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(11) EP 0 857 668 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
12.08.1998 Bulletin 1998/33

(51) Int. Cl.⁶: B65F 1/16

(21) Application number: 98200272.7

(22) Date of filing: 30.01.1998

(84) Designated Contracting States:
AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC
NL PT SE
Designated Extension States:
AL LT LV MK RO SI

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(30) Priority: 31.01.1997 GB 9702036

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(54) A lid-actuating apparatus

(57) A lid-actuating apparatus (10) for actuating a lid (92) of a container (80), such as a refuse bin, between an open state and a closed state. The apparatus (10) comprises an actuating member (14) for coupling to the container lid (92) and a pivoting member (16) having one end (22) pivotably connected to the actuating member (14) and the other end (32) connected to a pedal member (18). The pivoting member (16) is pivotably coupled, in use, to an external surface (86) of the container (80) and the actuating member (14) is coupled, in use, to an external surface of the lid (92).

The lid actuating apparatus (10) is detachably mountable on the external surface of a conventional container and is suitable for use with containers of varying shapes and sizes.

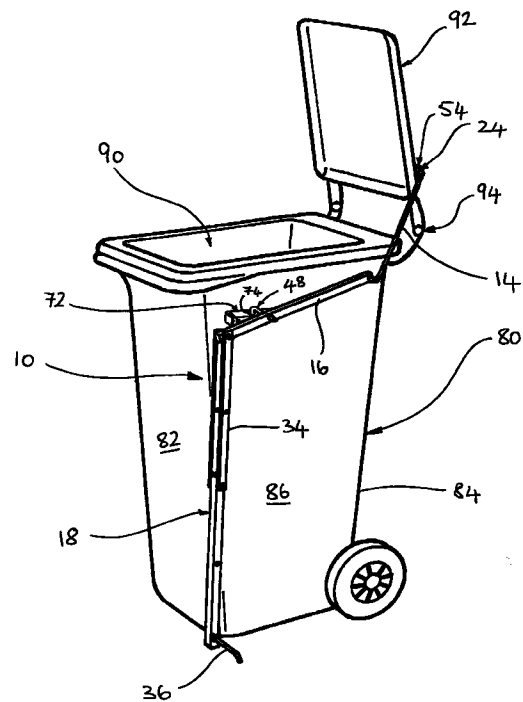


FIGURE 4

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Description

The present invention relates to a lid-actuating apparatus. In particular, the present invention relates to a foot operable, lid-actuating apparatus for a refuse container.

Commonly, containers such as refuse containers are provided with lids which are hingedly connected to the container. It is desirable for an individual to be able to open and close such containers without the use of his hands since, in many instances, both the individual's hands are carrying material, such as refuse, for depositing into the container. In some cases, such containers are provided with a foot pedal and lever mechanism for actuating the lid between open and closed positions. Typically, such pedal and lever mechanisms are integrally formed with the container so that the lever mechanism is located within the container and the pedal extends through the wall of the container so as to be located externally of the container.

Existing pedal and lever mechanisms suffer from the disadvantage that they are integral with the container which has already been modified to incorporate such a mechanism. Thus, existing pedal and lever mechanisms cannot readily be incorporated into an existing conventional container after production. Furthermore, since the lever mechanism is located within the container, there are restrictions on the size and shape of the mechanism. Consequently, it is often found that the pedal has a relatively small travel range and that the leverage produced by the lever mechanism is relatively small. Thus, such known devices are generally suitable for use on containers whose lids are relatively lightweight such as domestic kitchen bins.

It is an object of the present invention to overcome these disadvantages by providing a lid-actuating apparatus which is mountable, preferably detachably mountable, on an external surface of a conventional container and which is suitable for use with containers of varying shapes and sizes. It is a further object of the invention to provide a lid-actuating apparatus which is mountable, preferably detachably mountable, on any external surface of a container to suit the orientation and configuration of the lid of the container.

Accordingly, the present invention provides a lid-actuating apparatus for actuating a lid of a container, the apparatus comprising an actuating member for coupling to the lid; and a lever means for coupling to the container, characterised in that the lever means comprises a pivoting member having one end pivotably connected to the actuating member; and a pedal member connected to the other end of the pivoting member, the pivoting member being pivotably coupled, in use, to an external surface of the container so that the pivoting member is pivotable with respect to the container at a first pivot point between said one end and said other end.

Preferably, the actuating member is coupled, in use,

to an external surface of the lid. Preferably, the pedal member is pivotably connected to said other end of the pivoting member.

Further preferably, the pedal member is pivotable substantially through 360° relative to the pivoting member, and in that the actuating member is pivotable substantially through 360° relative to the pivoting member.

Preferably, the actuating member is coupled, in use, to the container lid by a first coupling means, which first coupling means comprises a substantially L-shaped first hook member extending from the free end of the actuating member so that the free end of the first hook member is substantially parallel with the actuating member; a sleeve member having an open end and an aperture formed in a wall of the sleeve member; and fixing means for detachably securing the sleeve member to the container lid, the sleeve member being dimensioned to receive the first hook member such that, in use, the free end of the hook member projects out of the sleeve member through the aperture.

Preferably, the pivoting member is coupled, in use, to the external surface of the container by a second coupling means, which second coupling means comprises a substantially L-shaped second hook member pivotably fixed to the pivoting member at the first pivot point; a bracket member having a socket for receiving the free end of the second hook member; and fixing means for detachably securing the bracket member to the external surface of the container.

Preferably, the pedal member comprises a rigid pedal shaft having a pedal head projecting substantially perpendicularly from one end, the other end of the pedal shaft being pivotably connected to said other end of the pivoting member, the pedal shaft being longitudinally extendible.

Preferably, the pivoting member is longitudinally extendible. Preferably, the actuating member is longitudinally extendible.

The invention further provides lidded container incorporating the lid-actuating apparatus.

The lid-actuating apparatus of the present invention is advantageous in that it can readily be mounted on an existing container without substantially altering the container. In addition, in preferred embodiments, the lid-actuating apparatus is detachably mountable on any external side of a container as required and can be adjusted to fit containers over a wide variety of shapes and sizes.

Embodiments of the invention will now be described with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a lid-actuating apparatus according to the present invention;

Figure 2 is a perspective view of a first coupling means of the lid-actuating apparatus of Figure 1;

Figure 3 is a perspective view of a second coupling means of the lid-actuating apparatus of Figure 1; and

Figure 4 is a perspective view of the lid-actuating apparatus of Figure 1 mounted on a container.

Referring now to Figure 1 of the drawings there is shown, generally indicated at 10, a lid-actuating apparatus according to the present invention. The apparatus 10 comprises lever means generally indicated at 12 and an actuating member in the form of an actuating rod 14. The lever means 12 comprises a pivoting member in the form of a pivoting bar 16; and a pedal member 18.

The actuating rod 14 has an end 20 pivotably connected to one end 22 of the pivoting bar 16 by any conventional means. A substantially L-shaped first hook member 24 is fixed to the free end 26 of the actuating rod 14. The hook member 24 has a first leg 28 and a second leg 30, the first leg 28 being so fixed to the actuating rod 14 that the second leg 30 is disposed substantially parallel with the actuating rod 14. The first hook member 24 serves as part of a first coupling means, generally indicated at 31, for coupling the actuating rod 14 to a container lid (not shown in Figure 1). The first coupling means 31 is described in greater detail below with reference to Figure 2.

The pedal member 18 comprises a rigid pedal shaft 34 and a pedal head 36. The pedal head 36 is fixed to, and projects substantially perpendicularly from, one end 38 of the pedal shaft 34. In the present embodiment, the pedal head 36 is rod-like but could equally be plate-like, ring-like or bar-like in shape. The other end 40 of the pedal shaft 34 is pivotably connected to the other end 32 of the pivoting bar 16.

The pedal shaft 34 comprises a pair of substantially parallel bars 35 which are connected to opposing faces of a base bar 37 at a joint 42. During normal use, the parallel bars 35 are rigidly fastened to the base bar 37 at the joint 42 using conventional bolts 44 to ensure that the pedal shaft 34 is rigid along its entire length. When the apparatus 10 is not in use, however, the joint 42 may be loosened using the bolts 44 to allow the pedal shaft 34 to fold at the joint 42 thereby facilitating storage of the apparatus 10. In addition, when the joint 42 is unfastened by removing the bolts 44, the pedal shaft 34 may be longitudinally extended or contracted by sliding the base bar 37 longitudinally relative to the parallel bars 35. A plurality of bolt-receiving apertures 46 are formed in the parallel bars 35 and in the base bar 37, through which apertures 46 the bolts 44 can be fastened. Thus, the length of the pedal shaft 34 is adjustable. The apparatus 10 is thus adjustable to fit containers of variable shapes and sizes.

It is also envisaged that, in alternative embodiments of the invention (not illustrated), the actuating rod 14 and the pivoting bar 16 are similarly longitudinally extendible and contractible to accommodate containers

of varying shapes and sizes. The pedal member 18, the actuating rod 14 and the pivoting bar 16 may equally be made longitudinally extendible and contractible using other conventional mechanical configurations such as a telescopic tube configuration (not illustrated).

A substantially L-shaped second hook member 48 has a first leg 50 and a second leg 52. The first leg 50 is pivotably connected to the pivoting bar 16 at a first pivot point between said one end 22 and said other end 32 of the pivoting bar 16 so that the second hook member 48 is pivotable through 360° relative to the pivoting bar 16 about an axis which is substantially perpendicular with the longitudinal axis of the pivoting bar 16. The arrangement is such that the first leg 50 projects substantially perpendicularly from the pivoting bar 16. The second hook member 48 serves as part of a second coupling means 51 for coupling the pivoting bar 16 to a container (not shown in Figure 1). The second coupling means 51 is described in greater detail below with reference to Figure 3.

In an alternative embodiment of the invention, the respective first and second legs 28, 50 and 30, 52 of the first and second hook members 24, 48 are longitudinally extendible by conventional means so that the apparatus 10 may be adapted to fit containers of varying shapes and sizes.

The first coupling means 31 comprises the first hook member 24 and a sleeve member. The sleeve member is shown in Figure 2 in the form of a sleeve 54. The sleeve 54, which is substantially rectangular in transverse cross-section, has an upper wall or face 56, a lower face 58 oppositely disposed to the upper face 56 and two mutually spaced-apart side faces 60, 62 joining the upper and lower faces 56, 58. Fixing means are provided in the form of a pair of conventional bolts 64 and respective nuts 65 and washers 67. A respective pair of apertures 66 (only one of each pair visible) for receiving the bolts 64 are formed in the upper and lower faces 56, 58. The sleeve 54 has an hook member-receiving aperture 68 formed in the upper face 56 and an open end 70. In use, a user (not shown) couples the first hook member 24 to the sleeve 54 by inserting the first hook member 24 through the open end 70 and guiding the second leg 30 of the hook member 24 through the aperture 68. Thus, the first hook member 24 is located, in use, within the sleeve 54 with the second leg 30 projecting through the aperture 68.

The second coupling means 51 comprises the second hook member 48 and a bracket member. The bracket member is illustrated in Figure 3 in the form of a bracket 72. The bracket 72, which is substantially rectangular in transverse cross-section, has a recess or socket 74 for receiving the second leg 52 of the second hook member 48. The bracket 72 further comprises fixing means in the form of a pair of conventional bolts 76 and respective nuts 77 and washers 79. A respective pair of apertures 78 (only one of each pair visible) for receiving the bolts 76 are formed in opposing sides of

the bracket 72 which sides are substantially perpendicularly disposed with respect to the mouth of the socket 74.

Figure 4 shows the lid-activating apparatus 10 *in situ* on a container 80 in the form of a conventional refuse bin. The container 80, which is substantially rectangular in transverse cross-section, comprises oppositely disposed front wall 82 and rear wall (not visible) and first and second oppositely disposed side walls 86 (second side wall not visible). The container 80 further comprises an underside (not visible) and an open mouth 90. A lid 92 is pivotably connected to the rear wall of the container adjacent the open mouth 90 by a hinge 94. The lid 92 is pivotable between an open position (as illustrated in Figure 4) in which the user can deposit material into the container 80 through the mouth 90 and a closed position in which the lid covers the mouth 90 of the container 80.

The sleeve 54 (only partially visible in Figure 4) is fixed to the external surface of the lid 92 by securing the bolts 64 through the lid 92 in conventional manner. The sleeve 54 is positioned adjacent an edge of the lid 92, which edge, in the present embodiment is adjacent the first side wall 86 of the container when the lid 92 is in the closed position. The sleeve 54 is arranged so that the aperture 68 is facing away from the surface of the lid 92 and the open end 70 of the sleeve 54 is facing said edge of the lid 92.

The bracket 72 is secured to the first side wall 86 of the container 80 using the bolts 76 in conventional manner. The bracket 72 is arranged so that the socket 74 faces upwardly (as viewed in Figure 4). The bracket 72 is laterally displaced from the sleeve 54 with respect to the rear wall of the container 80.

The first hook member 24 is coupled to the sleeve 54, as described above, and the second hook member 48 is coupled to the bracket 72 such that the second leg 52 is seated in the socket 74 and is maintained therein under gravity.

Thus, the apparatus 10 is mounted on the container 80 and is coupled to both the container 80 and the lid 92.

In use, the user presses down on the pedal head 36 with his foot (not shown) thereby causing the pivoting bar 16 to pivot (anti-clockwise as viewed in Figure 4) about the first leg 50 of the second hook member 48 (which second hook member 48 is fixed relative to the container 80 by the bracket 72) and causing the actuating rod 14 to move upwardly (as viewed in Figure 4). Upon movement of the actuating rod 14 upwardly, the first leg 28 of the first hook member 24 engages the upper surface 56 of the sleeve 54 and causes the lid 92 to pivot (clockwise as viewed in Figure 4) about the hinge 94 into the open position (as illustrated in Figure 4). When the user removes pressure from the pedal head 36, the lid 92 is allowed to return to the closed position under gravity. It will be appreciated that the apparatus 10 need not necessarily be activated by the

user's foot but may alternatively be activated by a hand, knee or elbow etc., as desired.

It will be appreciated that the actuating rod 14 and the pivoting bar 16 can readily be uncoupled from the sleeve 54 and the bracket 72 respectively. Thus, the apparatus 10 can readily be used on a number of separate containers (not shown) provided each container is provided with its own respective sleeve 54 and bracket 72. In any event, it is a simple task to remove the entire apparatus 10 from one container and mount it to another container.

It will be noted that the apparatus 10 is invertible or reversible by virtue of the pivotable connections between the actuating rod 14 and the pivoting bar 16, the pivoting bar 16 and the second hook member 48, and the pivoting bar 16 and the pedal shaft 34. Thus, the apparatus 10 is equally mountable on the second side wall (not visible) of the container 80. The ability of the apparatus 10 to be reversible is important in cases where a container is stored so that the user only has access to one particular side of the container. So that the apparatus 10 is adaptable to fit as wide a range of container types as possible, it is preferred if the aforementioned pivotable connections are pivotable substantially through 360°.

It will also be appreciated that the position at which the bracket 72 is fixed to the side wall 86 is dependent on the length of the pedal member 18 and the size of the container 80 - the user must ensure that there is sufficient clearance between the pedal member 18 and the ground (not shown) to allow the lid 92 to be pivoted into the open position.

It will further be appreciated that the degree of leverage exerted by the apparatus 10 on the lid 92 depends on the location of the sleeve 54 relative to the hinge 94. For a given application, therefore, the user must position the sleeve 54 so that the apparatus 10 can provide sufficient leverage to open the lid 92 without undue exertion on the part of the user.

In an alternative embodiment of the invention (not illustrated) the pedal shaft 34 is rigidly connected to the pivoting member 16. In this embodiment the apparatus 10 still functions as described above but is not reversible or invertible as described above.

In the embodiment illustrated in Figures 1 to 4, the pedal member 18 is described as comprising a pedal shaft 34 and a pedal head 36. In another alternative embodiment of the invention (not illustrated), the pedal member can take the form of a handle member which is fixed, either rigidly or pivotably, to the end 32 of the pivoting bar 16. Depending on the application, such a handle member need not be as long as the pedal member 18 and can be formed integrally with the pivoting member, if appropriate to the application.

In yet another alternative embodiment of the invention (not illustrated), the actuating arm 14 is coupled to the underside of the container lid 92. This requires that an aperture or notch be formed in the side of the lid 92

to accommodate the actuating arm 14 and to allow the lid 92 to close fully. The first coupling means 31 can be used in such an embodiment although the first hook member 24 must be arranged so that the second leg 50 points in substantially the opposite direction relative to the actuating bar 14 than is shown in Figure 1.

While the foregoing relates to containers with pivotably connected lids, it is also envisaged that the apparatus 10 may be employed in cases where a lid, or other covering, is slidable with respect to the main body of the container. A skilled person will understand that this is readily achievable by changing the orientation of the first coupling means with respect to the actuating rod 14.

Claims

1. A lid-actuating apparatus (10) for actuating a lid (92) of a container (80), the apparatus (10) comprising an actuating member (14) for coupling to the lid (92); and a lever means (12) for coupling to the container (80), characterised in that the lever means (12) comprises a pivoting member (16) having one end (22) pivotably connected to the actuating member (14); and a pedal member (18) connected to the other end (32) of the pivoting member (16), the pivoting member (16) being pivotably coupled, in use, to an external surface (86) of the container (80) so that the pivoting member (16) is pivotable with respect to the container (80) at a first pivot point between said one end (22) and said other end (32).
2. A lid-actuating apparatus (10) as claimed in Claim 1, characterised in that the actuating member (14) is coupled, in use, to an external surface of the lid (92).
3. A lid-actuating apparatus (10) as claimed in Claim 1 or 2, characterised in that the pedal member (18) is pivotably connected to said other end (32) of the pivoting member (16).
4. A lid-actuating apparatus (10) as claimed in Claim 3, characterised in that the pedal member (18) is pivotable substantially through 360° relative to the pivoting member (16), and in that the actuating member (14) is pivotable substantially through 360° relative to the pivoting member (16).
5. A lid-actuating apparatus (10) as claimed in any preceding claim, characterised in that the actuating member (14) is coupled, in use, to the container lid (92) by a first coupling means (31), which first coupling means (31) comprises a substantially L-shaped first hook member (24) extending from the free end (26) of the actuating member (14) so that the free end of the first hook member (24) is substantially parallel with the actuating member (14); a sleeve member (54) having an open end (70) and an aperture (68) formed in a wall (56) of the sleeve member (54); and fixing means (64, 65, 67) for detachably securing the sleeve member (54) to the container lid (92), the sleeve member (54) being dimensioned to receive the first hook member (24) such that, in use, the free end of the hook member (24) projects out of the sleeve member (54) through the aperture (68).
6. A lid-actuating apparatus (10) as claimed in any preceding claim, characterised in that the pivoting member (16) is coupled, in use, to the external surface (86) of the container (80) by a second coupling means (51), which second coupling means (51) comprises a substantially L-shaped second hook member (48) pivotably fixed to the pivoting member (16) at the first pivot point; a bracket member (72) having a socket (74) for receiving the free end of the second hook member (48); and fixing means (76, 77, 79) for detachably securing the bracket member (72) to the external surface (86) of the container (80).
7. A lid-actuating apparatus (10) as claimed in any preceding claim, characterised in that the pedal member (18) comprises a rigid pedal shaft (34) having a pedal head (36) projecting substantially perpendicularly from one end (38), the other end (40) of the pedal shaft (34) being pivotably connected to said other end (32) of the pivoting member (16), the pedal shaft (34) being longitudinally extendible.
8. A lid-actuating apparatus (10) as claimed in any preceding claim, characterised in that the pivoting member (16) is longitudinally extendible.
9. A lid-actuating apparatus (10) as claimed in any preceding claim, characterised in that the actuating member (14) is longitudinally extendible.
10. A lidded container incorporating a lid-actuating apparatus (10) according to any one of claims 1-9.

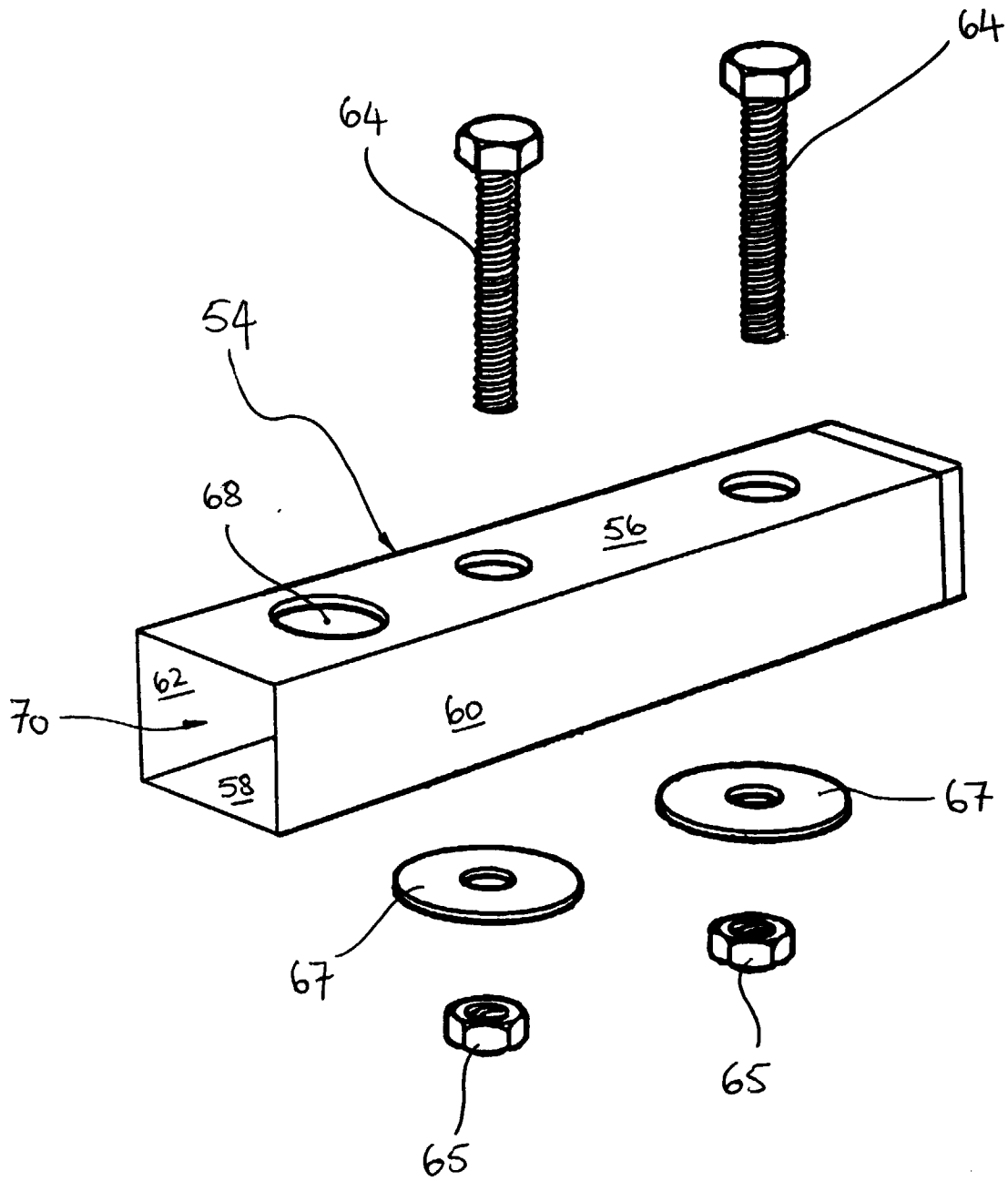


FIGURE 2

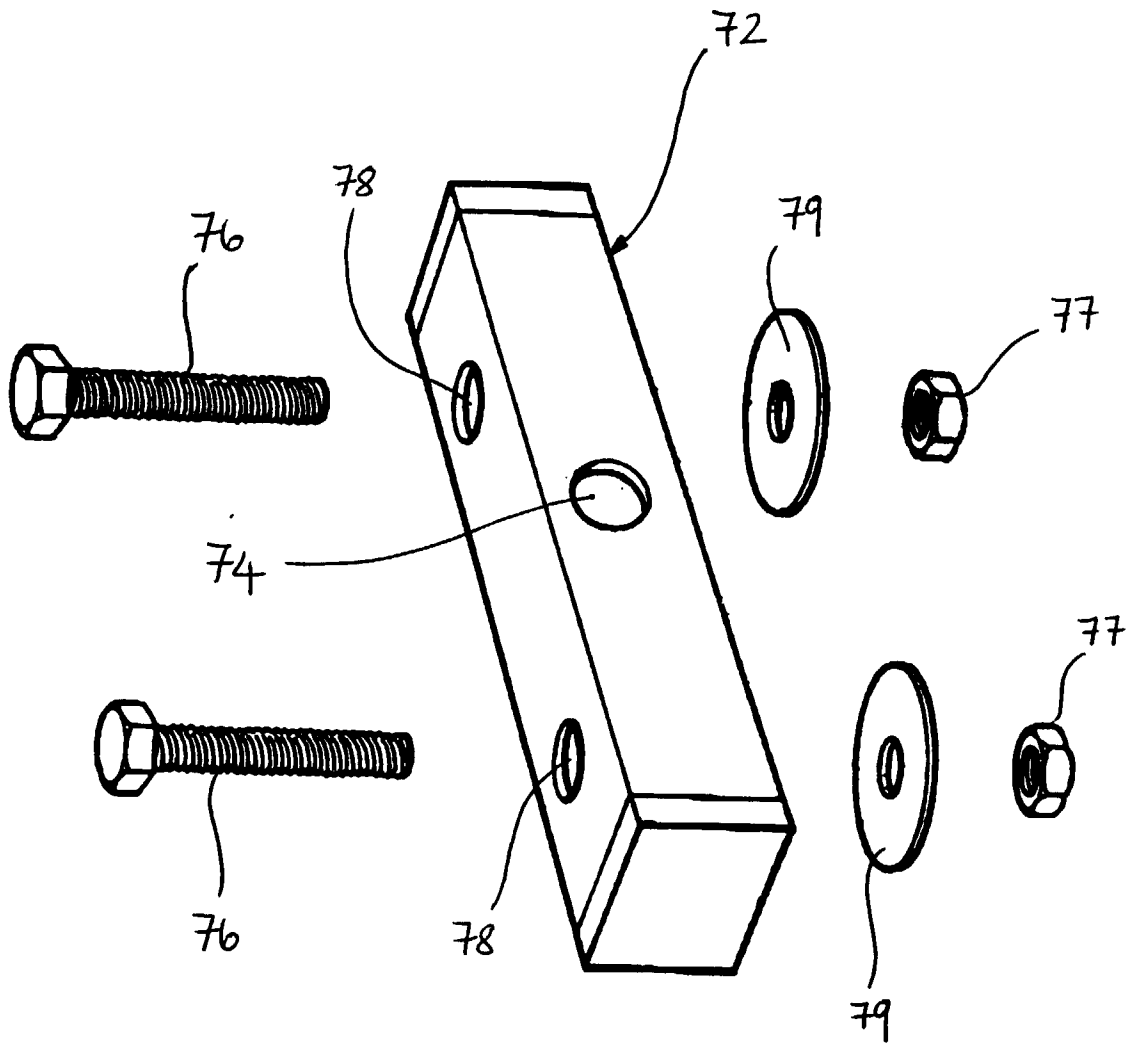


FIGURE 3

European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 98 20 0272

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X Y	DE 37 00 264 A (W. DÖRR) 25 June 1987 * the whole document * ---	1-3,10 9	B65F1/16
Y	US 3 224 717 A (R. MOTT) 21 December 1965 * column 3, line 11 - line 28 * * figure 2 * ---	9	
X	US 1 509 798 A (A. VANCE ET AL.) 23 September 1924 * page 1, line 60 - line 108 * * figures 1-3 * ---	1,2,10	
X	US 4 892 218 A (R. REILING) 9 January 1990 * column 2, line 23 - line 65 * * figures 1-5 * -----	1,10	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B65F
Place of search	Date of completion of the search	Examiner	
THE HAGUE	21 April 1998	Smolders, R	
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