This invention relates to a seat structure arrangement for use in conjunction with bathtubs for swingably mounting a seat over the bathtub so that a patient or invalid can be positioned on the seat and then moved into a position over the bathtub in the operation of bathing. More particularly, the invention deals with a device or attachment of the character defined having means for adjusting one support of the device to adapt it for use in conjunction with tubs of different depths, as well as to provide means for coupling the seat frame on the supporting frame of the device in two different positions to accommodate uses of the device on either end of a bathtub.

Still more particularly, the invention deals with a device of the character described, having an adjustable backrest support to adapt the occupant of the seat to different vertical or inclined positions.

The novel features of the invention will be best understood from the following description, when taken together with the accompanying drawings, in which certain embodiments of the invention are disclosed and, in which, the separate parts are designated by suitable reference characters in the drawings and, in which:

FIG. 1 is a plan view illustrating the arrangement of a seat device made according to my invention in connection with a bathtub, illustrating the seat in its initial position at one side of the bathtub, with parts of the construction broken away and in sectional view.

FIG. 2 is a bottom detail view of the means supporting the seat on the device, omitting all background showing.

FIG. 3 is a sectional view through portions of a bathtub, viewing the device, as seen in FIG. 1, in the direction of the arrow 2 in FIG. 1, with part of the construction broken away and shown in sectional and parts omitted and indicating in dotted lines the position of the swinging seat when disposed over the bathtub.

FIG. 4 is an enlarged sectional view generally on the plane 4–4 of FIG. 3, with part of the construction broken away.

FIG. 5 is a detail view showing one end portion of a flexible backrest and its support on one of the frame members of the seat; and

FIG. 6 is a view illustrating in a full line the upright support of a backrest, in dotted lines a partial inclined support, and in dot-dash lines the fully inclined support, and in dot-dash lines the fully inclined support.

Considering FIGS. 1 and 3 of the drawing, the device comprises a seat supporting frame consisting of a U-shaped leg frame 10, comprising a top crosshead 11 and depending leg members, one of which is clearly shown at 12 in FIG. 3 of the drawing. Adjustable upon the lower end of each of the leg members are supplemental members 13, having longitudinally spaced apertures 14, with which a spring-pressed pin 15 supported in 12 are adapted to be coupled in adjustable support of the height of the leg members to accommodate bathtubs of different depths. Suitably fixed to the lower ends of the members 13 is a rubber suction cup 16, one of which is partially shown in sectional detail in FIG. 3 of the drawing.

Suitably fixed to the upper crosshead 11 of the frame 10 are two similar U-shaped frames 17, 17' having parallel side members 18, 18', with pairs of spaced apertures therein for reception of bolts in the mounting of the seat supporting unit 19 upon either of the frames 17, 17'. In the present construction, the unit 19 is supported on the frame 17, as will clearly appear from a consideration of FIG. 1. The unit 19 comprises upper and lower plates 20 and 21, note FIG. 3, with annular grooved bearing portions 22 and 23, between which a plurality of bearing balls 24 are arranged, two of these balls being shown in FIG. 3, with no background illustration thereof in the section taken through the unit 19 and a portion of the bearing balls 24 as shown in FIG. 1. The unit 19 is further shown in enlarged section in FIG. 4 of the drawing to clearly illustrate the supports of this unit upon the side members 18 of the frame 17, as well as similar seat supporting frame members or arms 25. From FIG. 4 of the drawing, it will appear that the members 18 are apertured, as seen at 26, to receive bolts 27 in mounting the lower plate 21 upon the frame 17; whereas, screws 28 are passed through apertures in the frames 25 and are coupled with the seat, which is shown in partial section at 29 in FIG. 4 of the drawing.

Considering FIG. 3 of the drawing, it will appear that bolts 27, generally similar to the bolts 27, are arranged at the other side corner portions of the plate 21 of the unit 19; whereas, substituted for the screws, as at 28, are other bolts 27' for attachment of the plate 20 to the frame 25, these bolts being further illustrated in FIG. 1 of the drawing. It will appear, from a consideration of FIGS. 3 and 4, that one of the bolts 27 also extends through a fashioned end portion 30 of a brace member 31. This fashioned end is to conform to the contour of the member 19, as clearly seen in FIG. 4 of the drawing.

The brace member 31 is coupled with a transverse bracing tube 32 by a screw 33 shown in part, in FIG. 3 of the drawing, the tube 32 being fixed at its ends by similar screws, one of which is shown at 32' in FIG. 3. These couplings are similar to coupling of the members 18, 18' with other supports, as later described. The bracing tube 32 serves to brace and reinforce the leg members 12 at a point above the supplemental members 13. Noticeably two of the braces 31 are employed, the brace shown in FIG. 3 of the drawing being actually the brace arranged below the righthand member 18' of the frame 17; whereas, the other brace is arranged below the lefthand member 18 of the frame 17 and the fashioned end 30 of this latter brace is shown in section in FIG. 4.

At this time, it is well to point out that the apertures in the respective side members 18, 18' are in the same alignment and the part of these aligned apertures are indicated at 26 in the frame members 18 in FIG. 1, so that the entire unit 19 can be mounted on the members 18', as well as on 18, as shown in FIG. 1 of the drawing, in the two adjustable positions of the seat structure on the main frame.

Returning now to the supporting frame, it will appear clearly from a consideration of FIG. 1 that the free ends of the members 18, 18' are coupled with an elongated tube 34 of a tub wall engaging portion generally identified by the reference character 35. One of these coupling engagements is shown partially in section on one of the members 18' and comprises a nut 36 suitably fixed in the member 18' to be engaged by a screw 37, the end of the members 18, 18' being fashioned to conform with the contour of the tube 34, as indicated at 38. Secured to the ends of the tube 34 are similar U-shaped members or grippers 39, the attachment being through means, similar to 36, 37, the screws being identified at 40.

At this time, it is pointed out that the attachments of 31 with 32 and 32 with 12 are the same as the detail showing in FIG. 1 and 33, 32' would represent other views, similar to the screw 37. These constructions facilitate a knockdown assemblage. However, in some instances, welding can be utilized so that the parts become integrally and fixedly united. Mounted on the side portions of the U-shaped members 39 are rubber tubings 41, having enlarged end portions 42 to protect engagement of the
U-shaped members with the upper portion of a side wall 43 of a tub. Part of the bottom wall 44 of the tub is shown adjacent the foot 16 in FIG. 3 and a portion of this bottom wall is also shown in FIG. 1. The members 25 are generally of the same construction, with the exception that one member can be regarded as a leg, and the other a rafter, in that several directionally bent portions 45 thereof are directed in opposed directions to each other with respect to the intermediate substantially parallel portions 46 of these members, to which the unit 19 is attached, as clearly illustrated in FIG. 4 of the drawing. Considering FIGS. 1 and 3 of the drawing, it will appear that the bent portions 45 are bent upwardly, as seen in FIG. 3, and laterally, as seen in FIG. 1, in extending to short straight portions 47 which flare outwardly, as noted in FIG. 1 and, from these portions 47, the members 25 are curved and terminate in upwardly extending backrest supporting members or posts 48, with which a flexible backrest 49 is adjustably coupled, the backrest being made of any suitable strong fabric having non-stretch characteristics. The backrest support is reinforced by a tube 50 which extends between the short straight portions 47 and is coupled therewith by bolts, as seen at 51. Note, in this connection, FIG. 3 of the drawing. The brace 50 serves to maintain a more or less definite spacing of the members 48. However, these members can be tensioned inwardly to a slight extent toward each other in the operation of coupling inner pocket portions 52 of the backrest 49 therewith, so that, when the assemblage has been made, the backrest will be stretched taut between the members 48, as seen in FIG. 1 and as shown by the solid line 49 in FIG. 6. By reason of the small dimensions of the showing in FIG. 6, the solid lines are shown and the positions of the members 48 is indicated by attachment 52 therewith. However, in providing an inclined support for 49 between 48, one outer pocket portion 53 is coupled with one of the members 48 and 49 will then assume the dotted line position 49 in FIG. 6, with 52 indicated in dotted lines, so that 53 will then be positioned on the lefthand member 48. In providing a greater inclination to the support of the back, 49 can be extended to the position shown in dot-dash lines at 49' in FIG. 6, in which case the other outer pocket 53' has now been coupled with the righthand member 48 and the inner pocket 52 assumes the dot-dash position illustrated in said figure. The pockets 52, 53 are formed in the material of the backrest 49 and upper portions of these pockets are preferably covered to lie over the upper ends of the members 48 and this is illustrated in FIG. 1 of the drawing, as well as the upper portion 54, as noted in FIG. 5 of the drawing, wherein the depth of the backrest 49 is clearly shown. It will be understood that the backrest 49 can be removed from the members 48 for laundering or other purposes.

The seat 29 is more or less of conventional construction and preferably made of plastics and has an opening 55 between the side members of the front of the seat, as clearly illustrated in FIG. 1. The seat 29 is fixed to the members 25, as clearly seen in FIG. 4, and 46 have ends diverging laterally, as indicated at 46' in FIG. 1 of the drawing in dotted lines and terminate in curved and inwardly contracted end portions 46", each of which ends is fixed to the seat by pairs of screws 56, one pair of these screws being clearly shown in FIG. 3 of the drawing, as engaging the ends 46". Considering FIG. 3 of the drawing and the fact that the members 46 seat in recesses 20' in the plate 20 will illustrate that the seat 29 is supported directly upon the upper plate 20 and in spaced relationship over the frames 17, 17' as well as the U-shaped members 29 fixed to ends of the elongated portion 20' of the seat is free to move from the position shown in full lines in FIGS. 1 and 2 and indicated in dotted lines in FIG. 3, so that the seat will be positioned over and within boundaries of the bath tub, the seat being well within the wall 43 of the tub. The bearing balls 24 facilitate free rotation of the seat in its shifting swinging movement.

Turning now to the structure of the seat supporting unit 19, it will clearly appear from a consideration of FIG. 3 that the plates 20, 21 are pivoted together by a bolt 77 and, circumferentially spaced about the bolt, the bottom plate includes three apertures 58, clearly shown in FIG. 2 of the drawing, two of these apertures being disposed at sides of the unit 19 and 90° to the intermedate aperture 58, in which a key pin 59 is located to retain the seat in a fixed adjusted position, namely in the full line position shown in FIG. 1. In order to clearly illustrate the pin 59 and its engagement with one of the apertures 58, a broken away section is included in FIG. 4, from which it will appear that the pin 59 protrudes upwardly through an aperture 60 in the top plate 20. Note, in this connection FIG. 1 of the drawing, the pin 59 having a collar 61 arranged between the plates 20, 21 which checks upward manual movement of the pin 59 in bringing the lower bevelled coupling end 59' of the pin out of engagement with the aperture 58 to permit the upper plate 20 to swing relatively to the lower plate 21. After the pin 59 has been disengaged, it can be manually released and 59' will simply ride-over the surface 21' of the plate 21 until 59' drops into another of the apertures 58 to retain the seat in a position by which the position assumed by the seat when 59 was in the aperture 58, as shown in FIG. 4, and this would be one of the side apertures 58, shown in FIG. 2, depending upon with which frame 17, 17' the unit is coupled.

Considering FIG. 1 of the drawing, it will appear that attachment of the frames 17, 17' to the U-shaped frame 10 is through the medium of bolts, as seen at 62. All of the different frame members are made of tubing, preferably of lightweight metals to minimize the overall weight of the complete seat structure, which would facilitate attachment and detachment of the same with a bathtub. In actual use, after the structure has been adjustably supported in a tub, particularly with respect to adjustment of the members 13, in order to maintain the frames 17, 17' in a horizontal position over the upper edge of the tub, the seat proper 29 is first put into the position shown in full lines in FIGS. 1 and 2. This facilitates positioning of a patient or invalid on the seat 29 which is exposed at and by the attendant so to as to minimize movement of the patient from the floor, wheelchair or any other mobile support onto the seat. The pin 59 is now raised by the operator of the unit and the patient arranged upon the seat is gradually swung over the tub and, at the beginning of this operation, the pin 59 can be released and the nurse or other attendant can, as and when necessary, lift the legs of the patient to clear the wall 43 of the tub which operation is continued until such time as the pin 59 re-engages one of the side apertures 58, which will result in fixedly retaining the seat in the dotted line position, shown in FIG. 3.

After the invalid or patient has been bathed, the above operation is reversed by first raising the pin 59, starting the swinging operation of the seat; whereupon, the pin 59 can be released and the seat and patient swung into the full line position, during which operation the legs of the patient can, if necessary, be raised by the attendant to clear the wall 43. In the use of the device as mentioned above, it will be understood that the backrest support 49 will be adjusted on the supports 48 to maintain the body of the patient or occupant in the desired upright or inclined position. The suction cups or feet 16', in addition to frictional engagement of 41 with the wall 43, will retain the seat structure against any shifting movement longitudinally of the tub, it being understood that the structure will be properly positioned.
on the tub prior to arranging an individual or patient thereon.

Seat structures of the type and kind under consideration can be used in the home but have a primary use in hospitals in the bathing of patients who are unable to care for themselves. By reason of the simplicity of the structure as a whole and in utilizing materials throughout which would include the bearing balls 24 and the several fastening devices employed of rustproof or stainless materials, the seat structure can maintain a sanitary condition, as well as render a long service.

For purposes of description, the frames 10, 17, 34, 39 may be generally referred to as the supporting part; whereas, the members 25, including the seat proper 29 and the backrest 49 supported on 48, can be regarded as the seat part, which parts are rotatably coupled and united through the medium of the supporting unit 19 which has one plate 20, for example, fixed to the seat part and 21 fixed to the supporting part.

Considering Fig. 1 of the drawing, it will be apparent that the members 18 of the U-shaped frames 17, 17, 17 actually form frame members which brace and space the crosshead 11 of the frame 10 with the tube 34 of the tube wall engaging portion 35 of the supporting frame or part of the structure and, in some adaptations of my invention, may comprise a plurality of tubular members in connection with which the unit 19 is supported in the two adjustable positions of said unit, so that the seat proper can be swung to the left viewing Fig. 1 and as indicated in dotted lines in Fig. 3, or to the right, as viewed in Fig. 1. In both of these uses, the supporting frame part will amply brace the seat in its two adjusted positions.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A seat structure of the character defined consisting of a supporting part comprising a U-shaped leg frame having means for supporting said frame in connection with the bottom of a bathtub, spaced frame members fixed to and extending at right angles to said leg frame, said members having a tube fixed to ends thereof, U-shaped bathtub wall engaging grippers fixed to ends of said tube, a plate fixed to at least part of said frame members, said plate having a pivot portion, a seat supporting unit comprising a pair of arms, a seat properly mounted on one end portion of said arms, the other end portion of said arms forming backrest supporting parts, a plate fixed to said arms, means supporting said plate on the first named plate for rotation on the pivot of the first named plate in movement of the seat of said unit into different positions on said supporting part, a flexible strip backrest, means for detachably coupling said backrest with said plates, and interengaging means on said plates securing the seat proper in at least two different positions with respect to the first named part in position- ing the seat proper over one side wall of a bathtub and entirely within the environment of the bathtub.

2. A structure as defined in claim 1, wherein the means supporting the second named plate includes bearing balls disposed between both of the plates for free relative movement of the seat with respect to the supporting part.

3. A structure as defined in claim 1, wherein said last named means includes manually controlled means for retaining the seat proper in both of its adjusted positions with respect to the supporting part.

4. A structure as defined in claim 3, wherein said manually controlled means comprises a pin movably supported in the second named plate and operatively engaging apertures in the first named plate.

5. A structure as defined in claim 1, wherein the leg frame includes cushioned feet mounted on supplemental leg members including means for supporting the same on leg portions of said leg frame.

6. A structure as defined in claim 5, wherein the leg frame includes a brace tube joining said leg portions, and an angular brace member fixed to said brace tube and to one of said first named frame members.

7. A structure as defined in claim 1, wherein said arms include intermediate ends portions thereof upwardly and laterally curved portions.

8. A structure as defined in claim 7, wherein said last named curved portions join the posts in straight portions, and said straight portions being joined and reinforced by an elongated tube.

9. A structure as defined in claim 1, wherein said frame members comprise two U-shaped frames, and each of said U-shaped frames being fashioned for mounting of the first named plate thereon for arrangement of the seat supporting unit in two positions in the supporting part.

10. A structure as defined in claim 9, wherein each of said U-shaped frames include angular bracing means extending to and coupled with means on said U-shaped leg frame.

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