

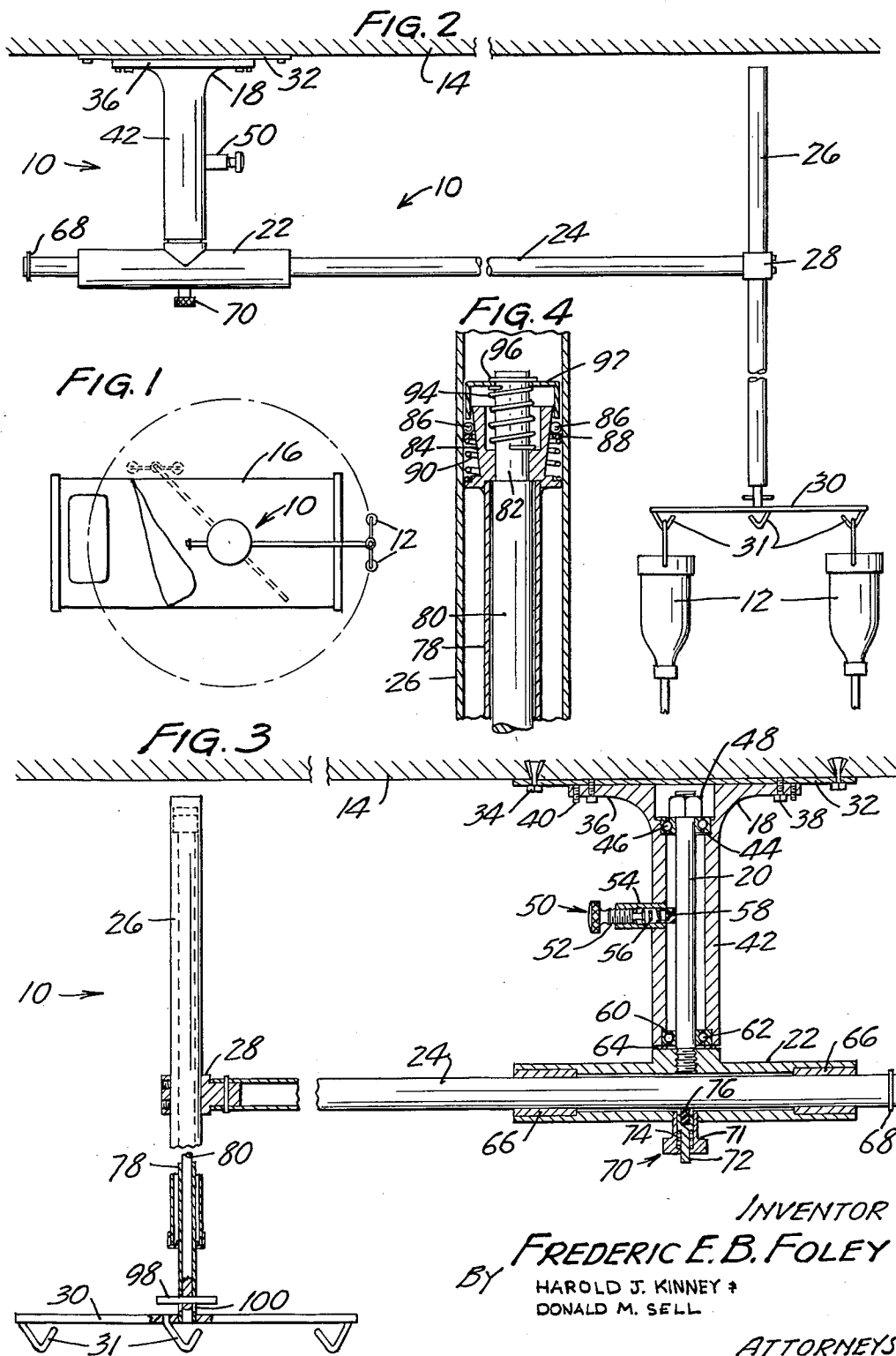
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SUSPENSION DEVICE FOR INTRAVENOUS FLUID SUPPLY CONTAINERS

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SUSPENSION DEVICE FOR INTRAVENOUS FLUID SUPPLY CONTAINERS

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The invention relates to a device for positioning an intravenous feeding container over the bed of a patient to be intravenously fed. More particularly, the invention relates to a ceiling suspension device for positioning and maintaining an intravenous feeding container in a preselected adjusted position.

Intravenous feeding of hospital, and other bedridden patients, has been commonly practiced for several years; yet, this delicate procedure has been carried out utilizing the most rudimentary intravenous container supporting equipment. In many instances the equipment comprises merely a bottle supporting tripod placed in the aisle beside the patient's bed on a temporary basis and exposed to aisle traffic in attendance of the patient. In operating rooms, these temporary tripod structures and other temporary devices, such as bed mounted bottle holding brackets and the like, are potential sources of danger and continuing inconveniences.

A ceiling suspension device to correct these inadequacies is the subject matter of Phelan Patent No. 2,814,457 issued November 26, 1957. While this device is a decided improvement over prior practice, its utility is limited in many respects; the device uses a long ceiling track requiring a considerable expanse of unencumbered ceiling and is movable horizontally only along a lineal path defined by the ceiling track; when mounted directly over a bed (as is the usual procedure since mounting between beds destroys the aisle space) the container hanger suspension leg is awkwardly positioned, even when not in use, for administering to the patient or to the patient's bedding; the container suspension height adjustment means, although effective, is difficult and time consuming to manipulate.

It is an object of this invention to provide a ceiling mounted suspension device for facilitating the positioning and holding of intravenous feeding containers in a new and useful manner, which device permits suspension of a container in any vertically adjusted horizontal position within a large circular area, the diameter of which may be at least as great as the length of a bed, it is another object of the invention to provide a vertically adjustable means carrying the container holding hanger, which means is easily operated with one hand and automatically locks in any desired adjusted position upon release of the operating means controlling the adjustment; it is yet another object to provide a ceiling suspension device of the character described which necessitates only a small ceiling mounted base in its mounting, which base in turn controllably supports a horizontal arm for sliding and swinging movement.

The foregoing and other objects and advantages, which will become apparent as the description proceeds, are attained by the present invention, a preferred embodiment of which is illustrated in the accompanying drawings wherein:

FIGURE 1 is a top view of the device mounted over a hospital bed or the like and illustrating the manner and versatility of its horizontal movement and the area covered thereby;

FIGURE 2 is a side elevational view of the device as suspended from a ceiling;

FIGURE 3 is a side elevational view of the device

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similar to FIGURE 2 with certain parts being shown in cross-section for clarity of internal detail; and

FIGURE 4 is an enlarged cross sectional view of a portion of the vertical adjusting means for the container hanger vertical adjustment illustrating the automatic locking arrangement.

Referring now to the accompanying drawings in detail there is illustrated in FIGURE 1 a preferred embodiment of the ceiling mounted intravenous feeding container suspension device of this invention which is designated in its entirety by the numeral 10. The device is shown in its suspended position over a hospital bed or the like 16 and supporting intravenous feeding bottles or containers 12 for positioning in any position within the area defined by the dotted circular path illustrated in the figure whereby a container may be positioned longitudinally or laterally at any position desired overlying the bed, and whereby the container suspension means may be swung out of the way to inconspicuous position when not in use.

In FIGURE 2 the device 10 is shown in side elevation suspended from a ceiling 14. The device comprises a mounting base 18 rotatably carrying at the lower end thereof a spindle 20 (FIG. 3), to the lower end of which is attached a horizontally disposed tubular bracket 22, within which bracket is slidably disposed an elongated horizontal arm 24. At the outer end of the horizontal arm 24 is attached a suitable clamping means 28, adjustably clamping therewithin a vertically extensible member 26 in preselected adjusted vertical positions. Carried at the lower end of the vertically extensible member 26 is a container holder or hanger 30, having suspension hooks 31 thereon by means of which the intravenous feeding containers or bottles 12 are supported in the manner illustrated.

The base construction and the attachment of the horizontally disposed rod 24 thereto is best illustrated in FIGURE 3. While base 18 may be attached directly to ceiling 14, it is preferably attached thereto by means of a separate mounting plate 32, the mounting plate 32 being first attached to the ceiling by means of suitable fasteners 34 and the base 18 attached thereafter to the mounting plate.

The base 18 comprises a circular base flange 36 which presents a flat supporting surface for attachment to the mounting plate 32. Fasteners 38 circumferentially disposed inwardly of the base flange periphery attach the base flange 36 to the mounting plate 32, or the ceiling 14 if desired, and leveling screws 40, also circumferentially spaced around the periphery of the base flange 36, enable adjustment of the base flange 36 with respect to the base plate 32 to level the base 18 and the horizontally disposed bracket 22 depended therefrom regardless of the slope of the ceiling 14.

The circular base flange 36 comprises the outwardly flared upper end of a downwardly depending tubular post 42, within the upper end of which is provided a bearing seat 44 carrying a suitable rotatable bearing 46 on which bearing is rotatably carried the enlarged head, in the form of nut 48 screwed on its upper end, of the rotatable spindle 20. Within the lower end of the tubular post 42 is disposed a second bearing seat 60 carrying suitable bearing 62 to rotatably journal the lower end portion of the rotatable spindle 20. Tubular bracket 22 is screwed into the lower end of spindle 20.

To control the ease with which the horizontally disposed tubular bracket 22 will rotate, the post 42 is provided with a suitable braking device 50 to frictionally engage the spindle 20 with varying frictional pressure and thereby control the resistance to rotation of the spindle. This base brake 50 comprises a knurled head screw 52

threadedly carried in a bushing 54, which bushing opens into the interior of the post 42. A brake shoe 58 is slidably disposed within the bushing 54 and coil spring 56 biases the brake shoe against the spindle 20, one end of the spring being seated against the inner end of the knurled head screw 52 and the other against the brake shoe 58. To vary the frictional engagement of the brake shoe 58 with spindle 20, the knurled head screw 52 is simply screwed into or out of the bushing 54.

A suitable flange 64 of bearing 60 is interposed between the lower end of the depending base post 42 and the horizontally disposed tubular bracket 22. Within the horizontally disposed tubular bracket 22 adjacent each end thereof is secured a suitable linear bearing or ball bushing 66 journaling the horizontal arm or shaft 24 for sliding movement within the bracket. A stop ring 68 is provided on the inner end of the horizontal arm 24 to limit the sliding movement of the arm outwardly from the bracket 22.

To control the sliding movement of the horizontal arm 24, the bracket 22 is provided with a suitable brake 70, which in effect comprises a hollow knurled head screw 71 screwed into the under surface of the bracket 22. Slidably disposed within this screw 71 is a shank 72 carrying in a slot within its enlarged upper end a suitable brake shoe 76 in frictional engagement with the horizontal arm 24. To control the frictional engagement of the brake shoe 76 with the horizontal arm 24, a coil spring 74 is disposed between the shoulder formed by the upper end portion of the shank 72 and a shoulder formed at the knob end of the hollow screw 71 whereby the spring braces the brake shoe 76 against horizontal arm 24 with a force controlled by the adjustment of screw 71.

While the vertical member 26 is grossly adjustable by means of selected adjustment on the clamping bracket 28 at the outer end of the horizontal arm 24, a more discriminating adjustment is used to vertically adjustably position container hanger 30. Thus, the vertical member 26 comprises a hollow guide tube within which is telescopically disposed a somewhat smaller tube 78 to the lower end of which is fixedly attached container hanger 30. Within the smaller tube 78 is slidably disposed an operating rod 80.

The upper end portion 82 of rod 80 is of reduced diameter and slidably projects through a center bore on an inverted frusto-conical wedge 84 attached to the upper end of tube 78. The tapered lower end of the ball wedge 84 is flanged outwardly to form a spring support for the biasing spring 90 which surrounds the wedge. A ball seating ring 88 rests on the upper end of said spring 90 and wedges balls 86 between the inside wall surface of guide tube 26 and wedge 84 to lock tube 78 in position.

To release tube 78 from its locked position, an inverted cup 92 is carried on the reduced upper end 82 of operating rod 80. The depending wall of cup 92 terminates above the wedging balls 86 and is normally held out of contact therewith by means of biasing spring 94 surrounding the upper end portion 82 of operating rod 80. Spring 94 seats at its lower end on a shoulder formed in the center bore of wedge 84 and at its upper end against the bottom of the cup 92 to constantly bias the cup upwardly against the stop ring 96 at the upper end of rod 80. Cross handle 98 at the lower end of operating rod 80 extends through vertically elongated slots 100 at opposite sides of tube 78. Squeezing handle 98 downwardly against hanger bar 30 causes the cup 92 at the upper end of rod 80 to push balls 86 out of wedging engagement with guide tube 26 and thereby enable telescoping movement of tube 78 out of guide tube 26 to lower the hanger bar 30. Release of handle 98 causes spring 94 to raise cup 92 out of its ball engaging relation and thereby automatically lock tube 78 in position. To raise hanger bar 30, it is necessary only to push up on the hanger bar as the ball wedging action only locks against downward movement.

In the operation of the device, after mounting on the ceiling, the depending vertical supporting tube 26 may be adjusted to a position in bracket 28 most convenient for subsequent adjustment of the height of container hanger 30 by means of handle 98 on operating rod 78. By sliding, or swinging, or a combination of these movements the hanger 30 may be brought to any position most convenient between the shoulders and feet of a patient to be intravenously fed.

When the device is not in use it may be swung aside to an inconspicuous position wherein it is neither a hazard to aisle traffic nor to administering to the patient.

From the foregoing description, the practice of the invention will be apparent. However, since numerous modifications and changes from the preferred embodiment will occur to those skilled in the art after a perusal of this specification and accompanying drawing, it is to be understood that the scope of the invention is limited only as required by the appended claims.

I claim:

1. A device for positioning an intravenous feeding container anywhere over the bed of a patient to be intravenously fed and maintaining the container in such position comprising a base having means for attaching the same to a ceiling, a horizontally disposed tubular bracket, means rotatably attaching said bracket to said base, a horizontally extending member carried by said tubular bracket for movement of at least one end toward and away from said bracket, a vertically extending extensible member having an intravenous feeding container holder at the lower end thereof, clamping means on said one end of said horizontally extending member adjustably attaching said vertically extending extensible member to said one end, said container holder being positionable in any selected vertically adjusted position in the circular area formed between the outermost and innermost paths traveled by said vertical member as said horizontally extending member is swung about said base in its respective positions most remote from and most proximate to said tubular bracket whereby said container holder can be positioned in any position transversely or longitudinally of a bed.

2. A device for positioning an intravenous feeding container anywhere over the bed of a patient to be intravenously fed and maintaining the container in such position comprising a base having means for attaching the same to a ceiling, a horizontally disposed tubular bracket, means rotatably attaching said bracket to said base, a horizontally extending member slidably carried by said bracket for movement of its ends toward and away from said bracket, a vertically extending extensible member comprising an outer tube and an inner extensible and retractable member having an intravenous feeding container holder at the lower end thereof, locking means inter-engaging said outer tube and inner member locking said inner member in place within said outer tube, and lock releasing means carried by said inner member adjacent the lower end thereof between said outer tube and said container holder and movable toward said container holder to release said locking means upon the application of manual squeezing pressure exerted against said container holder and said lock releasing means whereby said inner member is simultaneously released for movement and guidingly retained against uncontrolled movement in the same operation, clamping means on one end of said horizontally extending member adjustably attaching said vertically extending extensible member to said one end, said container holder being positionable in any selected vertically adjusted position in the circular area formed between the outermost and innermost paths traveled by said vertical member as said horizontally extending member is swung about said base in its respective positions most remote from and most proximate to said tubular bracket whereby said container holder can be positioned in any position transversely or longitudinally of a bed.

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3. A device for positioning an intravenous feeding container anywhere over the bed of a patient to be intravenously fed and maintaining the container in such position comprising a base having means for attaching the same to a ceiling, a horizontally disposed tubular bracket, means rotatably attaching said bracket to said base, a horizontal arm slidably carried by said bracket for movement of its ends toward and away from said bracket, a vertically extending extensible member having an intravenous feeding container holder at the lower end thereof, clamping means on one end of said horizontal arm adjustably attaching said vertically extending extensible member to said one end, and stop means carried by the other end of said horizontal arm to limit its movement toward said tubular bracket, said container holder being positionable in any selected vertically adjusted position in the circular area formed between the outermost and innermost paths traveled by said vertical member as said horizontal arm is swung about said base in its respective positions most remote from and most proximate to said tubular bracket whereby said container holder can be positioned in any position transversely or longitudinally of a bed, said vertically extending extensible member comprising a tubular sleeve held by said clamping means and having slidably telescopically disposed there-
within a smaller extensible member to the lower end of which said holder is attached, locking means interengaging the upper end of said smaller member and said tubular sleeve adjustably locking said smaller member against downward extension from said tubular sleeve, and movable means operable by squeezing pressure from the lower end of said smaller tube for releasing said locking means while adjusting the height of said intravenous feeding container holder.

4. The device of claim 3 wherein said movable means includes an element movable toward and away from said

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intravenous feeding container holder and carried by said smaller member between said outer sleeve and said intravenous feeding container holder.

5. A device for positioning an intravenous feeding container over the bed of a patient to be intravenously fed and maintaining the container in such position, said device comprising a ceiling mounting base having an elongated downwardly extended hollow stem, a shaft rotatably mounted within said stem and having mounted on the lower end thereof outside of said stem a horizontally disposed tubular bracket, means carried by said base for adjustably controlling the resistance to rotation of said shaft, a horizontal arm carried by said horizontal bracket for movement toward and away from said bracket, a vertically extending extensible member carried by said horizontal arm, the extensible portion of said extensible member having at the lower end thereof an intravenous feeding container holder, means locking said extensible portion against downward movement and means accessible upon grasping said extensible portion adjacent said container holder for simultaneously moving said extensible portion and releasing said locking means whereby with a single operation the container holder is positionable in a selected vertically adjusted position throughout a 360° horizontal path.

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