An adjustable bath panel support frame comprises first (3) and second (4) unitary parts, each unitary part comprises first (5) and second (6) substantially parallel elongate members connected by at least one upright (7), wherein the spacing between the substantially parallel elongate members of the first and second unitary parts is substantially equal and each of the first and second substantially parallel elongate members of one part is adapted to co-operate slidably e.g. telescopically with the corresponding first or second member or the other part such that the length of the adjustable bath panel support frame can be slidably adjusted in order to accommodate the side panels of baths of various different sizes. The support frame can be adjusted to various different heights by using bolts (18) threaded through the elongate member which in use is situated closest to the floor.
Adjustable Bath Panel Support Frame

The present invention relates to an adjustable bath panel support frame which can be used to support a panel of a bath.

For some time it has been common practice to enclose the spaces surrounding a bath tub using panels. Often a bath tub will be situated adjacent two walls and two panels will be used to box in the space surrounding the sides of the tub that are not adjacent to the walls. Typical baths are elongate so one panel is longer than the other. The longer panel is normally referred to as the side panel and the shorter panel the end panel. Often a bath will be situated at the end of a room so as to fit neatly between two sides of the room such that only a side panel is required to completely box the bath in.

Bath tubs for use with side panels are typically provided with a downwardly extending lip at their edge so as to provide a generally "n"-shaped section with the legs of the "n" provided by the side-wall of the bath and the downwardly extending lip. The height of the bath panel is typically slightly shorter than the height of the top surface of the bath once fitted. Thus it can be manoeuvred into place with its top edge loosely held in the groove of the "n".

Since the fit into the groove is loose and the panel is typically made from relatively flexible plastic material, in order to enhance the stability of the bath panel it is necessary to provide a support to which the panel can be attached by means of screws, adhesive, Velcro™ etc. At the most basic level, the support may simply be a batten approximately the same length as the bath which is fixed to the floor of the bathroom. The bath panel can then be held loosely at the top in the groove and attached at its bottom edge to the batten. However, this technique still leads to a degree of instability since the panel is merely held at the top and the bottom without any rigidity being imparted in the vertical dimension.
Accordingly, in order to provide adequate support to the bath panel, it is common to build a wooden support frame by providing the batten with a plurality of uprights connected at their top end to a second batten running along the n-shaped groove. The panel may then be attached to the frame along the lower batten and also attached to the uprights so as to increase the structural rigidity.

Building such wooden frames is time consuming and often requires the work of a carpenter in addition to a plumber who usually installs the bath.

Unfortunately, due to the fact that floors are often uneven and baths come in various different shapes and sizes (and may not be completely uniform themselves), it is not possible to provide a single ready-made wooden bath frame which would be suitable for installing different shaped bath panels in various different groups.

The height of most baths is in the region of 500mm to 700mm. However, the length can vary widely and is generally between 1500mm and 2400mm.

In an attempt to overcome the need for carpentry and provide an adjustable frame for supporting a bath panel, an assembly frame for a tub is proposed in EP0673616 B1. The frame of EP0673616 B1 contains substantially horizontal and vertical profiles and securing elements for a panel and has at least two "part frames" in which each of the part frames has two "assembly groups". The assembly groups of each part frame contain a pair of horizontal profiles which are continuously variable with respect to one another and vertical profiles to which the horizontal profiles must be attached.

However, as the reader will see, the assembly frame of EP0673616 whilst avoiding the necessity for a carpenter, is still very complicated indeed, requiring a large number of vertical and horizontal profiles to be connected to one another in the correct way. The fact that many different but similar pieces need to be connected correctly means that construction of the frame is still time consuming and difficult.

This invention seeks to overcome this problem and provide a simpler bath panel support frame which can be more quickly assembled.
Accordingly, there is provided a adjustable bath panel support frame comprising first and second unitary parts, each unitary part comprising first and second substantially parallel elongate members connected by at least one upright, wherein the spacing between the substantially parallel elongate member of the first and second parts is substantially equal and each of the first and second substantially parallel elongate members of one part is adapted to co-operate slidably with the corresponding first or second member of the other part, such that the length of the adjustable bath panel support frame can be slidably adjusted; the adjustable bath panel support frame further comprising adjustable legs depending from the first elongate member of the first part of the adjustable bath panel support frame, and adjustable attachment means for engaging with a groove between a side-wall and a lip of a bath tub, the attachment means extending from the second elongate member of the first unitary part of the adjustable bath panel support frame.

Because the first and second parts of the adjustable bath panel support frame are unitary, it is far simpler to build the support frame simply by slidably engaging the respective substantially parallel elongate members of one part with the respective substantially parallel elongate members of the other part resulting in a frame including both horizontal elongate members and uprights to which the bath panel can be attached.

The provision of adjustable legs depending from the first elongate member results in the support frame being adjustable to take into account baths of different heights and/or non-uniform floors, in addition to being adjustable lengthwise to fit different lengths of bath panel by adjusting the slidable connection between the first and second unitary parts.

The provision of adjustable attachment means extending from the second elongate member for the first part of the bath support frame provides an additional means for adjusting the overall height of the bath panel support frame.
Preferably the connection of the first and second substantially parallel elongate members by the at least one upright is made in the region of one of the ends of each of the substantially parallel elongate members. More preferably the connection of first and second substantially parallel elongate members by the at least one upright is made at one of the ends of each of the substantially parallel elongate members.

By providing uprights toward or at the end of the substantially parallel elongate members, they are easy to locate when attaching the bath panel and any part of the attachment means that extends through the bath panel is kept at the ends of the panels where it will be relatively inconspicuous.

Preferably the adjustable bath panel support frame further comprises at least one brace member between the first and second parallel elongate members of the first part.

The provision of a brace member improves the rigidity of the support frame as well as providing an additional piece to which the bath panel can be attached.

Preferably there are a plurality of adjustable attachment means for engaging with the groove in the bath tub so that the adjustment can be fine tuned in order to deal with any lack of uniformity along the length of the groove.

Preferably the substantially parallel elongate members of one of the unitary parts are telescopically slidable within the parallel elongate members of the other unitary part.

More preferably the substantially parallel elongate members of the second part are telescopically slidable within the substantially parallel elongate members of the first unitary part.

The telescopic arrangement is one which is extremely simple to comprehend and thus ensures the adjustable bath panel support frame is exceptionally simple and quick to assemble.

Preferably the substantially parallel elongate members of the second part include longitudinal slits to allow the legs and adjustable attachment means to pass through them.
Preferably the first and second unitary parts are sized such that the slidable
connection allows the total length of the bath panel support frame to be adjusted from
less than 1.8m to more than 2.0m.

More preferably the first and second unitary parts are sized so that the slidable
connection allows the bath panel support frame to be adjusted from less than 1.6m to
more than 2.2m.

Most preferably the first and second unitary parts are sized such that the slidable
connection allows the total length of the bath panel support frame to be adjusted from
less than 1.5m to more than 2.4m.

The invention also provides a method of manufacturing a bath panel support frame
according to the invention by injection moulding, rotary moulding extruding or vacuum
forming the first and second unitary parts from plastics material or plastics welding
extruded box-section plastics tubes to form the first and second unitary parts.

Manufacturing by these methods is simple and resulting in a product that can
easily be cut and shaped, for example to fit particularly short baths.

These different degrees of slidability allow different lengths of baths to be handled
with the most preferred arrangement allowing the bath panel support frame to
accommodate virtually all common lengths of bath.

The invention may be understood more readily and various other aspects of the
other features of the invention may become apparent in consideration of the following
description.

The embodiment of the invention will now be described by way of example only
with reference to the accompanying drawings in which:

Figure 1 shows an isometric drawing of an adjustable bath side panel support
frame in combination with an end panel support frame.

Figure 2 shows a cross-section through the elongate members of the first part and
the elongate members of the second part shown in Figure 1.
Figure 3 shows a side elevation of the bath panel support frame according to the invention.

Figure 4 shows a plan view of the bath panel support frame shown in Figure 3.

Figure 5 shows a side elevation of an end panel.

Figure 6 shows a plan view of the end panel of Figure 5.

Figure 7 shows a cross-section through the bath panel support frame according to the invention in position with a bath tub.

Figure 1 shows a bath panel support frame 1 for supporting the end panel of a bath and an adjustable bath panel support frame 2 for supporting the side panel of a bath (not shown). The adjustable bath panel support frame 2 also shown in Figures 3 and 4 consists of a first unitary part 3 and a second unitary part 4. The first unitary part 3 includes a first elongate member 5 in the form of a square section tube and a second elongate member 6 also in the shape of a square section tube; the second elongate member 6 is the same length as, and parallel to the first elongate member 5. Figure 2 shows a cross-section of the square section tube of the first elongate member 5 and it will be understood that the cross-section of the second elongate member 6 would appear identical.

The first elongate member 5 and the second elongate member 6 are spaced by an upright 7 formed from the same straight-sided square section tube which is situated at one end and is perpendicular to the parallel elongate members 5 and 6. The first and second parallel elongate members are also spaced by an end brace member 9 and two intermediate brace members 8, the end brace member 9 runs parallel to the upright 7 at the opposite end of the elongate members 5 and 6. The other brace members 8 are positioned parallel to the upright 7 and brace member 9 and situated between them. All the brace members are also formed as straight-sided square section tube.

The first unitary part 3 is integrally formed, suitably by extruding polyvinyl chloride to form tubing with a thickness of 3mm and outer dimensions of 44mm x 44mm and
plastic welding sections of the tubing marking up the upright 7 and the brace members 8, 9, to the elongate members 5, 6. The hollow of the tubing thus has a cross-sectional area of 38mm x 38mm. The parallel elongate members 5 and 6 are each the same length suitably 1450mm and the height of the upright 7 and brace members 8 and 9 is suitably 385mm such that the outer dimensions of the first unitary part 4 is 473mm x 1450mm x 44mm.

The second unitary part 4 of the adjustable bath panel support frame 2 comprises a first elongate member 10 and a second elongate member 11 which are equal in length and parallel to one another. The parallel elongate members 10 and 11 are spaced by an upright 12 connected at one end thereof and perpendicular to both elongate members 10 and 11. The parallel elongate members 10 and 11 and upright 12 are formed as square section tubing of a suitable size for the first and second elongate members 10 and 11 to fit neatly into the hollow interior of the respective first and second elongate members of the first unitary part 3. The illustration in Figure 2 of a cross-section through the tubing of the second unitary part shows its size in relation to the elongate members 5, 6 of the first unitary part 3 from which it is clear that it fits snugly inside the hollow interior.

Therefore in this embodiment the tubing of the second unitary part 4 is 3mm thick and has outer dimensions of 38mm x 38mm in order that the first and second elongate members 10, 11 of the second unitary part 4 may connect slidably, telescopically within the respective first and second elongate members 5, 6 of the first unitary part 3. The height of the upright 12 is 391mm giving a total height including the elongate members 11 and 10 of 467mm. The total length of each elongate member is suitably 1000mm and with a depth of 38mm the total dimensions of the second unitary part 4 are 1000mm x 467mm x 38mm.
Like the first unitary part 3 the second unitary part 4 may be integrally formed by extruding square section tubing from PVC to form the elongate members 10 and 11 and the upright 12 and plastic welding the tubing to form the second unitary part.

Figure 1 also shows a perspective view of the end panel support frame an elevation of which is shown in Figure 5 and a plan view of which is shown in Figure 6. From these drawings it can be seen that the optional end panel support frame 1 is formed similarly to the first part of the adjustable bath panel support frame 2. The end panel support frame 1 comprises a pair of elongate members 13 and 14 which are equal in length and parallel to one another spaced by a pair of uprights 15, 16 at each end of the elongate members 13 and 14 and a brace member 17 situated centrally between the two uprights. The uprights 15 and 16 and brace member 17 are all perpendicular to the parallel elongate members 13 and 14. Like the first and second unitary parts 3 and 4, the end panel support frame 1 is suitably formed from PVC by plastic extrusion followed by plastic welding, so as to provide the elongate members 13, 14, uprights 15, 16 and brace 15 as an integral piece made up of interconnecting straight-sided square section tube with 3mm thick walls and a depth of 42mm. The parallel elongate members are intended to span the width of the end panel and can suitably be 640mm long. The upright 16 is intended to abut the upright 7 of the first unitary part and accordingly should have the same height, suitably 385mm, so that including the 44mm depth of the tubing of the first and second elongate members 13 and 14, the total height is 473mm. Obviously, in order that the elongate members 13 and 14 are parallel, the other upright 15 and brace member 17 should be identical in height to the upright 16 described above.

The first elongate member 5 of the first unitary part 3 of the adjustable bath panel support frame 2 and the first elongate member 13 of the end panel support frame 1 are provided with adjustable legs 18 which are downwardly depending in use and thus extend from the first elongate members 5, 13 in the opposite direction to the second elongate members 6, 14. The adjustable legs 18 are suitably formed as resin bolts
having a screw thread to engage with holes cut through the first elongate members 5, 13 and/or captive nuts 19 attached to the first elongate members 5, 13 on the side closest to the second elongate members 6, 14. The legs 18 are thus able to be adjusted by screwing through the holes and/or captive nuts 19. In order to achieve a good degree of adjustability the bolts are suitably 150mm in length. As shown in Figure 1, the legs 18 are ideally spaced evenly along the elongate members 5, 13 suitably with one halfway between each upright or brace member and the adjacent upright or brace member. Similar legs could also be provided on the second unitary member, but in order to avoid restricting the adjustability, should only be provided at the end near the upright 12 or should be removable.

As shown in Figure 1, the second elongate members 6, 14 of the adjustable bath panel support panel frame 2 and end panel support frame 1 are provided with adjustable attachment means 20 for engaging with the groove between the side-wall and lip of the bath tub. The adjustable attachment means 20 are similar in construction to the legs 18 and extend in the opposite direction to the legs 18. They too can be formed as resin bolts with a thread that engages with holes in the second elongate members 6, 14 and/or a locking nut (not shown). They too can suitably be 150mm in length. One difference between the adjustment means 20 and legs 18 is that the head of the bolt for the adjustment means preferably elongate whereas the legs are more suitably disc-shaped and can have a rubber or similar surface to increase the friction with the floor and improve steadiness.

To assemble the adjustable bath panel support frame 2, the first elongate member 10 of the second unitary part 4 is slid into the hollow in the first elongate member 5 of the first unitary part. At the same time the second elongate member 11 of the second unitary part 4 is slid into the second elongate member 6 of the first unitary part. The distance into the elongate members 5, 6 of the first unitary part 3 that the elongate members 10, 11 of the second unitary part 4 are slid is adjusted so that the total longitudinal distance
of the adjustable bath panel support frame is equivalent to or slightly smaller than the length of the bath panel. The length may be fixed by friction between the elongate members or alternatively another mechanism for fixing the length, such as inserting a screw through the side of the elongate members in the region of the overlap could be employed.

Then the adjustable legs 18 and adjustable attachment means 20 are inserted into their respective holes in the first and second elongate members 5, 6 of the first unitary part 3. It can be seen that the first and second elongate members 10, 11 of the second unitary part 4 include longitudinal slits 21, 22 in the top and similar slits (not shown) are disposed in the bottom in order that the legs 18 or the adjustable attachment means 20 can pass through them if necessary. The adjustable attachment means 20 and legs 18 are then adjusted so that the total height from the bottom of the feet of the legs 18 to the top of the attachment means is slightly shorter than the height of the underneath surface 23 of the n-shaped groove between the side-wall 24 and the downwardly extending lip 25 of a bath tub 26. Then the adjustable side panel support frame 2 is manoeuvred into place along the side of the bath tub so that the adjustable attachment means 20 are in the groove between the side-wall 24 and lip 25 with the uprights 7, 12 vertical and the elongate members 5, 6, 10, 11 horizontal as shown in Figure 7. A spirit level may be used in this step.

The feet 18 are extended to wedge the adjustable bath panel support frame 2 into place. If the optional end bath panel support frame 2 is also being used the upright 16 is attached to upright 7 (for example using self-tapping screws) so that the first and second elongate members 5, 6 are perpendicular to the first and second elongate members 13, 14 of the end bath panel support frame 1. The end panel support frame 1 is wedged in place in the same manner as the adjustable side bath panel support frame 2 and the bath panels (not shown) can then be installed in the usual manner and attached by
suitable means to the horizontal elongate members 5, 6, 10, 11, 13, 14 and/or
uprights/brace members 7, 8, 9, 12, 15, 16, 17.

Various modifications from the embodiments described above could be made. An
exemplary alternative includes the provision of uprights which are not simply straight
sided tubes running between the two closest ends of the horizontal elongate members
and perpendicular to them but rather connect at different points on the horizontal
members and are not necessarily perpendicular to them, but rather span the plane
between them at an angle other than 90° to each horizontal member for example an
upright in the shape of an "X" connected at two points to both the first and second
elongate members.

In another exemplary alternative, rather than providing a the first and second
elongate members 10, 11 of the second unitary part 4 with longitudinal slits 21, 22 in the
top and similar slits are disposed in the bottom in order that the legs 18 or the adjustable
attachment means 20 to pass through them, the elongate members 10, 11, of the
second unitary part 4 could be provided with a series of holes running longitudinally
along the elongate member 10, 11, such that the appropriate hole may be selected to
adjust the length. Equally, the series of longitudinal holes could be formed in the first
and second elongate members 5, 6 of the first unitary part 3, and the holes to be used
could be chosen on the basis of where a corresponding hole in the second unitary part 4
lines up with one in the series - in this case, a longitudinal series of holes in the elongate
members 10, 11 of the second unitary part would not be necessary. Of course, the
situation where the choice of holes in the first unitary part is fixed and the corresponding
holes in the second unitary part decided by the length required is preferable so that the
position of the legs or adjustable attachment means can be determined to best support
the bath panel.
CLAIMS:

1. An adjustable bath panel support frame comprising first and second unitary parts, each unitary part comprising first and second substantially parallel elongate members connected by at least one upright, wherein the spacing between the substantially parallel elongate member of the first and second parts is substantially equal and each of the first and second substantially parallel elongate members of one part is adapted to co-operate slidably with the corresponding first or second member of the other part, such that the length of the adjustable bath panel support frame can be slidably adjusted; the adjustable bath panel support frame further comprising adjustable legs depending from the first elongate member of the first part of the adjustable bath panel support frame, and adjustable attachment means for engaging with a groove between a side-wall and lip of a bath tub, the attachment means extending from the second elongate member of the first unitary part of the adjustable bath panel support frame.

2. An adjustable bath panel support frame according to claim 1 wherein the connection of the first and second substantially parallel elongate members by the at least one upright is made in the region of one of the ends of each of the substantially parallel elongate members.

3. An adjustable bath panel support frame according to claim 1 wherein the connection of first and second substantially parallel elongate members by the at least one upright is made at one of the ends of each of the substantially parallel elongate members.
4. An adjustable bath panel support frame according to any one of the preceding claims further comprising at least one brace member between the first and second parallel elongate members of the first part.

5. An adjustable bath panel support frame according to any one of the preceding claims wherein the substantially parallel elongate members of one of the unitary parts are telescopically slidable within the parallel elongate members of the other unitary part.

6. An adjustable bath panel support frame according to claim 5 wherein the substantially parallel elongate members of the second part are telescopically slidable within the substantially parallel elongate members of the first unitary part.

7. An adjustable bath panel support frame according to claim 6 including longitudinal slits in the substantially parallel elongate members of the second part to allow the legs and adjustable attachment means to pass through them.

8. An adjustable bath panel support frame according to claim 6 including a series of longitudinal holes in the substantially parallel elongate members of the second part to allow the legs and adjustable attachment means to pass through them.

9. An adjustable bath panel support frame according to any one of the preceding claims wherein the first and second unitary parts are sized such that the slidable connection allows the total length of the bath panel support frame to be adjusted from less than 1.8m to more than 2.0m.
10. An adjustable bath panel support frame according to any one of the preceding claims wherein the first and second unitary parts are sized so that the slidable connection allows the bath panel support frame to be adjusted from less than 1.6m to more than 2.2m.

11. An adjustable bath panel support frame according to any one of the preceding claims wherein the first and second unitary parts are sized such that the slidable connection allows the total length of the bath panel support frame to be adjusted from less than 1.5m to more than 2.4m.

12. A method of manufacturing a bath panel support frame according to any of the preceding claims by injection moulding, rotary moulding extruding or vacuum forming the first and second unitary parts from plastics material, or joining extruded box-section plastics tubes to form the first and second unitary parts.

13. A method of joining extruded box-section plastics tubes to form the first and second unitary parts according to claim 12 comprising plastic welding the extruded box-section plastics tubes.

14. A method of joining extruded box-section plastics tubes to form the first and second unitary parts according to claim 12 comprising inserting the extruded box-section plastics tubes into L-shaped or T-shaped sections to form the desired shape.

15. A method of joining extruded box-section plastics tubes according to claim 14 including gluing or welding the extruded box-section plastics tubes into the L-shaped or T-shaped sections.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

INV. A47K3/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A47K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
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<td>DE 199 29 497 AI (CORRECTA GMBH [DE]) 4 January 2001 (2001-01-04)</td>
<td>1-3, 5-15</td>
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<td>EP 1 273 253 A2 (DUNLOP LAWRENCE JAMES [GB]) 8 January 2003 (2003-01-08)</td>
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Further documents are listed in the continuation of Box C. See patent family annex.

Date of the actual completion of the international search

21 July 2010

Date of mailing of the international search report

28/07/2010

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