(12) UK Patent Application (19) GB (11) 2 457 377 (13) A

(43) Date of A Publication 19.08.2009

(21) Application No: 0902463.9

(22) Date of Filing: 13.02.2009

(30) Priority Data:
(31) 12032770 (32) 18.02.2008 (33) US

(51) INT CL:
A47K 3/00 (2006.01) *A47K 17/00* (2006.01)
E04F 11/18 (2006.01)

(56) Documents Cited:
EP 0730839 A US 6199808 A
US 4981276 A US 2144602 A

(58) Field of Search:
INT CL A47K, E04F
Other: ONLINE:EPODOC, WPI

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(54) Abstract Title: **Method and apparatus for attaching grab bar to wall flange**

(57) A grab bar 10 for attachment to a wall mount surface 12 includes a mount assembly 18 having a sleeve 26, a base flange 24, and a set screw 28. The sleeve 26 is attached to a wall facing side of the grab bar. The base flange has a base portion 44 to be associated with the wall mount surface and a wall portion 46 extending outwardly from the base portion. Once the sleeve is attached to the grab bar and the base flange is attached to the wall mount surface, the sleeve is received over the wall portion in an overlapping relationship. Set screw 28 is then used to secure the sleeve to the base flange. The flange can have two wall portions which may have threaded holes to receive the set screw, there can also be an insert 74 in one of the walls.

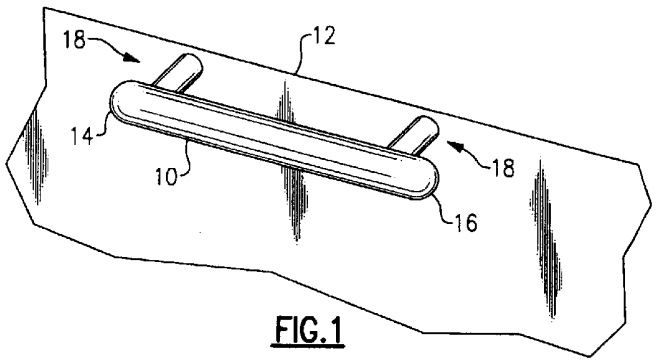

FIG.1

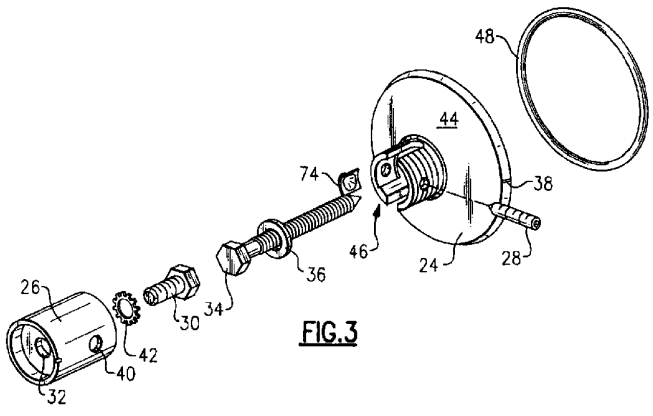

FIG.3

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METHOD AND APPARATUS FOR ATTACHING GRAB BAR TO WALL FLANGE

TECHNICAL FIELD

[0001] This invention relates to a bar that is utilized in bathrooms, such as a grab bar for example, where the bar is installed to have an unobstructed front face.

BACKGROUND OF THE INVENTION

[0002] Grab bars are utilized in bathroom applications to provide support for an individual during exit or entry in a bathtub or shower, for example. Typical grab bars include a linear/straight body member that is spaced apart from, and parallel to, a wall. The grab bar has end mounts that extend toward the wall such that the grab bar can be mounted to the wall. In some configurations, the linear/straight body member may include angled portions such that the grab bar can be gripped at different orientations.

[0003] These known grab bars are typically installed using an end mount assembly at each end of the bar to provide a two-point mount configuration. In one known example, in order to securely attach the grab bar to the wall, through holes are machined at each end of the body member. The through holes extend entirely through the body member from a front facing side to a wall facing side. The end mount assemblies include fasteners, which are installed in these through holes to secure the body member to the wall. Covers or caps are then used to cover the through holes on the front facing side. Such caps and covers do not provide a smooth, uninterrupted surface, and as such, are not aesthetically pleasing.

[0004] Thus, there is a need to provide a more aesthetically pleasing two-point mount configuration that can still securely attach the grab bar to the wall without adversely affecting overall cost.

SUMMARY OF THE INVENTION

[0005] A grab bar for use in a bathroom structure such as a shower or tub, for example, includes a mount assembly having a sleeve, a base flange, and a set screw. The mount assembly is generally hidden from view from a front side and allows the grab bar to be secured to a wall mount surface without affecting a front facing surface of the grab bar.

[0006] In one example, the sleeve is attached to a wall facing side of the grab bar. The base flange has a base portion to be associated with the wall mount surface and a wall portion extending outwardly from the base portion. Once the sleeve is attached to the grab bar, and once the base flange is attached to the wall mount surface, the sleeve is then received over the wall portion of the base flange in an overlapping relationship. The set screw is then used to secure the sleeve to the base flange.

[0007] In one example, the sleeve includes a first central bore and the base flange includes a second central bore that is aligned with the first central bore. The wall portion of the base flange comprises a first wall that extends partially around the second central bore and a second wall that extends partially around the second central bore. The first and second walls are separated from each other by an air gap.

[0008] In one example, each of the first and second walls includes a threaded hole. The set screw is inserted through a wall of the sleeve and into the first and second threaded holes to secure the sleeve and the base flange together.

[0009] In one example, only one of the first and second walls includes a threaded hole. The set screw is inserted through a wall of the sleeve and into the single threaded hole to secure the sleeve and the base flange together.

[0010] In one example, the first wall includes a threaded hole and the second wall includes an opening that receives an insert. The set screw is inserted through a wall of the sleeve and into the threaded hole until a distal end of the set screw is received within the insert.

[0011] The subject grab bar mount assembly and method of attaching the grab bar to a bathroom wall surface provides a secure attachment interface while additionally providing an aesthetically pleasing appearance for a front facing side of the grab bar. These and other features of the present invention can be best understood from the following specification and drawings, the following of which is a brief description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Figure 1 is a schematic view of a grab bar with first and second mount assemblies for attachment of the grab bar to a bathroom wall structure.

[0013] Figure 2 is an enlarged perspective view of one mount assembly for a grab bar.

[0014] Figure 3 is an exploded view of one mount assembly.

[0015] Figure 4 is a schematic cross-sectional view of the mount assembly of Figure 3.

[0016] Figure 5A is a side view of an insert used in the mount assembly of Figure 4.

[0017] Figure 5B is an end view of the insert of Figure 5 A.

[0018] Figure 5C is a cross-sectional side view of the insert of Figure 5A.

[0019] Figure 6 is a schematic cross-sectional view of another example of a mount assembly.

[0020] Figure 7 is a schematic cross-sectional view of another example of a mount assembly.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0021] A grab bar 10 for attachment to a bathroom wall structure 12 is shown in Figure 1. The grab bar 10 includes first 14 and second 16 ends. Mounting assemblies 18 are positioned near each of the first 14 and second 16 ends such that the grab bar 10 can be secured to the bathroom wall structure 12 in a two-point mount configuration. In the example shown in Figure 1, the grab bar 10 is a generally straight configuration; however, the grab bar 10 could include one or more angled portions (not shown) or could have a non-linear configuration, such as an oval shape that is partially shown in Figure 2.

[0022] The grab bar 10 is formed from a body structure that includes a wall facing side 20 and a front facing side 22 that is opposite the wall facing side 20. Each mounting assembly 18 is attached to the wall facing side 20 such that the front facing side 22 comprises a continuous, uninterrupted and unobstructed surface. As such, the mounting assemblies 18 are generally hidden from view from a front side such that the front facing side 22 of the grab bar 10 provides an aesthetically pleasing appearance.

[0023] Each mounting assembly 18 includes at least a base flange 24, a sleeve 26, and a set screw 28. The set screw 28 is used to secure the sleeve 26 to the base flange 24. This will be discussed in greater detail below. Before the set screw 28 is installed, the sleeve 26 is first attached to the wall facing side 20 of the grab bar 10 to form a grab bar and sleeve assembly. The sleeve 26 is installed onto the wall facing side 20 of the grab bar 10 by inserting a fastener 30 into a threaded post portion 32 of the sleeve 26 as shown in Figure 3. A washer 42 may also optionally be used in the assembly.

[0024] Next, the base flange 24 is attached to the wall structure 12 with a fastener 34 and washer 36 as shown in Figure 3. Because the base flange 24 is a separate piece from the grab bar 10, it is important to provide a proper way to help re-align the base flange 24 to the grab bar 10 during installation. This is accomplished by providing an alignment notch 38 in the base flange 24 as shown in Figure 2.

[0025] Once the base flange 24 is attached to the wall structure 12, and once the sleeve 26 is attached to the grab bar 10, the sleeve 26 is then slid over the base flange 24. Finally, the set screw 28 is inserted through an access hole 40 in the sleeve 26 and is threaded into the base flange 24 to secure the sleeve 26 and grab bar 10 to the base flange 24.

[0026] The sleeve 26 and base flange 24 are shown in greater detail in Figure 4. The base flange 24 has a base portion 44 that is associated with the wall structure 12 and a wall portion 46 that extends outwardly from the base portion 44. An o-ring 48 is associated with the base portion 44 to provide a sealed interface at the wall structure 12. The base flange 24 also includes a central bore 50 that has an axis A1 that is perpendicular to a surface of the wall structure 12. The central bore 50 is also concentric to an outer diameter of the base portion 44 and the o-ring 48. This assures a uniform distributed load over an entire surface of the o-ring 48 once the fastener 34 is installed.

[0027] As shown in Figures 3 and 4, the wall portion 46 of the base flange 24 is comprised of a first wall 46a that extends partially about the central bore 50 and a second wall 46b that extends partially about the central bore 50. In the example shown, the first 46a and second 46b walls are curved members that are separated from each other by an air gap 52. The air gap 52 allows material to be removed from the mount assembly 18 without having any significant reduction in overall strength of the attachment joint, which accordingly provides a cost reduction. Further, the air gap 52 allows the second wall 46b to flex slightly during tightening of the set screw 28. This will be discussed in greater detail below.

[0028] The sleeve 26 also includes a central bore 60 that is aligned with the central bore 50 of the base flange 24, and as such, also has an axis A2 that is perpendicular to a surface of the wall structure 12. The sleeve 26 includes a wall with an outer surface 62 and an inner surface 64 that defines the central bore 60. When the sleeve 26 is installed onto the base flange 24, the first 46a and second 46b walls are inserted into the central bore 60 of the sleeve 26 in an overlapping relationship, such

that an outer surface of the wall portion 46 contacts or abuts against the inner surface 64 of the sleeve 26. The access hole 40 extends through the wall of the sleeve 26 as shown in Figure 4.

[0029] In the example of Figure 4, the first wall 46a includes a first threaded hole 70 that is aligned with the access hole 40 in the sleeve. The second wall 46b includes an opening 72 that receives an insert 74. The first threaded hole 70 and the opening 72 are axially aligned with each other along a direction that is perpendicular to the axis Al. The set screw 28 is inserted through the access hole 40 and is threaded into the first threaded hole 70 until a distal end 76 of the set screw 28 is received within the insert 74.

[0030] During assembly, reaction forces are such that the first wall 46a is forced against the inner surface 64 of the sleeve 26. Conversely, the set screw 28, which is being threaded through the first threaded hole 70, is forced against a conical shaped inside face 78 (Figure 5C) of the insert 74.

[0031] In one example, the insert 74 (Figures 5A-5C) comprises a brass insert that is press-fit into the opening 72 in the second wall 46b. The insert 74 has an outside face with a plurality of grooves cut at right angles to form a diamond pattern 80 as shown in Figure 5B. These grooves, i.e. the grooves forming the diamond pattern 80, engage with the inner surface 64 of the sleeve 26 as indicated at 82. Once the set screw 28 is fully tightened, the diamond pattern 80 becomes slightly embedded into the inner surface 64 and locks the entire assembly from movement.

[0032] Another example of a wall portion configuration of the base flange 24 is shown in Figure 6. This example is similar to that of Figure 4 but instead of using an insert, two threaded holes are utilized. As such, the first wall 46a includes the first threaded hole 70 and the second wall 46b includes a second threaded hole 90, which is aligned with the first threaded hole 70.

[0033] The reaction forces are such that the first wall 46a is forced against the inner surface 64 of the sleeve 26. Further, during assembly, while the set screw 28 is being threaded through the first 70 and second 90 threaded holes, the distal end 76 is forced against the inner surface 64 of the sleeve 26 as indicated at 92. In one example, the point style of the set screw 28 is oval in shape to eliminate high stress concentrations on the inner surface 64 of the sleeve 26 that would be generated by using other point styles. As the set screw 28 is tightened, the second wall 46b flexes slightly toward the first wall 46a and locks the set screw 28 in place, which prevents set screw movement during normal use.

[0034] Figure 7 shows another example of a wall portion configuration for the base flange 24. This example is similar to Figure 6 but uses only one threaded hole instead of two threaded holes. As such, the first wall 46a includes the first threaded hole 70 and the second wall 46b does not include any holes or openings. The reaction forces during assembly are such that the first wall 46a is forced against the inner surface 64 of the sleeve 26. Further, the set screw 28 is threaded through the first threaded hole 70 and is forced against an inner surface 100 of the second wall 46b. As the set screw 28 is further tightened, the second wall 46b flexes outwardly and comes to rest on the inner surface 64 of the sleeve 26, indicated at 102, which secures the assembly from movement.

[0035] Each mounting configuration allows the grab bar 10 to be installed into a wet environment with a two-point mount configuration. The concentrically placed mounting fastener 34 provides even pressure on the o-ring seal. Further, the use of the separate sleeve and base flange combination allows for a clean, obstruction free front face of the grab bar, which is aesthetically pleasing. Additionally, the use of two walls separated by an air gap provides a cost saving without adversely affecting strength of the assembly.

[0036] Although a preferred embodiment of this invention has been disclosed, a worker of ordinary skill in this art would recognize that certain modifications would come within the scope of this invention. For that reason, the following claims should be studied to determine the true scope and content of this invention.

CLAIMS

1. A mount assembly for a bathroom grab bar comprising:

a sleeve having an attachment interface for securement to a wall facing side of a grab bar;

a base flange having a base portion to be associated with a wall mount surface and a wall portion extending outwardly from said base portion, wherein said sleeve is received over said wall portion in an overlapping relationship; and

a set screw to secure said sleeve to said base flange, said set screw extending through said sleeve and into said wall portion.

2. The mount assembly for a bathroom grab bar according to claim 1 wherein said sleeve includes a first central bore and said base flange includes a second central bore aligned with said first central bore, and wherein said wall portion of said base flange extends into said first central bore such that an outer surface of said wall portion contacts at least a portion of an inner surface of said sleeve.

3. The mount assembly for a bathroom grab bar according to claim 2 wherein said wall portion includes a first wall and a second wall separated by an air gap, and wherein at least one of said first and second walls includes a threaded hole to receive said set screw.

4. The mount assembly for a bathroom grab bar according to claim 3 wherein each of said first and second walls includes a threaded hole to receive said set screw.

5. The mount assembly for a bathroom grab bar according to claim 2 wherein said wall portion includes a first wall and a second wall separated by an air gap, and wherein said first wall includes a threaded hole to receive said set screw and said second wall includes an opening to receive an insert that cooperates with a distal end of said set screw.

6. The mount assembly for a bathroom grab bar according to claim 5 wherein said insert includes a textured outer surface that is embedded within said sleeve once said set screw is fully tightened,

7. The mount assembly for a bathroom grab bar according to claim 1 including a first fastener to secure said sleeve to the grab bar and including a second fastener to secure said base flange to the wall mount surface.

8. A bathroom grab bar comprising:

a grab bar body having a wall facing side and a front facing side opposite said wall facing side, said grab bar body including at least first and second mount interfaces located at said wall facing side; and

first and second mount assemblies respectively associated with said first and second mount interfaces for securement of said grab bar body to a wall mount surface, each of said first and second mount assemblies including a sleeve that is attached to said grab bar body, a base flange having a base portion to be associated with the wall mount surface and a wall portion extending outwardly from said base portion, and a set screw that secures said sleeve to said base flange, wherein said set screw extends through said sleeve and into said wall portion.

9. The bathroom grab bar according to claim 8 wherein an entirety of said front facing side of said grab bar body comprises a continuous and uninterrupted surface.

10. The bathroom grab bar according to claim 8 wherein said sleeve includes a first central bore and said base flange includes a second central bore aligned with said first central bore, said first and said second central bores to be orientated generally perpendicular to the wall mount surface, and said wall portion of said base flange is at least partially inserted within said first central bore to form an overlapping relationship such that an outer surface of said wall portion contacts at least a portion of an inner surface of said sleeve.

11. The bathroom grab bar according to claim 10 wherein said wall portion includes a first wall extending partially around said second central bore and a second wall extending partially around said second central bore at a position opposite from said first wall, said first and said second walls being separated from each other by an air gap such that at least one of said first and second walls is moveable relative to the other of said first and second walls.

12. The bathroom grab bar according to claim 11 wherein at least one of said first and second walls includes a threaded hole to receive said set screw.

13. The bathroom grab bar according to claim 11 wherein each of said first and second walls includes a threaded hole to receive said set screw.

14. The bathroom grab bar according to claim 11 wherein said first wall includes a threaded hole to receive said set screw and said second wall includes an opening to receive an insert that cooperates with a distal end of said set screw.

15. The bathroom grab bar according to claim 8 including a first fastener to secure said sleeve to the grab bar prior to attaching said sleeve to said base flange, and including a second fastener to secure said base flange to the wall mount surface prior to attaching said sleeve to said base flange.

16. A method for assembling a bathroom grab bar to a wall mount surface comprising the steps of:

(a) attaching at least one sleeve to a rear facing side of a grab bar body to form a grab bar and sleeve assembly;

(b) attaching a base flange to a wall mount surface;

(c) sliding the sleeve of the grab bar and sleeve assembly over the base flange; and

(d) fastening the sleeve and base flange together.

17. The method according to claim 16 wherein steps (a) and (b) are performed prior to steps (c) and (d).

18. The method according to claim 16 including forming the base flange with a base portion to be associated with the wall mount surface and a wall portion extending outwardly from the base portion, wherein the wall portion comprises a first wall extending partially about a central bore and a second wall extending partially about the central bore and being separated from the first wall by an air gap, and wherein step (d) includes threading a set screw through the sleeve and into a threaded hole formed in at least one of the first and second walls.

19. The method according to claim 18 wherein step (d) includes threading a set screw through the sleeve and into threaded holes formed in both the first and second walls.

20. The method according to claim 16 including forming the base flange with a base portion to be associated with the wall mount surface and a wall portion extending outwardly from the base portion, wherein the wall portion comprises a first wall extending partially about a central bore and a second wall extending partially about the central bore and being separated from the first wall by an air gap, and wherein step (d) includes providing a threaded hole in the first wall, forming an opening in the second wall, installing an insert into the opening, and threading a set screw through the sleeve and into the threaded hole such that a distal end of the set screw is received within the insert.

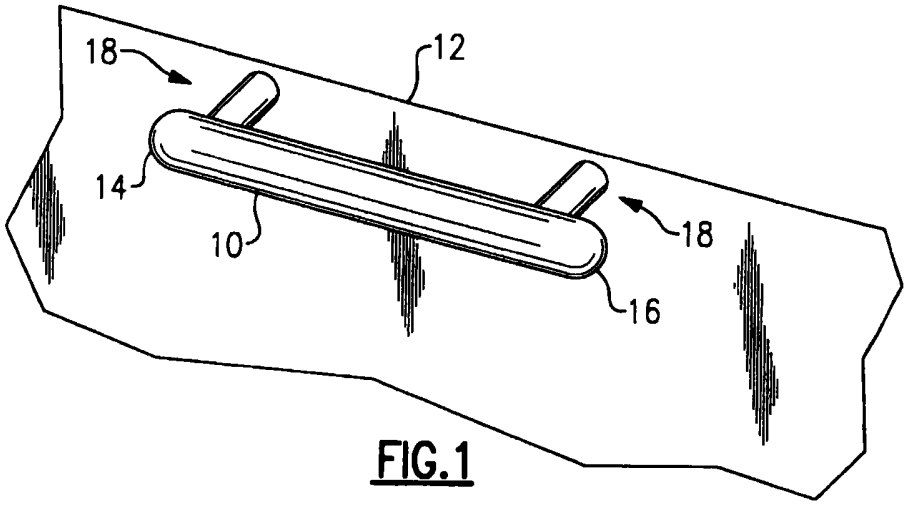

FIG.1

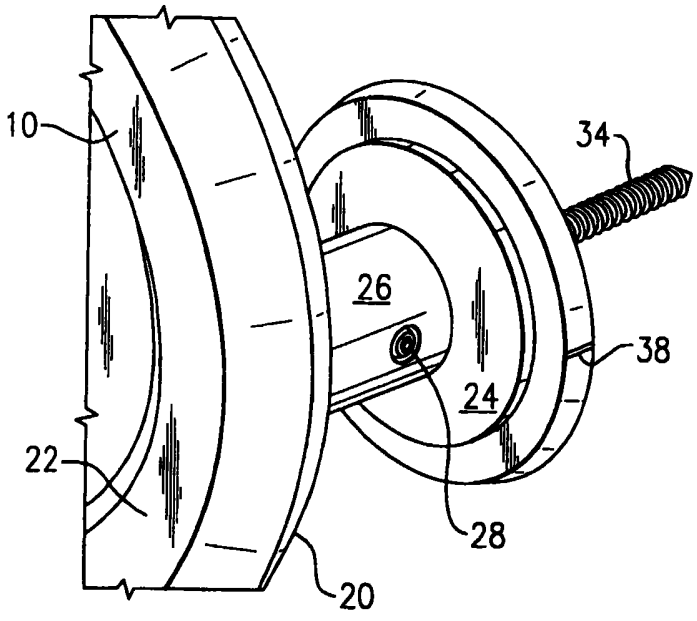

FIG.2

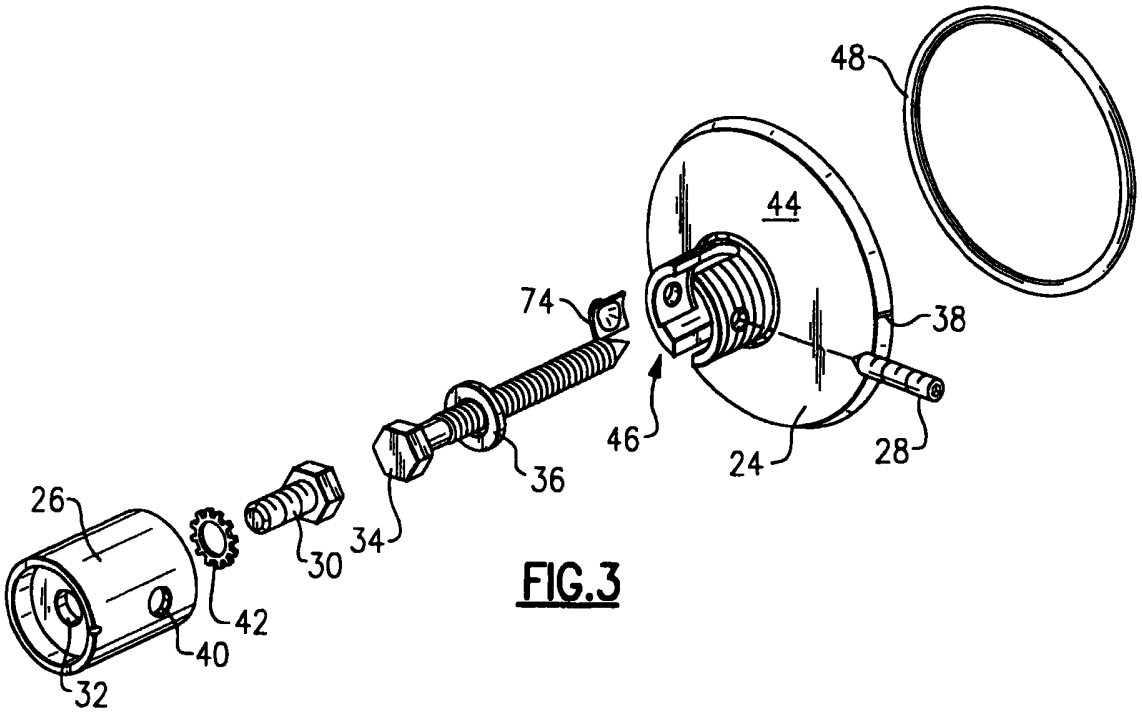
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FIG.3

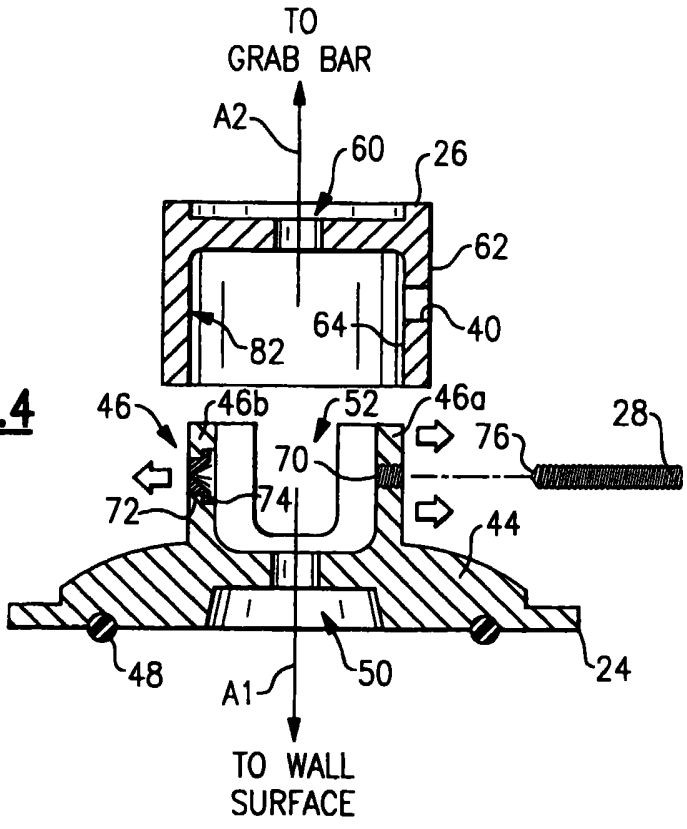
TO
GRAB BAR
A2
60
26
62
64
40
82
46
46b
52
46a
28
76
70
72
74
44
48
A1
50
24
TO WALL
SURFACE

FIG.4

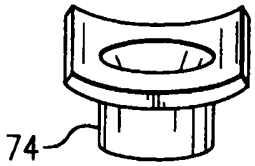

FIG.5A

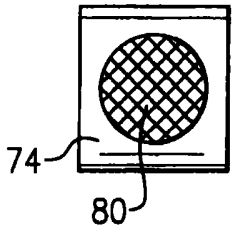

FIG.5B

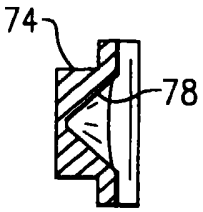

FIG.5C

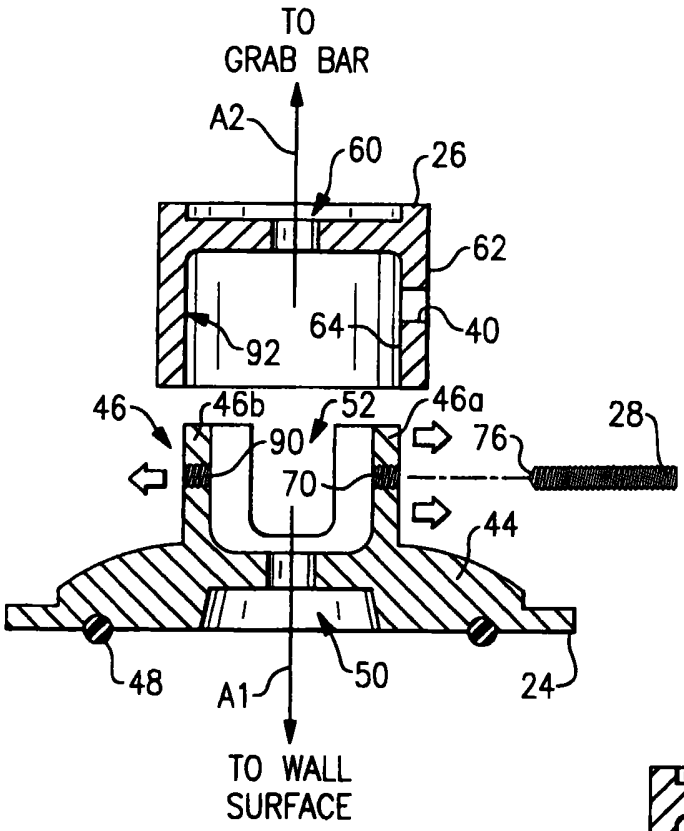

FIG.6

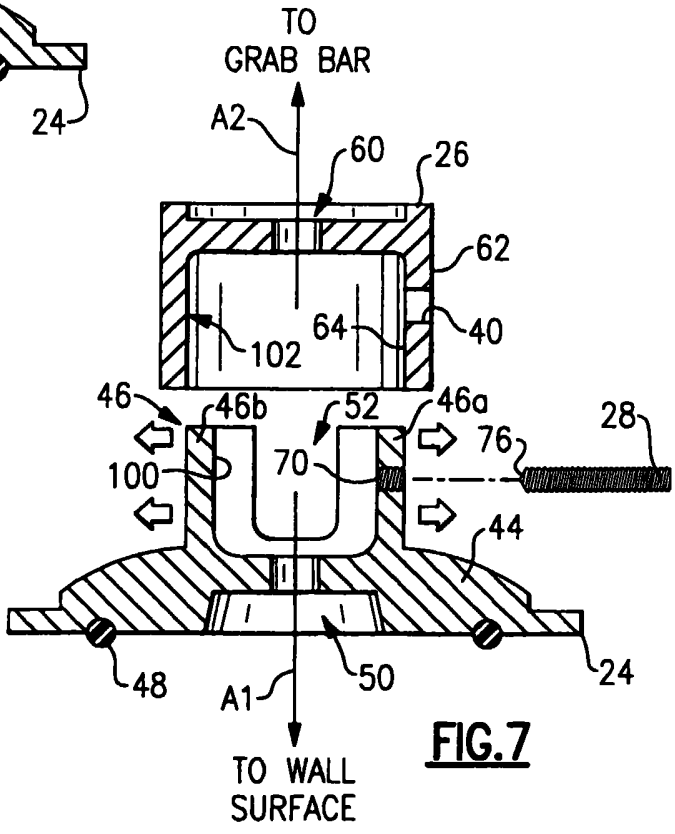

FIG.7

INTELLECTUAL PROPERTY OFFICE

Application No: GB0902463.9 **Examiner:** Mr Matthew Evans

Claims searched: 1 - 20 **Date of search:** 20 May 2009

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-3, 7-12, 15-18	US4981276 A (AGOR) See whole document, esp. figures 1, 2 and column 2 lines 20-21
X	1, 2, 7-10, 15-17	EP0730839 A (MATEINA) See figures 1, 3b & 4.
X	1, 2, 7-10, 15-17	US6199808 A (LIN) See Figures 2, 3, 5 & 6
X	16 at least	US2144602 A (BALMER) See figure 3.

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^{X} :

Worldwide search of patent documents classified in the following areas of the IPC

A47K; E04F

The following online and other databases have been used in the preparation of this search report

ONLINE:EPODOC, WPI

International Classification:

Subclass	Subgroup	Valid From
A47K	0003/00	01/01/2006
A47K	0017/00	01/01/2006
E04F	0011/18	01/01/2006