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(54) Latching apparatus.

(57) A waste disposal container has an end door 12 controlled by a latching apparatus 14. The latter has hooks 16 on the container body 10 for co-acting with hasps 20 on the door 12. The hooks 16 are mounted on a rotatable bar 18, the latter also mounting a pair of spaced cam members 24. On the bar 18 between the cam members 24 there is freely mounted a tube 26 which provides a manual operating lever 28. An abutment pin 34 is locatable in selective positions on the cam members 24 whereby to be engaged by respective movements of the lever 28. On opening of the door 12, any whiplash effect on the hooks 16, caused by the pressure of the load inside the container, is transmitted into rotation of the bar 18 on the cam members 24 but has no effect on the lever 28, thereby avoiding health and safety problems normally associated with lever locking arrangements.

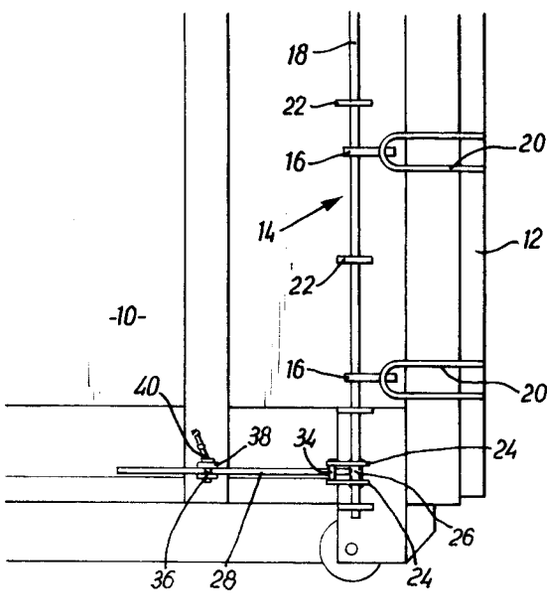

FIG.1

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This invention is concerned with latching apparatus for use in the opening and closing of a member on a body, and is particularly concerned with use in relation to a door of a waste disposal container.

When a waste disposal container is fully loaded, there are potentially significant pressures applied to the container door system by the load inside the container and this pressure in turn is transmitted through the door locking mechanism. A lever system for control of the door is preferred but the whiplash effect on the lever created by the pressure of the load within the container can, under certain circumstances, make the lever a major health and safety problem.

It has previously been proposed to obviate or mitigate this problem by providing a turnbuckle and wheel door locking system, requiring numerous turns on the wheel to open the locking mechanism slowly. However this system is slow to operate and, unless the screw threads are kept greased and clean, jamming can occur. Also, because of the time involved in winding the door open and closed, operator errors can lead to the door not being fully closed. An alternative arrangement uses a lever system in conjunction with a gas strut where the lever is pulled to open the locking gear and the gas strut takes the pressure, slowly opening the locking mechanism. However, this system is expensive and if there is loss of pressure in the gas strut, the lever will not be damped. Further, in the waste disposal industry where vandalism can be a problem, a highly pressurised gas strut in a fire environment is not considered to be completely safe.

According to the present invention there is provided latching apparatus for use in the opening and closing of a member on a body, the apparatus comprising two releasably engagable arrangements, a first of the latter having movable latching means, and manually operable means provided for moving the latching means selectively in different directions, the manually operable means being normally movable relative to the latching means and control means being selectively associated with the first arrangement to enable the manually operable means to co-act with the latter for movement of the latching means in the selected direction, for respective opening or closing of the body member.

Preferably the manually operable means is freely movable relative to the latching means whereby, when the control means is associated with the first arrangement enabling movement of the latching means in one of the selected directions, the manually operable means remains freely movable relative to the latching means in the other direction. The control means may comprise abutment means selectively locatable on the first arrangement.

Preferably also the first arrangement comprises a cam arrangement on which the abutment means can be selectively mounted whereby, when the manually operable means co-acts with the first arrangement by way of the abutment means, the cam arrangement is adapted to cooperate with the body to provide for movement of the latching means selectively into or out of latching engagement with the second arrangement.

The cam arrangement preferably comprises a pair of cam members spaced apart on a rotatable bar of the first arrangement, with the manually operable means in the form of a lever movably mounted on the bar and located between the cam members. The abutment means may comprise a pin which is locatable through selected aligned apertures in the cam members whereby to extend thereacross and be engagable by the lever when the latter is moved in one direction of rotation on the bar.

The latching part may comprise a hook, and the second component may comprise a hasp for cooperation with the hook.

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

Fig. 1 is a side elevation of part of a container with a latching apparatus according to the invention thereon;

Fig. 2 is an enlarged view of part of the latching apparatus of Fig. 1:

Fig. 3 is a further enlarged view of certain components of the latching apparatus in one mode of operation; and

Fig. 4 is a view similar to Fig. 3 but showing the components in another mode of operation.

Referring to the drawings, a waste disposal container 10 has an end door 12, the opening and closing of which is controlled by a latching apparatus 14. The container 10 is loaded with products for waste disposal, and such products create pressure within the container which pressure is applied to the door 12 and is transmitted through the latching apparatus 14.

The latching apparatus 14 includes open hooks 16 mounted for rotation with a bar 18 which extends substantially vertically on the container body 10 towards the door end thereof. The hooks 16 are vertically spaced on the bar 18 and are arranged to co-act with a pair of hasps 20 mounted on the door 12. The bar 18 locates in carriers 22 vertically spaced on the container body 10, to be rotatably mounted and also to be movable laterally of the body 10 for a purpose hereinafter described.

Towards its lower end, the bar 18 mounts a cam arrangement in the form of a pair of spaced cam members 24. On the bar 18 between the cam members 24 a tube 26 is located for free rotation,

the tube 26 mounting a radially extending, manual operating lever 28. The cam members 24 are provided with a first pair of aligned through apertures 30 spaced from a second pair of aligned through apertures 32, an abutment pin 34 being locatable selectively through either pair of aligned apertures. The pin 34 is retained captive on the bar 18 by means of a chain 36.

The latching apparatus 14 is shown in Fig. 1 in a closed condition where the hasps 20 are grabbed by the hooks 16 and the door 12 is retained closed. In this condition the lever 28 can be locked to the container body in any suitable way, for example by a locking pin 36 engagable through retaining brackets 38 on the body 10, the pin 36 being retained captive on the body 10 by means of a chain 40.

For opening of the door 12, the locking pin 36 is removed and the abutment pin 34 is located through the aligned apertures 32 to locate outwardly of the lever 28. Movement of the latter away from the body 10 will lead to engagement of the lever 28 with the abutment pin 34 and consequent movement of the cam members 24 and rotation of the bar 18 so that the hooks 16 move away from the hasps 20. It is at this stage that the pressure within the container transmitted through the latching apparatus can lead to a whiplash effect on the hooks 16. This effect is transmitted into rotation of the bar 18 and the cam members 24 but, due to the free mounting of the tube 26 on the bar 18, the abutment pin 34 simply moves away from the lever 28 and the whiplash has no effect therefore on the latter. This obviates the potential problems of a whiplash effect on the operating lever.

For latching of the door 12 in a closed position, the abutment pin 34 is located through the aligned apertures 30 in the cam members 24, so that subsequent movement of the lever 28 towards the body 10 results in an engagement of the lever 28 with the abutment pin 34 and consequent movement of the cam members 24 and the bar 18. The profile of the cam members 24 is such that not until the latter are moved through a top dead centre position will the profile then cause lateral movement of the bar 18 laterally outwardly of the body 10 and consequently movement of the hooks 16 into engagement with the hasps 20.

There is thus provided a simple lever mechanism which is easy to operate, inexpensive to manufacture, and simple to maintain but which is yet highly effective in preventing the health and safety problems normally associated with such door latching equipment. The container cannot be opened or closed without the abutment pin being in the correct apertures and thus the apparatus cannot be operated inadvertently.

Various modifications may be made without departing from the invention. For example, the configuration of the various components may differ from that described and shown provided the apparatus operates in accordance with the invention. It will be appreciated that the invention can be applied to other than waste disposal containers and the invention is not to be interpreted as being restricted to use with the latter.

Claims

1. Latching apparatus for use in the opening and closing of a member (12) on a body (10), the apparatus comprising two releasably engagable arrangements, a first of the latter having movable latching means (16), and manually operable means (28) provided for moving the latching means (16) selectively in different directions, characterised in that the manually operable means (28) is normally movable relative to the latching means (16), and control means (34) is selectively associated with the first arrangement to enable the manually operable means (28) to co-act with the latter for movement of the latching means (16) in the selected direction, for respective opening or closing of the body member (12).

2. Apparatus according to Claim 1, characterised in that the manually operable means (28) is freely movable relative to the latching means (16) whereby, when the control means (34) is associated with the first arrangement enabling movement of the latching means (16) in one of the selected directions, the manually operable means (28) remains freely movable relative to the latching means (16) in the other direction.

3. Apparatus according to Claim 1 or 2, characterised in that the control means comprises abutment means (34) selectively locatable on the first arrangement.

4. Apparatus according to Claim 3, characterised in that the first arrangement comprises a cam arrangement (24, 30, 32) on which the abutment means (34) can be selectively mounted whereby, when the manually operable means (28) co-acts with the first arrangement by way of the abutment means (34), the cam arrangement (24, 30, 32) is adapted to cooperate with the body (10) to provide for movement of the latching means (16) selectively into or out of latching engagement with the second arrangement.

5. Apparatus according to Claim 4, characterised in that the cam arrangement comprises a pair

of cam members (24) spaced apart on a rotatable bar (18) of the first arrangement, with the manually operable means in the form of a lever (28) movably mounted on the bar (18) and located between the cam members (24).

6. Apparatus according to Claim 5, characterised in that the abutment means comprises a pin (34) which is locatable through selected aligned apertures (30, 32) in the cam members (24) whereby to extend thereacross and be engagable by the lever (28) when the latter is moved in one direction of rotation on the bar (18).

7. Apparatus according to Claim 6, characterised in that the pin (34) is retained captive on the bar (18).

8. Apparatus according to any of the preceding Claims, characterised in that means (36, 38) are provided for locking the manually operable means (28) to the body (10).

9. Apparatus according to any of the preceding Claims, characterised in that the latching means comprises a hook (16), and the second arrangement comprises a hasp (20) for cooperation with the hook (16).

10. A waste disposal container having an openable door and characterised by a latching apparatus according to any of the preceding Claims for use in the opening and closing of the door on the container.

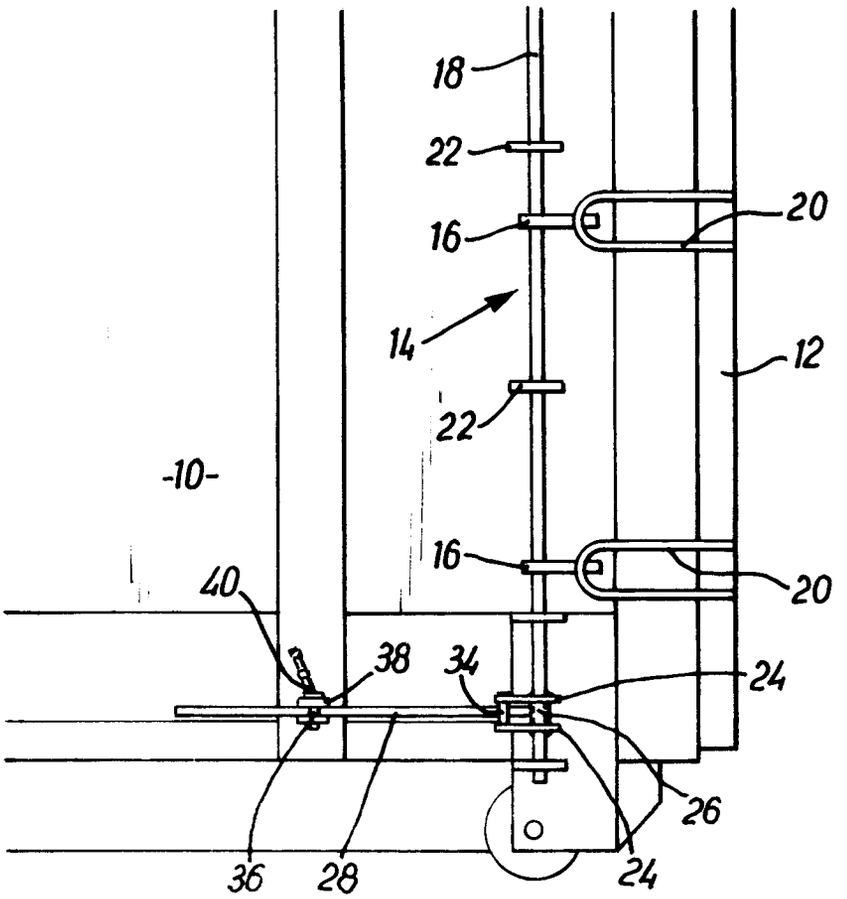
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FIG. 1

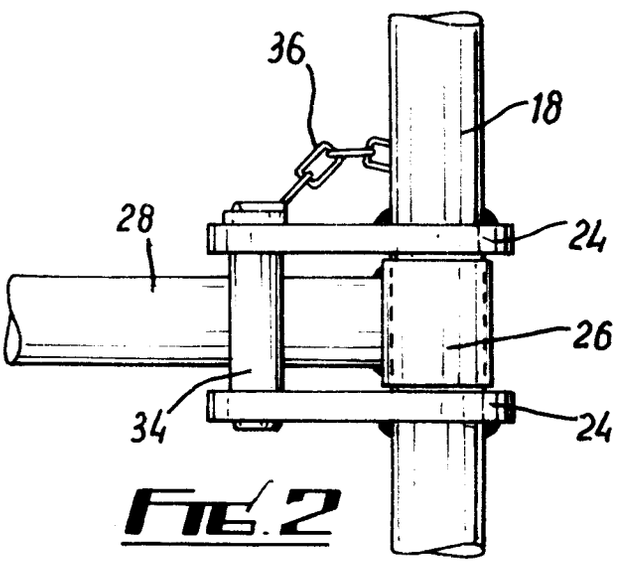
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FIG. 2

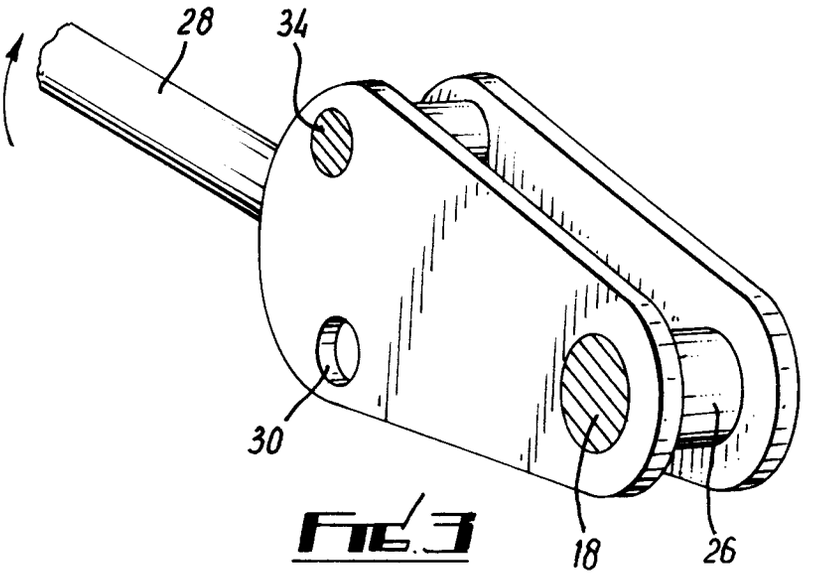

FIG.3

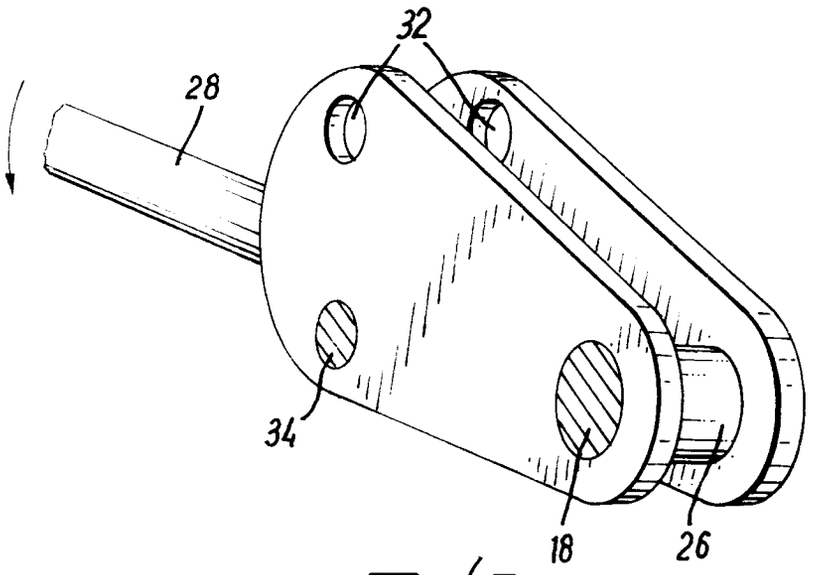

FIG.4

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 30 5409

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.5)
X	US-A-4 290 352 (SCHMIDT ET AL.) * the whole document *	1,9,10	E05C9/08 B65F1/16 B65D90/00
X A	US-A-4 784 414 (FREE) * the whole document *	1 2	B65F1/12
X	US-A-4 545 523 (GALBREATH ET AL.) * the whole document *	1,2,8,10	
X	US-A-4 538 512 (BLOUGH) * the whole document *	1,2,9	
X	DE-A-3 117 033 (EDELHOFF POLYTECHNIK GMBH) * the whole document *	1,10	
X	DE-C-640 191 (BUCHER) * the whole document *	1	
X	FR-A-2 577 270 (REGIE NATIONALE DES USINES RENAULT) * the whole document *	1,9	
X	FR-A-2 611 226 (TORDO BELGRONO) * the whole document *	1	
X	AU-B-600 646 (DANNY KO TUN WU) * the whole document *	1,3	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

E05B
E05C
B65F
B30B
B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	10 SEPTEMBER 1992	VESTIN K.

CATEGORY OF CITED DOCUMENTS

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