

[54] **SOCKET WRENCH RETAINER AND ASSEMBLIES**

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[58] Field of Search **206/16 D**

[56] **References Cited**

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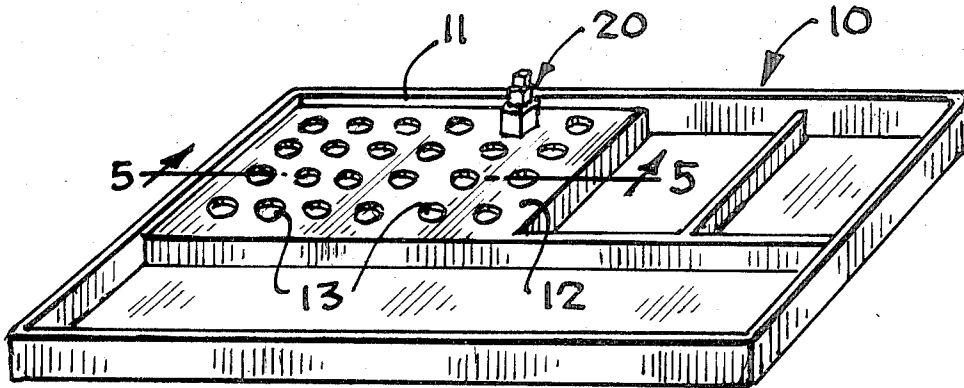
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[57] **ABSTRACT**

A socket wrench retainer comprising a lug of a configuration adapted to engage the drive opening of a socket wrench is provided. The socket wrench retainer can be made separately for insertion into a base, formed integrally in a tool box or tray, or can be formed or attached on sheets which can then be cut to fit a tray or tool box as desired, to fit individual tool needs. For greater versatility, a tiered retainer comprising several retainers of different sizes and formed concentrically as a one piece combination retainer is provided. Accordingly, a single retainer can accommodate socket wrenches of several different sizes. For special applications or uses, the socket wrench retainer can be combined with other features.

4 Claims, 10 Drawing Figures



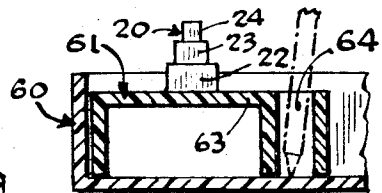
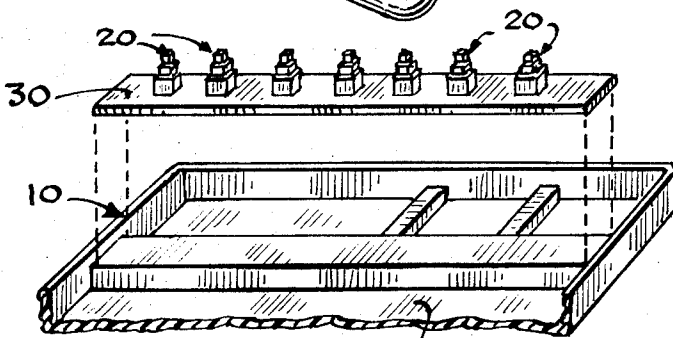
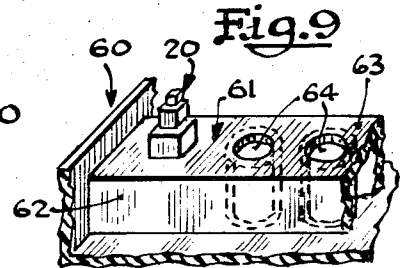
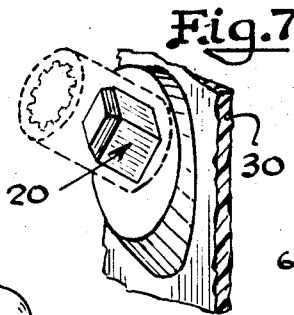
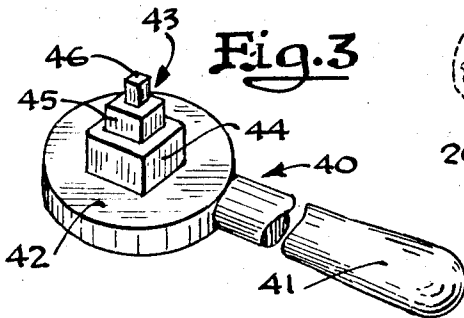
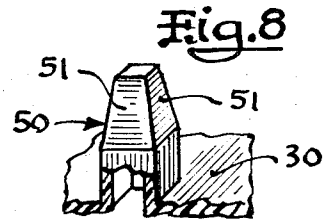
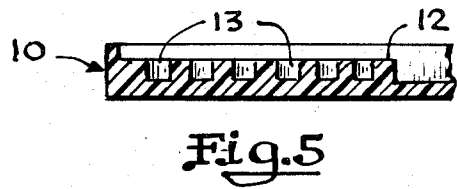
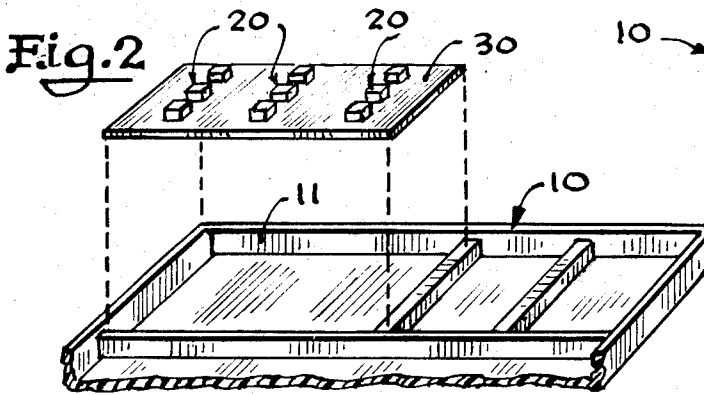
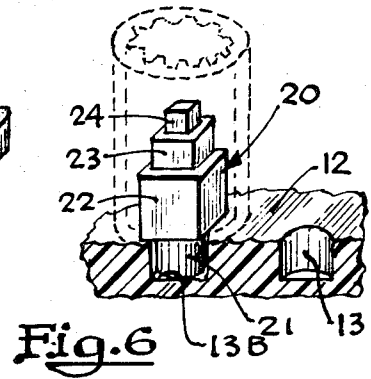
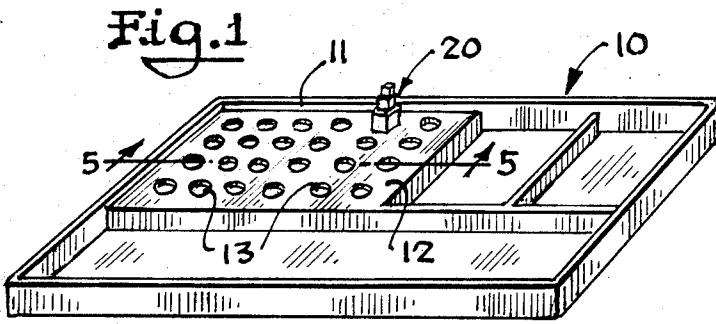


Fig. 4

Fig. 10

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SOCKET WRENCH RETAINER AND ASSEMBLIES

BACKGROUND OF THE INVENTION

Socket wrenches have considerable utility for the application and removal of nuts, bolts and other fastening devices. Such wrenches generally comprise a small cylinder with a drive opening on one end and the opening on the other end being adapted to fit a particular size nut. A set of socket wrenches comprises a plurality of individual sockets, each with the same size drive opening and each being engageable with a different size nut. To use a socket wrench, the socket is inserted onto a ratchet drive which is then used to twist the socket to apply or remove the nut. Ratchets are generally available with square drives in $\frac{1}{4}$ - to $\frac{3}{4}$ -inch sizes in $\frac{1}{8}$ -inch increments. T- or L-handles, handles with hinged joints, extension bars for positioning between the ratchet and the socket, and other components are also available making a socket wrench set extremely useful and versatile with considerable working ease, particularly in tight spaces.

A complete wrench set including ratchet or other driving device, extension bars or other components, and a number of socket wrenches are generally stored in a typical tool box. Complete sets generally include a minimum of eight or nine sockets which are stored in a tapered tray or trough to accommodate the full set of wrenches which vary in diameter according to size. Even though the trays are tapered, it is difficult to prevent spilling of the sockets and even more difficult to prevent mixing of the sockets so that they are out of order with respect to size. It is also difficult to determine readily whether any sockets are missing so that a craftsman who must move to different job locations can easily misplace a socket. Recently, plastic molded tool boxes have become available with a series of openings molded therein, the openings having varying diameters corresponding to the diameters of the series of sockets for storage thereof. With such tool boxes while missing sockets are readily apparent, spillage can easily occur and the sockets are difficult to remove for use.

SUMMARY OF THE INVENTION

A socket wrench retainer engageable with the drive opening of a socket wrench is provided which will firmly retain the individual socket wrenches preventing spillage. By employing a plurality of the retainers, a complete set of wrenches can be arranged in the desired order and will be retained in place for convenient use. The socket wrench retainer of the present invention can be made separately for insertion into a base, can be formed, as by molding, integrally in a tool box or tray, or can be formed on sheets which can then be cut to fit a tray or tool box as desired. When formed on sheets, the bottom can be made magnetic to aid in holding it in a tray or tool box or it can be used separately by placing it on a metallic surface.

The socket wrench retainer of the present invention comprises a lug of a configuration adapted to engage the drive opening of a socket wrench, which openings are generally square but may be hexagonal or have other configurations. Since the drive on a ratchet, handle or other driving portion of a complete wrench set must fit all of the socket wrenches of a set, all of the wrenches will accordingly have the same size drive opening and likewise, all of the retainers for a particu-

lar set will be of the same size and configuration. For example, for a wrench set having a $\frac{1}{2}$ inch drive, all of the socket wrenches will have a $\frac{1}{2}$ -inch square drive opening. Suitable retainers for such a set will accordingly comprise $\frac{1}{2}$ -inch square lugs, preferably tapered to facilitate insertion, removal and retention of the socket wrenches. Specific embodiments of the retainers may take several forms as hereinafter explained.

As previously indicated, when formed on sheets, socket retainer groups can be made by cutting the sheets and groups to fit individual tool needs. The groups can then be hung vertically on a wall, at an angle in showcases, or horizontally on tables, tool boxes, trays, drawers and the like.

DRAWINGS

The invention will be described with reference to the attached drawings wherein:

FIG. 1 is a perspective view illustrating a tool tray having one compartment of socket wrench retainers.

FIG. 2 is a fragmentary perspective view illustrating a tool tray with a sheet containing a plurality of socket wrench retainers and cut to fit one of the tray compartments.

FIG. 3 is a fragmentary perspective view of a driving tool having a combination drive portion.

FIG. 4 is a fragmentary perspective view illustrating a tool tray with a sheet containing a plurality of socket wrench retainers and cut in a strip to fit the tray.

FIG. 5 is a fragmentary side view in cross-section of the socket wrench retainer base of FIG. 1 as viewed along the line 5—5.

FIG. 6 is a fragmentary perspective view, partly in cross-section, illustrating a socket wrench retainer inserted in the base of FIG. 5.

FIG. 7 is a fragmentary perspective view, partly in cross-section, illustrating a socket wrench retainer adapted for vertical mounting.

FIG. 8 is a fragmentary perspective view, partly in cross-section, illustrating a socket wrench retainer integrally formed into the bottom of a sheet.

FIG. 9 is a fragmentary perspective view illustrating an embodiment of the present invention including a single socket wrench retainer adapted to several drive openings.

FIG. 10 is a side elevational view in cross-section of the embodiment of FIG. 9.

DETAILED DESCRIPTION

Referring to the drawings, FIG. 1 illustrates a multi-compartment tool tray 10 having one compartment 11 of socket wrench retainers 20. In this embodiment, the retainer assembly comprises a base 12 having a plurality of openings 13 therein, as best seen in FIG. 5, in which openings 13 are inserted the retainers 20 as illustrated in FIG. 6. While in this embodiment, the retainers 20 are fastened to the base 12 by a friction fit of a cylindrical boss 21 projecting from the bottom of the retainer 20 and the opening 13, other suitable means or fastening such as mating threaded parts, adhesives such as epoxy, or riveting and the like may be employed. With this type of assembly, the craftsman can arrange any assortment of retainers 20 to fit individual tool or job requirements. For example, in the

base 12 illustrated, two rows of openings 13 in the base 12 can be fitted with retainers 20 of a size and configuration to fit ¼-inch drive openings. These retainers 20 would be used for socket wrenches with a ¼ inch drive for small nuts and hard to reach spaces. The remaining two rows could be fitted with retainers 20 of ½-inch size for socket wrenches with a ½-inch drive to be used for larger nuts. For ease of arrangement and selection, the size of each socket wrench can be stamped or imprinted on the top of each retainer 20. For greater versatility, a tiered retainer 20 as illustrated in FIG. 6 can be employed. With this retainer 20, several retainers 22, 23, 24 of different sizes are formed concentrically as a one piece combination retainer. As an example, the bottom tier on the largest retainer 22 can be one-half inch in size, the next retainer 23 of ⅜-inch size, and the top tier or retainer 24 of ¼-inch size. Accordingly, the single retainer 20 can be used with socket wrenches having ½-, ⅜- or ¼-inch drive openings. Referring to the retainer base 12, by fitting several of the rows of openings 13 with combination retainers as described above and one row of openings 13 with retainers 20 for socket wrenches having ¼-inch drive openings, a vast array or assortment of different size wrenches can be assembled. In this manner, as array of socket wrenches most suitable for a particular job can be selected without the necessity of carrying several wrench sets.

FIGS. 2 and 4 illustrate embodiments in which the socket wrench retainers are molded, formed or attached directly to sheet material. Using conventional plastic molding procedures such as injection molding or thermoforming methods, for example, sheets of retainers can be prepared. The sheets can then be cut to fit trays, tool boxes or drawers as previously described or hung vertically for vertical mounting of socket wrench sets above tool benches or for display as illustrated in FIG. 7. FIG. 2 illustrates a tool tray 10 in which a sheet 30 of retainers 20 has been cut to fit one of the compartments 11. In FIG. 4, the sheet 30 of retainers 20 has been cut in a strip to fit the trough 14 or compartment of a tray 10 and the retainers 20 are of the tiered or combination type for greater versatility. The fitted sheets 30 can be attached by adhesive or other fastening means, or if the trays 10 are metal, the sheets 30 can be formed of magnetic material.

Likewise, flat sheets 30 when formed of plastic can have magnetic material dispensed therein so that the sheets 30 when placed in a metallic tool tray or compartment will be held therein. Instead of being placed in a tool tray or compartment, the sheet of retainers 30 can be used separately by placing the desired socket wrenches thereon and carrying it to the job location where it can be held in position by placing it on a metallic object such as an automobile fender or shelf. The wrenches are thereby readily accessible and yet are held firmly in place.

FIG. 3 illustrates a driving tool having a combination drive portion for driving socket wrenches having different size drive openings. As previously described, socket wrench sets are available with different size driving tools and corresponding drive openings in the socket wrenches, the larger sizes such as those having ½- or ¾-inch drives and corresponding drive openings in the socket wrenches being especially adapted for heavier service and larger size wrenches while the

smaller size sets such as those having ¼-inch drives and drive openings being especially adapted for lighter service and the smaller size wrenches. Consequently, each size drive opening or socket wrench set requires a separate driving tool. With the driving tool 40 illustrated in FIG. 3, a single tool can be used to drive several different size socket wrenches. The driving tool 40 comprises a handle 41 projecting from a head 42 from which projects a driving portion or stud 43. As illustrated, the driving portion 43 comprises a plurality of concentric, tiered drives 44, 45, 46 each tier or drive being of a size and configuration to engage a different size socket wrench drive opening. As previously described with reference to the combination retainer 20 illustrated in FIG. 6, each tier or drive 44, 45, 46 can be square and of ½-inch, ⅜-inch and ¼-inch size respectively, so that the single driving tool 40 can be used with socket wrenches having correspondingly shaped and sized drive openings. Accordingly, the single driving tool 40 can be used with several different size wrenches.

The driving portion or stud 43 can be formed separately in the manner of the socket wrench retainer 20 illustrated in FIG. 6 but without the cylindrical boss 21 and having instead an opening or depression of a configuration and size to fit the drive portion or stud of a conventional driving tool. Accordingly, such a separately formed stud can be employed as an adapter by engaging it with the drive of a driving tool thereby converting it to a driving tool having a combination drive portion as illustrated in FIG. 3.

FIG. 8 illustrates a socket wrench retainer 50 which has been integrally formed into the bottom of the tray or compartment 11 or the sheet 30. As illustrated the retainer 50 is of square configuration and has tapering side walls 51 to aid in insertion and removal of the socket wrench.

The socket wrench retainer of the present invention can be combined with other features for special applications or uses. FIGS. 9 and 10 illustrate one embodiment comprising a tray 60 having a channel shaped base 61 therein defined by end walls 62 and top panel 63 and having one or more retainers 20 attached thereto or formed therein. Included in the base 61 are one or more cylindrical depressions 64 for storage or retention of small parts or tools. As illustrated, the retainer 20 is of the tiered or combination type and includes several retainers 22, 23, 24 of different sizes. The tray 60 can be advantageously employed for jobs, particularly at remote or difficult locations, which require a small number of wrenches and other parts or tools. Screwdrivers, bolts, spark-plugs and the like can be stored in the cylindrical depressions for use or application while the appropriate wrenches can be placed on the retainers 20. Hence, only the wrenches and other tools or parts required need be carried to the job location.

What is claimed is:

1. In a multi-compartment tool box including a compartment for arranging and storing a plurality of socket wrenches, said wrenches having a drive opening for engagement with a driving tool, the improvement comprising:

One of said compartments having a plurality of spaced socket wrench retainers, disposed therein,

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said retainers comprising projecting lugs of a size and configuration adapted to engage the drive opening of the socket wrenches and wherein said retainers are of different sizes and configurations to fit corresponding drive openings of the socket wrenches whereby an array of different size wrenches having different drive openings can be assembled and retained in said tool box.

2. The tool box of claim 1 wherein the socket wrench retainers comprise combination retainers having a plurality of concentric tiers, the size and configuration of each tier adapted to fit a different size socket wrench drive opening.

3. In a socket wrench retaining device for retaining

and storing a plurality of socket wrenches, said socket wrenches having a drive opening for engagement with a driving tool, said device comprising a flat sheet having a plurality of spaced socket wrench retainers disposed thereon, the improvement comprising:

said retainers comprising combination retainers having a plurality of concentric tiers, the size and configuration of each tier adapted to fit a different size socket wrench drive opening.

4. The socket wrench retaining device of claim 3 wherein said sheet is magnetic to aid in holding it in place.

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