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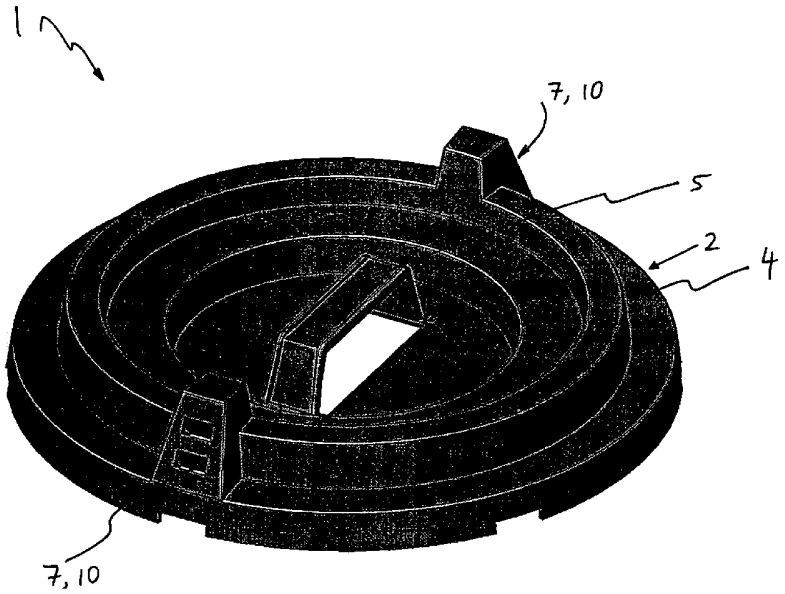
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(54) Title: A COMPACTOR



(57) **Abstract:** A compactor for both safe and hygienic manual compacting of rubbish is provided. The compacting device 1 has a body 2 having a lower contacting surface 3 and an upper non-contacting surface 4. A handle 5 is positioned on the upper surface and one or more projections 6 extend from the lower contacting surface 2. In another embodiment, a gridation of projections 6 are provided in a T-shape. The projections may be of any shape and/or form as required or as dictated to provide an impaction or tearing ability upon rubbish objects. A user grasps the handle 5 and positions the compactor upon rubbish, for example within a bin (or bag) and rotates while compressing the rubbish to thereby compact it by reducing or eliminating void spaces in the rubbish.

WO 2004/103861 A1

A COMPACTOR

TECHNICAL FIELD

This invention relates to compactors and in particular, though not solely to a compaction device for compacting materials which are stored within a waste container such as a rubbish bin, for example a "wheelie bin".

BACKGROUND ART

Recent trends in refuse and/or waste storage prior to disposable have emerged with the use of reusable refuse storage. Such facilities in domestic and light commercial applications are often in the form of large wheeled rigid plastic bins (often with hinged lids) referred to as "wheelie bins". This has helped alleviate and minimise utilisation of resources required to contain refuse, such as refuse sacks and/or bags.

However, due to the limited space/volume of such bins, a user is often required to manually force additional refuse into such bins prior to bin's contents having disposed of by local authorities. Often such manual force using feet or hands is undertaken but this is undesirable due to often unsavoury contents and/or the risk associated with this process due to unknown refuse, for example, broken glass, broken knives, scissors, syringes, needles, soil or blood stained items and decomposing meat items.

Therefore it is desirable to provide a compaction device that allows for substantially safe compaction of materials within a bin, as well as increased compaction of stored refuse for enhanced bin volume utilisation.

Furthermore, the generation and/or leaking of odours from stored refuse can be unpleasant and particularly unsavoury. Foul or unusual odour generation may be a

result of degradation of refuse. These foul odours may be particularly concentrated and/or particularly unpleasant if untreated or if allowed to fester in elevated ambient temperature conditions. Storage of waste or such refuse at cooler temperatures (i.e. cooler ambient temperature conditions) may slow the degradation of refuse and generation of odours, however odours will still exist. It is therefore desirable to provide, particularly to light commercial and household users, an odour reduction device that may help alleviate foul odours associated with the storage of refuse.

All references, including any patents or patent applications cited in this specification are hereby incorporated by reference. No admission is made that any reference constitutes prior art. The discussion of the references states what their authors assert, and the applicants reserve the right to challenge the accuracy and pertinency of the cited documents. It will be clearly understood that, although a number of prior art publications are referred to herein, this reference does not constitute an admission that any of these documents form part of the common general knowledge in the art, in New Zealand or in any other country.

It is acknowledged that the term 'comprise' may, under varying jurisdictions, be attributed with either an exclusive or an inclusive meaning. For the purpose of this specification, and unless otherwise noted, the term 'comprise' shall have an inclusive meaning - i.e. that it will be taken to mean an inclusion of not only the listed components it directly references, but also other non-specified components or elements. This rationale will also be used when the term 'comprised' or 'comprising' is used in relation to one or more steps in a method or process.

It is an object of the present invention to provide a compacting device which will go at least go some way towards addressing or overcoming the above problems or to at least provide the public with a useful choice.

Further aspects and advantages of the present invention will become apparent from the ensuing description which is given by way of example only.

DISCLOSURE OF INVENTION

Accordingly, in a first aspect, the invention consists in a compacting device comprising:

a body having a lower contacting surface, and an upper non-contacting surface upon which a handle means is positioned,

wherein one or more projections extend from the lower contacting surface.

Preferably, said projections are resiliently flexible.

Preferably, said one or more projections are arranged and positioned about the lower contacting surface in a grid pattern or in a circular pattern, and/or in a circumferential pattern.

Preferably, a ventilation channel extends between the lower contacting surface and the upper non-contacting surface of said body.

Preferably, said lower contacting surface substantially transfers compression and/or rotational forces exerted upon said handle means.

Preferably, said handle means comprises a single centrally located handle or grip.

Preferably, said handle means comprises two or more handles or grips located about the upper non-contacting surface.

Preferably, said handle or grip is detachably mountable to said upper surface.

Preferably, said handle or grip includes an upper surface engaging member or members, such as a set of fingers or tabs extending from the handle(s) or grip(s) which are receivable in receiving slots or apertures in the upper surface.

Preferably, the body further includes a container attached upon the upper non-contacting surface or within said ventilation channel, adapted to include or retain deodorising and/or insecticidal means.

Preferably, the container is a rigid container and/or bag.

Preferably, said body is sized to fit within a rubbish bin or bag.

Preferably, said body is substantially circular.

Preferably, said body is flat or disc-shaped.

Preferably, said lower contacting surface includes a central contacting portion and an outer, recessed portion forming part of said ventilation channel.

Preferably, said ventilation channel includes at least one aperture.

Preferably, said projections are provided on the central portion and are arranged to form a passage directed towards the at least one aperture.

In a second aspect, the invention consists in a method of use by a user of a compacting device, to compact the contents of a receptacle comprising the steps of:

i) engaging a lower contacting surface of the compacting device with the contents of a receptacle,

ii) applying a compressive and rotational face to a handle means located upon an upper non-contacting surface of said compacting device,

iii) repeating step ii.) until a desired compaction of said receptacle contents has occurred, and then

iv) disengaging said compacting device from the contents of the receptacle.

Preferably, the method includes the further step of:

v) mounting said handle means to the upper surface prior to the step of engaging, and dismounting said handle means from the upper surface following the step of disengaging.

BRIEF DESCRIPTION OF DRAWINGS

Further aspects of the present invention will become apparent from the following description which is given by way of example only and with reference to the accompanying drawings in which:

Figure 1 is a top view of one possible embodiment of a compacting device according to the present invention;

Figure 2 is a bottom view of the compacting device shown in Figure 1;

Figure 3 is a side view of the compacting device shown in Figure 1;

Figure 4 is a perspective view of a deodorising device for use with the compacting device shown in Figures 1-3 and 5-8;

Figure 5 is a top perspective view of a compacting device according to a further embodiment of the present invention;

Figure 6 is a third angle projection of the compacting device of Figure 5 including plan, front elevation and side elevational views;

Figure 7 is a perspective view from the underside of the compacting device of Figure 5; and

Figure 8 is a side elevation view of two of the compacting devices of Figure 5 stacked upon one another.

BEST MODES FOR CARRYING OUT THE INVENTION

With reference to Figures 1-3 and 5-8, there is shown two embodiments of a compacting device in accordance with the present invention generally indicated by arrow 1. The compacting device 1 has a body 2 having a lower, contacting surface 3, and an upper, non-contacting surface 4 upon which a handle means 5 is positioned. One or more projections 6 extend from the lower, contacting surface 2. Figure 8 illustrates how the compacting devices 1 according to the second embodiment can be stacked on top of one another for storage purposes.

Figures 2 and 3 illustrate one embodiment of the present invention in which four substantially circular projections 6 extend from the lower contacting surface 2. Figures 7 and 8 illustrate a further embodiment in which a gridation of projections 6 are provided in a T-shape. Advantageously the projections 6 are resiliently flexible which enable the projections to resist flexing from contact with any objects which they may come into contact with (the method of use of the compacting device is explained below). The projections 6 may be of any shape and/or form as required or as dictated to provide substantially increased material on impaction or tearing ability.

Further, projections 6 may be of any extension length from the lower surface 2 and/or projections may vary in length to provide substantially varied tearing and/or impaction and/or crushing of waste material. The compacting device 1 may be made of any suitable material that may withstand the rigours of everyday use. For

example, injection moulded plastics or high density plastics may be suitable, wood, metals or metal alloys or a combination of any, may all be suitable materials for the compacting device

In use, the lower contacting surface 2 is placed in contact with waste, for example within a bin, the user then presses the compaction device via the handle, against the waste while at the same time rotating the handle, and therefore the entire device, back and forth in opposite directions of rotation for example. The result of this compressive, rotative force is to rearrange waste into a more compact volume. In particular, the projections 6 "grip" portions of waste and move them into void spaces in the waste. The projections also enable tearing of plastic bags, for example, which may be sealed and therefore entraining air within wasted void spaces which the present invention reduces or eliminates. The lower, contacting surface substantially transfers compression and/or rotational forces exerted upon said handle means 5.

The handle means generally comprises a single centrally located handle or grip, although of course two or more handles (or grips) 5 could be located about the upper non-contacting surface 4. In addition, it is also considered that the handle or grip can be detachably mountable to said upper surface, for example the handle or grip can include an upper surface engaging member or members, such as a set of fingers or tabs (not shown) which extend from the handle(s) or grip(s) which are receivable in receiving slots or apertures (also not shown) in the upper surface 4.

The handle may be any suitable gripping means that allows the user of the compacting device to grip and/or apply either a downward force and/or rotational forces. The handle may incorporate a surface with imperfections (or roughness) or a rubber-type surface to enable better gripping of the handle by a user.

Preferably the handle 5 is located and attached to the upper surface 4 of the body 2 which then defines a lower surface 3 which is adapted to contact waste to be compacted. The gripping means or handle may be, for example, in the form of a T shape, L shape, D shape or any other form which allows a user to grip the compacting device and subsequently transfer forces via the handle and main body to the waste to be compacted beneath the lower, contacting surface.

The handle would be required to be formed in such a manner to withstand substantial forces which are transferred during the compression and rotation of waste during use of the device upon waste materials.

As mentioned above, the lower, contacting surface includes one or more projections 6, which are arranged and positioned about the lower contacting surface in a grid pattern or in a circular pattern, and/or in a circumferential pattern, such as is shown in Figures 2, 3 and 7. Desirably, these projections contact objects, for example rubbish within a rubbish bin, such as for example plastic bags or waste food items, and grip the rubbish objects and, either during compression and/or rotational forces applied to the handle the compacting device shreds the rubbish objects and helps compact the rubbish bin or container items.

In addition, a ventilation channel 7 extends between the lower contacting surface and upper non-contacting surface of said body. The lower contacting surface can also include a central contacting portion 8 and an outer, recessed portion 9 forming part of the ventilation channel 7. The ventilation channel 7 can further include at least one aperture 10 for the release of air and/or rubbish gases which try to escape upon contact and compression of the compacting device into the rubbish bin contents. Air (or gases) held within pockets of rubbish generally take up space within a rubbish bin or bag, and if this space was reduced, a greater utilisation of bin

or bag can be instead filled with solid wastes. Therefore, removal of at least some air or gases is desirable.

The projections provided on the central portion 8 can be advantageously arranged to form a passage directed towards the at least one aperture 10. In particular, the projection arrangement as shown in Figures 7 and 8 clearly illustrate how gas may be directed and ducted around the ventilation channel and recessed portion, and then allowed to disperse via the apertures.

Figures 2 and 3 illustrate a simple alternative embodiment of the ventilation channel 7 and apertures 10.

The compacting device 1 may be any suitable shape, size, configuration or arrangement which enables its use for compacting, preferably rubbish items, contained within a rubbish bin or other container (or even bag). For example, a substantially circular shape may be suitable for most applications (given the rotational movement of the device to enable rubbish object shredding), and which can be rotated within most containers (so long as it is smaller in diameter than the container). During such use, the projections 6 may assist in tearing or crushing the materials in contact with the lower surface. This may assist in the degradation of the waste material and/or otherwise allow for the easier compacting of same.

The compacting device can be any suitable shape, as previously mentioned, however a substantially flat or disc-shape may also be particularly suitable.

The compacting device body can further include a container 11 as shown in Figure 4 attached upon the upper non-contacting surface or within said ventilation channel, adapted to include or retain deodorising and/or insecticidal means 12. This deodoriser and/or insecticidal means 12 can help to minimise odours from or in the rubbish, as well as impart some insecticidal properties to the rubbish. The

deodorising device is provided with connection means for example, in the form of double sided adhesive tape. Once the adhesive backing sheet of the double sided tape has been removed, the deodorising device may be adhered to the surface of an appropriate object. In the embodiment shown, the deodorising device is particularly adapted to be affixed to lower surface 3.

The means for retaining the deodorising means 12 is in the form of a spring-loaded clip. The clip is hinged about a pivot point and is configured so that the clip is urged against the underside of the deodoriser container.

The deodorising means may also contain insecticidal means and/or fungicidal means in the container as or if appropriate. Furthermore, once the deodorising means 12 has been exhausted or run out, it may be removed and a new deodoriser, insecticidal or fungicidal means 12 can be fitted to the deodorising device 11. The deodorising means may be any deodoriser which substantially reduces and/or minimises foul odours emanating from the waste container, similarly the insecticidal means provides for the deterrents and/or minimisation or reduction of insects or pestilent being attracted to or accumulating in and or around the storage and/or waste container.

Desirably, the present invention may be made from a moulded or injection moulded plastic. For example, nylon plastics, high and/or low density polyethylene (HDPE, LDPE) or other composite materials which impart generally rigid properties. Of course, metals and/or wood materials can also be used to make the compacting device.

In addition, the applicant has devised a method of use of the compacting device 1 by a user to compact the contents of a receptacle comprising the steps of:

i) engaging a lower contacting surface 3 of the compacting device 1 with the contents of a receptacle,

ii) applying a compressive and rotational face to a handle means 5 located upon an upper non-contacting surface 4 of said compacting device 1,

iii) repeating step ii.) until a desired compaction of said receptacle contents has occurred, and then

iv) disengaging said compacting device 1 from the contents of the receptacle.

An optional additional further step of:

v) mounting said handle means 5 to the upper surface 4 prior to the step of engaging, and dismounting said handle means from the upper surface following the step of disengaging,

may also be included.

The compacting device 1 is specifically designed to compact waste within a wheeled waste container (or "wheelie bin"). In use, the handle 5 will be gripped by a user and the lower surface 3 pushed down upon the waste contained within the wheelie bin. By placing pressure on the body 2 and/or handle(s) 5 of the compacting device 1 waste contained within a wheelie bin may be compacted as appropriate.

The compacting device 1 can also provided with attachment means (not shown) to releasably retain the compacting device 1 within the lid of a wheelie bin, when not in use.

It may be advantageous that the deodorising device and compacting device are integrated together to provide dual function of waste compaction and/or a

deodorising effect and/or insecticidal effect. Further, the compacting device 1 allows a user to safely and hygienically substantially compress the contents of a rubbish receptacle without likelihood of contacting broken glass, used needles, rotting food, or other waste items. For example, when a users hands are spread around the handle and confined within the bounds of the compactor device upper surface (which could be referred to as an "inner safety ring", desirably the hands cannot slip out (and accidentally contact rubbish objects) and an even downward compression can be applied.

Aspects of the present invention have been described by way of example only and it should be appreciated that modifications and additions may be made thereto without departing from the scope thereof.

CLAIMS:

1. A compacting device comprising:

   a body having a lower contacting surface, and an upper non-contacting surface upon which a handle means is positioned,

   wherein one or more projections extend from the lower contacting surface.

2. A compacting device as claimed in claim 1, wherein said projections are resiliently flexible.

3. A compacting device as claimed in claim 1 or claim 2, wherein said one or more projections are arranged and positioned about the lower contacting surface in a grid pattern or in a circular pattern, and/or in a circumferential pattern.

4. A compacting device as claimed in any one of the preceding claims, wherein said lower contacting surface transfers compression and/or rotational forces exerted upon said handle means.

5. A compacting device as claimed in any one of the preceding claims, wherein said handle means comprises a single centrally located handle or grip.

6. A compacting device as claimed in claimed in any one of claims 1 to 4, wherein said handle means comprises two or more handles or grips located about the upper non-contacting surface.

7. A compacting device as claimed in any one of the preceding claims, wherein said handle or grip is detachably mountable to said upper surface.

8. A compacting device as claimed in claim 7, wherein said handle or grip includes an upper surface engaging member or members, extending from the handle(s) or grip(s) which are receivable in receiving slots or apertures in the upper surface.

9. A compacting device as claimed in any one of the preceding claims, wherein a ventilation channel extends between the lower contacting surface and the upper non-contacting surface of said body.

10. A compacting device as claimed in claim 9, wherein the body further includes a container attached upon the upper non-contacting surface or within said ventilation channel, adapted to include or retain deodorising and/or insecticidal means.

11. A compacting device as claimed in claim 10, wherein the container is a rigid container and/or bag.

12. A compacting device as claimed in any one of claims 9 to 11, wherein said lower contacting surface includes a central contacting portion and an outer, recessed portion forming part of said ventilation channel.

13. A compacting device as claimed in any one of claims 9 to 12, wherein said ventilation channel includes at least one aperture.

14. A compacting device as claimed in claim 13, wherein said projections are provided on the central portion and are arranged to form a passage directed towards the at least one aperture.

15. A compacting device as claimed in any one of the preceding claims wherein said body is sized to fit within a rubbish bin or bag.

16. A compacting device as claimed in any one of the preceding claims, wherein said body is substantially circular.

17. A compacting device as claimed in any one of the preceding claims, wherein said body is flat or disc-shaped.

18. A method of use by a user of a compacting device, to compact the contents of a receptacle comprising the steps of:

i) engaging a lower contacting surface of the compacting device with the contents of a receptacle,

ii) applying a compressive and rotational face to a handle means located upon an upper non-contacting surface of said compacting device,

iii) repeating step ii) until a desired compaction of said receptacle contents has occurred, and then

iv) disengaging said compacting device from the contents of the receptacle.

19. The method as claimed in claim 18, including the further step of:

v) mounting said handle means to the upper surface prior to the step of engaging, and dismounting said handle means from the upper surface following the step of disengaging.

20. A compacting device substantially as hereinbefore described with reference to the accompanying drawings.

21. A method of use by a user of a compacting device substantially as hereinbefore described with reference to the accompanying drawings.

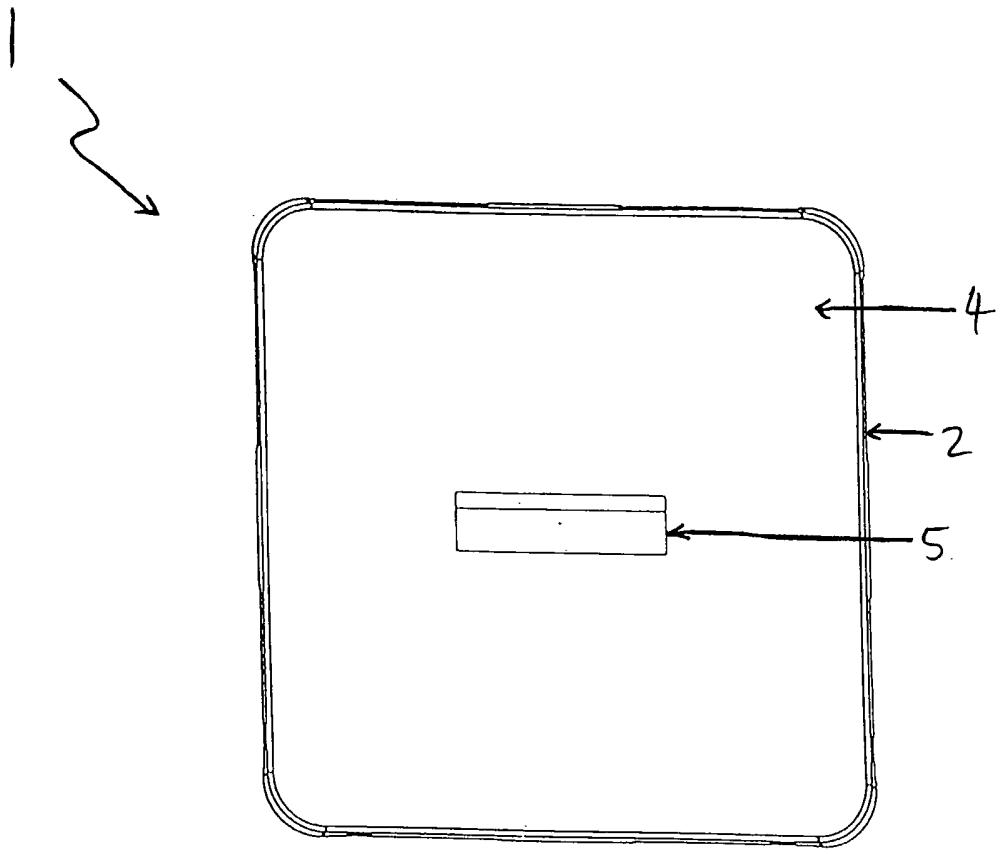


FIGURE 1

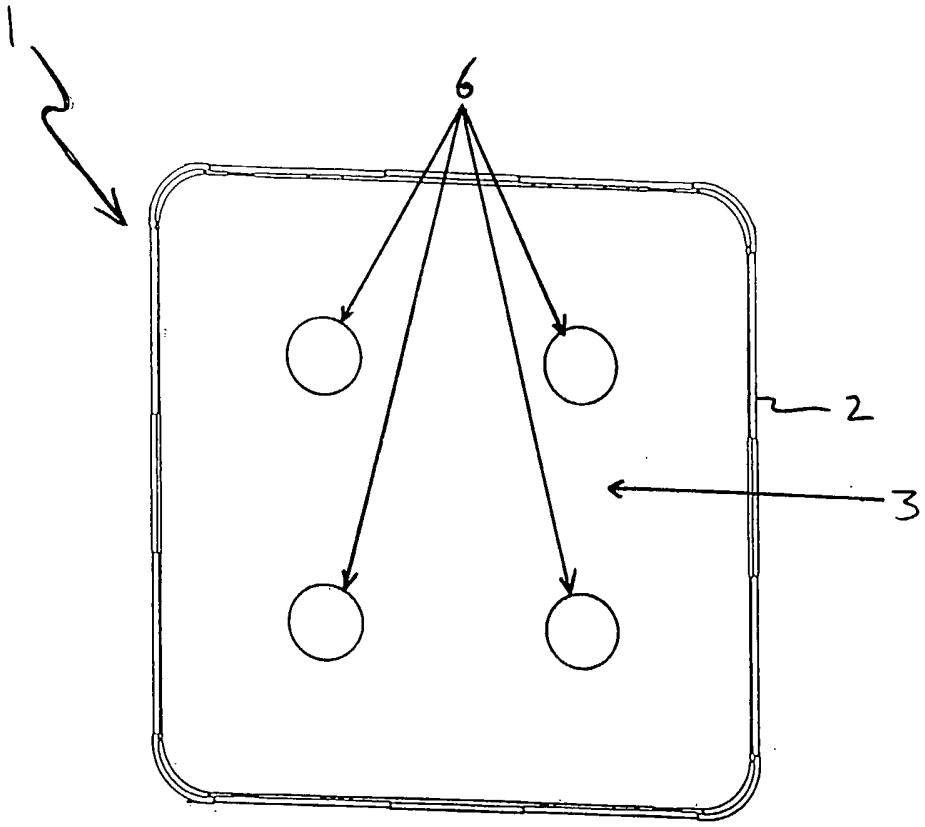


FIGURE 2



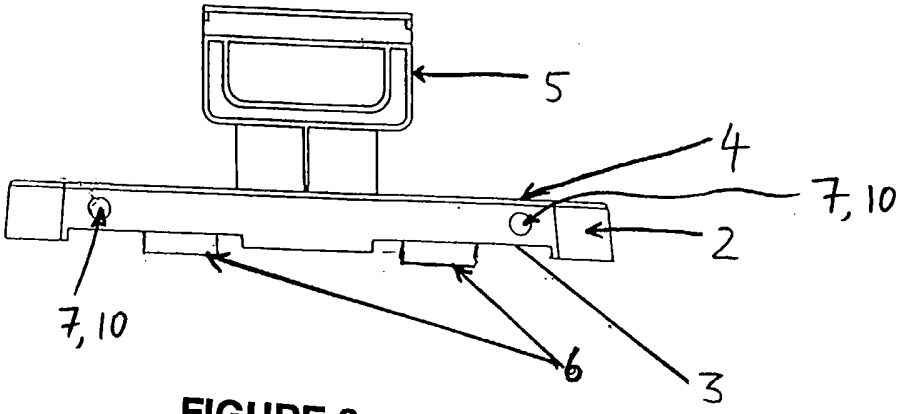


FIGURE 3

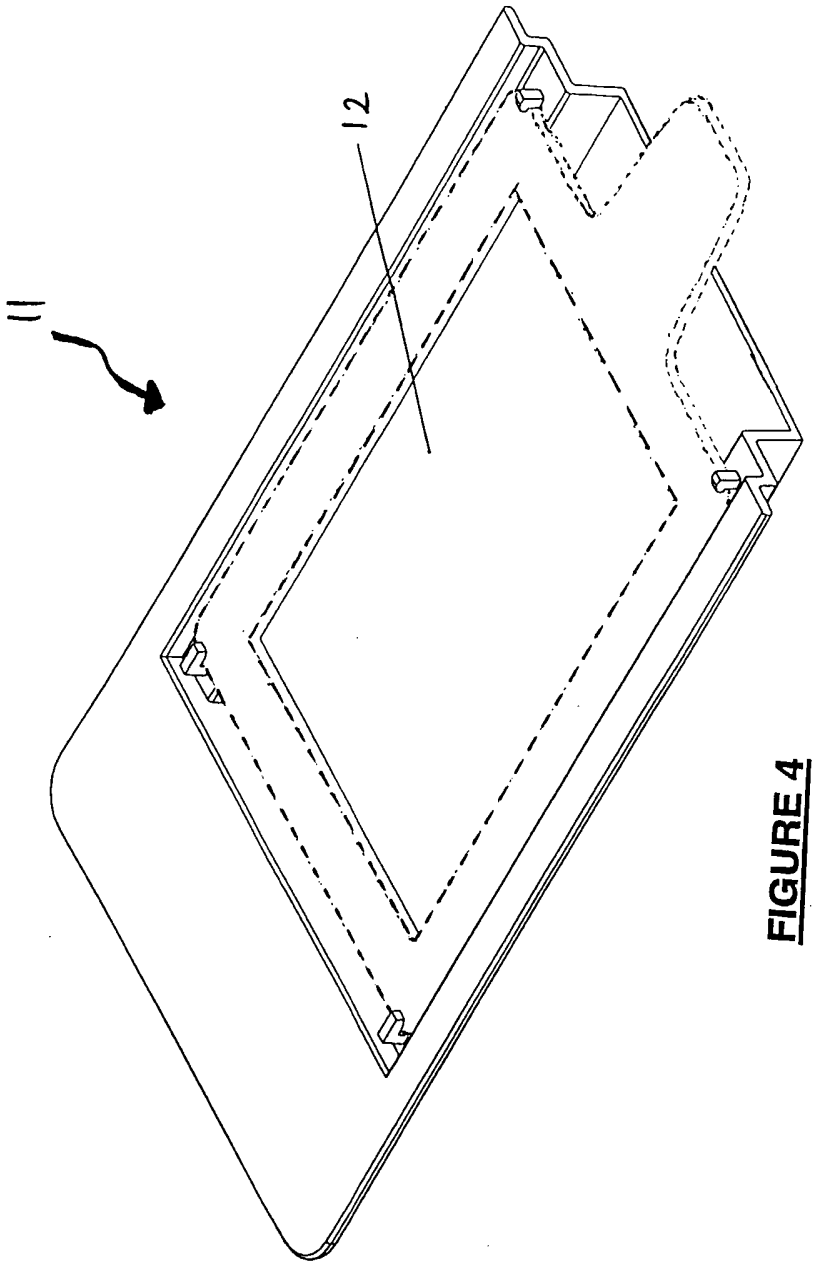


FIGURE 4

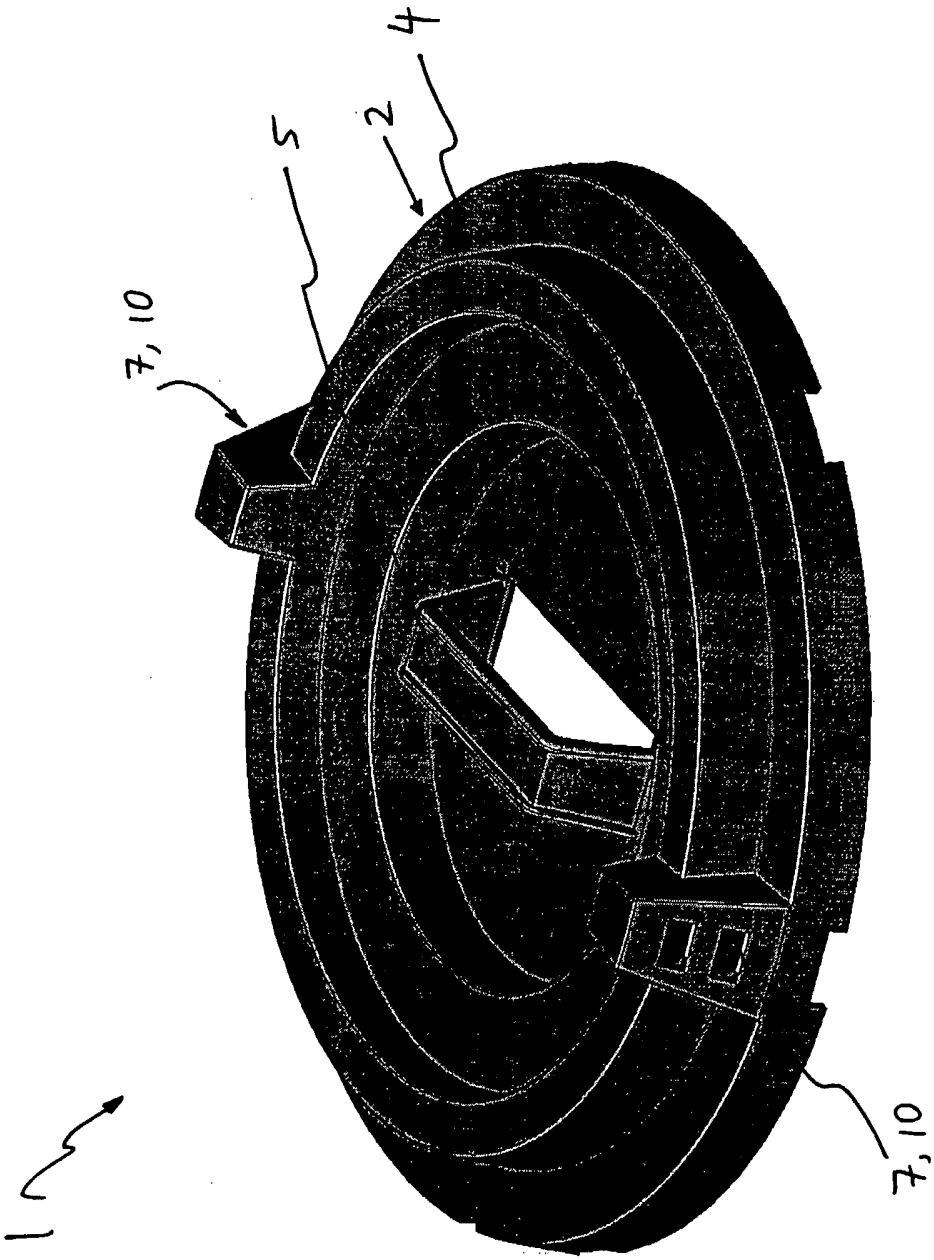


FIGURE 5

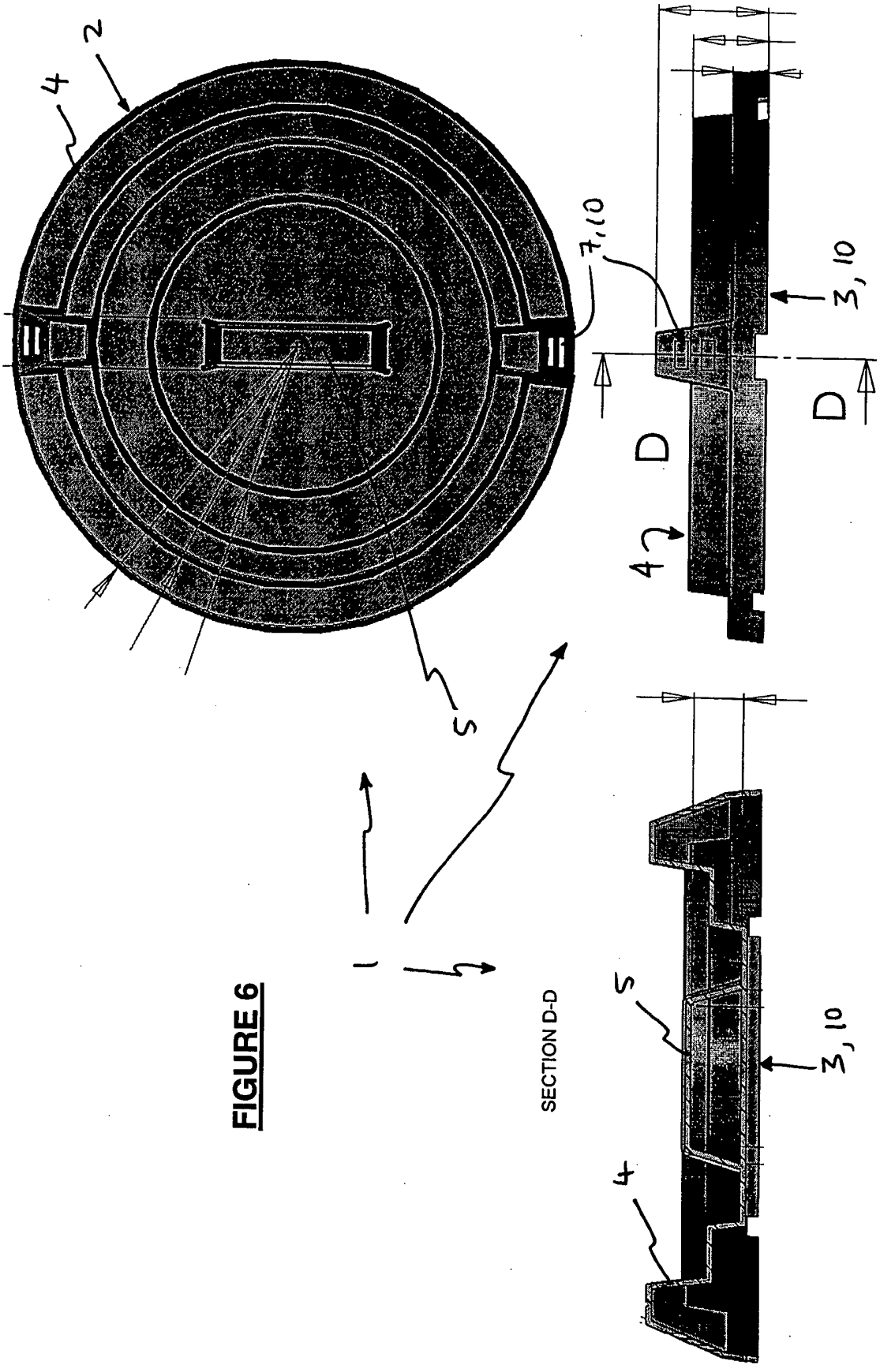


FIGURE 6

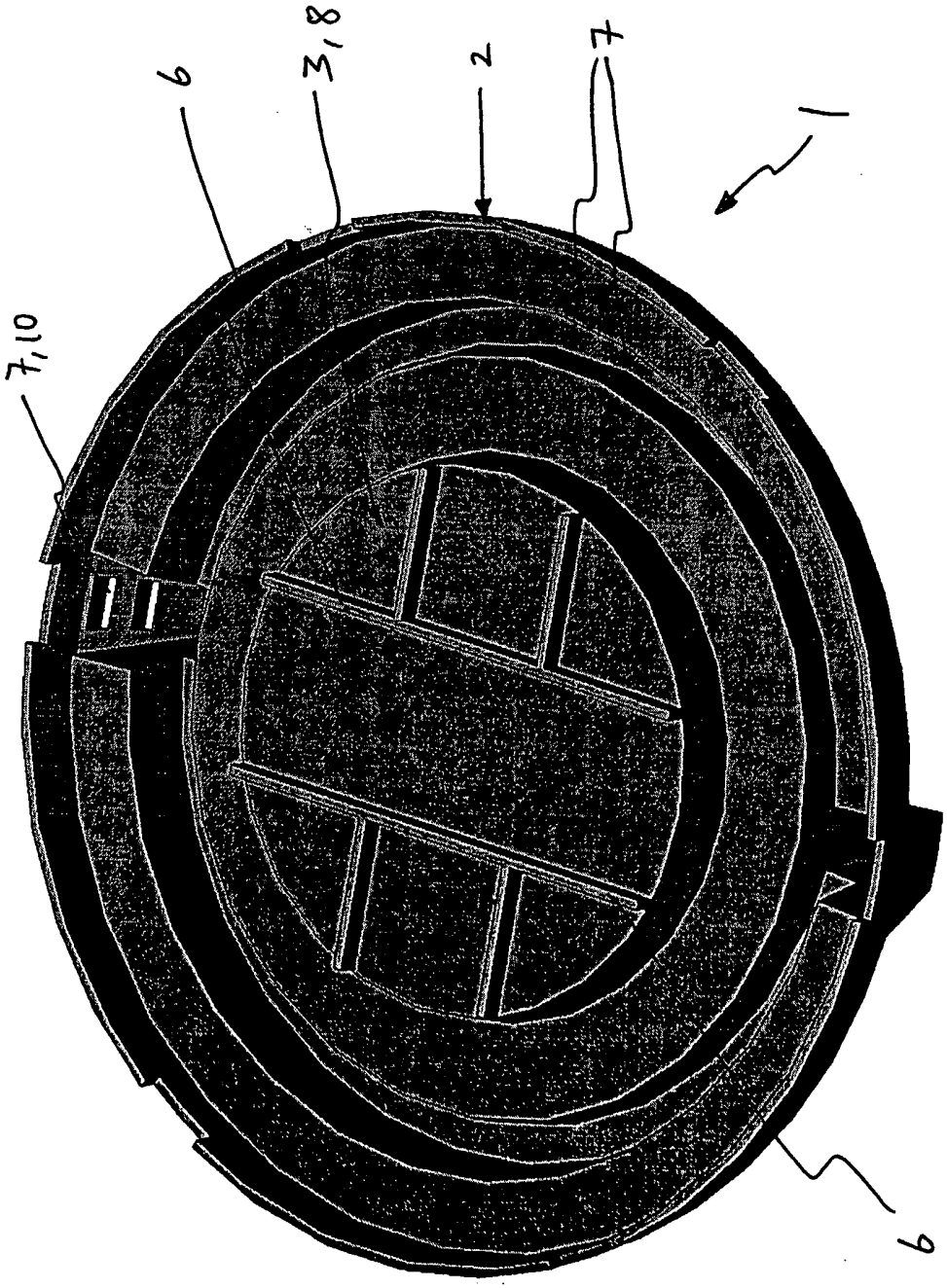


FIGURE 7

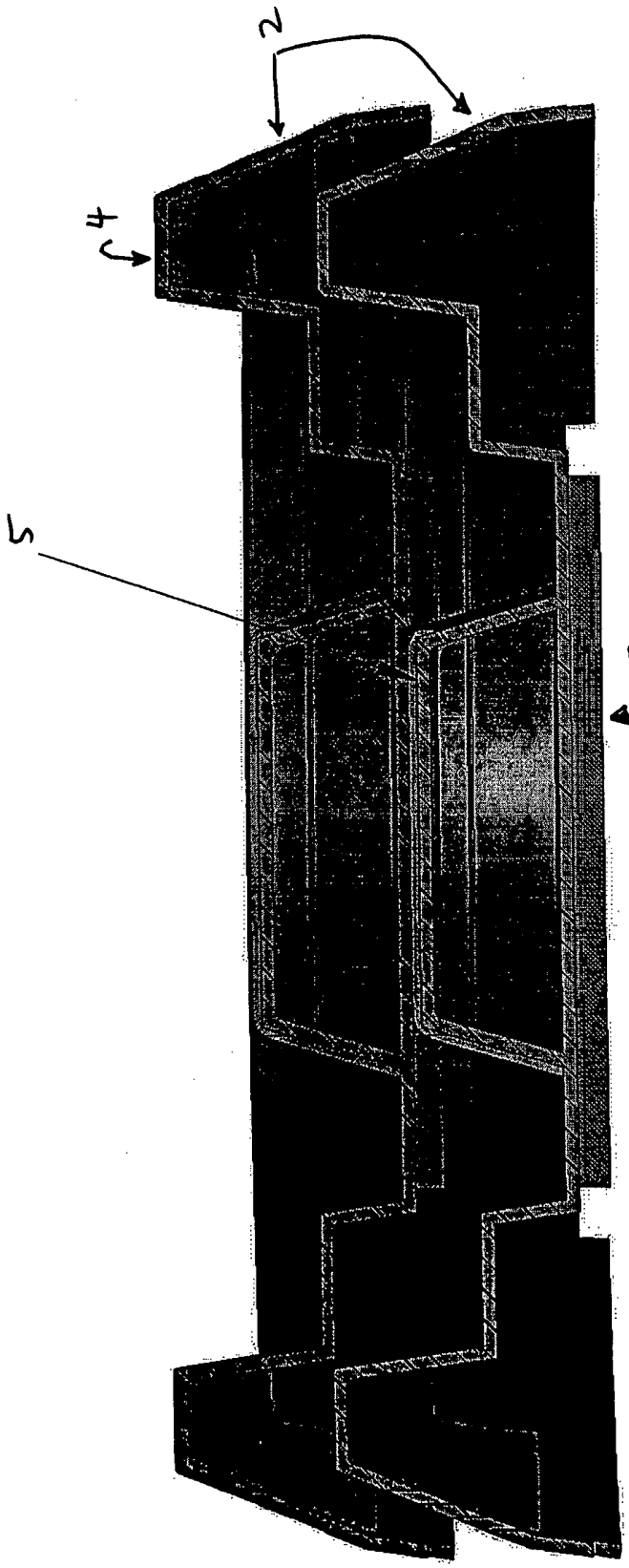


FIGURE 8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/NZ2004/000094

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. [7]: B65F 1/14

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)

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 practicable, search terms used)
DWPI: IPC B30B 9/00, B65F 1/14 and keywords (rubbish, refuse, compact+, project) and like terms

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	WO 1998/019855 A1 (WITTER) 14 May 1998	
X	Whole document, especially figures 2, 11A, 11B	1-8, 15-21
Y		9, 13
	GB 2,143,721 A (KEHL) 20 February 1985	
X	See page 3, lines 73-77, and figures 2, 4	1-8, 15-21
Y		9, 13
	US 4,991,500 (KNAPP) 12 February 1991	
Y	See column 3, lines 51-56	9, 13
	GB 2,349,799 A (ZAGURY) 15 November 2000	
X	Whole document	1-8

[X] Further documents are listed in the continuation of Box C [X] See patent family annex

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Date of the actual completion of the international search	Date of mailing of the international search report
4 August 2004	- 6 AUG 2004
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/NZ2004/000094

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4,331,074 (BEHMAN) 25 May 1982 Whole document	1-8
P, A	WO 2004/011349 A1 (MYKLEBUST) 5 February 2004 Whole document	1-21

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/NZ2004/000094

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
WO	9819855	AU	54284/98	US	5857408	US	5862748
GB	2143721						
US	4991500						
GB	2349799						
US	4331074	EP	0064079	WO	8201508		
WO	2004011349						

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

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