

(19)



(11)

EP 3 375 495 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
22.07.2020 Bulletin 2020/30

(51) Int Cl.:
A62C 3/00 (2006.01) B65F 1/14 (2006.01)

(21) Application number: **17196789.6**

(22) Date of filing: **17.10.2017**

(54) SELF QUENCH WASTE CONTAINER

SELBSTLOESCHENDER ABFALLBEHAELTER

RECIPIENT A DECHETS AUTO-EXTINCTEUR

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(30) Priority: **16.03.2017 FI U20174075 U**
13.06.2017 FI U20174161 U

(43) Date of publication of application:
19.09.2018 Bulletin 2018/38

(73) Proprietor: **Tokset Oy**
Helsinki (FI)

(72) Inventor: **Blomberg, Juha**
00760 Helsinki (FI)

(74) Representative: **Heinonen & Co**
Attorneys-at-Law Ltd
Fabianinkatu 29 B
00100 Helsinki (FI)

(56) References cited:
WO-A1-82/04032 NL-A- 8 201 637
US-A1- 2005 217 871

EP 3 375 495 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

TECHNICAL FIELD

[0001] The invention relates to a bin for collecting, storing and/or distributing goods. For example, the invention relates to fire-extinguishing solutions for collection bins, such as garbage bins as well as accumulator and battery collection bins, such as lithium accumulator collection bins in particular. The bins can also be clothing collection bins or mail distribution boxes and be situated outdoors or indoors.

BACKGROUND OF THE INVENTION

[0002] Bin fires are a big problem causing dangerous situations and extensive costs. In Finland, collection bin fires break out every day as a result of people's carelessness or deliberate actions. In addition, any used batteries and lithium accumulators present in the collection bins may result in short-circuits, possibly starting a fire.

[0003] The bin fires generate combustion gases which are dangerous when inhaled and put people in danger. Besides, costs are involved with the fire damages to the bins and the facilities where they are kept. Further, the fires will spread to buildings, resulting in considerable damage.

[0004] Documents WO 82/04032A1, NL 8201637A, and US 2005/217871 disclose solutions where bins are equipped with fire extinguishing means, which however may be insufficiently effective.

SUMMARY OF THE INVENTION

[0005] The present invention aims at providing a solution for eliminating or alleviating the above-mentioned drawbacks. In particular, the invention aims at solving how to extinguish an ongoing bin fire as quickly as possible and with minimal damage.

[0006] The firesafe bin according to the invention is characterized in what is set forth in the characterizing part of the independent claim 1.

[0007] A firesafe bin according to an embodiment of the invention comprises a vessel and fire-extinguishing means which are provided at or near the vessel and which may comprise fire-extinguishing devices and fire-extinguishing systems as well as means provided at the fire-extinguishing means for detecting a fire in said bin and for activating the fire-extinguishing means. The fire-extinguishing means can be placed, for instance, at the top of the bin, on the inside of it, or near the bin, on the outside of it. Besides, a fire alarm can be provided at the bin and/or the fire-extinguishing means, having a siren or horn, for example, to emit an acoustic alarm signal to the surroundings.

[0008] A fire broken out in a bin can possibly be effectively extinguished by using fire-extinguishing means

based on aerosol technology, for example. It is preferable to use an aerosol fire-extinguishing agent because the aerosol fire-extinguishing agent has a good fire-extinguishing performance for a number of different fire types and, compared to gaseous fire-extinguishing agents and inert gases, the amount of it that is needed can be 3 to 4 and 30 to 40 times smaller, respectively, with the result that the aerosol fire-extinguisher can be smaller in size and cause less disturbance to the use of the bin. Further, the fire-extinguishing means may comprise a dry-powder extinguisher, and, the fire-extinguishing means is based on impulse technology. Further, the fire-extinguishing means can be based on a liquid fire-extinguishing agent.

[0009] According to an embodiment, the fire detection means comprise a temperature sensor for sensing the temperature of the bin. The temperature sensor connected to the fire-extinguishing means can be any temperature sensor suitable for the purpose, reacting fast enough to the temperature and any change in the temperature. The temperature sensor can also be adapted to only sense when a set temperature is exceeded.

[0010] According to an embodiment, the also comprises a loading-aperture door adapted to close by gravity, a spring, motor or some other closing means without any user action. A loading aperture like this may allow the amount of air flowing into the bin to be reduced, possibly decreasing the supply of oxygen to the fire.

[0011] According to the invention, the bin is adapted for collecting used batteries and/or accumulators, such as lithium accumulators. According to the invention, the fire-extinguishing means provided at the bin comprise an impulse extinguisher. For some bins, it may be preferable to use an impulse extinguisher because the impulse extinguisher forms a fire-insulating barrier on the surface of a material, allowing glowing combustion to be suppressed as well. Besides, being non-conductive, the impulse extinguisher may, especially in battery collection bins, prevent a fire from breaking out again due to a short circuit caused by the batteries. Preferably, aerosol technology involving some other extinguisher than an impulse extinguisher is applied to collection bins intended for accumulators, such as lithium accumulators.

[0012] The utility of the bin according to the invention arises from a number of facts. The extinguishers based on aerosol technology are pressure-free, possibly reducing the danger to people from the extinguisher as such. The present extinguishers are nontoxic, i.e. the use of the extinguisher does not contribute to the greenhouse effect, does not destroy the ozone layer, it does not have a lifespan in the atmosphere, the extinguisher does not contain CFC or HFC compounds, chlorine or bromide, it does not pose an environmental burden or danger, the use of the extinguisher does not pose a risk of choking, and it does not displace oxygen.

[0013] Moreover, the extinguishers based on aerosol technology have a high discharge energy and effective mass, which, combined with the bins, may allow for effective fire extinction as the fire-extinguishing agent also

is capable of piercing through a large front of flames and directly into the burning matter. The extinguishers may also comprise a dry-powder extinguisher. The extinguishers can be one, two or more in number.

[0014] In this application, "a bin" or "a vessel" refers to vessels, boxes, closets etc. in different shapes. The lid and/or door can be provided on the top or on the side of the bin/vessel.

[0015] In this application, the term "a collection bin" refers widely to vessels for collecting and/or storing municipal waste in different forms, such as household trash, used clothing, newspapers, batteries and accumulators as well as post packages, which may vary in size and shape depending on the goods to be collected. The bin can be installable outdoors or indoors.

BRIEF DESCRIPTION OF THE FIGURES

[0016] In the following, preferred embodiments of the invention will be explained in more detail with reference to the accompanying drawings wherein

Figure 1 is a perspective view of a bin according to an embodiment of the invention,

Figure 2 is a cross-sectional lateral view of a bin according to an embodiment of the invention,

Figure 3 shows aerosol-based fire-extinguishing means according to an embodiment of the invention, attached to the top of a bin,

Figure 4 shows a closing mechanism for the loading-aperture door of the bin according to an embodiment of the invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0017] Figures 1 and 2 are a perspective view and a cross-sectional lateral view of a bin according to an embodiment of the invention, respectively. The bin 100 of the present invention comprises a vessel 102, comprising, according to an embodiment, a lid 104 and an openable door 106. Fire-extinguishing means 108 based on aerosol-technology are attached to the top of the bin, according to an embodiment, to the lid 104, and means for detecting a fire in the bin and for activating the fire-extinguishing means 108 are provided at the fire-extinguishing means. According to another embodiment, the fire-extinguishing means 108 are provided in some other way above the vessel 102.

[0018] The bin of the invention may vary in size and shape depending on the matter collected, stored or distributed by the bin. According to the exemplary embodiment shown in figures 1 and 2, the front of the bin is openable in order to allow a separate vessel to be inserted into the bin. In this case, the vessel, of course, does not have a lid so as not to disturb the operation of the

fire-extinguishing means situated above the vessel of the bin.

[0019] As mentioned above, according to an embodiment, the vessel of the bin can also have a lid and a door.

The door can be lockable and the door can operate, for example, to only allow the key to be pulled out as the door is closed. In this case, the joints of the vessel of the bin are usually made to seal the vessel as tightly as possible.

[0020] Figure 3 shows aerosol-based fire-extinguishing means 108 according to an embodiment of the invention, attached to the top of a bin, in the present embodiment, to the lid 104 of the vessel of the bin. Preferably, the fire-extinguishing means are attached to the bin in such a way that they do not disturb the use of the bin but allow, in case of fire, the fire-extinguishing agent to effectively spread throughout the entire bin. As shown in Figure 3, the attachment can be implemented by means of brackets 110, for example. In embodiments where the vessel of the bin does not have a lid, the brackets can be attached to the edges of the vessel.

[0021] The means provided at the fire-extinguishing means for detecting a fire in the bin and for activating the fire-extinguishing means 108 can be implemented in many different ways, such as by means of a temperature sensor, infrared sensor or gas detector, just to mention a few. According to an embodiment, the fire detection means comprise a temperature sensor for sensing the temperature of the bin. The temperature sensor is adapted to activate the fire-extinguishing means when the temperature of the bin exceeds 200°C, for example. It is also possible to use some other activation temperature for the fire-extinguishing means.

[0022] According to another embodiment, means for remote communication of a signal or information in the event of a detected fire are provided at the bin. As an example, this may comprise sending a text or email message to a predetermined address over a wireless cellular communication network, for example.

[0023] Figure 4 shows a closing mechanism for the loading-aperture door of the bin according to an embodiment of the invention. In embodiments where the vessel of the bin comprises a lid and loading aperture, the door of the loading aperture, according to an embodiment, is adapted to close by gravity. As an example, the closing can be implemented by means of the mechanism shown in Figure 4, wherein, after the user has pulled or pushed the door open, the door, when it is released, slides, by means of a wheel 112, along a rail 114 back to its closed position. The wheel 112 is provided on the door in such a way that the door, when in its opened position, is able to press down to its closed position by gravity. Instead of gravity, the closing of the door can be implemented by means of a spring, motor or some other closing means in order to close the door without any user action. The door can also be lockable by a key.

[0024] The above only described some embodiments of the solution according to the invention. The principles,

such as the details of implementation and the applications, of the invention are, of course, susceptible to modification within the scope defined by the claims.

Claims

1. A bin (100) for collecting, storing and/or distributing goods, wherein the bin (100) comprises, for increased fire safety, a vessel (102) and fire-extinguishing means (108) provided at or near the vessel (102) as well as means provided at the fire-extinguishing means for detecting a fire in said bin and for activating the fire-extinguishing means, **characterized in that** said fire-extinguishing means (108) comprise an impulse extinguisher.
2. A bin (100) as defined in claim 1, **characterized in that** the fire detection means comprise a smoke detector and/or a temperature sensor for observing the temperature of the bin (100).
3. A bin (100) as defined in any of the preceding claims, **characterized in that** the bin (100) also comprises a loading-aperture door (106) adapted to close by gravity, a spring and/or some other closing means without any user action.
4. A bin (100) as defined in any of the preceding claims, **characterized in that** said fire-extinguishing means (108) are based on aerosol technology.
5. A bin (100) as defined in any of the preceding claims, **characterized in that** said bin (100) is provided for collecting and/or storing batteries, accumulators, clothing, newspapers and/or post packages.
6. A bin (100) as defined in any of the preceding claims, **characterized in that** it has a fire detector provided at the vessel.
7. A bin (100) as defined in any of the preceding claims, **characterized in that** it has means for remote communication of a signal or message in the event of a detected fire.
8. A method of collecting, storing and/or distributing goods in a bin, **characterized in that**, for increased fire safety, means provided at or near a vessel (102) comprised by the bin (100) detect a fire in said bin and activate fire-extinguishing means (108) comprising impulse extinguisher, which will extinguish the fire.
9. A method as defined in claim 8, **characterized in that** it comprises a functionality according to any of claims 2 to 7.

Patentansprüche

1. Abfallbehälter (100) zum Sammeln, Aufbewahren und/oder Verteilen von Gütern, wobei der Abfallbehälter (100) für einen erhöhten Brandschutz ein Gefäß (102) und ein am oder in der Nähe des Gefäßes (102) vorgesehenes Feuerlöschmittel (108) sowie ein am Feuerlöschmittel vorgesehenes Mittel zum Detektieren eines Feuers im Abfallbehälter und zum Aktivieren des Feuerlöschmittels umfasst, **dadurch gekennzeichnet, dass** das Feuerlöschmittel (108) einen Impuls-Feuerlöscher umfasst.
2. Abfallbehälter (100) nach Anspruch 1, **dadurch gekennzeichnet, dass** das Feuerdetektionsmittel einen Rauchdetektor und/oder einen Temperatursensor zum Überwachen der Temperatur im Abfallbehälter (100) umfasst.
3. Abfallbehälter (100) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Abfallbehälter (100) auch eine Beladungsöffnungstür (106), die zum Schließen durch Schwerkraft ausgelegt ist, eine Feder und/oder einige andere Schließmittel ohne jegliche Benutzerhandlung umfasst.
4. Abfallbehälter (100) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Feuerlöschmittel (108) auf Aerosol-Technologie basiert ist.
5. Abfallbehälter (100) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Abfallbehälter (100) zum Sammeln und/oder Aufbewahren von Batterien, Akkumulatoren, Bekleidung, Zeitungen und/oder Postpaketen vorgesehen ist.
6. Abfallbehälter (100) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** er einen am Gefäß vorgesehenen Feuerdetektor aufweist.
7. Abfallbehälter (100) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** er ein Mittel für Fernkommunikation eines Signals oder einer Benachrichtigung im Fall eines detektierten Feuers aufweist.
8. Verfahren zum Sammeln, Aufbewahren und/oder Verteilen von Gütern in einem Abfallbehälter, **dadurch gekennzeichnet, dass** für einen erhöhten Brandschutz ein an einem oder in der Nähe eines Gefäßes (102) vorgesehenes Mittel, welches der Abfallbehälter (100) enthält, ein Feuer im Abfallbehälter detektiert und ein Feuerlöschmittel (108), das einen Impuls-Feuerlöscher umfasst, welches das

Feuer löscht, aktiviert.

9. Verfahren nach Anspruch 8, **dadurch gekennzeichnet, dass** es eine Funktionalität nach einem der Ansprüche 2 bis 7 umfasst.

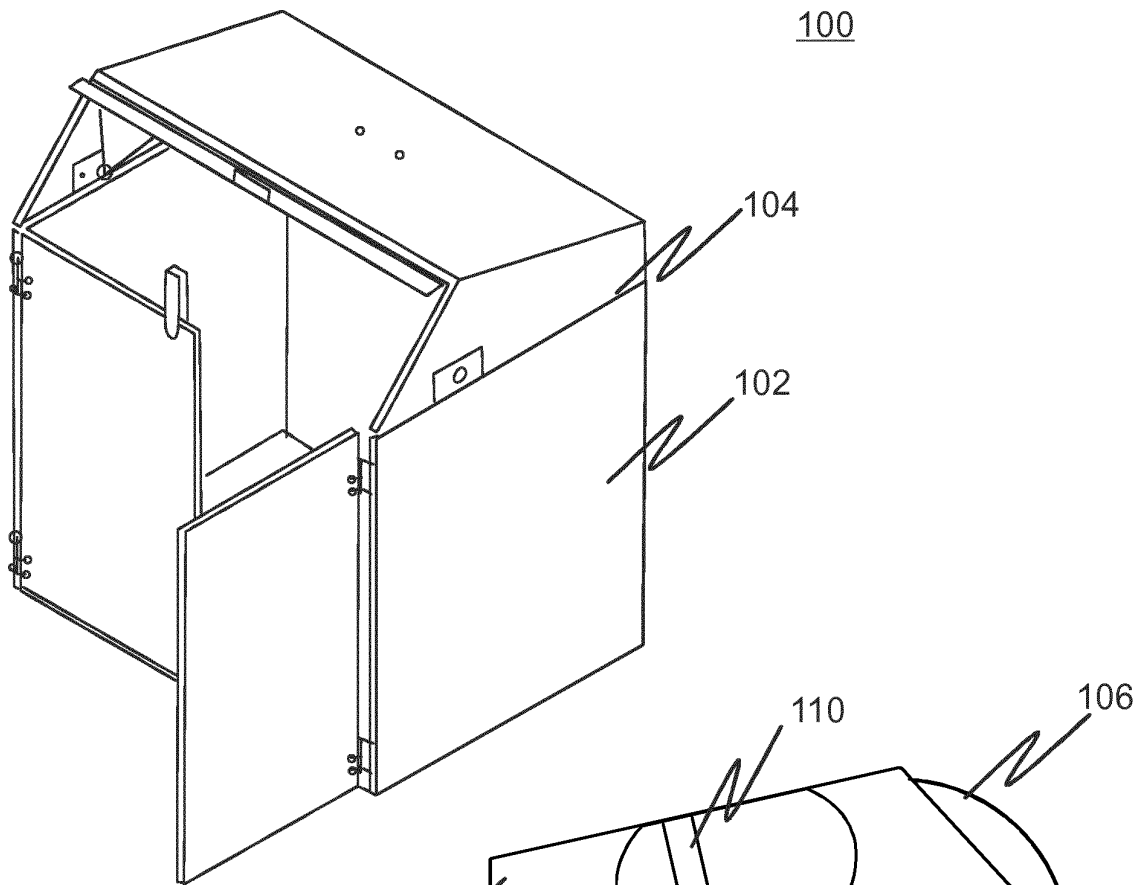
5

Revendications

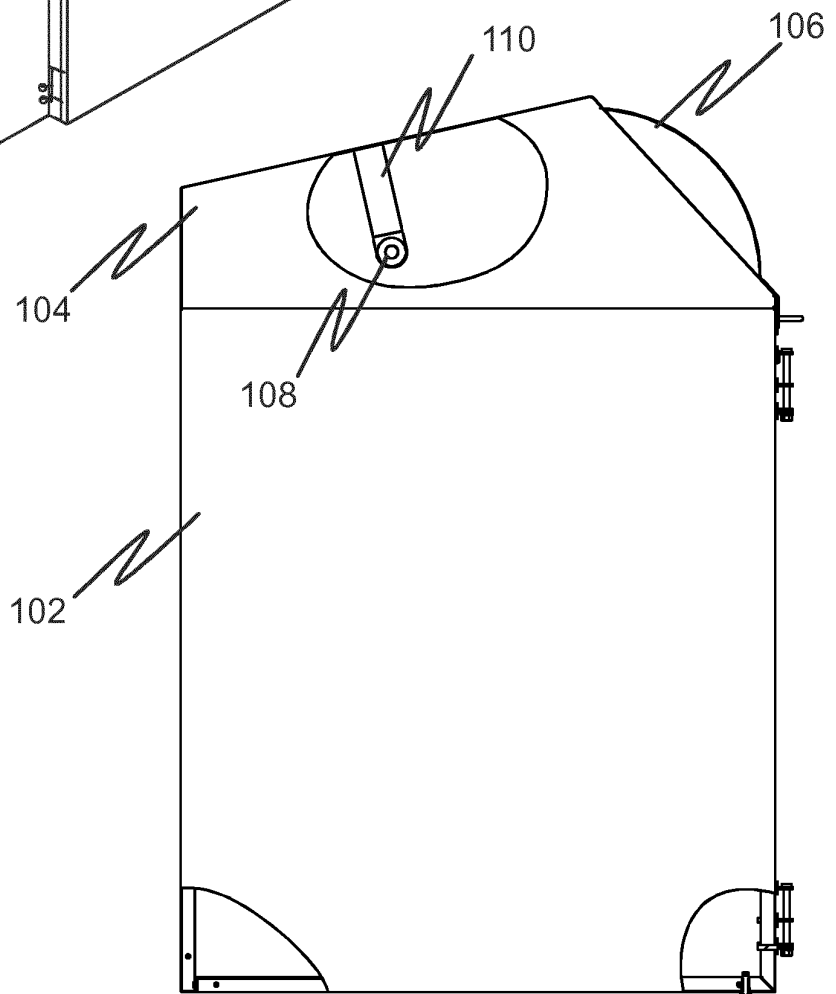
1. Bac (100) pour la collecte, le stockage et/ou la distribution de produits, le bac (100) comprenant, pour une plus grande sécurité incendie, un récipient (102) et des moyens extincteurs (108) disposés au niveau du récipient (102) ou à proximité de celui-ci, ainsi que des moyens disposés au niveau des moyens extincteurs, pour la détection d'un incendie dans ledit bac et pour l'activation des moyens extincteurs, **caractérisé en ce que** lesdits moyens extincteurs (108) comprennent un extincteur à impulsion. 10
15
20
2. Bac (100) selon la revendication 1, **caractérisé en ce que** les moyens de détection d'incendie comprennent un détecteur de fumée et/ou un capteur de température pour l'observation de la température du bac (100). 25
3. Bac (100) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le bac (100) comprend également une porte d'ouverture de chargement (106) adaptée à une fermeture par gravité, un ressort et/ou un autre moyen de fermeture sans aucune intervention d'un utilisateur. 30
4. Bac (100) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** lesdits moyens extincteurs (108) sont basés sur une technologie d'aérosol. 35
5. Bac (100) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit bac (100) est destiné à la collecte et/ou au stockage de batteries, d'accumulateurs, de vêtements, de journaux et/ou de colis postaux. 40
6. Bac (100) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** celui-ci possède un détecteur d'incendie disposé au niveau du récipient. 45
7. Bac (100) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** celui-ci possède des moyens pour la transmission à distance d'un signal ou d'un message en cas d'incendie détecté. 50
55
8. Procédé pour la collecte, le stockage et/ou la distribution de produits dans un bac, **caractérisé en ce que**, pour une plus grande sécurité incendie, des

moyens disposés au niveau du récipient (102) ou à proximité de celui-ci, compris dans le bac (100), détectent un incendie dans ledit bac et activent des moyens extincteurs (108) comprenant un extincteur à impulsion, destinés à éteindre l'incendie.

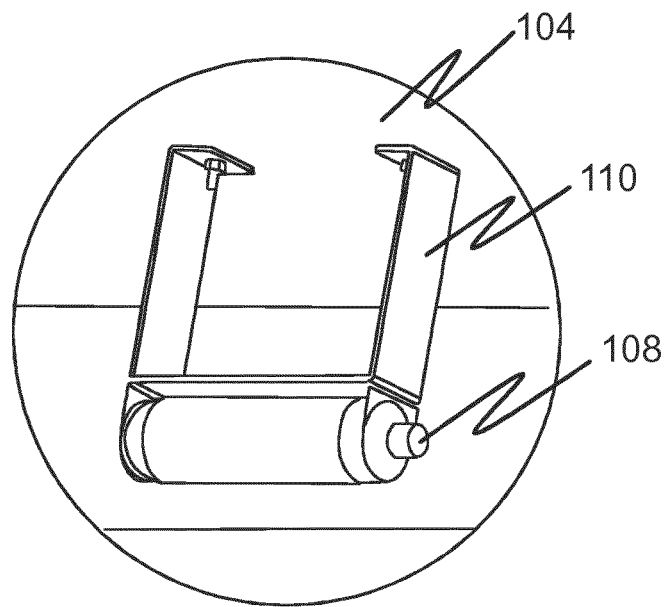
9. Procédé selon la revendication 8, **caractérisé en ce que** celui-ci comprend une fonctionnalité selon l'une quelconque des revendications 2 à 7.



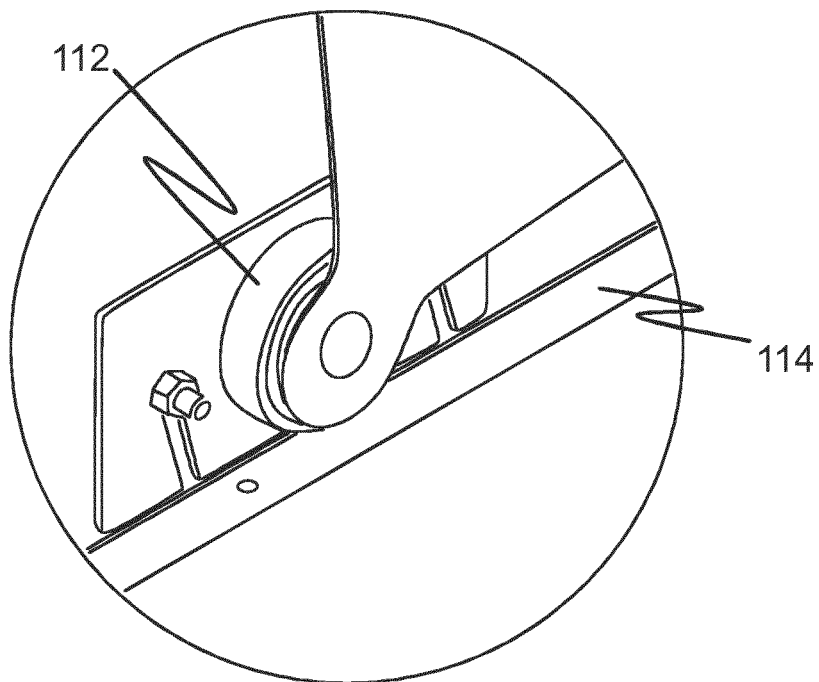
Kuva 1



Kuva 2



Kuva 3



Kuva 4

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 8204032 A1 [0004]
- NL 8201637 A [0004]
- US 2005217871 A [0004]