A removable floor mounted support pole for assisting elderly and disabled persons with standing from a seated surface, and providing adjacent support while moving on, to, and from a bed, bathtub, or toilet. The apparatus is designed to be installed and used typically in buildings with a concrete slab type floor such as a hospital or nursing home. The apparatus comprises two major assemblies: firstly, a floor receptacle which is installed permanently within a concrete slab type floor, and secondly, a support pole assembly which removably fastens into the floor mounted receptacle. When the support pole is not required, it may be removed in less than a minute, and placed in storage. The floor receptacle is sealed with a flush cap when a support pole is not installed within.

The present design includes several novel features including: a novel fastening means to secure the support pole assembly into the floor receptacle, novel mating geometry to ensure minimal movement of the pole while installed in the floor receptacle, a novel means of using the support pole as a tool to disengage the floor receptacle cap, and a novel method of storing the sealing cap of the floor receptacle within the pole while the pole is installed in the floor receptacle.
REMOVABLE FLOOR MOUNTED SUPPORT POLE FOR ELDERLY AND DISABLED PERSONS

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] This invention relates to a removable floor mounted support pole for assisting elderly and disabled persons with standing from a seated surface, and providing adjacent support while moving on, to, and from a bed, bathtub, or toilet. The apparatus is designed to be installed and used in buildings with a concrete slab type floor, such as in a hospital or nursing home.

[0003] 2. Description of Prior Art

[0004] Elderly and disabled persons often require support surfaces such as hand rails or grasping bars to pull themselves up to a standing position from a bed, toilet, chair or wheelchair. Support surfaces are also needed to help bear their weight while transferring between two functional surfaces such as a bed and wheelchair. Support surfaces are also helpful to lower or steady themselves in the event of a sudden loss of balance, and thereby preventing a fall, which in more senior individuals can result in a serious injury such as a broken hip. Further, in an institutional setting, such as a hospital, support surfaces are important to allow the patient to assist with weight bearing to prevent injury to care staff who are assisting the patient with standing or transferring.

[0005] There are numerous prior art devices for these purposes including; wall mounted grab bars, mobile wheeled walkers, floor to ceiling support poles, bed mounted support rails and permanent floor mounted rails. However, each of these devices has its disadvantages; Wall mounted grab bars cannot provide support in the middle of a room where most standing and transfer actions occur, wheeled walkers can slip during transfers, and have the further disadvantage of occupying considerable floor space making them awkward to use in smaller rooms. Floor to ceiling poles provide good support directly adjacent to a transfer area, however, in many institutional applications, the floor to ceiling height is typically too high to allow the installation of such a device. Bed mounted support rails can be difficult to install, and have limited height thereby not providing a higher gripping point to effect an upward pull. Permanent floor mounted support rails suffer from the disadvantage of being in the way of patients who do not require them.

[0006] Also, in the typical hospital, many different individuals with different support needs may use a particular room within a given time period. Therefore a device that is able to be installed directly beside a bed or toilet, yet easily removed would be beneficial to help meet the frequently changing needs of the various occupants of a particular room.

[0007] The present removable floor mounted support pole device is unique in that it provides support that can be easily installed at a transfer location such as at a bed or toilet, yet it can be removed if not required, and the remaining in-floor receptacle sealed with a flush cap.

SUMMARY OF THE INVENTION

[0008] It is the object of the invention to provide a removable floor mounted support pole for assisting elderly and disabled persons with standing from a seated surface, and providing adjacent support while moving on, to, and from a bed, bathtub, or toilet. The apparatus is designed to be installed and used in buildings with a concrete slab type floor such as in a hospital or nursing home. The support pole is designed to be deployed quickly when required and removed when not required in a given location, leaving a unobtrusive flush sealed floor receptacle.

[0009] According to the present invention, the removable floor mounted support pole for elderly and disabled persons comprises the following two major assemblies: the support pole assembly, and the floor receptacle assembly.

[0010] The floor receptacle is a hollow, open top, cylindrically shaped member that is designed to be installed within a cored hole in a concrete slab type floor with the aid of concrete bonding compound with its top surface flush with the surrounding floor surface. The floor receptacle is typically installed at locations where a support pole would be beneficial such as beside a bed, or toilet. The outer surface of the floor receptacle is roughened to optimize adhesion with the concrete bonding agent. A receptacle cap assembly seals the floor receptacle in a liquid tight manner when not in use. The floor receptacle also has means to secure the support pole tightly with minimal deflection during use.

[0011] The support pole assembly provides a solid gripping surface for use by a person undertaking standing or transferring from a bed or toilet. The support pole includes taper mating surface geometry to ensure minimal movement of the pole while installed in the floor receptacle. The support pole also includes two drive pins on the bottom which are used to engage the floor receptacle cap to rotate it for removal. Further, the support pole includes a space within the top knob to store the sealing cap of the floor receptacle within the pole while the pole is installed in the floor receptacle.

[0012] Other objects, features and versions of the present invention will become apparent from the following detailed description, which, when interpreted with the listed drawings, together disclose a preferred embodiment of the invention. It is to be understood that the drawings are intended for the purpose of illustration only, and are not intended as a definition of the limits of the invention.

BRIEF DESCRIPTION OF DRAWINGS

[0013] FIG. 1 is a perspective view of one embodiment of the present invention installed beside a typical hospital bed, showing the floor receptacle installed in a cutaway view of the concrete floor.

[0014] FIG. 2 is a perspective view of one embodiment of the present invention depicting the support pole assembly separated from the floor receptacle.

[0015] FIG. 3 is a perspective view of one embodiment of the floor receptacle with receptacle cap assembly partially removed

[0016] FIG. 4. is a top view of the floor receptacle with cap installed.

[0017] FIG. 5. is a side view of the floor receptacle with cap installed.

[0018] FIG. 6. is a section view I-I of the floor receptacle with cap installed.
FIG. 7 is a section view II-II of the floor receptacle with cap installed.

FIG. 8 is a perspective view of one embodiment of the present invention showing the support pole assembly, floor receptacle, and cap removed.

FIG. 9 is an enlarged detail view “I” depicting the drive pins on the bottom of the pole aligning with blind holes in the floor cap.

FIG. 10 is a perspective view of one embodiment of the present invention showing the support pole assembly, knob cover, and receptacle cap assembly partially exploded.

FIG. 11 is an enlarged detail view “II” depicting the receptacle cap assembly being stored within the knob of the support pole, and knob cap to cover the receptacle cap assembly while in storage.

FIG. 12 is a side view of one embodiment of the present invention depicting the support pole assembly installed within the floor receptacle.

FIG. 13 is an enlarged partial section view “III-III” depicting the receptacle cap assembly stored within the support pole.

FIG. 14 is an enlarged partial section view “IV-IV”.

Detailed Description of the Preferred Embodiment

Referring now to the figures, FIG. 1 illustrates one embodiment of the present invention showing the general appearance of the device in use beside a hospital style bed 28, located in a room with a concrete slab type floor 4. Further referring to FIG. 1, the present invention consists of a support pole assembly 1, with grip 2, which fastens into a floor receptacle 3 mounted within a concrete slab type floor 4. Knob 5 is rotated to secure the support pole assembly 1, into the floor receptacle 3 to prevent its inadvertent removal during use.

FIG. 2 shows the support pole assembly 1, removed from the floor receptacle 3.

Referring FIG. 3, floor receptacle 3, comprises receptacle body 6, and bottom cap 8a. When not in use, the top opening of floor receptacle 3, is sealed with receptacle cap assembly 9. Receptacle cap assembly 9, comprises cap 10, o-ring 11, and threaded stem 12 which are shown in more detail further on. Pin 14, (not shown) holds the threaded stem 12 into the cap 10, in a manner that is somewhat loose to permit minor misalignment of the parts when assembled. Blind holes 13, provide sub-flush engagement surfaces which are used to help rotate the receptacle cap assembly 9 to secure it into the floor receptacle 3 thereby sealing the floor receptacle 3 when not in use.

FIGS. 4 through 7 depict various views of the floor receptacle 3 with receptacle cap assembly 9, fastened in place.

FIG. 4 shows a top view of the floor receptacle 3, depicting the location of the blind holes 13 on the top surface of cap 10.

FIG. 5 shows a side view of the floor receptacle 3. Floor receptacle 3 is cylindrical in shape, and preferably fabricated from a strong material such as steel or more preferably stainless steel for corrosion resistance. Floor receptacle 3 is preferably fabricated with outer cylindrical surface geometry and texture to permit good engagement and adhesion with standard concrete bonding agents to hold floor receptacle 3 securely in place within a cored hole in a concrete slab type floor. By example, floor receptacle 3 may be preferably fabricated with helical annular grooves 7. Most preferably two sets of helical annular grooves 7 are used with opposite lead angles as shown to prevent the floor receptacle from rotating within a bonding agent should the surface adhesion mechanism fail. Furthermore, and to promote better surface adhesion with the bonding agent, outer cylindrical surface 8 is preferably roughened in some manner such as diamond knurling. Floor receptacle 3 is preferably surface treated in a manner, such as by nickel electroplating, to prevent corrosion when installed in the typically corrosive concrete environment.

FIG. 6 is a section view “I-I”. Floor receptacle 3, is sealed when not in use by receptacle cap assembly 9 which is secured into floor receptacle 3, by rotating receptacle cap assembly 9, causing the threadforms 16, on the tip of threaded stem 12 to engage into threaded bore 15. Cap 10, is cylindrical in shape with a clearance fit into the top of receptacle body 6. Cap 10 has two blind holes, 13, which provide sub flush engagement surfaces which are used to help rotate the receptacle cap assembly 9, using drive pins 17, (not shown) on bottom of the support pole assembly 1.

Upper section of cap 10, has a groove 18, to permit easier grasping of the receptacle cap assembly 9 when it is being removed up out of the floor receptacle 3. A second sealing groove, 19, holds o-ring 11, which seals against inside bore surface 20, of floor receptacle 3. O-ring 11, serves two purposes: firstly, it prevent liquids and debris from entering floor receptacle 3, when sealed with receptacle cap assembly 9. Secondly, o-ring 11, provides resistance to the receptacle cap assembly 9, being rotated, thereby preventing it from becoming unfastened due to vibrational back-driving of threadforms 16 while installed.

Cap 10 has blind bore 23 centrally located in the bottom of the cap 10, to receive the top end of threaded stem 12. Blind bore 23 has a slightly larger diameter than the diameter of threaded stem 12 to permit some angular deflection of threaded stem 12 relative to cap 10 to allow for misalignment of the cap 10 when initially placed in the floor receptacle 3.

Cap 10, has cross drilled hole 21, which permits the insertion of pin 14, through cross drilled hole 21 and hole 22 in the threaded stem 12 to join threaded stem 12 to cap 10. Preferably, hole 22 has a slightly larger diameter than the diameter of pin 14, to permit some angular deflection of threaded stem 12 relative to cap 10.

Receptacle bottom 24, is typically fabricated separately, and then subsequently joined to the bottom end of receptacle body 6 by permanent means such as welding. Receptacle bottom 24 is preferably made from a strong material such as steel. Receptacle bottom 24 has threaded bore 15, located centrally, and outer boss surface 25, with taper surface 26, and a total of four locking holes 27 which are discussed in more detail further on. Bottom cap 6a, slides over the bottom end of the floor receptacle 3 with the purpose of preventing the concrete bonding compound from entering the threaded bore 15, and locking holes 27 during
installation. Bottom cap 6a is preferably fabricated from a flexible yet ductile material such as polypropylene plastic.

[0037] FIG. 7 shows section view “II-III” depicting the preferable layout of locking holes 27, as four equally spaced holes.

[0038] FIG. 8 shows the support pole assembly 1, along with receptacle cap assembly 9 removed from the floor receptacle 3.

[0039] FIG. 9 is an enlarged detail view “I” depicting the manner in which drive pins 17 engage into blind holes 13 of the receptacle cap assembly 9. FIG. 9 also provides a view of the retaining screw 29, taper collar 30, and o-ring 31 to be discussed in more detail with FIG. 14.

[0040] FIG. 10 shows support pole assembly 1, along with knob cover 32, and receptacle cap assembly 9 partially inserted into its storage location within the top of knob 5.

[0041] FIG. 11 is an enlarged detail view “II” depicting the manner in which receptacle cap assembly 9 inserts into a storage space located within the top of knob 5. Guide bushing 33 is fabricated from a soft material such as plastic, to guide the threaded stem 12 into the hollow middle area of the knob 5, while preventing damage to threadform 16 (not seen) on the tip of threaded stem 12. The internal surfaces of knob 5 have geometry to aid with the insertion, and retention of receptacle cap assembly 9. Taper surface 34 inside knob 5, helps to compress the o-ring 31 when the receptacle cap assembly 9 is pressed down into storage. Bore surface 35 has a suitable interference diameter dimension to retain the receptacle cap assembly 9 in place within the knob 5, during transport.

[0042] FIG. 12 is a side view of the support pole assembly 1, installed within the floor receptacle 3.

[0043] FIG. 13 is an enlarged partial section view “III-III” Lower portion of knob 5 fits coaxially within outer tubular member 52, with the shoulder surface 57 of the knob resting on washer 51, which rests upon the top surface of the outer tubular member 52. Washer 51 is intended to communicate thrust load from the knob 5 to the top surface of outer tubular member 52 and is preferably fabricated from a wear resistant, low friction material such as UHMW plastic. Guide bushing 33 is press fit within the bore 54 of knob 5 to guide the insertion of threaded stem 12. Groove 54 holds o-ring 50. O-ring 50 acts as a smooth bearing surface between knob 5 and inside surface of outer tubular member 52. Inner tubular member 48 fits within the bore 54 of knob 5, and is held within the knob 5 by two pins 49 inserted through hole 58 of inner tubular member 48. Inner tubular member 48 serves as a rotational and tension member to fasten and secure the support pole assembly 1 into the floor receptacle 3 as detailed in the discussion of FIG. 14.

[0044] FIG. 14 is an enlarged partial section view “IV-IV” showing the bottom of the support pole assembly 1 almost fully inserted into the floor receptacle 3 leaving a small gap between mating surfaces for illustrative purposes. Outer tubular member 52 is connected to base stem 36 by permanent means such as welding. Base stem 36 inserts into bore of floor receptacle 3, until two sets of tapered surfaces simultaneously mate: The first mating surface set is the inner taper surface 37 on the inside bottom edge of base stem 36 which mates against taper surface 26 of receptacle bottom 24. The second mating surface set is that collar taper surface 39 mates with taper seat 40 of floor receptacle 3. The angular nature of these mating surfaces serves to center the support pole assembly 1 within the floor receptacle 3, and remove free play between the two items resulting in a tighter feel of the support pole assembly 1 when in use. The o-ring 41 is also pressed against the inside edge 42 of the floor receptacle 3 creating a seal that prevents liquid and debris from entering the floor receptacle 3 while the support pole assembly 1 is installed in the floor receptacle 3. Further, drive pins 17 engage into locking holes 27 to prevent support pole assembly 1 from rotating while in use. This allows additional horizontal rail optional accessories (not shown) to be added onto the support pole assembly thereby allowing lateral forces to be born by such horizontal rail accessories without rotating the pole.

[0045] Taper Collar 30 is preferably made of a rigid material such as steel, and is attached to base stem 36 by permanent means such as welding.

[0046] Threadform 53 on bottom of threaded spool 43 engages into threaded bore 15 of floor receptacle 3 to hold support pole assembly 1 into floor receptacle 3. Spool top boss 46 of threaded spool 43 fits within bore of inner tubular member 48 and held therein by pin 47 through drilled hole 55 and hole 56. Therefore, when knob 5 is rotated, inner tubular member 48, and threaded spool 43 are rotated causing threadform 53 to engage into threaded bore 15, thereby pulling support pole assembly tightly into the floor receptacle, and thereby giving the support pole assembly a rigid feel while in use, and preventing inadvertent removal during use.

[0047] When support pole 1 is removed from floor receptacle 3, threaded spool 43 is held captive within base stem 36 by retaining screw 29 acting on either the top shoulder 44 or the bottom shoulder 45 of the threaded spool.

[0048] Top shoulder 44 and bottom shoulder 45 of threaded spool 43 have an outside diameter that is slightly less that the inside diameter of base stem 36 to permit the threaded spool 43 to float slightly from side to side to allow for any misalignment.

[0049] Although the invention has been described relating to a preferred embodiment, it should be understood that various modifications, additions, and alterations may be made to the invention by one skilled in the art without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. A support pole for elderly and disabled persons comprising an outer tubular member enclosing a rotatable inner tubular member with means at its lower end to engage a cylindrical floor mounted receptacle.

2. A support pole as defined in claim 1 wherein the cylindrical floor receptacle has an annular groove arrangement on the outer surface.

3. A support pole as defined in claim 2 wherein the annular groove is of helical configuration.

4. A support pole as defined in claim 3 wherein a pair of helical grooves having opposite leads are used.

5. A support pole as defined in claim 4 wherein the interior of the cylindrical floor receptacle has a taper surface at its upper end and at its lower end.
6. A support pole as defined in claim 5 wherein a pair of locking holes are located at the bottom of the cylindrical floor receptacle.

7. A support pole as defined in claim 6 including a hollow knob connected to the inner tubular member and located at the top of the pole.

8. A support pole as defined in claim 7 including a circular cap member with an attached threaded stem which slidably fits into the knob.

9. A support pole as defined in claim 8 having a grip member on the outer surface.

10. A support pole as defined in claim 9 wherein the cap member sealingly engages the cylindrical floor receptacle when the support pole is not in use.

11. A support pole as defined in claim 10 wherein the outer tubular member is connected to a base stem member.

12. A support pole as defined in claim 11 including a pair of pins at the bottom of the base stem member which are adapted to fasten the cap to the cylindrical floor receptacle.

13. A support pole as defined in claim 12 wherein the pins are adapted to engage the locking holes of the cylindrical floor receptacle.

14. A support pole as defined in claim 13 wherein the base stem member engages the tapered surfaces of the cylindrical floor receptacle.

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