March 20, 1962 M. E. STACK 3,026,079

ADJUSTABLE SUPPORT MEANS FOR LIQUID DISPENSING VESSELS

Filed April 4, 1960 2 Sheets-Sheet 1

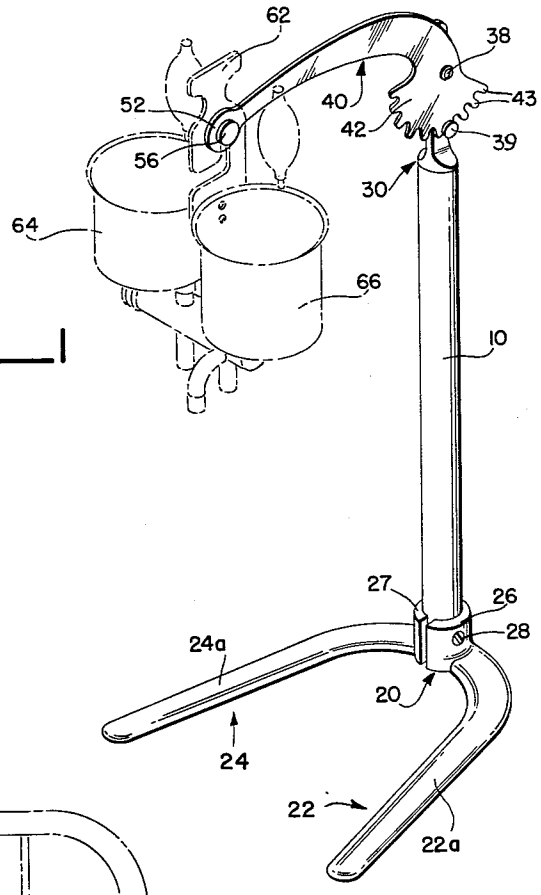


FIG. 1

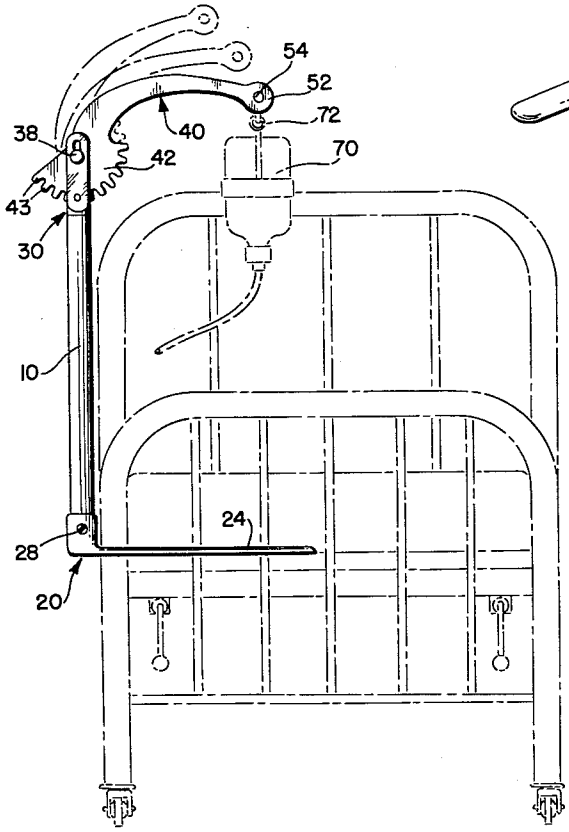


FIG. 2

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FIG. 3

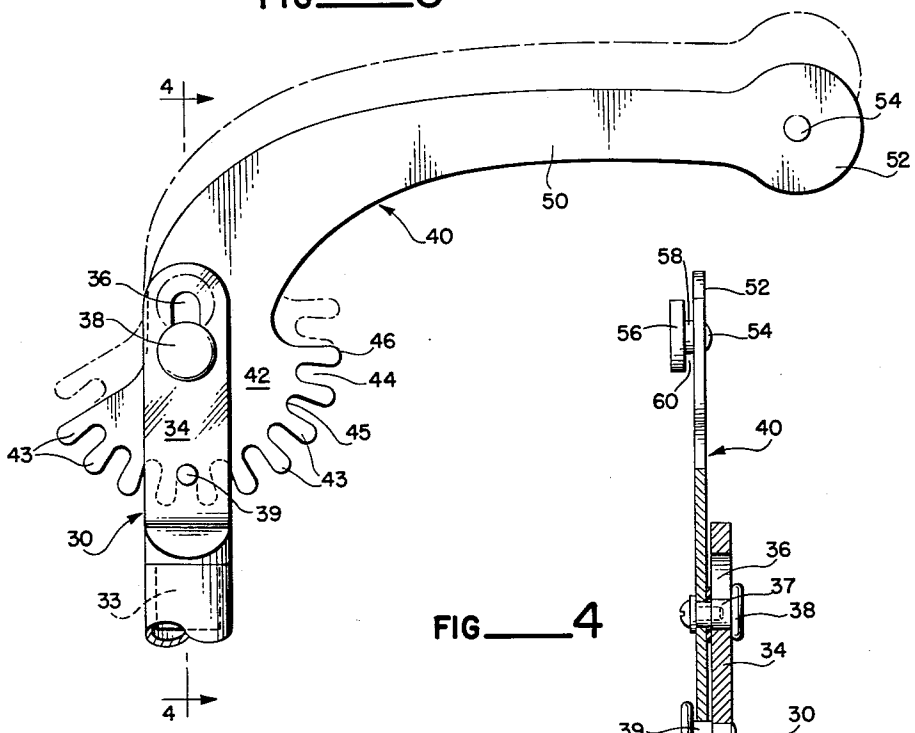


FIG. 4

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ADJUSTABLE SUPPORT MEANS FOR LIQUID DISPENSING VESSELS

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3 Claims. (Cl. 248—125)

This present invention relates to that general class of accessory devices used primarily in hospitals and more particularly to an adjustable means for positioning liquid dispensing vessels and which employs means which fit between the mattress and springs supporting the mattress so as to hold the adjustable stand in its position of use.

This present equipment is designed for particular use with my equipment for giving peristaltic enemas and which are shown in U.S. patents, Nos. 2,606,557 and 2,832,341. In this use it becomes necessary to have a means that can normally be easily adjusted by one hand as the nurse or operator usually is required to hold the injection tube with one hand yet it is many times very critical that the proper hydraulic pressure be provided. It therefore becomes very desirable to be able to quickly make small changes in elevation to increase or decrease the volume of the fluid involved in the injection. It follows that when a device is provided for one purpose it may also serve many other purposes and in this present instance this device, while desirable for use with my previous equipment, has found to be also particularly useful in giving blood plasma or intravenous feedings to patients. In both these cases the flow is dependent upon the height of the fluid container and in the beginning of an injection it is very desirable that the nurse have hold of the injection needle, so that it will not be displaced from a blood vessel, and still be able to change the pressure on the fluid by raising the height of the vessel from which the fluid flows. To be able to do this with one hand, as is provided for in this present equipment, has been found to be a very great aid in treating many types of hospital patients.

The principal object of my invention therefore is to provide an adjustable support means for a fluid vessel which may be secured in operational position by inserting the spaced apart feet of the stand between the mattress and springs of a hospital bed for instance or between the table surface and the pad on which a patient may be lying while he is being given a treatment or being transported about the hospital on an operating table of the type having caster wheels for such a purpose.

A further object of this invention is to provide an easily adjustable means so that the vessel containing the fluid, which is being used in the treatment of a patient, can be easily adjusted in vertical position by the use of only one hand of the operator.

A further object of this invention is to provide vertical adjustment means for fluid vessels in which the adjusted position is a fixed one not dependent upon friction in any way but which has a definite relationship in height to the other adjacent adjusting means on a quadrant so that the operator can readily make an adjustment to reduce or increase the volume of the flowing liquid and know in advance exactly the amount of that increase or decrease.

Further objects, advantages and capabilities will be apparent from the description and disclosure in the drawings or may be comprehended or are inherent in the device.

FIGURE 1 is a perspective view showing my device in its preferred arrangement in solid lines and illustrating appropriate supported vessels in dashed lines.

FIGURE 2 is a side elevation of my device showing the same in association with a hospital bed and mattress

which are shown in dashed lines and illustrating successive positions of the adjusting arm in dashed lines.

FIGURE 3 is a fragmentary side elevation of the upper adjusting arm and the coacting parts of the supporting standard in order to show the cooperative relationship between these various parts.

FIGURE 4 is a vertical sectional view taken along the line 4—4 of FIGURE 3.

Referring to the drawings, throughout which like reference characters indicate like parts, numeral **10** designates the vertical standard, which in order to keep the overall weight of the device to a minimum is normally made of tubing, as illustrated in FIGURES 3 and 4. Standard **10** is supported in its vertical position by a bottom fitting or base **20**. At its upper end standard **10** is provided with a special top fitting **30** to which is pivotably secured the quadrant arm **40** in a manner permitting limited vertical movement, in addition to its arcuate movement.

The bottom fitting or base **20** is provided with the well spaced base members **22** and **24**. These base members having straight foot portions **22***a* and **24***a* respectively that are preferably of substantial width but of minimum height so that they become in effect rigid straps that can be easily slid between a mattress and a spring or between the top of an operating or conveying table and the pad thereon. The foot portions have a substantially flat bottom and arcuate top surfaces. To define substantial width and minimum height an acceptable proportion is a height of ⅜″ at the outer end to ½″ at the anchor end of the feet and a width 1¼″ at the outer end and 1⅝″ at the anchor end. The general form of base **20** is illustrated in FIGURES 1 and 2 in which it will be noted that the longitudinal axes of the individual base members **22** and **24** are divergently positioned. Each of the foot members is provided with horizontally disposed curved end portions joining or terminating in a semicyclindrical sleeve portion as **26** and **27**. A clamping bolt **28** serving to secure the standard **10** and the sleeve portions together with said curved end portions when secured to said standard, together with base members **22** and **24**, forming a horizontally disposed U-shaped bend centered on said standard. This arrangement permits the easy disassembly of this portion of the support means and makes it convenient for shipping as well as for storing during periods in which it is not being used. By having the upward extent of the semicylindrical portions **26** and **27** of reasonable length they provide a very secure base for standard **10**.

At its upper end tube **10**, which forms the standard, is provided with a top fitting which is probably best illustrated in FIGURE 4 and to a lesser degree in FIGURE 3. Here it will be noted that fitting **30** has a flange **31** that has the same outside diameter as tube **10** and this fitting is provided with a downwardly extending plug portion **33** adapted to snugly fit inside of standard **10** in order to give security while the device is in use and yet permit ready disassembly of the same for storage, transportation and the like. At its upper end fitting **30** is provided with a relatively thin flat portion **34**. At its upper end this flattened portion **34** is provided with the axially disposed slot **36** to accommodate the enlarged portion **37** of the pivot pin **38**. Near its lower end surface the flat portion **34** is provided with a riveted-in-place two-diameter pin **39** forming the locating pin which determines the angular position of quadrant arm **40**. The two diameter body is used with all three pins and rivets to assure ample clearance from the quadrant arm.

Quadrant arm **40** is provided with the quadrant portion **42** having a plurality of tooth-like members **43** between which are provided the open end slots **44**. The form and

proportions of each of the slots **44** should be such that they will provide a round, engaging surface **45** to freely engage the larger step portion of rivet **39**. At its outer ends the side walls or slots **44** join the circular end portions **46** of the tooth-like lug members **43** providing a very convenient centering arrangement so that as the operator makes an adjustment of the quadrant, with one hand, it is only necessary to raise the quadrant arm to disengage the slot **44** being used from rivet **39** and to then move the quadrant about pivot pin **38**. Because of the freedom provided by the curved end portions **46** the toothed quadrant can again be readily engaged with rivet **39**.

The general form of quadrant arm **40** is quite well illustrated throughout the various drawings and particularly in FIGURE 3 in which it will be noted that the arm portion **50** is substantially at right angles to the median line of quadrant **42**. At its extreme outer end arm **50** is provided with what in effect is an enlarged bearing plate **52**, preferably formed circularly and centered upon opening **54**. For its principal purpose this device is preferably constructed with a riveted-in load supporting pin **56**. This pin is provided preferably with a large flat head so as to form the engagement space or annular channel **60** with a predetermined width which will engage a fitting such as the one shown in dashed lines at **62** in FIGURE 1. In viewing this figure it will be believed apparent that it is desirable that the bearing surfaces of plate **52** be of sufficient width to engage member **62** so as to support it adequately in case one of the cans as **64** might at one time contain more liquid than the other can **66**. These cans and the appropriate fitting **62** form no part of this present invention but are components employed with the patents noted in the preamble to this application and are illustrated and discussed in order to show the coaction between the particular structure of arm **50** and the equipment for which it is normally designed for use.

Method of Use

In using my present support means for fluid containers, reference is made to FIGURE 1 which illustrates some of the equipment of my former patent applications as previously noted. In using my stand in its prime intended use it is very necessary to have a convenient means for adjusting the vertical height of the fluid containers **64** and **66** so that the fluid flow may be increased or decreased at the will of the nurse. In the treatment of persons who have very low vitality, as the result of long illness, it is necessary that adequate graduation of volume be achievable and it is in such cases that this equipment is particularly useful. If it is decided that the liquid containers should be raised to give additional volume then the operator grasps the substantially horizontal portion **50** of quadrant arm **40** raising the whole assembly including the fluid vessels. This act disengages the previously engaged slot **44** from contact with rivet **39** and permits the whole quadrant and any weight it supports to be revolved around pivot pin **38**. The operator will normally determine for the equipment used a degree of calibration so the moving of the quadrant **42**, one tooth on either side of the original starting point, can be revolved to give the height required when another open end slot **44** is engaged with rivet **39**. The position of the quadrant arm **40** is re-established as fixed and a new elevation will be given to the fluid containers whether it is containers as shown in FIGURE 1 or possibly a container such as shown in FIGURE 2 at **70** which is of a general type that is used for administering blood plasma or intravenous feedings. In the case of container **70** it will be necesary to have some supporting means as **72** which will engage member **56** or this member may be removed and attachment made by suitable means passing through opening **54**. In any case, however, it is desirable that the fluid vessel be capable of swinging about opening **54** as a center. It is for this reason that arm **40** has considerable length so that even though the most unfavorable of slots **44** are engaged by rivet **39** the fluid container will still swing freely, facilitating uniform flow from the container.

It is believed that it will be clearly apparent from the above description and the disclosure in the drawings that the invention comprehends a novel construction of vertically adjusted means for liquid dispensing vessels.

Having thus disclosed the invention, I claim:

1. An adjustable support means for liquid dispensing vessels, comprising: a vertically disposed standard of tubular form; a base having two spaced apart base members; said base members having subtantially straight foot portions each of minimum height and substantial width and an arcuate top surface; said base members having a sleeve portion adapted to partially encircle the bottom of said standard and a horizontally curved portion on each of said base members intermediate the foot portion and sleeve portion; a bolt passing through said sleeve portions and said standard for clamping said base members onto said standard; a top fitting secured to the top of said standard and having a relatively thin flat portion extending vertically and an axially disposed slot adjacent the upper end of said flat portion; a rivet secured in the lower portion of said flat portion and having an enlarged head spaced away from said flat portion to form a guideway; a quadrant arm slidably and pivotally secured to said flat portion of said top fitting by a pivot pin, vertically slidable in said axial slot; said quadrant arm having a quadrant formed of a plurality of substantially radial teeth disposed in a circle about said pivot pin, said teeth engaging said guideway and having slots between them adapted to selectively engage said rivet; said quadrant arm having an arm portion terminating in vertically disposed bearing plate having a central opening to facilitate securing liquid dispensing vessels thereto.

2. An adjustable support means for liquid dispensing vessels, comprising: a vertically disposed standard; a substantially U-shaped base having two divergently disposed base members, said standard secured to said base at substantially the center of the U base; a top fitting secured in the top of said standard and having a relatively thin flat portion extending vertically and an axially disposed slot adjacent the upper end of said flat portion; a rivet secured in the lower portion of said flat portion and having an enlarged head spaced away from said flat portion to form a guideway; a quadrant arm slidably and pivotably secured to said top fitting by a pivot pin, vertically slidable in said axial slot; said quadrant arm having a quadrant formed of a plurality of substantially radial positioned lug members disposed in a circle about said pivot pin, said lugs having slots between them adapted to selectively engage said rivet; said quadrant arm having an arm portion terminating in a vertically disposed bearing plate having a load supporting pin provided with a large flat head spaced away from said bearing plate and parallel to it to facilitate securing liquid dispensing vessels thereto.

3. An adjustable support means for liquid dispensing vessels, comprising: a vertically disposed standard; a base having two spaced base members each having a substantially straight foot portion of flat strap form; a semicylindrical sleeve portion terminating one end of each of said base members and adapted to partially encicle the bottom of said standard; a horizontally disposed curved end on each of said base members terminating in said sleeves; means for clamping said sleeves on said standard; a top fitting removably secured in the top of said standard and having a relatively thin flat portion extending vertically and an axially disposed slot adjacent the upper end of said flat portion; a rivet fixedly secured in the lower portion of said flat portion and having an enlarged head spaced away from said flat portion to form a guideway; a quadrant arm slidably and pivot-

ably secured to said flat portion of said top fitting by a pivot pin, vertically slidable in said axial slot; said pivot pin having an enlarged flat head on the side of said flat portion of the top fitting opposite the side engaging said quadrant arm; said quadrant arm having a quadrant formed with a plurality of substantially radial teeth disposed in a circle about said pivot pin, said teeth having slots between them adapted to selectively engage said rivet; said quadrant arm having an arm portion disposed substantially at right angles to the median line of said quadrant and terminating in a vertically disposed bearing plate having a central opening to facilitate securing liquid dispensing vessels thereto.

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