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(54) Temporary entryway flood barrier

(57) Apparatus for preventing floodwater from entering a building. The apparatus specifically comprises an entryway flood barrier comprising a frame assembly for mounting in a lowermost portion of an entryway. The frame assembly comprises at least one vertically disposed removable downward pressure stay (401) and a plurality of horizontally disposed connecting bars (402). The frame assembly comprises a waterproof cover (302,408) stretched over the frame. The at least one removable downward pressure stay and at least one horizontally disposed connecting bar possess means for providing pressure between the frame assembly and the entryway.

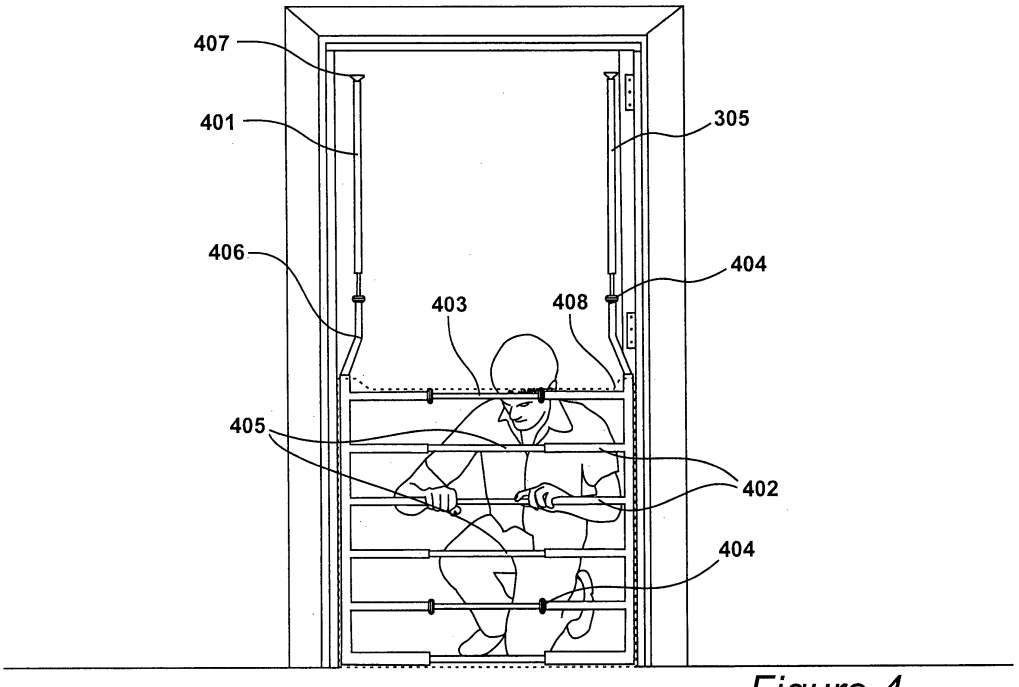

Figure 4

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Description

Cross Reference to Related Application

[0001] This application claims priority from UK Patent Application No 0905272.1.

Technical Field

[0002] The present invention relates to a temporary entryway flood barrier, suitable for fitting in the lowermost portion of doors and windows, for preventing floodwaters from entering a building.

Background of the Invention

[0003] There has been an increase in flooding of urban areas in recent years, which may be attributed to the phenomenon of global warming. Around five million people live in areas at risk of flooding in England and Wales. Property, land and assets to the value of several hundred billion dollars are at risk of flooding in England and Wales.

[0004] Flooding poses a real threat to society, both socially and economically yet many homeowners are inadequately prepared for dealing with a flood.

[0005] Apparatus and measures for preventing floodwater or storm water from entering a building are known. In particular, it is known to lay a wooden or metal panel across the entryway and hold it in place with sandbags. It is also known to attach a metal or plastic screen to the entryway to prevent entry of water into the building. However, there are problems associated with all of the existing apparatus or measures for preventing floodwater or storm water from entering a building. The existing apparatus or measures are either cumbersome to position in the entryway or lacking in their ability to seal with the surface of the entryway. Furthermore, the existing apparatus do not enable a quick and straightforward adjustment to allow the flood resistant barrier to be accommodated in doorways and window recesses of a range of sizes.

[0006] There is therefore a genuine need for a domestic flood defence system that can meet all of these requirements; a domestic flood defence system that can be both easily and quickly positioned in a doorway or window recess without the need for any permanent fixings; a domestic flood defence system that can be positioned in doorways and windows that range significantly in height and width; and, a domestic flood defence system which can form a tight seal with the surfaces of such doorways and windows.

Brief Summary of the Invention

[0007] According to a first aspect of the invention, there is provided an entryway flood barrier for blocking floodwaters from entering a building comprising a frame assembly for mounting in a lowermost portion of an entryway, said frame assembly comprising at least one vertically disposed removable downward pressure stay and a plurality of horizontally disposed connecting bars, said frame assembly comprising a waterproof cover stretched over the frame, **characterised in that** the at least one removable downward pressure stay and at least one horizontally disposed connecting bar possess means for providing pressure between the frame assembly and the entryway.

[0008] The temporary entryway flood barrier may be positioned in a doorway or a window recess of a building at risk of flooding. The height and width of the temporary entryway flood barrier are adjustable, allowing it to be positioned in doorways and window recesses having a wide range of dimensions. Advantageously, the temporary entryway flood barrier can be quickly and rapidly assembled and positioned in the entryway of a building. The combination of the means of providing pressure by both a removable downward pressure stay and at least one horizontally disposed connecting bar results in direct engagement of the temporary entryway flood barrier with the surface of the base and sides of entryway. This ensures a tight seal with these surfaces to prevent the entry of floodwater or storm water into the building.

[0009] In a preferred embodiment, the means for providing pressure comprise co-operating threaded components.

[0010] Preferably, the means for providing pressure comprise adjusting wheels around a threaded rod. The threaded rod may be metal, and preferably stainless steel. The adjusting wheels can be initially rotated by hand. The adjusting wheels may comprise holes for adjustment with a tool. After an initial rotation by hand, a tool can be inserted in these pre-drilled holes to enable pressure seals to be created between the frame and the opening of the hole.

[0011] In a preferred embodiment, the frame assembly comprises two parts.

The two parts may be identical. The two parts are assembled before positioning of the frame assembly in the entryway. The two parts are connected at the centre of the horizontally disposed connecting bars. This embodiment provides the advantage of ease of storage of the temporary entryway flood barrier when not in use.

[0012] Preferably, at least one horizontally disposed connecting bar comprises an insert at the centre of the horizontally disposed connecting bars, wherein the insert is in telescopic engagement with the connecting bar. This insert may be made from nylon. These inserts in one or more of the connecting bars provide a degree of flexibility to the frame assembly for ease of assembly.

[0013] In a preferred embodiment, the vertically disposed removable downward pressure stays comprise a kink. This kink is situated in the vertically disposed removable downward pressure stay at the height where an average sized person comfortably uses their arms whilst standing. This advantageously enables the frame assembly to be positioned without the user scraping their

arms and/or hands on the surface of the entryway, namely the doorway or window recess. The kink therefore increases the ease of positioning of the frame assembly. Preferably, the vertically disposed removable downward pressure stays may include feet for direct engagement with the surface of the entryway. These feet may be fabricated from rubber or plastic. This allows the vertically disposed removable downward pressure stay to be adjusted where necessary in the case of an uneven surface of the entryway, such as an uneven windowsill or an arched doorway. Furthermore, the feet improve the tightness of the seal between the frame assembly and the surface of the entryway.

[0014] Preferably, the frame assembly is made from metal, and more preferably, the frame assembly is made from aluminium. Aluminium is durable yet lightweight. This advantageously facilitates the positioning of the frame assembly by persons who are weak and/or small.

[0015] In a preferred embodiment, the waterproof cover stretched over the frame assembly is made from tri-laminate neoprene. The frame, together with its waterproof cover, can hold back a body of water up to 0.9 metres deep. There are no seams on the front surface, namely the surface facing the exterior of the building, where floodwater may act as a pressure surface. The rear surface of the waterproof cover, namely the surface facing the interior of the building, possesses an opening to allow access to the frame adjusting mechanisms. The opening may be of any size. However, optimally, the opening may be of a size that allows a person positioning the temporary flood resistant barrier to easily adjust the means for providing pressure.

[0016] Preferably, a resilient sealing material is provided between the frame assembly and the waterproof cover. The resilient sealing material may be closed-cell expanded foam. The resilient sealing material may be welded to the frame assembly or be attached by means of an adhesive material. The resilient sealing material may be permanently attached to the frame assembly or may be incorporated onto the frame assembly before positioning of the temporary entryway flood barrier. This aids in creating a watertight seal on uneven surfaces, between the frame assembly and the surface of the entryway.

Brief Description of the Drawings

[0017]

Figure 1 shows a house in a flooded area;
Figure 2 shows an open doorway, through which flood water or storm water may easily flow;
Figure 3 illustrates a temporary entryway flood barrier with a waterproof covering before assembly in the lowermost portion of a doorway;
Figure 4 shows the adjustment of the horizontally disposed connecting bars;
Figure 5 shows the adjustment of the vertically disposed removable downward pressure stays;
Figure 6 shows a perspective view of the temporary entryway flood barrier positioned in the lowermost portion of a doorway. An opening is shown in the waterproof cover on the side facing the interior of the building;
Figure 7 shows a detailed view of a horizontally disposed connecting bar; and
Figure 8 shows a detailed view of a vertically disposed removable downward pressure stay.

Detailed Description of the Invention

Figure 1

[0018] A house in a flooded area is shown in Figure 1. There has been an increase in flooding in recent years. Flooding poses a real threat to society, both socially and economically yet many homeowners are inadequately prepared for dealing with a flood. Known apparatus and measures for preventing floodwater from entering a building through an entryway 101 are inadequate. There are no known measures which can be both easily and quickly positioned in the lowermost portion of a doorway or window recess without the need for any permanent fixings; which can be positioned in doorways and windows ranging significantly in size; and also which can form a tight seal with the surfaces of such doorways and windows.

Figure 2

[0019] An entryway 201 through which floodwater or storm water may flow is shown in Figure 2. The entryway 201 may be a doorway or a window recess of any type of building. Doorways or window recesses may vary significantly in size, both in height and width. However, the temporary entryway flood barrier claimed herein can be quickly and easily adjusted to be accommodated in a range of different sized doorways.

Figure 3

[0020] The positioning in the lowermost portion of an entryway of the temporary entryway flood barrier 301 claimed herein is shown in Figure 3. The user fits the waterproof covering 302 over the frame assembly before positioning the entryway flood barrier in the lowermost portion of a doorway or window recess 201. The waterproof covering 302 is shaped to fit snugly over the frame assembly. However, a section 305 of the frame assembly is not contained within the waterproof covering 302. The waterproof covering may be fabricated from any waterproof material. However, in the preferred embodiment, the waterproof material used for fabrication of the waterproof covering 302 is tri-laminate neoprene. The frame assembly may have two parts, which may be identical. The two parts are connected together to form the frame assembly.

Figure 4

[0021] The main elements of the construction of the frame assembly are shown in Figure 4. The frame assembly further comprises at least one vertically disposed removable downward pressure stay 401 and a plurality of horizontally disposed connecting bars 402. In a preferred embodiment, as shown in Figure 4, there are two vertically disposed removable downward pressure stays 401. In this preferred embodiment, the plurality of horizontally disposed connecting bars 402 are disposed between the two vertically disposed removable downward pressure stays 401.

[0022] The two parts of the frame assembly are connected at the centre 403 of the horizontally disposed connecting bars 402. The uppermost portion 305 of the at least one vertically disposed removable downward pressure stay is not contained within the waterproof covering 302. The waterproof covering 302 is not shown in Figure 4 in order that the construction of the frame assembly is visible. However, the position of the waterproof covering is shown with a dotted outline, labelled 408 in Figure 4.

[0023] In a preferred embodiment, a resilient sealing material is provided between the frame assembly and the waterproof cover. The resilient sealing material may be closed-cell expanded foam. The resilient sealing material may be welded to the frame assembly or be attached by means of an adhesive material. The position of the resilient sealing material is not shown in Figure 4.

[0024] The at least one removable downward pressure stay 401 and at least one connecting bar 402 possess means for providing pressure 404 between the frame assembly and the entryway. The means for providing pressure 404 may be co-operating threaded components.

[0025] At least one horizontally disposed connecting bar 402 comprises an insert 405 at the centre of the horizontally disposed connecting bar 402, wherein the insert is in telescopic engagement with the horizontally disposed connecting bar 402. This insert may be made from nylon. In a preferred embodiment, as shown in Figure 4, there are three horizontally disposed connecting bars with inserts. The other three horizontally disposed connecting bars 402 in Figure 4 are shown with means for providing pressure 404 between the frame assembly and the entryway.

[0026] The at least one vertically disposed removable downward pressure stay 401 comprises a kink 406. This kink is situated in the vertically disposed removable downward pressure stay 401 at the height where an average sized person comfortably uses their arms whilst standing. The at least one vertically disposed removable downward pressure stay may include feet 407 for direct engagement with the surface of the entryway. These feet may be rubber or plastic.

Figure 5

[0027] The frame assembly with two vertically disposed removable downward pressure stays 401 is shown in Figure 5. The vertically disposed removable downward pressure stays 401 can be detached from the frame assembly for ease of storage when the temporary entryway flood barrier is not in use. The vertically disposed removable downward pressure stays 401 may be hollow cylindrical tubes.

[0028] The two vertically disposed removable downward pressure stays shown in Figure 5 have a means of providing pressure 404 between the vertically disposed removable downward pressure stay and a surface of the entryway. The means for providing pressure 404 may be co-operating threaded components.

Figure 6

[0029] Figure 6 shows the temporary entryway flood barrier positioned in the lowermost part of a doorway. The rear surface of the waterproof cover 302, the surface facing the interior of the building, possesses an opening 601 to allow access to the frame adjusting mechanisms. In this manner, the waterproof cover 302 can be fitted over the frame assembly before the frame assembly in positioned in the lowermost part of a doorway or window recess. The opening 601 in the waterproof cover 302 is optional. However, where present, the opening 601 in the waterproof cover 302 can be of any size.

Figure 7

[0030] A detailed view of a horizontally disposed connecting bar is shown in Figure 7.

[0031] At least one horizontally disposed connecting bar 402 comprises a means of providing pressure 404. The means of providing pressure 404 may comprise at least one adjusting wheel 701 around a threaded rod 702. The adjusting wheel is maintained in position in the horizontally disposed connecting bar 402 through means of a spigot 703, the outer diameter of which is such that it fits inside the inner diameter of the horizontally disposed connecting bar 402. The threaded rod 702 also has an outer diameter that enables it to fit inside the inner diameter of the horizontally disposed connecting bar 402.

[0032] The adjusting wheels 701 can be initially rotated by hand. The adjusting wheels comprise holes 704 for adjustment with a tool. The tool may be a lever, an Allen key, a Tommy bar or a T-bar.

[0033] In a preferred embodiment, as shown in Figure 7, the means of providing pressure 404 comprise two adjusting wheels 701 around a threaded rod 702. When the adjusting wheels 701 are rotated, the length of the threaded rod 702 in between the two adjusting wheels 701 is altered in length. This enables the width of the horizontally disposed connecting bar 402 to be adjusted. The adjusting wheels 701 of the horizontally disposed connecting bar 402 therefore enable the easy adjustment of the entryway flood barrier to be accommodated in doorways and window recesses of a range of different widths.

The adjusting wheels 701 of the horizontally disposed connecting bar 402 also enable a pressure to be exerted on the sides of the entryway to ensure a tight seal between the entryway flood barrier and the surface of the entryway.

Figure 8

[0034] A detailed view of a vertically disposed removable downward pressure stay is shown in Figure 8.

[0035] In this preferred embodiment, the means for providing pressure 404 in the vertically disposed removable downward pressure stays 401 comprise one adjusting wheel 801 around a threaded rod 802, as shown in Figure 8.

[0036] In this preferred embodiment, the adjusting wheel 801 is maintained in position through means of a spigot 803, the outer diameter of which is such that it fits inside the inner diameter of the vertically disposed removable downward pressure stay 401. The threaded rod has an outer diameter that enables it to fit inside the inner diameter of the uppermost part of the vertically disposed removable downward pressure stay 401. The threaded rod 802 may be permanently attached to the uppermost part of the vertically disposed removable downward pressure stay 401 by welding. In an alternative embodiment, the threaded rod 802 may be attached to the uppermost part of the vertically disposed removable downward pressure stay 401 through a threaded mechanism, to allow for adjustment.

[0037] The adjusting wheel 801 can be initially rotated by hand. The adjusting wheel 801 comprises holes 804 for adjustment with a tool. The tool may be a lever, an Allen key, a Tommy bar or a T-bar. When the adjusting wheel 801 is rotated, the length of the screwed metal rod 802 in between the adjusting wheel 801 and the uppermost part of the vertically disposed removable downward pressure stay 410 is altered in length. This enables the height of the vertically disposed removable downward pressure stays 401 to be adjusted. The adjusting wheels 801 of the vertically disposed removable downward pressure stays 401 therefore enable the easy adjustment of the entryway flood barrier to be accommodated in doorways and window recesses of a range of different heights. The adjusting wheels 801 of the vertically disposed removable downward pressure stays 401 also enable a downward pressure to be exerted on the base of the entryway to ensure a tight seal between the entryway flood barrier and the surface of the entryway

Claims

1. An temporary entryway flood barrier for blocking floodwaters from entering a building comprising
a frame assembly for mounting in a lowermost portion of an entryway,
said frame assembly comprising at least one vertically disposed removable downward pressure stay and a plurality of horizontally disposed connecting bars,
said frame assembly comprising a waterproof cover stretched over the frame assembly,
characterised in that the at least one removable downward pressure stay and at least one horizontally disposed connecting bar possess means for providing pressure between the frame assembly and the entryway.

2. An entryway flood barrier according to claim 1 wherein the means for providing pressure comprise cooperating threaded components.

3. An entryway flood barrier according to claim 2 wherein the means for providing pressure comprise an adjusting wheel around a threaded rod.

4. An entryway flood barrier according to claim **3** wherein the adjusting wheel comprises holes for adjustment with a tool.

5. An entryway flood barrier according to claim **1** wherein said frame assembly comprises two parts, and wherein the two parts of the frame assembly are connected at the centre of the horizontally disposed connecting bars.

6. An entryway flood barrier according to claim **5,** wherein at least one horizontally disposed connecting bar comprises an insert at the centre of the horizontally disposed connecting bars, wherein the insert is in telescopic engagement with the connecting bar.

7. An entryway flood barrier according to claim 6, wherein the insert is made from nylon.

8. An entryway flood barrier according to claim **1,** wherein the vertically disposed removable downward pressure stays comprise a kink.

9. An entryway flood barrier according to claim **1,** wherein the vertically disposed removable downward pressure stays comprise feet for direct engagement with the surface of the entryway.

10. An entryway flood barrier according to claim **1,** wherein the frame assembly is made from metal.

11. An entryway flood barrier according to claim **1,** wherein the frame assembly is made from aluminium.

12. An entryway flood barrier according to claim **1,** wherein the waterproof cover is made from tri-laminate neoprene.

13. An entryway flood barrier according to claim **1,** wherein a resilient sealing material is provided between the frame assembly and the waterproof cover.

14. An entryway flood barrier according to claim **13,** wherein the resilient sealing material is closed-cell expanded foam.

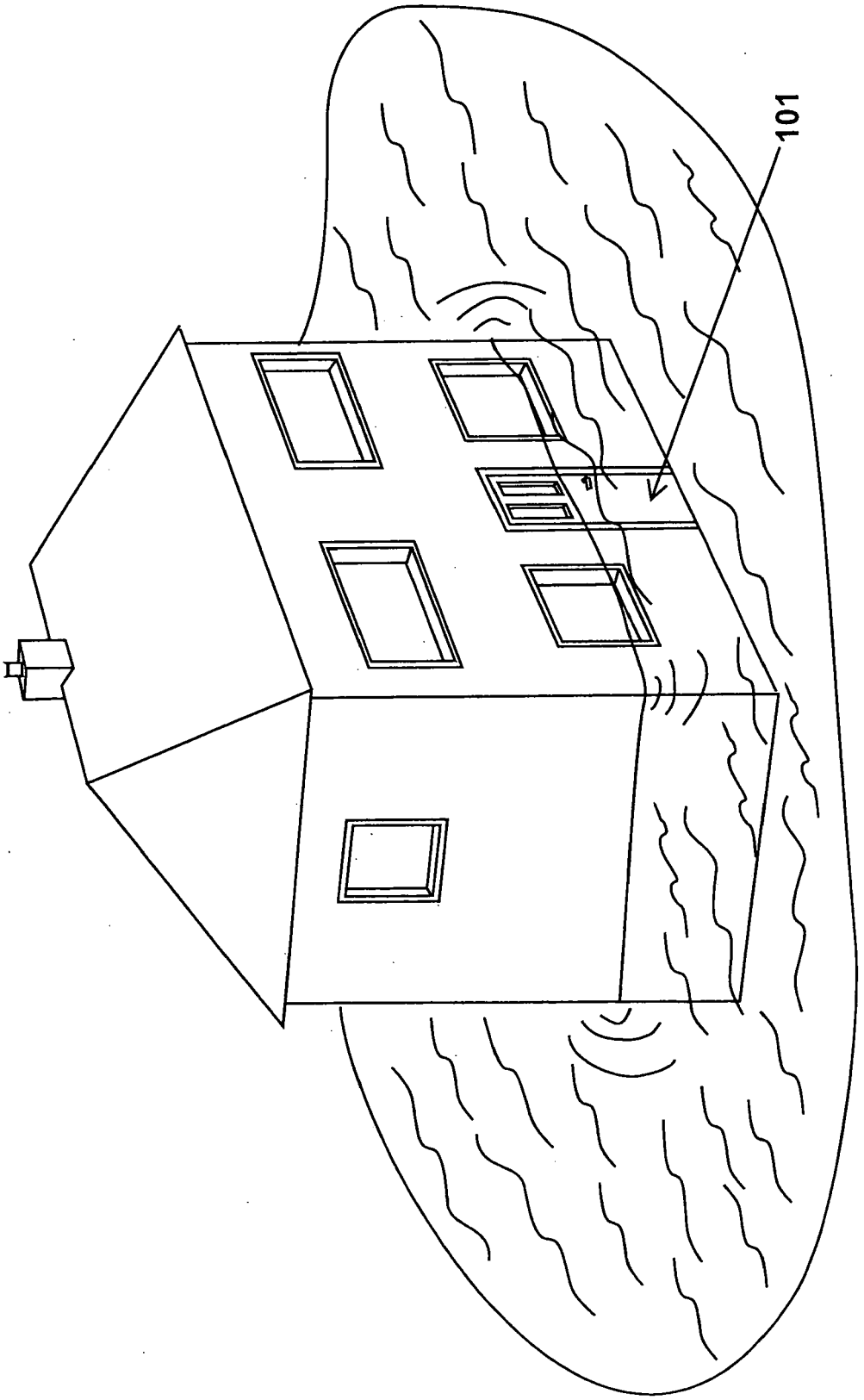

Figure 1

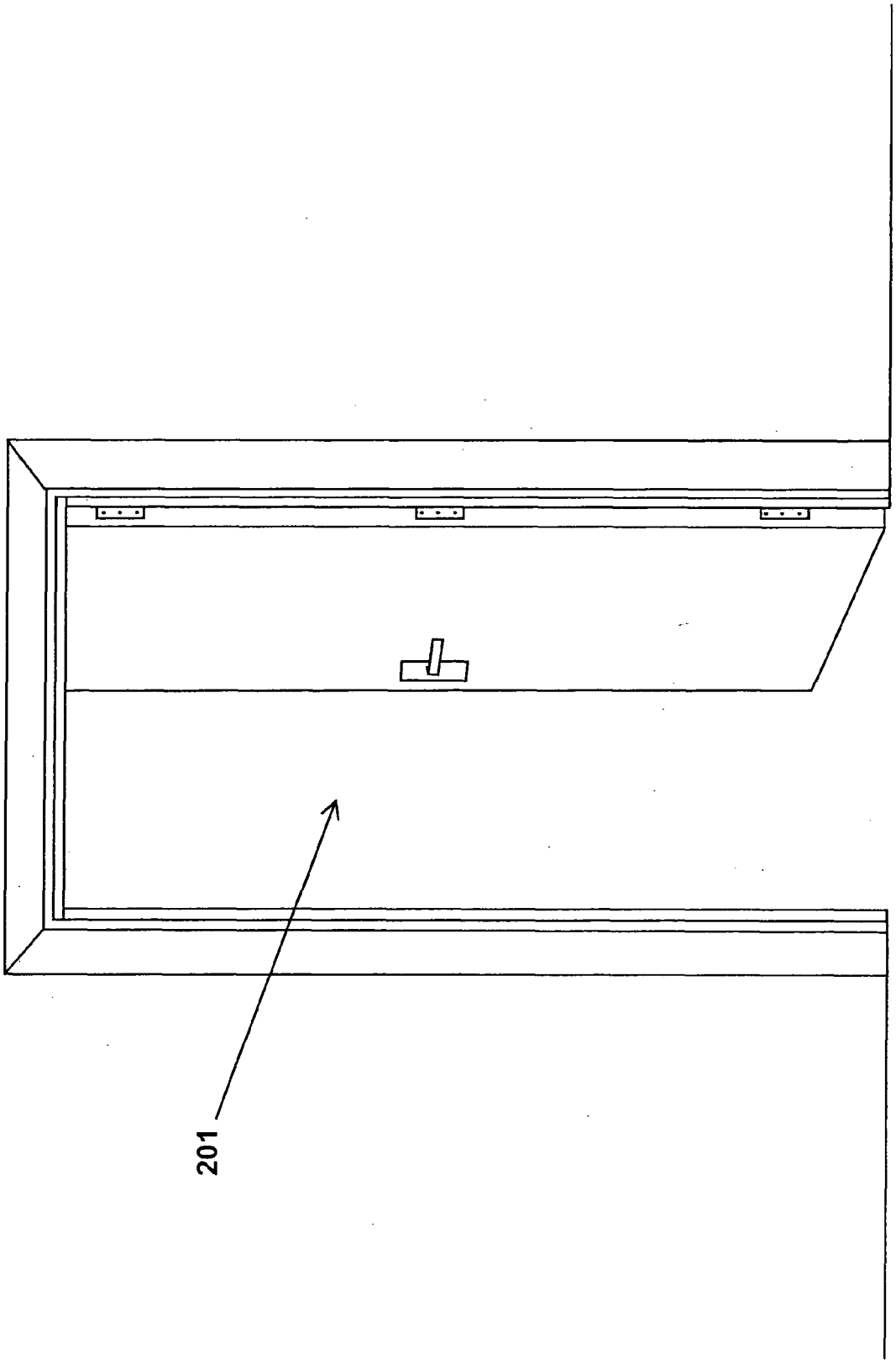

Figure 2

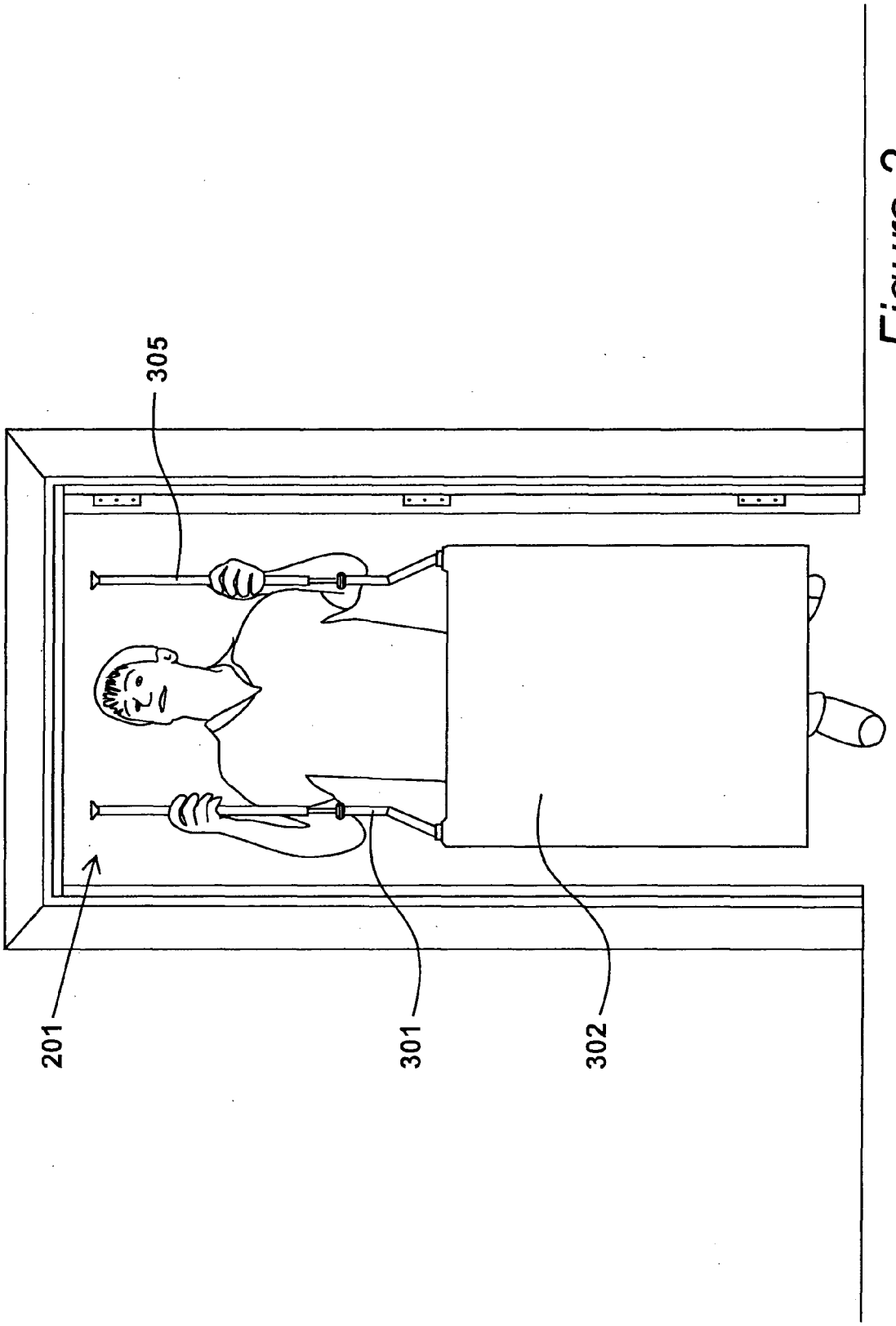

Figure 3

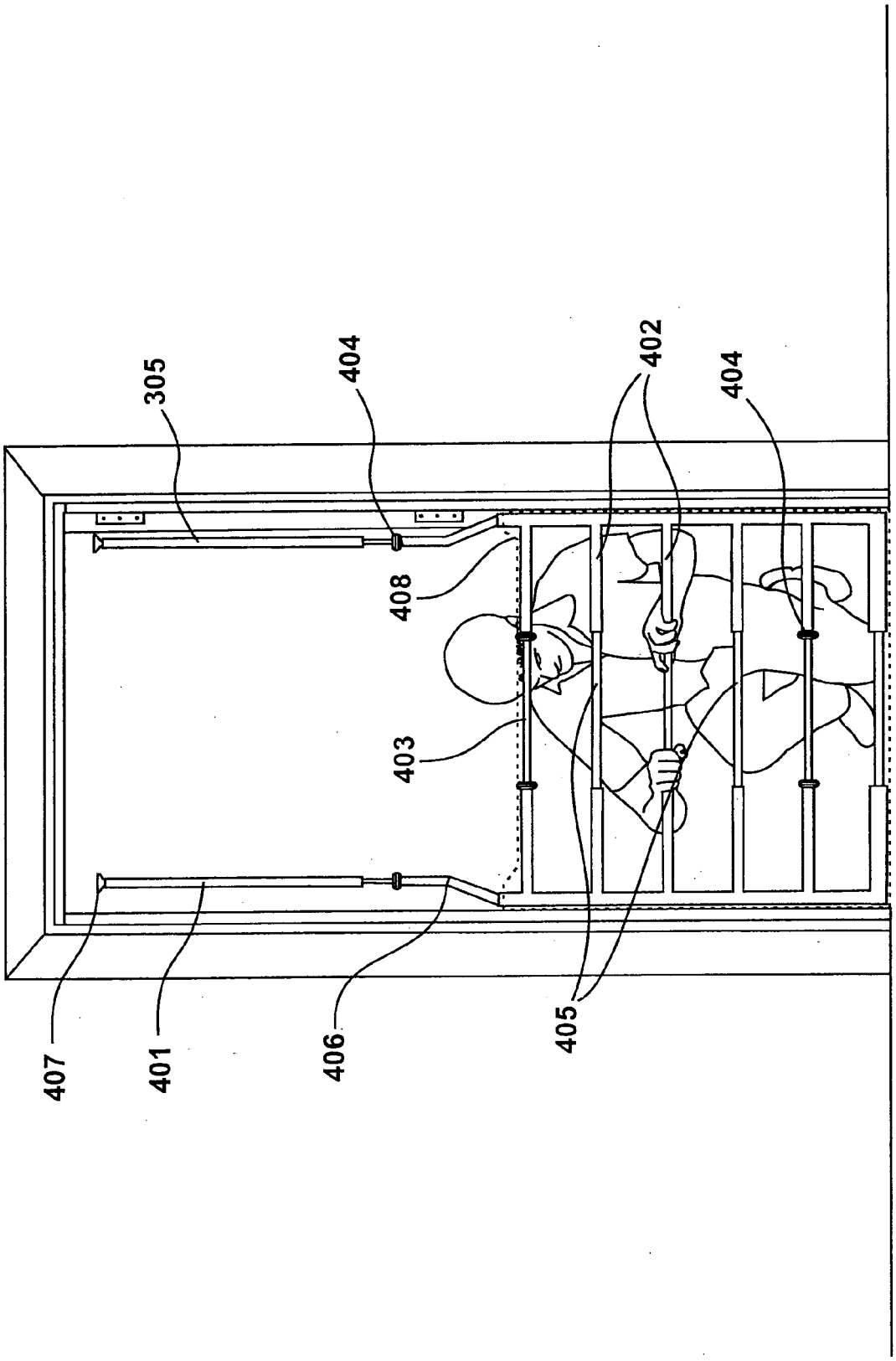

Figure 4

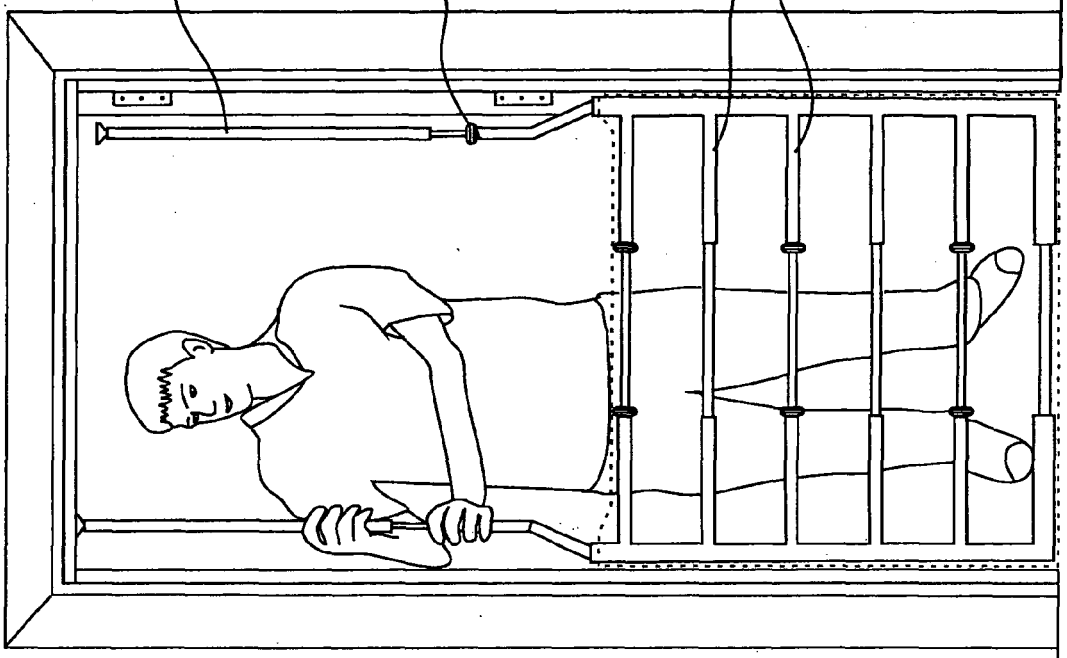

Figure 5

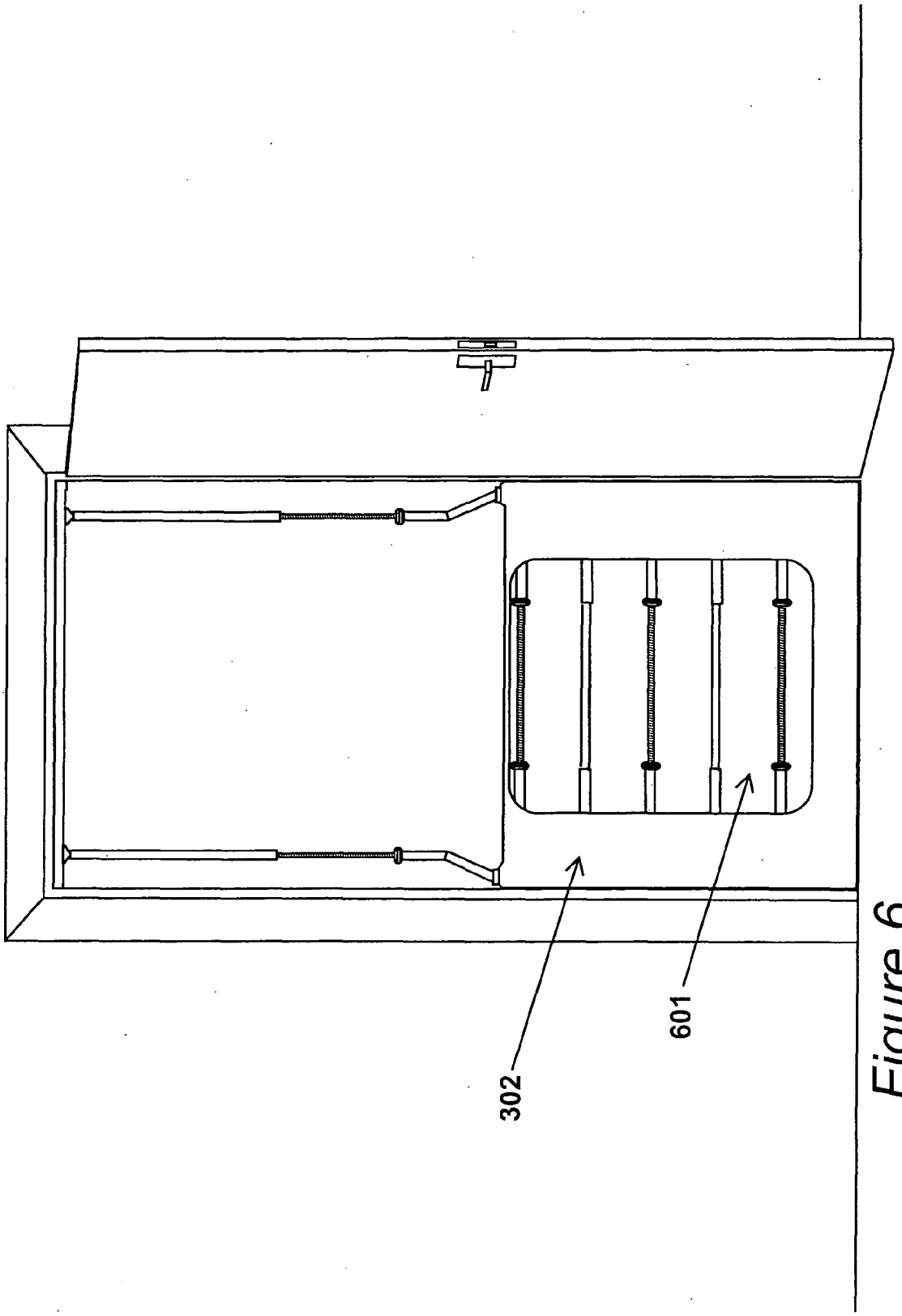

Figure 6

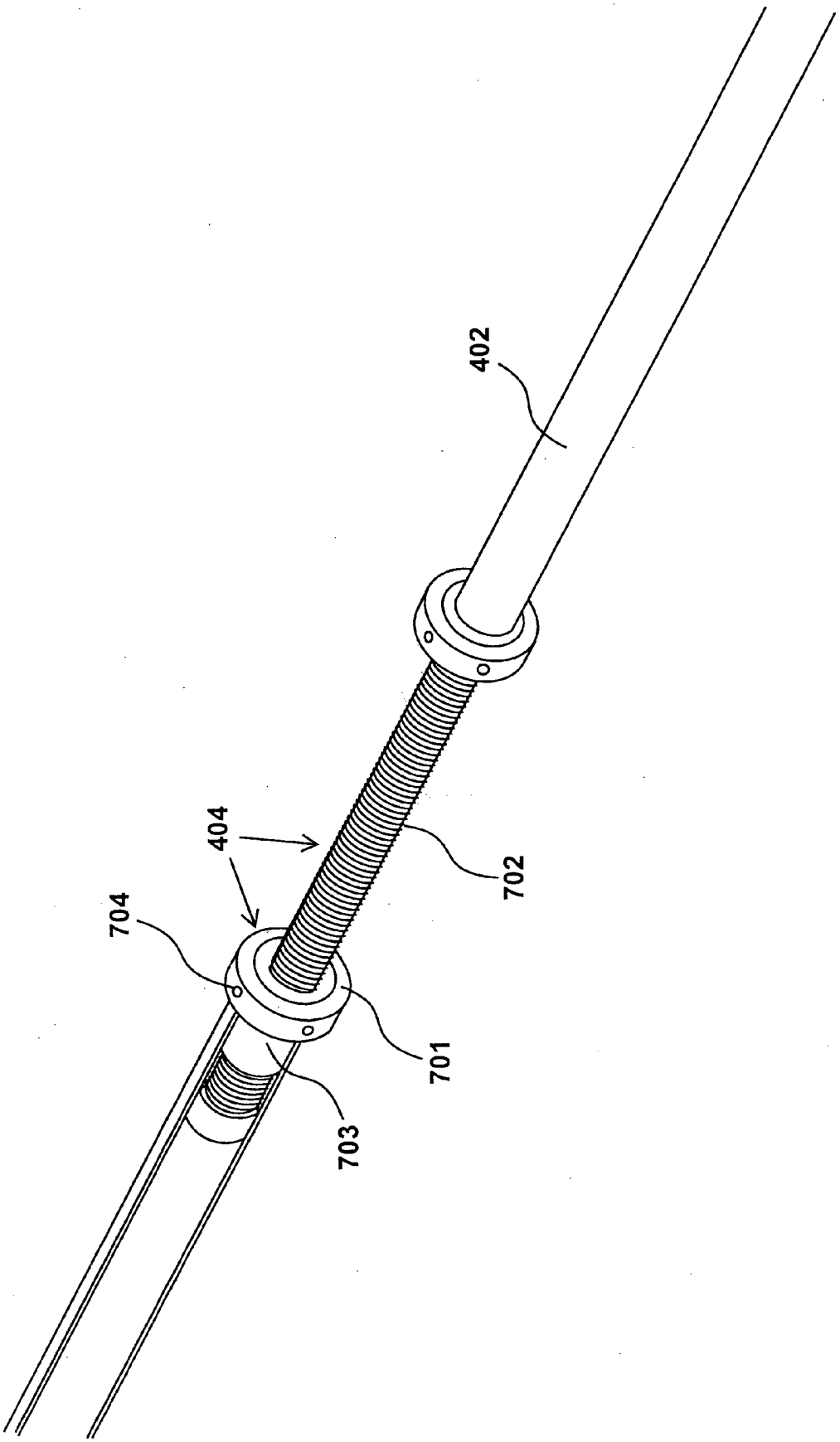

Figure 7

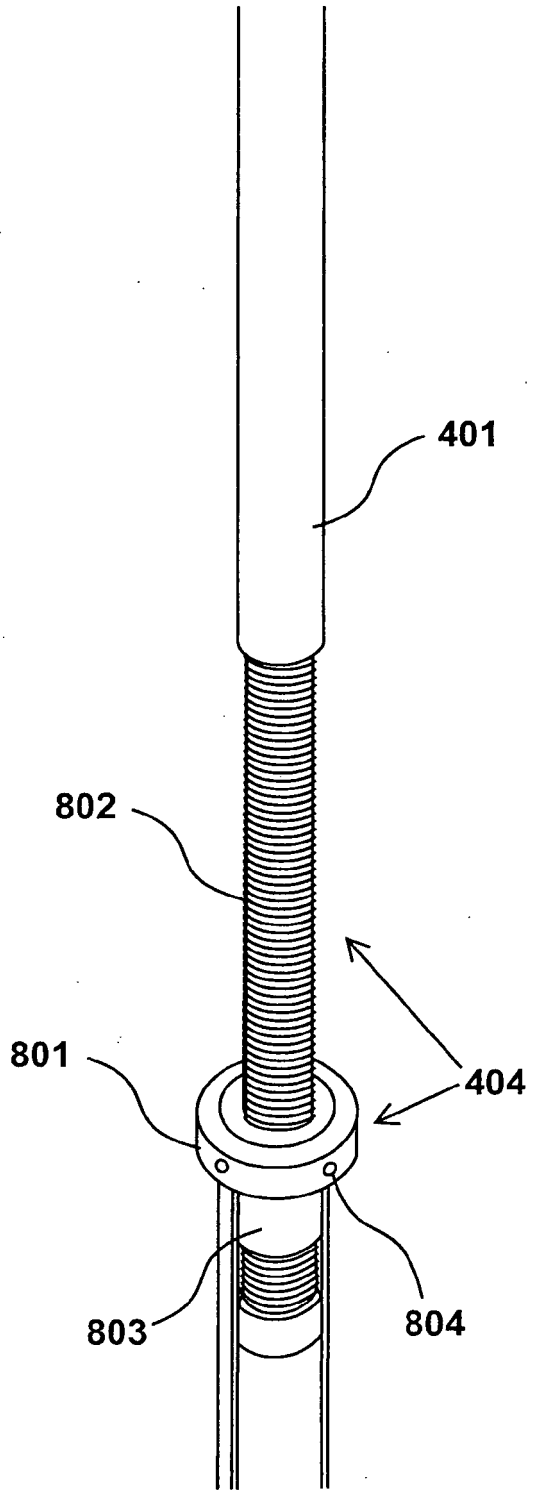

Figure 8

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- GB 0905272 A **[0001]**