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(54) TAPERED NUT KIT AND METHODS OF USE

(76) Inventor: Louis DeJohn JR., Greenwell Springs, LA (US)

Correspondence Address:
SIEBERTH & PATTY, LLC
4703 BLUEBONNET BLVD
BATON ROUGE, LA 70809 (US)

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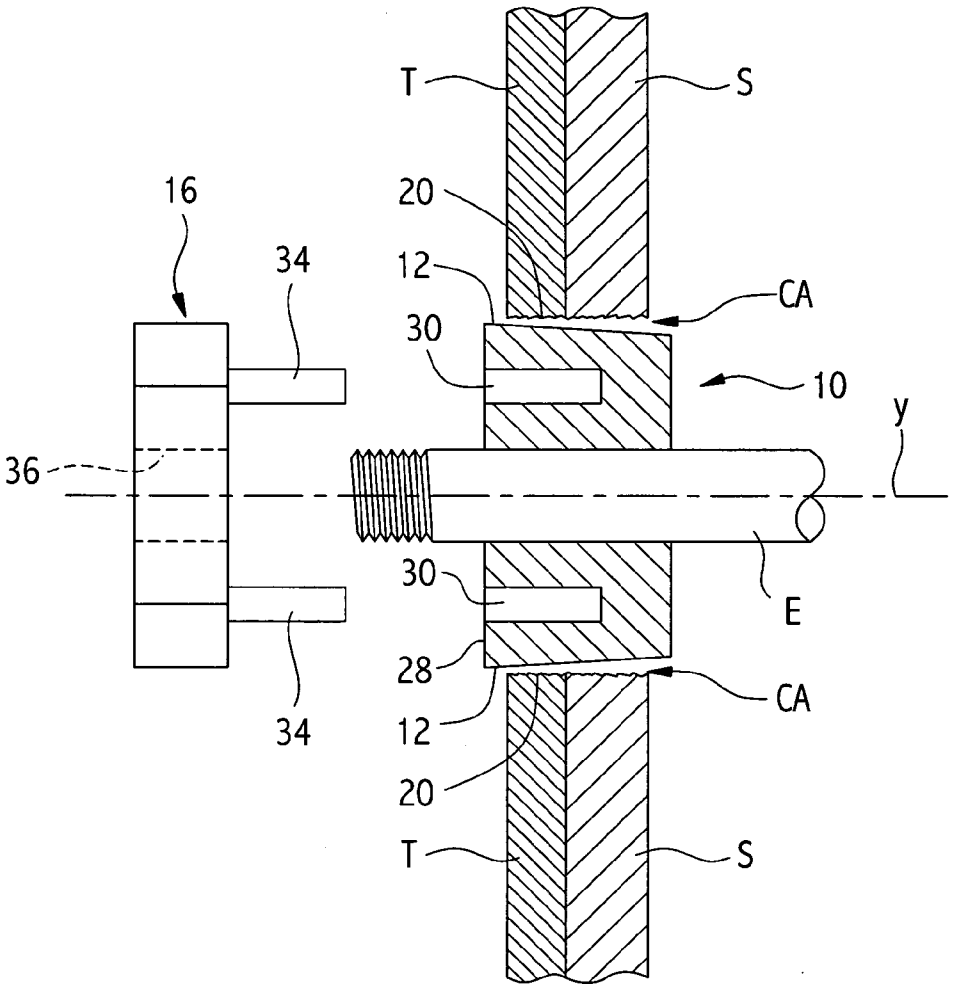
(57) ABSTRACT

A method for engaging a nut member with an elongate member extending from a subsurface of a building structure, whereby a clearance area above the subsurface of the building structure and surrounding the elongate member is occupied at least in part by the nut member while the surface is applied to the subsurface. The surfacing material is attached to the subsurface of the building structure proximate to the clearance area while the clearance area is so occupied and subsequently the nut member is disengaged from the elongate member to thereby vacate the clearance area previously occupied by the nut member. Also provided are kits comprising nut members alone or in combination with key members which cooperate with the nut members to disengage them from elongate members.



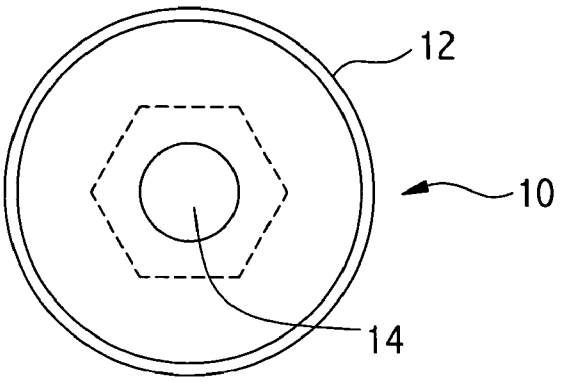


FIG. 1

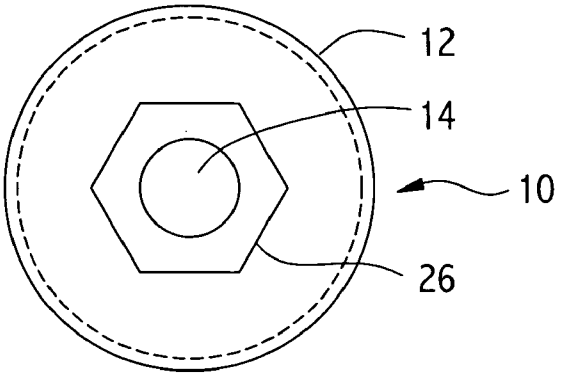


FIG. 2

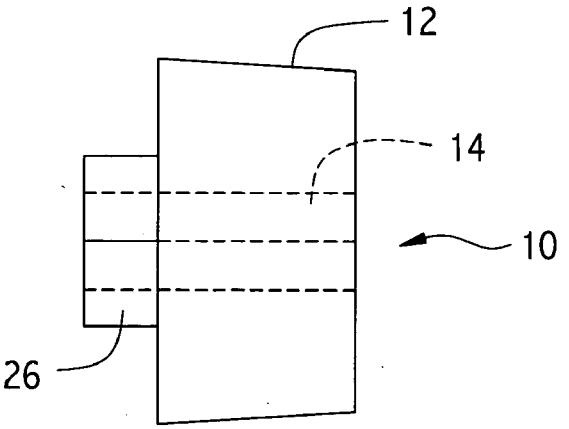


FIG. 3

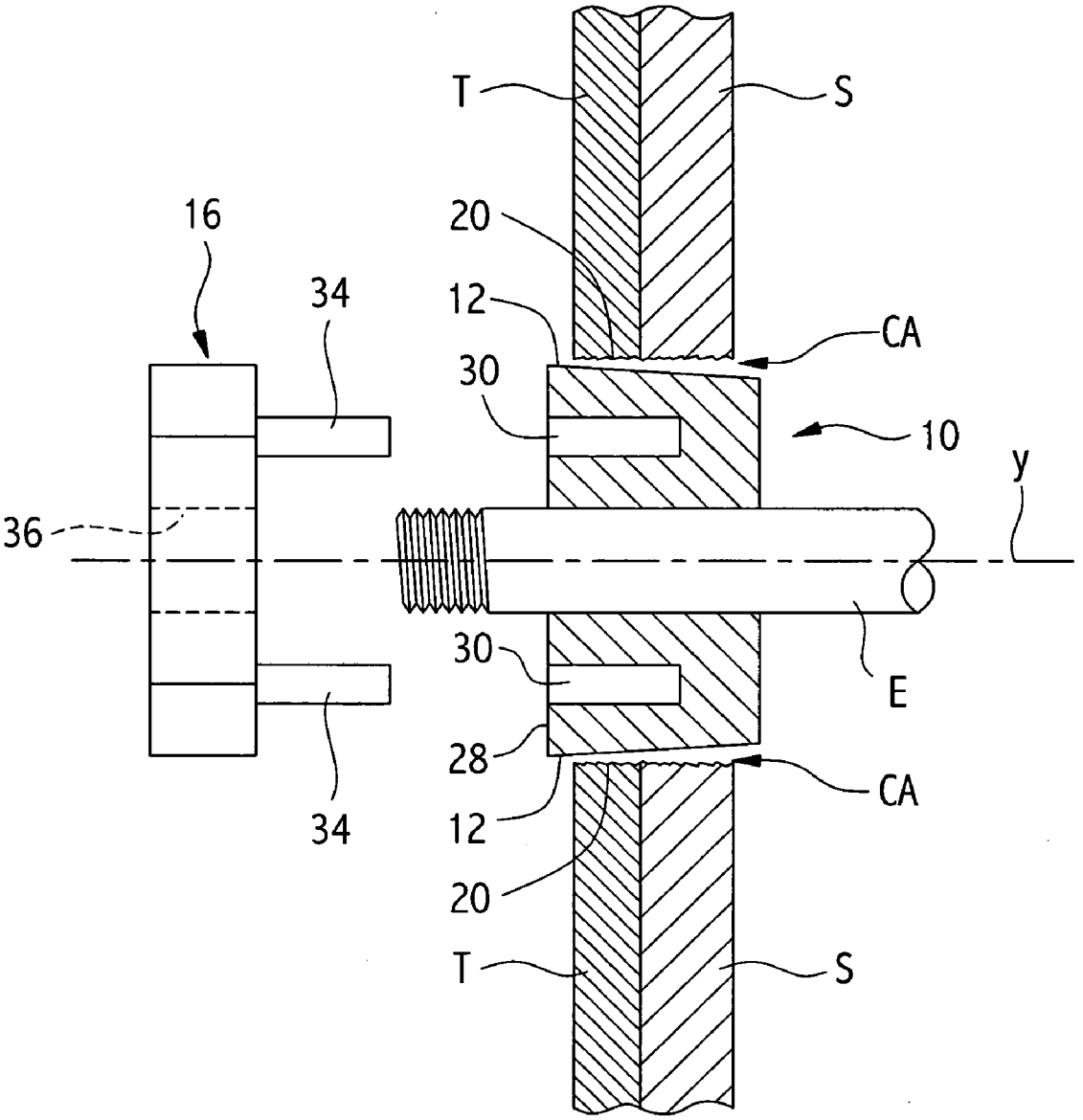


FIG. 4

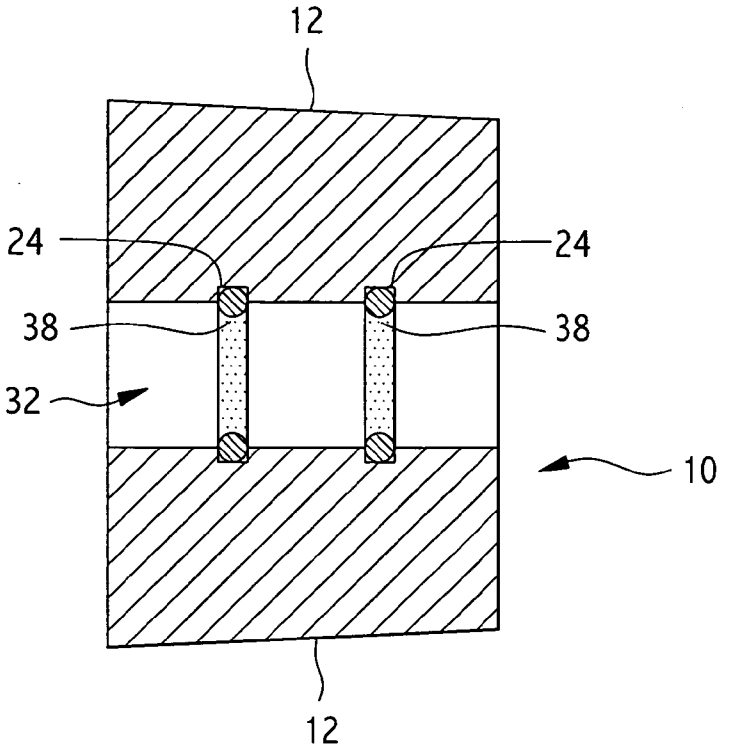


FIG. 5

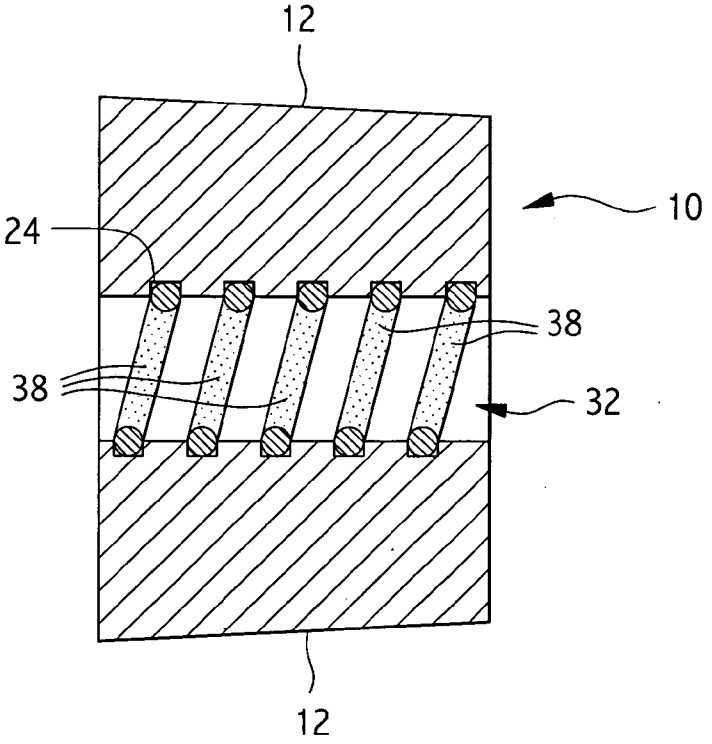


FIG. 6

TAPERED NUT KIT AND METHODS OF USE

REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of U.S. Provisional Appl. No. 60/546,016 filed on Feb. 19, 2004, the disclosure of which is incorporated herein by reference.

FIELD OF THE INVENTION

[0002] The present invention relates to methods of use of a nut as an aid for maintaining clearance around a device or elongate member projecting from a surface of a building structure.

BACKGROUND

[0003] In building and construction trades, when utility devices such as lavatories, sinks and toilets are installed, especially in newly constructed buildings, the supporting bolts for these utilities are provided at a very early stage of "roughing-in" of the walls and floors. As the building process continues, other layers of construction materials such as wall panels, drywall, tile and other materials are added around these pre-installed bolts and appurtenances. Often when the step of actually installing of the utility device is about to take place, one or more layers of surfacing materials must be laboriously chipped or cut away from the area surrounding the support bolts or "carrier" bolts in order to provide adequate space in the finished walls, floors or ceilings for setting back-up nuts, trap adapters, closet flanges and other hardware. This is an aggravating, expensive requirement, with the added hazard of possibly damaging the finished surface of these secondary surfacing materials.

[0004] Thus, a need exists for a simple, economical method and device to allow reserving a clearance area around these pre-installed carrier bolts. In this manner wall, floor and ceiling surfacing materials can be easily and safely installed or attached while maintaining an area which can quickly be freed-up to permit later installation of the hardware incident to installation of the utility devices such as lavatories, sinks, and toilets, for example, without cumbersome removal of unwanted surface material in the region of the carrier bolts.

SUMMARY OF THE INVENTION

[0005] The present invention meets these and other needs by providing among other things, a method which comprises (A) engaging a nut member with an elongate member extending from a subsurface of a building structure, whereby a clearance area above the subsurface of the building structure and surrounding the elongate member is occupied at least in part by the nut member, (B) attaching one or more surfacing materials to at least a portion of the subsurface of the building structure proximate to the clearance area to form a surface while the clearance area is so occupied, and subsequently (C) disengaging the nut member from the elongate member to thereby vacate the clearance area previously occupied by the nut member.

[0006] In yet another preferred embodiment of this invention either or both of steps (A), engaging a nut member with an elongate member, and (C), disengaging the nut member from the elongate member, are carried out by applying force to a gripping portion of the nut. Preferably, the gripping portion defines a multi-sided shape. Such a shape can be hexagonal and therefore can be gripped, for instance, by using a conventional wrench.

[0007] In a preferred embodiment of the invention, the nut member defines a tapered exterior side surface which is substantially straight in cross-section, the tapered exterior side surface being configured to facilitate disengagement of the nut member from the elongate member and any adjacent portion of the surfacing materials after the surfacing materials have been attached to the subsurface of the building structure. Preferably, the nut member is a tapered cylinders of size and length as required for a particular application. The tapering allows for an easy-off situation that will leave adequate space or clearance area in the finished walls, floors, or ceilings. Thus the present invention will alleviate the situation whereby the craftsman historically had to chip and cut finished surfaces in order to set back up nuts, trap adapters, closet flanges, and the like. Use of the methods and kits of this invention make possible the necessary anchoring steps of conventional appliances without loss of time and money for laborious chipping away of surfacing materials. Although, the cylinder nuts are preferably tapered, straight-sided cylinders can be used where the application requires.

[0008] Another embodiment of the invention provides that the nut member defines an aperture sized and configured to receive the elongate member, and that an interior surface of the nut member comprises a frictional surface. The frictional surface is sized and configured to engage the elongate member sufficiently to inhibit free movement of the nut member relative to the elongate member along the longitudinal axis of the elongate member after the nut member is engaged with the elongate member. Preferably, the frictional surface is formed at least in part by at least one annular ridge or at least in part by a spiral ridge.

[0009] In another preferred embodiment of the invention, a kit is provided which comprises at least one nut member for engagement with an elongate member extending from a subsurface of a building structure. Engagement of the nut member with the elongate member provides a clearance area above the subsurface of the building structure and surrounding the elongate member, which clearance area is occupied at least in part by the nut member. The nut member defines a tapered exterior side surface which is substantially straight in cross-section and configured to facilitate disengagement of the nut member from the elongate member and any adjacent portion of one or more surfacing materials which have been attached to the subsurface of the building structure. In a particularly preferred embodiment of the invention, the nut member defines an aperture sized and configured to receive the elongate member and an interior surface of the nut member comprises a frictional surface. The frictional surface is sized and configured to engage the elongate member sufficiently to inhibit free movement of the nut member relative to the elongate member along the longitudinal axis of the elongate member after the nut member is engaged with the elongate member. The frictional surface is formed at least in part from at least one annular ridge or at least in part by a spiral ridge. The nut member also defines a gripping portion sized and configured to facilitate disengagement of the nut member from the elongate member when force is applied to the gripping portion, which preferably defines a multi-sided shape.

[0010] An embodiment of this invention also comprises a kit comprising (I) at least one nut member for engagement with an elongate member extending from a subsurface of a building structure. The nut member defines a tapered exterior side surface which is substantially straight in cross-section and configured to facilitate disengagement of the nut member from the elongate member and any adjacent portion of one or more surfacing materials after the surfacing materials have been attached to the subsurface of the building structure to form a surface of the building structure. The kit also comprises (II) at least one key member, sized and configured to cooperate with the nut member to disengage the nut member from the elongate member. This engagement of the nut member with the elongate member causes the nut member to occupy at least in part a clearance area within the subsurface of the building structure and surrounding the elongate member.

[0011] The kit also preferably provides the nut member which defines an aperture sized and configured to receive the elongate member. An interior surface of the nut member comprises a frictional surface which is sized and configured to engage the elongate member sufficiently to inhibit free movement of the nut member relative to the elongate member along the longitudinal axis of the elongate member after the nut member is engaged with the elongate member. In preferred embodiments, the frictional surface is formed at least in part by at least one annular ridge or at least in part by a spiral ridge.

[0012] In a particularly preferred embodiment of this invention the elongate member comprises a threaded bolt and the nut member defines a threaded aperture sized and configured to receive the threaded bolt, although the inside of the barrel of the nut member can be smooth for easy fit on pipes, rods and bolts of all sizes and types.

[0013] In another embodiment of this invention an exterior face of the nut member defines a plurality of recesses therein, the key member forms a plurality of projecting pins, and the projecting pins of the key member are sized and configured to engage with the recesses of the exterior face of the nut member during disengagement of the nut member from the elongate member. The key member preferably has a hexagonal head that slips over the elongate member, pipe or support rods to back off the nut members of this invention. The manner in which the projecting pins or studs of the key member fit into the recesses of the exterior face of the nut member aids in installing and/or backing out the nut member. Different sizes of key members are provided as appropriate for each size of nut member.

[0014] The nut member can be threaded or non-threaded, with a threaded nut member used where there will be a screw-on application and a non-threaded nut member for use where slip-on attachment is indicated. This invention, when properly used, can save over 25% of the labor required to do trim work in construction trades.

[0015] This invention is valuable for use as a "form" to keep tile, grout, brick, block, mortar, etc. from having to be laboriously cut away from water closet carrier bolts. In this use the nut member is threaded on the support bolt to a location such that about 50% of the nut member is recessed into the rough wall cavity, before the wall is built or before ceramic tile is installed. After the wall is substantially completed, the nut member is removed, leaving an opening or clearance area in all wall layers which can be finished with washers, flanges, and the like. In order to provide correct positioning of the nut member within the wall clearance area or cavity, it is preferable that tape be wrapped around the closet carrier bolt at an appropriate location to allow the nut to slide onto the bolt or thread onto the bolt to the correct depth. Of course, it is possible to mark the correct location for positioning the nut on the carrier bolt by some other means such as, but not limited to, marking the carrier bolt with ink. When properly used, the kits of this invention will provide perfect cavities to install back-up nuts and washers easily. This eliminates the aggravating expense of chipping into finished walls.

[0016] This product can be used in many other applications such as trap adapters for lavatories and sinks, and closet flanges for floor-mounted water closets.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] **FIG. 1** illustrates a rear plan view of a nut member of this invention.

[0018] **FIG. 2** illustrates a front plan view of a nut member of this invention having a hexagonal gripping portion which allows for easy installation and removal.

[0019] **FIG. 3** depicts an embodiment of the invention where the nut member is in cross section.

[0020] **FIG. 4** represents an exploded cross-sectional view of a nut member of this invention engaged with an elongate member. A key member of this invention is shown aligned to receive the elongate member so that the pins of the key member fit into the recesses of the nut member.

[0021] **FIG. 5** depicts an embodiment of the invention showing the nut member in cross-section with a frictional surface depicted as ridges.

[0022] **FIG. 6** depicts an embodiment of the invention showing the nut member in cross section with a frictional surface depicted a spiral ridge.

DETAILED DESCRIPTION OF THE INVENTION

[0023] It will now be appreciated that the nut member, with or without the key member, of this invention enables fast and efficient installation of various utility devices, such as those found in the plumbing industry, onto elongate members, such as threaded carrier bolts or support bolts which project from floor, wall and ceiling subsurfaces of a building structure.

[0024] Use of the methods and kits of this invention alleviate the need for cutting away secondary surfacing materials, such as, for example, grout, brick, tile, mortar, drywall and plaster board, from around support bolts. When this invention is used, a clearance area is reserved around the support bolt which can be used to later accommodate finishing hardware such as mounting nuts, washers and flanges.

[0025] Turning now to the drawings, **FIGS. 1, 2** and **3** illustrate a referred embodiment of this invention. In **FIG. 3**, nut member **10** comprises a tapered exterior side surface **12** and an aperture **14** of nut member **10**. The degree of taper of exterior side **12** of nut member **10** can be varied as the

situation dictates. Such tapering is intended to facilitate easy removal of nut member **10** from an elongate member. Aperture **14** is shown to have a smooth, circular bore, but it is within the scope of the invention to provide aperture **14** with appropriate threads for engagement with an elongate member E, best seen in **FIG. 4**, where the elongate member E is illustrated as comprising a threaded bolt E.

[**0026**] As may be seen in **FIG. 2**, nut member **10** also comprises a gripping portion **26**, herein shown as a multi-sided, hexagonal portion. Gripping portion **26** can be of any suitable shape and/or texture to permit engagement and/or disengagement of nut member **10** by hand or by supplemental use of conventional tools such as a hex-head wrench.

[**0027**] **FIG. 4** depicts nut member **10** engaged with elongate member E, shown as a partially threaded bolt, which extends from subsurface S of a building structure. Although nut member **10** is shown as having an unthreaded aperture **14** (best seen in **FIGS. 1 and 2**), it is to be understood that aperture **14** can be threaded or unthreaded as dictated by the relevant application. Engagement of nut member **10** with elongate member E provides a clearance area CA within subsurface S of the building structure. A surfacing material T is shown here as being attached to subsurface S after clearance area CA was occupied by at least in part by nut member **10**.

[**0028**] Surfacing material T is shown in **FIG. 4** to be tiles, but can be any desired surfacing material which is more easily trimmed to the desired dimensions if nut member **10** presents a discrete benchmark.

[**0029**] Also shown in **FIG. 4**, in perspective view, is a key member **16** of a preferred embodiment of the invention. Key member **16** is sized and configured to cooperate with nut member **10** to disengage nut member **10** from elongate member E after surfacing material T has been attached to subsurface S of the building structure. As shown in **FIG. 4**, key member **16** comprises a multi-sided shape having projecting pins **34,34** aligned to fit into a plurality of recesses **30,30** defined by an exterior face **28** of nut member **10**. When projecting pins **34,34** engage with recesses **30,30**, appropriate wrenching force applied to key member **16** facilitates disengagement and removal of nut member **10** from elongate member E. Key member **16** also comprises notch **36** which is sized and configured to receive elongate member E when key member **16** is brought into proximity with nut member **10**.

[**0030**] Clearance area CA is occupied in part by nut member **10**. Typically, nut member **10** will be engaged with elongate member E so that approximately 50% of nut member **10** is within clearance area CA of subsurface S. The depth to which the nut member is inserted into the subsurface can vary depending on several conditions of the application, including the size and type of utility device being provided for, the accessibility of the location of the elongate member and the size and configuration of the elongate member.

[**0031**] Particular applications, including, but not limited to, plumbing facility installations, can be made to proceed with unexpected ease and efficiency by use of methods and kits of this invention. It is, of course, understood that the nut member, the gripping surface and/or the key member can have various internal and external dimensions based on the application.

[**0032**] In a preferred embodiment of this invention nut member **10** defines a tapered exterior side surface **12**, as shown in **FIG. 4** to be substantially straight in cross-section. By substantially straight in cross-section it is meant that side surface **12** has the shape of an uninterrupted line having no appreciable indentations or set-ins. Having such a tapered side surface **12** provides a shape for nut member **10** which facilitates disengagement of nut member **10** from elongate member E and any adjacent portion **20** of surface materials T after such materials have been attached to subsurface S of the building structure.

[**0033**] As shown in **FIGS. 5 and 6**, an interior surface **32** of nut member **10** comprises a frictional surface **38**. Frictional surface **38** is sized and configured to engage elongate member E sufficiently to inhibit free movement of nut member **10** relative to elongate member E along longitudinal axis Y of elongate member E (best seen in **FIG. 4**) after nut member **10** is engaged with elongate member E. Free movement of the nut member is sufficiently inhibited if the nut member maintains a desired position relative to the Y axis of the elongate member after engagement and while surface materials are being attached to the subsurface of the building.

[**0034**] **FIG. 5** depicts a preferred embodiment of the invention in which the frictional surface comprises two annular ridges **38,38**. As shown, annular ridges **38,38** are depicted as "O-ring" type elements which occupy channels **24,24** defined by interior surface **32** of nut member **10**. In like manner, as depicted in **FIG. 6**, spiral ridge **38** occupies spiral channel **24** defined by interior surface **32**. Typically, the frictional surface and, and in particular, the annular ridges and spiral ridge of preferred embodiments, are constructed of rubber, plastic material or Teflon® coated material. While the embodiments of this invention as shown in **FIGS. 5 and 6** have a frictional surface comprising one or more ridges embedded in or otherwise attached to the interior surface of the nut member, it is within the scope of the invention that such ridges be integral to the interior surface of the nut member.

[**0035**] The components of this invention can be constructed of any suitable material having sufficient firmness and resilience to provide the characteristics of the claimed features. This material can include, but is not limited to, metal, plastic, and synthetic resin.

[**0036**] Each and every patent or other publication referred to in any portion of this specification is incorporated entirely into this disclosure by reference, as if fully set forth herein.

[**0037**] This invention is susceptible to considerable variation in its practice. Therefore the foregoing description is not intended to limit, and should not be construed as limiting, the invention to the particular exemplifications presented hereinabove. Rather, what is intended to be covered is as set forth in the ensuing claims and the equivalents thereof permitted as a matter of law.

1. A method which comprises:

(A) engaging a nut member with an elongate member extending from a subsurface of a building structure, whereby a clearance area above the subsurface of the building structure and surrounding the elongate member is occupied at least in part by the nut member;

(B) attaching one or more surfacing materials to at least a portion of the subsurface of the building structure proximate to the clearance area to form a surface while the clearance area is so occupied; and subsequently

(C) disengaging the nut member from the elongate member to thereby vacate the clearance area previously occupied by the nut member.

2. A method according to claim 1 wherein the nut member defines a tapered exterior side surface which is substantially straight in cross-section, the tapered exterior side surface being configured to facilitate disengagement of the nut member from the elongate member and any adjacent portion of the surfacing materials after the surfacing materials have been attached to the subsurface of the building structure.

3. A method according to claim 1 wherein the nut member defines an aperture sized and configured to receive the elongate member and wherein an interior surface of the nut member comprises a frictional surface which frictional surface is sized and configured to engage the elongate member sufficiently to inhibit free movement of the nut member relative to the elongate member along the longitudinal axis of the elongate member after the nut member is engaged with the elongate member.

4. A method according to claim 3 wherein the frictional surface is formed at least in part by at least one annular ridge.

5. A method according to claim 3 wherein the frictional surface is formed at least in part by a spiral ridge.

6. A method according to claim 1 wherein the elongate member comprises a threaded bolt and wherein the nut member defines a threaded aperture sized and configured to receive the threaded bolt.

7. A method according to claim 1 wherein the surfacing materials comprise one or more tiles.

8. A method according to claim 2 whereby either or both of steps (A) and (C) are carried out by applying force to a gripping portion of the nut member.

9. A method according to claim 8 wherein the gripping portion defines a multi-sided shape.

10. A method according to claim 2 whereby either or both of steps (A) and (C) are carried out by wrenching of the nut member with a key member which key member forms a plurality of projecting pins, and wherein an exterior face of the nut member defines a plurality of recesses sized and configured to receive the plurality of projecting pins.

11. A kit comprising at least one nut member for engagement with an elongate member extending from a subsurface of a building structure whereby engagement of the nut member with the elongate member provides a clearance area above the subsurface of the building structure and surrounding the elongate member, which clearance area is occupied at least in part by the nut member, and wherein the nut member defines a tapered exterior side surface which is substantially straight in cross-section and configured to facilitate disengagement of the nut member from the elongate member and any adjacent portion of one or more surfacing materials which have been attached to the subsurface of the building structure.

12. A kit according to claim 11 wherein the nut member defines an aperture sized and configured to receive the elongate member and wherein an interior surface of the nut member comprises a frictional surface which frictional surface is sized and configured to engage the elongate member sufficiently to inhibit free movement of the nut member relative to the elongate member along the longitudinal axis of the elongate member after the nut member is engaged with the elongate member.

13. A method according to claim 12 wherein the frictional surface is formed at least in part by at least one annular ridge.

14. A method according to claim 12 wherein the frictional surface is formed at least in part by a spiral ridge.

15. A kit according to claim 11 wherein the elongate member comprises a threaded bolt and the nut member defines a threaded aperture sized and configured to receive the threaded bolt.

16. A kit according to claim 11 wherein the nut member defines a gripping portion sized and configured to facilitate disengagement of the nut member from the elongate member when force is applied to the gripping portion.

17. A kit according to claim 16 wherein the gripping portion defines a multi-sided shape.

18. A kit comprising:

(I) at least one o nut member for engagement with an elongate member extending from a subsurface of a building structure, which nut member defines a tapered exterior side surface which is substantially straight in cross-section and configured to facilitate disengagement of the nut member from the elongate member and any adjacent portion of one or more surfacing materials after the surfacing materials have been attached to the subsurface of the building structure to form a surface of the building structure; and

(II) at least one key member, sized and configured to cooperate with the nut member to disengage the nut member from the elongate member;

whereby engagement of the nut member with the elongate member causes the nut member to occupy at least in part a clearance area within the subsurface of the building structure and surrounding the elongate member.

19. A kit according to claim 18 wherein the nut member defines an aperture sized and configured to receive the elongate member and wherein an interior surface of the nut member comprises a frictional surface which frictional surface is sized and configured to engage the elongate member sufficiently to inhibit free movement of the nut member relative to the elongate member along the longitudinal axis of the elongate member after the nut member is engaged with the elongate member.

20. A method according to claim 18 wherein the frictional surface is formed at least in part by at least one annular ridge.

21. A method according to claim 18 wherein the frictional surface is formed at least in part by a spiral ridge.

22. A kit according to claim 18 wherein the elongate member comprises a threaded bolt and the nut member defines a threaded aperture sized and configured to receive the threaded bolt.

23. A kit according to claim 18 wherein an exterior face of the nut member defines a plurality of recesses therein, the key member forms a plurality of projecting pins, and the projecting pins of the key member are sized and configured to engage with the recesses of the exterior face of the nut member during disengagement of the nut member from the elongate member.

* * * * *