonly referred to as service kits and are used to hold articles for storage or display. The invention relates, more particularly, to an improved service kit for containing a graduated series of O-rings of different sizes.

Persons engaged in both the sale and use of O-rings frequently find it necessary, or desirable to maintain on hand a large supply of O-rings of different sizes. There is, therefore, a demand for a practical and inexpensive container for holding a supply of O-rings of different sizes in an organized fashion so that an O-ring of a particular size may be readily selected from the container. In the case of persons engaged in selling O-rings, it is further desirable that a storage container be constructed in such a way that it may be used also to display the O-rings to potential purchasers. A container of this type is commonly referred to as a service kit.

A general object of the present invention is to provide an improved service kit for containing a graduated series of O-rings of different sizes in such a manner that the different sized O-rings contained within the kit, and their respective dimensions, are readily visible.

Another object of the invention is to provide an O-ring service kit of the character described which is relatively simple in construction, inexpensive to manufacture, pleasing in appearance, lightweight, and otherwise uniquely constructed and arranged to optimally fulfill its intended functions.

Other objects, advantages, and features of the invention will become readily apparent to those skilled in the art as the description proceeds.

Briefly, the objects of the invention are attained by providing an O-ring container, or service kit, which may be conveniently made as a two-piece, molded plastic structure including a base and a hinged cover. On the base are a series of upright, cylindrical posts of different diameters corresponding to the internal diameters of the O-rings to be contained in the kit. These cylindrical posts are also grouped as to the cross-sectional dimension of the O-rings. Each post is proportioned so that its respective size of O-ring has a light slip fit on the post, whereby each post serves the normal circular shape and diameter of the O-rings positioned therein.

The number of posts of each diameter and the axial length or height of the posts is determined in accordance with the number of O-rings of each size to be contained in the kit, which number, in turn, may be determined by the number of O-rings of each size that a typical purchaser of the kit finds convenient to have on hand.

The service kit is uniquely constructed so that when the cover of the kit is closed on the base, the cover serves to retain the O-rings on their respective supporting posts.

According to one aspect of the invention, for example, this is accomplished by so proportioning the posts of the kit that the cover engages the upper end faces of the posts, or is spaced from such upper end faces a distance less than the cross-sectional diameter of the O-rings on the respective posts, when the cover is closed.

In accordance with a further aspect and preferred practice of the invention, however, some of the O-ring supporting posts, which are designed to hold O-rings of the more frequently used sizes, such as O-rings of very small diameter, extend from the ends of other supporting posts which are designed to hold O-rings of larger diameters. In this case, the cover of the service kit retains the O-rings on the small diameter posts nearest the cover. The cover is further provided with at least one hold-down, and preferably two hold-downs, adapted to retain the O-rings on the larger diameter posts nearest the base of the service kit.

According to the preferred method of fabrication of the service kit, the base and cover of the kit each comprises a single, integral molded structure. It will become evident as the description proceeds, however, that the present improved O-ring service kit may be made in other ways.

A presently preferred embodiment of the invention will now be described by reference to the attached drawings, wherein:

FIG. 1 is a perspective view of the present O-ring service kit with its cover closed;
FIG. 2 illustrates the kit, empty of O-rings, with its cover open;
FIG. 3 is an enlarged plan view of a portion of the base of the kit;
FIG. 4 is an enlarged section taken on line 4—4 in FIG. 2;
FIG. 5 is an enlarged section taken on line 5—5 in FIG. 2; and
FIG. 6 is an enlarged view looking in the direction of arrow 6 in FIG. 5.

The O-ring kit 10 illustrated in these drawings comprises a container structure 12 including a base 14 and a hinged cover 16. According to the preferred practice of the invention, the base 14 is a one-piece molded plastic member which is configured to define the various structural elements hereinafter described in connection with the cover. Similarly, cover 16 is also preferably a one-piece molded plastic member which is configured to define the various structural elements hereinafter described in connection with the cover. It will become evident to those skilled in the art as the description proceeds, however, that the container structure 12 of the present O-ring kit may be made in other ways. Conceivably, for example, the various structural elements which are included on the base and cover members could be separately fabricated and then attached in some convenient way to their respective members.

Referring now to the base 14 in detail, the latter will be seen to have a flat bottom wall 18, the peripheral edge portion of which is reduced in thickness, as shown, to form a ledge 20 along the front edge 22 and side edges 24 of the wall. Rising from the rear edge of the wall 18 is a rear wall 26. Joined to the bottom wall 18 adjacent its side edges 24 and to the ends of the rear wall 26, and extending forwardly from the rear wall, are beveled, gusset-like wall sections 28. These sections reinforce the rear wall against lateral deflection.

Rising from the bottom wall 18 of the base 14 are a multiplicity of cylindrical O-ring supporting posts which have been collectively designated by the reference numeral 30. The O-rings R to be contained in the present O-ring kit 10 are stacked one over the other on these posts in the manner shown in the drawings. As mentioned earlier, and as is evident from the drawings, the present O-ring kit 10 is designed to contain or hold a supply of O-rings R having a graduated series of different diameters grouped as to similar O-ring cross-sectional dimension. According to the preferred practice of the invention, the O-ring supporting posts are provided with different diameters corresponding, respectively, to the
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different internal diameters of the O-rings to be contained in the kit. In the drawings, for example, the post 30a has the smallest diameter and is designed to hold the smallest sized O-rings contained in the kit. The remaining posts, up to the largest diameter post 38b, have progressively increasing diameters and are designed to hold O-rings of progressively increasing diameter in groupings of similar cross section, as shown.

According to the preferred practice of the invention, each O-ring supporting post is diametrically sized to receive its respective size of O-rings with a light slip fit such that the rings are not stretched, at any appreciable extent, when placed on the posts. In this way, the posts aid in preserving the correct diameter and normal circular shape of the O-rings in the kit.

It is quite obvious that O-ring requirements vary from one O-ring purchaser or user to another. One purchaser, for example, may not have any need at all for some O-ring sizes which are required by other purchasers. It is equally obvious that each kit cannot possibly be individually filled with just the correct numbers and sizes of O-rings to fulfill the requirements of each individual purchaser of the kit.

For this reason, the present invention contemplates O-ring kits which are tailored to different classes of purchasers and equipped with the proper numbers and sizes of O-rings to satisfy the O-ring requirements of the average purchasers of the respective classes. The O-ring service kit 18 illustrated in the drawings, for example, is tailored to satisfy the average O-ring requirements of a class of O-ring purchaser who uses O-rings that vary in external diameter from one-quarter to one inch. Once the numbers and sizes of O-rings to be contained in a particular class of service kit are determined, of course, the numbers and diameters of the O-ring supporting posts required to hold the O-rings can be determined.

It is evident that the O-ring storage capacity of the present O-ring service kit 18 can be varied by varying the number and/or axial length of the posts. According to the preferred practice of the invention, each post is axially dimensioned so that it is slightly longer than the overall length of the stack of O-rings to be initially placed on the post. Referring to FIGS. 2 and 4, it will be observed that one group 30' of the O-ring supporting posts 30 is of substantially the same length and each post in this group has a uniform diameter.

The reason for this equal length of the posts in group 30' will be explained shortly. Suffice it to say at this point that the posts in group 30', in addition to being axially dimensioned in relation to the stack of O-rings initially placed thereon in the manner explained above, are of a length slightly less than the desired overall thickness of the O-ring kit with the cover 16 closed, as will be hereinafter explained in more detail.

The remaining group 30'' of O-ring supporting posts is composed of the smallest diameter posts and the largest diameter posts, as shown. Each smaller post in post group 30'' is shorter than the posts of group 30' and extends from the end of a larger post which is also shorter than the posts of group 30'. The reason for making the smallest and largest diameter O-ring supporting posts of group 30'' shorter than the posts of group 30' is that in the class of O-ring purchaser for which the illustrated kit is tailored, these sizes of O-rings are less frequently used than the sizes of O-rings which are placed on the posts of group 30' and, therefore, need not be provided in such large quantity as the latter rings. Placing the short, smallest diameter posts on the short, largest diameter posts, of course, permits the base 14 to be made smaller, and, thereby, the kit as a whole to be made more compact, than if all of the posts were placed directly on the bottom wall 18 of the base.

It will be observed in FIG. 4 that the overall length of each post pair in group 30'', that is to say, each post pair consisting of a short small diameter post and its respective short large diameter post, is substantially equal to the length of the longer posts in group 30'. The reason for this will be explained presently.

Reference is now made to cover 16 of the present O-ring service kit 10. Cover 16 will be seen to comprise a top wall 32, a front wall 34 along the forward edge of the top wall, a rear wall 36 along the rear edge of the top wall, and side walls 38 along opposite side edges of the top wall and joined to the front and rear walls 34 and 36. When the cover 16 is in its closed position, the lower edge of the rear cover wall 36 is disposed in close proximity to or about the upper edge of the rear base wall 26. In this position of the cover, the lower edges of the front wall 34 and side walls 38 of the cover rest on the ledge 28 about the edge of the base. Cover 16 is pivotally connected to the base, for swinging between its closed position of FIG. 5 and its opened position of FIG. 2, by hinges 40 on the rear walls 26 and 36 of the base and cover, respectively. While any convenient type of hinges may be employed for this purpose, hinges 40 have been illustrated as comprising cooperating hinge parts 42 and 44 which are molded integrally with and project from the rear surfaces of the rear base wall 26 and the rear cover wall 36, respectively. As may be best observed in FIG. 1, the rear edges of the cover side walls 38 are beveled at 46 to complement the beveled forward edges of the rear base wall gussets 28 when the cover is closed. In this closed position of the cover, the beveled cover side wall edges 46 are disposed in close proximity to or about the opposing beveled edges of the gussets.

It is desirable, though not essential, that the cover 16, when in its closed position on the base 14, be latched to the base. Any convenient releasable latch means, such as that illustrated at 48, may be employed for this purpose. The illustrated latch, for example, comprises cooperating latch parts integrally molded with the cover and base.

Referring now to FIGS. 4 and 5, it will be observed that the O-ring supporting posts 30 are so axially dimensioned with respect to the spacing between the bottom wall 18 of the base 14 and the top wall 32 of the cover 16 that when the latter occupies its closed position on the base, the top cover wall 32 is disposed in close proximity to the upper ends of all of the O-ring supporting posts 30. In this way, the O-rings on the O-ring post group 30' as well as the O-rings on the short, upper, small diameter posts in the post group 30'' are restrained against slipping off their respective supporting posts when the cover 16 of the kit is closed. Thus, the O-rings on the posts just referred to will remain on the posts, regardless of the position occupied by the O-ring kit 10.

According to the invention, the O-rings R on the short, lower, larger diameter posts in the post group 30'' are retained on these posts by holddown pins 50 depending from the underside of the cover top wall 32. In the preferred practice of the invention, a pair of holddowns 50 are associated with each of the lower posts in post group 30'' and are arranged to straddle the respective lower post in a direction parallel to the pivot axis of the cover, as may be observed best in FIG. 4. The lower ends of the holddowns 50 have been illustrated as terminating approximately in the plane of the end faces of the respective lower posts. When the cover 16 of the kit 10 is closed on the base 14, therefore, a pair of holddowns 50 are disposed opposite the upper end of the stack of O-rings R on each lower post in post group 30'' and serve to retain the O-rings on these latter posts regardless of the position occupied by the O-ring kit 10. It will be obvious that while two holddowns 50 have been illustrated for each lower post, only one holddown, or more than two holddowns, could conceivably be employed.

The above-described arrangement of the present O-ring kit, whereby the O-rings R contained in the kit are restrained against slipping off their supporting posts 30
when the cover 16 of the kit is closed, constitutes a highly unique and important feature of the invention. Thus, it will be evident that if the O-rings were not thus retained on the post, the rings could easily slip off of the posts if the kit were inverted. This would obviously result in a jumbled mass of O-rings of different sizes in the kit.

The sizes of the O-rings on each supporting post 30 may, if desired, be identified by a suitable legend on the end face of the post. Also, if desired, the kit may be color coded by making the posts 30 which support O-rings of the same size of the same color and the posts which support O-rings of different sizes of different color. This color coding of the O-ring kit not only facilitates selection of an O-ring of the desired size but also renders the O-ring kit extremely pleasing in appearance such that it may be used to advantage either as a sales kit by an O-ring salesman or as a convenient storage container by the O-ring purchaser or user.

As indicated earlier, an additional advantage of the present O-ring kit configuration is that the O-ring supporting posts 30, being diametrically dimensioned to receive the O-rings with a light slip fit, serve to preserve the normal circular shape and proper diameter of the O-rings placed thereon. A further advantage of this configuration, also as mentioned earlier, resides in the fact that a substantial reduction in the overall size of the O-ring kit is effected by placing the short, small diameter posts in post group 30' on the ends of the respective short, large diameter posts.

Various possible alternative designs of the present O-ring service kit will immediately present themselves to those skilled in the art. It is quite evident, for example, that all of the posts 30, both those in the post group 30' and those in the post group 30", may be placed directly on base wall 13 and be made of substantially the same height, in which case the top panel 32 of the cover 16 would serve to retain the O-rings on all of the O-ring supporting posts. As already indicated, of course, the numbers and the diameters of the several different sized O-ring supporting posts included in the kit may be varied, as desired, in accordance with the numbers and sizes of O-rings to be contained in the kit.

Clearly, therefore, the invention herebefore described and illustrated is fully capable of attaining the several objects and advantages preliminarily set forth. Various modifications in the design and arrangement of parts of the invention, in addition to those mentioned earlier, are possible within the spirit and scope of the following claims.

What is claimed is:

1. An O-ring service kit comprising:
   a container including a base having a bottom wall and a cover for said base having a top wall which is disposed in spaced, opposing relation to said bottom wall when said cover occupies its closed position on said base;
   a normally upright O-ring supporting post rising from said bottom wall for receiving O-rings;
   the normally upper end of said post being spaced a distance from said top wall when said cover occupies its closed position;
   at least one O-ring removably positioned on said post;
   and
   a holddown depending from the normally undersize of said cover top wall in a position such that the normally lower end of said holddown is laterally offset slightly from the upper end of said post and disposed to engage the O-ring on said post when said cover is closed and the O-ring is positioned adjacent the upper end of said post, thereby to retain the O-ring on said post.

2. An O-ring service kit comprising:
   a container including a base having a bottom wall and a cover for said base having a top wall which is disposed in spaced, opposing relation to said bottom wall when said cover occupies its closed position on said base;
   a normally upright O-ring supporting post rising from said bottom wall for receiving O-rings;
   the normally upper end of said post being spaced a distance from said top wall when said cover occupies its closed position;
   at least one O-ring removably positioned on said post;
   and
   a pair of spaced holddowns depending from the normally underside of said cover top wall in positions to straddle the normally upper end of said post when said cover occupies closed position, thereby to retain said O-ring on said post.

3. An O-ring service kit comprising:
   a container including a base having a bottom wall and a cover for said base having a top wall which is disposed in spaced, opposing relation to said bottom wall when said cover occupies its closed position on said base;
   a normally upright O-ring supporting post rising from said bottom wall for receiving O-rings;
   the normally upper end of said post being spaced a distance from said top wall when said cover occupies its closed position;
   at least one O-ring removably positioned on said post;
   and
   a pair of spaced holddowns depending from the normally underside of said cover top wall in positions to straddle the normally upper end of said post when said cover occupies closed position, thereby to retain said O-ring on said post.

4. An O-ring service kit comprising:
   a base;
   a first cylindrical O-ring supporting post rising from said base for receiving O-rings;
   a second cylindrical O-ring supporting post extending coaxially from the upper end of said first post for receiving O-rings;
   at least one O-ring removably positioned on each post;
   said second post being substantially smaller in diameter than said first post and the external diameter of the O-ring on said second post being smaller than the internal diameter of the O-ring on said first post, whereby the O-ring may be removed from and placed on said first post without removing the O-ring from said second post; and
   each post having a uniform diameter throughout its length and being diametrically sized to receive its respective O-ring with a light slip fit, whereby each post aids in preserving the proper diameter and circular shape of its respective O-ring irrespective of the position of the latter along the corresponding post.

5. An O-ring service kit comprising:
   a container including a base having a bottom wall and a cover for said base having a top wall which is disposed in spaced, opposing relation to said bottom wall when said cover occupies its closed position on said base;
   a first normally upright O-ring supporting post rising from said base for receiving O-rings;
   the normally upper end of said post being spaced a distance from said top wall when said cover occupies its closed position;
   at least one O-ring removably positioned on each post;
   said second post being substantially smaller in diameter than said first post and the external diameter of the O-ring on said second post being smaller than
the internal diameter of the O-ring on said first post, whereby the O-ring may be removed from and placed on said first post without removing the O-ring from said second post; and

the normally upper end of said second post being disposed in close proximity to said top wall when said cover occupies said closed position, thereby to retain the O-rings against axial movement beyond the upper end of said second post.

6. An O-ring service kit according to claim 5 including:

a holdown depending from the normally underside of said cover top wall in a position such that the normally lower end of said holdown is laterally offset slightly from the upper end of said first post and disposed to engage the O-ring on said first post when said cover is closed and the latter O-ring is positioned adjacent the upper end of said first post, thereby to retain the O-ring on said first post.

7. An O-ring service kit comprising:

a molded plastic container having a flat rectangular base having a rear wall rising from its rear edge and a multiplicity of normally upright O-ring supporting posts rising from its normally upper surface;

a cover including a rectangular top wall, side walls along opposite side edges of the top wall, and front and rear walls along the front and rear edges, respectively, of the top wall;

means hinging said rear cover wall on said rear base wall for swinging of said cover about an axis parallel to said rear edges between an open position wherein said base is exposed and a closed position wherein said cover top wall is disposed over and spaced from said base and said cover side and front walls seat at their lower edges against the base; releasable latch means to lock said cover in said closed position;

a plurality of first, normally upright posts rising from said base over which O-rings are adapted to be placed;

a plurality of second, normally upright posts rising from said base over which O-rings are adapted to be placed;

the normally upper ends of said second posts being spaced a distance from said top wall when said cover occupies said closed position;

a third, normally upright post extending from the upper end of each second post over which O-rings are adapted to be placed and having a smaller diameter than its respective second post;

O-rings on said posts;

said first posts and third posts terminating substantially in a common plane and being disposed in close proximity to said top wall when said cover is closed, such that the O-rings are retained on said first and third posts by said cover when the latter is closed;

a holdown for each second post depending from the normally underside of said cover top wall in a position such that the normally lower end of each holdown is laterally offset slightly from the normally upper end of its respective second post and is disposed to engage the upper O-ring on its respective second post when said cover is closed, whereby said holdowns retain the O-rings on said second posts;

said posts having different diameters corresponding to the internal diameters, respectively, of different sized O-rings and being diametrically sized to receive their respective O-rings with a slip fit, whereby said posts aid in preserving the original diameter and circular shape of the O-rings on the posts.

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