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(54) **A hose guiding wheel**

(57) A hose guiding member (8) is provided. The hose guiding member (8) has a rotation axis (16) and a groove adapted to receive a hose. More particularly, the hose guiding member (8) comprises a first and a second outer portion having a first radius, and an inner portion having a second radius, wherein the inner portion is placed between the first and second outer portions, such that the first and second outer portions and said inner portion form the groove. A difference between the first radius and the second radius is larger than a diameter of the hose. A fuel dispensing unit (1) comprises a hose guiding member (8) is also provided, as well as a method for handling a hose.

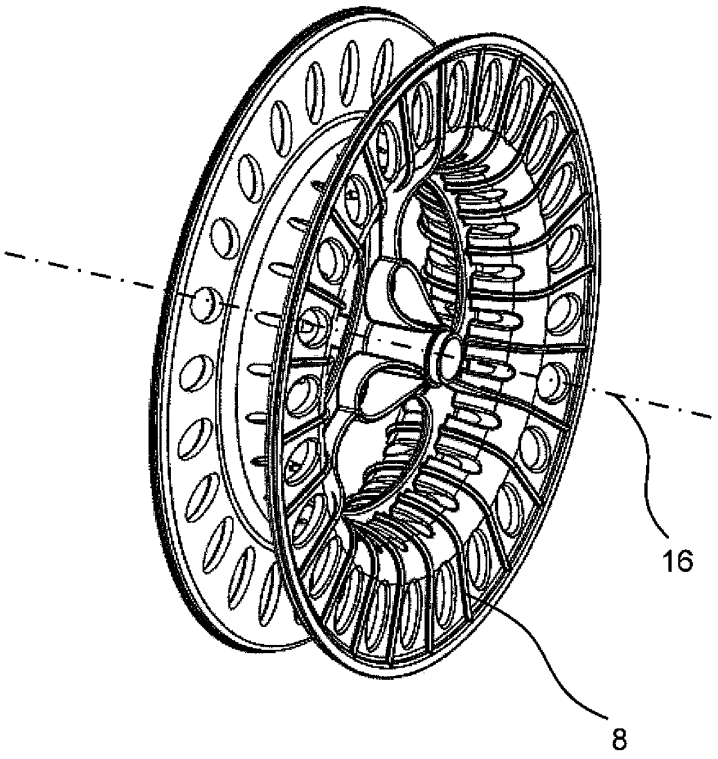

Fig. 5a

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Description

Technical field

[0001] The present invention generally relates to a device for handling a hose, more particularly to a hose guiding member, a fuel dispensing unit and a method for handling a hose.

Background of the invention

[0002] A fuel dispensing unit, such as a petrol pump, typically comprises a pump part standing on the ground, a display part showing the chosen type of petrol, cash readout, volume readout etc., and a column to which one or more hoses are connected. Inside the fuel dispensing unit different arrangements are provided in order to make the hoses easy to pull out of the fuel dispensing unit and in order to make the hoses retract efficiently into the fuel dispensing unit when the hoses are placed in their boots.

[0003] Further, in order to make it easier to use the fuel dispensing unit, it is an advantage if the hoses can be pulled out a long distance, thereby lowering the demands of how close to the fuel dispensing unit a vehicle must be placed. However, from an economical point of view, the hoses should be as short as possible. This means that, in order to make a user friendly but yet cost efficient fuel dispensing unit, the hose handling within the fuel dispensing unit is crucial.

[0004] Thus, there is a demand for fuel dispensing units having efficient hose handling such that the hoses are easy to pull out from the fuel dispensing unit, such that they retract into the fuel dispensing unit when they are not in use, and such that a large portion of the hose can be pulled out from the fuel dispensing unit.

Summary

[0005] In view of the above, an objective of the invention is to solve or at least reduce the problems discussed above. In particular, an objective is to obtain an efficient hose handling.

[0006] According to a first aspect, there is provided a hose guiding member having a rotation axis and a groove adapted to receive a hose, the hose guiding member comprising a first and a second outer portion having a first radius, and an inner portion having a second radius, the inner portion being placed between the first and second outer portions, the first and second outer portions and the inner portion forming the groove, wherein a difference between the first radius and the second radius is larger than a diameter of the hose.

[0007] An advantage of this is that the hose is not squeezed between the hose guiding member and another device, such as guiding means, which has the effect that it is easier for a user to pull out the hose from a fuel dispensing unit.

[0008] Further, the hose guiding member may be made of a conductive plastic material.

[0009] An advantage of this is that the electrical voltage that may arise when the hose guiding member rotates around the rotation axis can be lead away from the hose guiding member.

[0010] Further, the groove may be provided with a number of holes.

[0011] An advantage of this is that the friction between the hose and the hose guiding member is improved.

[0012] The hose guiding member may be a wheel.

[0013] According to a second aspect there is provided a fuel dispensing unit, such as petrol pump, comprising a hose guiding member as described above.

[0014] The fuel dispensing unit may further comprise guiding means adapted to guide the hose guiding member, the guiding means comprising a groove adapted to receive the hose guiding member.

[0015] An advantage of having such guiding means is that the hose guiding member can be moved along the guiding means in a controlled manner.

[0016] Further, the first and the second outer portions of the hose guiding member can be arranged to be in contact with the guiding means.

[0017] An advantage of this is that the hose is held between the groove of the hose guiding member and the guiding means, thereby reducing the risk that the hose ends up outside the groove of the hose guiding member.

[0018] The guiding means may have a U-shaped cross section such that said hose guiding member is guided to rotate around said rotation axis of said hose guiding member.

[0019] Moreover, the guiding means may be a part of a framework for a housing of the fuel dispensing unit.

[0020] An advantage of this is the guiding means may be utilised both as means holding the housing of the fuel dispensing unit and as guiding means for the hose guiding member.

[0021] The fuel dispensing unit may further comprise a hose guiding member holder arranged to hold the hose guiding member.

[0022] Further, at least one elastic member may be attached to the hose guiding member holder.

[0023] Alternatively, at least one elastic member may be attached to said hose guiding member.

[0024] An advantage of having this is that the hose guiding member holder, as well as the hose guiding member attached to the hose guiding member holder, may be automatically retracted when the hose is in an idle mode, that is e.g. when the nozzle is placed in the nozzle boot.

[0025] The at least one elastic member may be any one from a group of a spring, and a rubber band.

[0026] Further, the fuel dispensing unit may comprise a bar perpendicular to and attached to the guiding means thereby preventing the hose guiding member holder from passing the bar along the guiding means.

[0027] By having such a bar a stop may be provided in the end position. An advantage of this is that a hose connection (that is, an end of the hose) may be exposed

to less wear.

[0028] The bar may have a U-shaped cross section.

[0029] An advantage of this is that the bar may be mounted onto the guiding means such that the hose guiding member may easily roll over.

[0030] According to a third aspect there is provided a method for handling a hose within a fuel dispensing unit when the hose is pulled out from the fuel dispensing unit, the method comprising rolling a hose guiding member along guiding means, the hose guiding member being provided with a groove adapted to receive the hose, the groove being formed by a first and a second outer portion having a first radius and an inner portion having a second radius, wherein a difference between the first radius and the second radius is larger than a diameter of the hose.

[0031] Other objectives, features and advantages of the present invention will appear from the following detailed disclosure, from the attached dependent claims as well as from the drawings.

[0032] Generally, all terms used in the claims are to be interpreted according to their ordinary meaning in the technical field, unless explicitly defined otherwise herein. All references to "a/an/the [element, device, component, means, step, etc]" are to be interpreted openly as referring to at least one instance of said element, device, component, means, step, etc., unless explicitly stated otherwise. The steps of any method disclosed herein do not have to be performed in the exact order disclosed, unless explicitly stated.

Brief description of the drawings

[0033] The above, as well as additional objects, features and advantages of the present invention, will be better understood through the following illustrative and non-limiting detailed description of preferred embodiments of the present invention, with reference to the appended drawings, where the same reference numerals will be used for similar elements, wherein:

Fig. 1 is a front view of one embodiment of a fuel dispensing unit.

Fig 2a illustrates a hose handling device in a state where the hose is retracted.

Fig 2b illustrates the hose handling device in a state where the hose is pulled out.

Fig 2c is a detailed illustration of a part of the hose handling device.

Fig 2d is a detailed illustration of the same part of the hose handling device, where a part of the guiding means is removed in order to illustrate how the hose guiding member holder is arranged inside the guiding means.

Fig 2e is a detailed illustration of the same part of the hose guiding device seen from above.

Fig 3 illustrates a cross section of an embodiment of the guiding means.

Fig 4a is a side view of a hose guiding member attached to a hose guiding member holder.

Fig 4b is a perspective view of the hose guiding member attached to the hose guiding member holder.

Fig 4c is a front view of the hose guiding member attached to the hose guiding member holder.

Fig 5a is a perspective view of the hose guiding member.

Fig 5b is a front view of the hose guiding member.

Detailed description of referred embodiments

[0034] Fig. 1 shows a fuel dispensing unit 1, having eight hose storage spaces 2, an electrical cabinet 3 containing all the electronics for the fuel dispensing unit 1, a hydraulic cabinet 4 containing fuel dispensing means (not shown), e.g. fuel metering means, valves, vapour recovery system etc, and a column 5 extending vertically between and separating the electrical cabinet 3 and the hydraulic cabinet 4 from the hose storage spaces 2. The fuel dispensing unit 1 is connected to an underground fuel container (not shown). When filling up the tank of a vehicle, the fuel is pumped from the underground container by means of a pump (not shown) which is located in the hydraulic cabinet 4, and from there to the column 5 and out to a nozzle 6 via a hose. When filling-up does not take place, the hose is accommodated in a hose storage space 2 and the nozzle 6 is inserted in a nozzle boot. The hose can be handled by a hose handling device, which can be arranged in every hose storage space 2. The electronics located in the electrical cabinet 3, such as means for choosing the desired type of fuel and display means for showing the chosen type of fuel, the volume of dispensed fuel etc, are securely isolated in order to encapsulate electronic components from possible presence of flammable gases. The electronics can also include a payment terminal.

[0035] Fig 2a and fig 2b illustrate a hose handling device 7 which can be placed inside a hose storage space 2. The hose handling device 7 can comprise a hose guiding member 8 rotatably arranged in a hose guiding member holder 9, which in turn may be slidably attached to a beam 10. The hose runs from the nozzle (not shown in fig 2a or fig 2b) via the hose guiding member 8 to a hose connection 11 placed on the beam 10. In order to obtain a stable construction a cross bar 12 can be attached to the beam 10. Further, an elastic band 13 can be attached to the hose guiding member holder 9 and to the hose connection 11, or alternatively the beam 10. The hose can run from the point of attachment on the hose guiding member holder 9 to the point of attachment on the hose connection 11 via a roller 14 attached to an upper part of the beam.

[0036] When the hose handling device is in an idle mode, that is when the hose is not pulled out from the hose storage space 2, the elastic band 13 pulls the hose guiding member holder 9 and the hose guiding member 8 to the upper end of the beam 10 as illustrated in fig 2a. An effect of this is that the hose is retracted into hose

storage space 2.

[0037] When the hose is pulled out from the hose storage space 2, the hose guiding member holder 9 and the hose guiding member 8 is pulled towards the hose connection 11, as illustrated in fig 2b. If a cross bar 12 is attached to the beam 10, the cross bar 12 may be such that the hose guiding member 8 can roll over the cross bar 12. This is possible, for instance, if the cross section of the cross bar 12 is formed as U and the welded side of the cross bar 12 is directed from the beam 10. Moreover, in order to reduce the impact of the cross bar 12, the hose guiding member 8 may have a large radius.

[0038] Further, the cross bar 12 may function as a hose length lock. That is, when the hose guiding member 8 has been pulled down over the cross bar 12, the cross bar 12 can function as a catch that makes it less easy for the hose guiding member 8 to be retracted towards the upper part of the beam.

[0039] In order to make the hose easy pull out, the depth of a groove in the hose guiding member 8 can be larger than the diameter of the hose. This means that the hose may be completely received by the hose guiding member 8. A positive effect of having a deep groove is that the outer portions of the hose guiding member 8 will be in contact with the beam 10, which makes it easier to pull out the hose. The contact surface between the hose guiding member 8 and the beam 10 can be provided with a rubber moulding, The rubber moulding can be attached to the hose guiding member 8, for example on its outer portions, as well as along the beam 10.

[0040] As illustrated in fig 2c and fig 3, the beam 10 may be a profile formed as a U, thereby partly enclosing the hose guiding member 8.

[0041] Further, the hose guiding member 8 may have a number of holes such that the weight of the hose guiding member 8 is reduced, and thereby in some cases also reducing the amount of material needed.

[0042] The hose guiding member 8 may be made of conductive plastics. The electric voltage which may be built up due to the rotation of the hose guiding member 8 may be lead to ground via the hose guiding member holder 9, which may be made of steel, or via the beam 10, which may be made of aluminium.

[0043] The elastic band 13 may run in the space formed by the hose guiding member 8 and the beam 10 together with the hose. Further, in order to keep the hose and the elastic band 13 apart, the elastic band 13 can run on the inside of the cross bar 12, that is in the space between the cross bar 12 and the beam 10, and the hose can run in the space between the hose guiding member 8 and the cross bar 12.

[0044] Further, as illustrated in fig 2d and fig 2e, the hose guiding member holder 9 can be slidably attached to the beam 10 by a set of wheels 15a, 15b on the hose guiding member holder 9 running in grooves of the beam 10.

[0045] In order to increase the space for the hose and the elastic band 13, two projections on the bar can be adapted such that the outer portions of the hose guiding member 8 is in contact with these when the hose guiding member 8 is moved along the beam 10. The projections, which are further illustrated in fig 3, may also be utilised when mounting the bar, e.g. by inserting a plate attached to a ground based platform between the two projections.

[0046] Fig 4a, fig 4b and fig 4c illustrate the hose guiding member 8, the hose guiding member holder 9 and the hose in different views. In this embodiment, the depth of the groove of the hose guiding member 8 is larger than the diameter of the hose. This has the effect that when the hose guiding member 8 and the hose guiding member holder 9 moves along the beam 10, the hose is not squeezed between the hose guiding member 8 and the beam 10.

[0047] The hose guiding member 8 is further illustrated in fig 5a and fig 5b. In order to improve the grip between the hose guiding member 8 and the hose, the hose guiding member 8 can be provided with a number of holes on the inner portion, constituting the bottom of the groove, as well as on the outer portions, constituting the sides of the groove.

[0048] The elastic band 13 which may be attached to said hose guiding member 8 or said hose guiding member holder 9 can be replaced with a rigid wire or the like. In this case, a retraction effect is achieved by a weight also attached to said wire.

[0049] In an alternative embodiment, instead of a groove with a depth being larger than the diameter of the hose, the length of the projections of the beam 10 and the depth of the groove can be larger than the diameter of the hose. In contrast to the embodiment where the depth is larger than the diameter of the hose, when the hose guiding member 8 passes the cross bar 12, the hose will be squeezed between the cross bar 12 and the beam 10. This is a disadvantage since the hose cannot be pulled out as smooth and easy as in the embodiment where the depth of the groove is larger than the diameter of the hose. Further, a smaller hose guiding member will make it less easy to pull out the hose.

[0050] The invention has mainly been described above with reference to a few embodiments. However, as is readily appreciated by a person skilled in the art, other embodiments than the ones disclosed above are equally possible within the scope of the invention, as defined by the appended patent claims.

Claims

1. A hose guiding member (8) having a rotation axis (16) and a groove adapted to receive a hose, said hose guiding member (8) comprising
   a first and a second outer portion having a first radius, and
   an inner portion having a second radius, said inner portion being placed between said first and second outer portions,

said first and second outer portions and said inner portion forming said groove,
wherein a difference between said first radius and said second radius is larger than a diameter of said hose.

2. The hose guiding member (8) according to claim 1, wherein said hose guiding member (8) is made of a conductive plastic material.

3. The hose guiding member (8) according to any of the preceding claims, wherein said groove is provided with a number of holes.

4. The hose guiding member (8) according to any of the preceding claims, wherein said hose guiding member (8) is a wheel.

5. A fuel dispensing unit (1), such as petrol pump, comprising
a hose guiding member (8) according to any of the preceding claims.

6. The fuel dispensing unit (1) according to claim 5, further comprising
guiding means (10) adapted to guide said hose guiding member (8), said guiding means (10) comprising a groove adapted to receive said hose guiding member (8).

7. The fuel dispensing unit (1) according to claim 6, wherein said first and said second outer portions of said hose guiding member (8) are arranged to be in contact with said guiding means (10).

8. The fuel dispensing unit (1) according to claim 6 or 7, wherein said guiding means (10) have a U-shaped cross section such that said hose guiding member (8) is guided to rotate around said rotation axis (16) of said hose guiding member (8).

9. The fuel dispensing unit (1) according to any of claims 6 to 8, wherein said guiding means (10) is part of a framework for a housing (5) of said fuel dispensing unit (1).

10. The fuel dispensing unit (1) according to any of the claims 5 to 9, further comprising
a hose guiding member holder (9) arranged to hold said hose guiding member (8).

11. The fuel dispensing unit (1) according to claim 10, further comprising
at least one elastic member (13) attached to said hose guiding member holder (9).

12. The fuel dispensing unit (1) according to claim 5, further comprising
at least one elastic member (13) attached to said hose guiding member (8).

13. The fuel dispensing unit (1) according to any of the claims 11 or 12, wherein said at least one elastic member (13) is any one from a group of a spring, and a rubber band.

14. The fuel dispensing unit (1) according to any of the claims 6 to 13, further comprising
a bar (12) perpendicular to and attached to said guiding means (10) thereby preventing said hose guiding member holder (9) from passing said bar along said guiding means.

15. The fuel dispensing unit (1) according to claim 13, wherein said bar (12) has a U-shaped cross section.

16. A method for handling a hose within a fuel dispensing unit (1) when said hose is pulled out from said fuel dispensing unit (1), said method comprising
rolling a hose guiding member (8) along guiding means (10), said hose guiding member (8) being provided with a groove adapted to receive said hose, said groove being formed by a first and a second outer portion having a first radius and an inner portion having a second radius, wherein a difference between said first radius and said second radius is larger than a diameter of said hose.

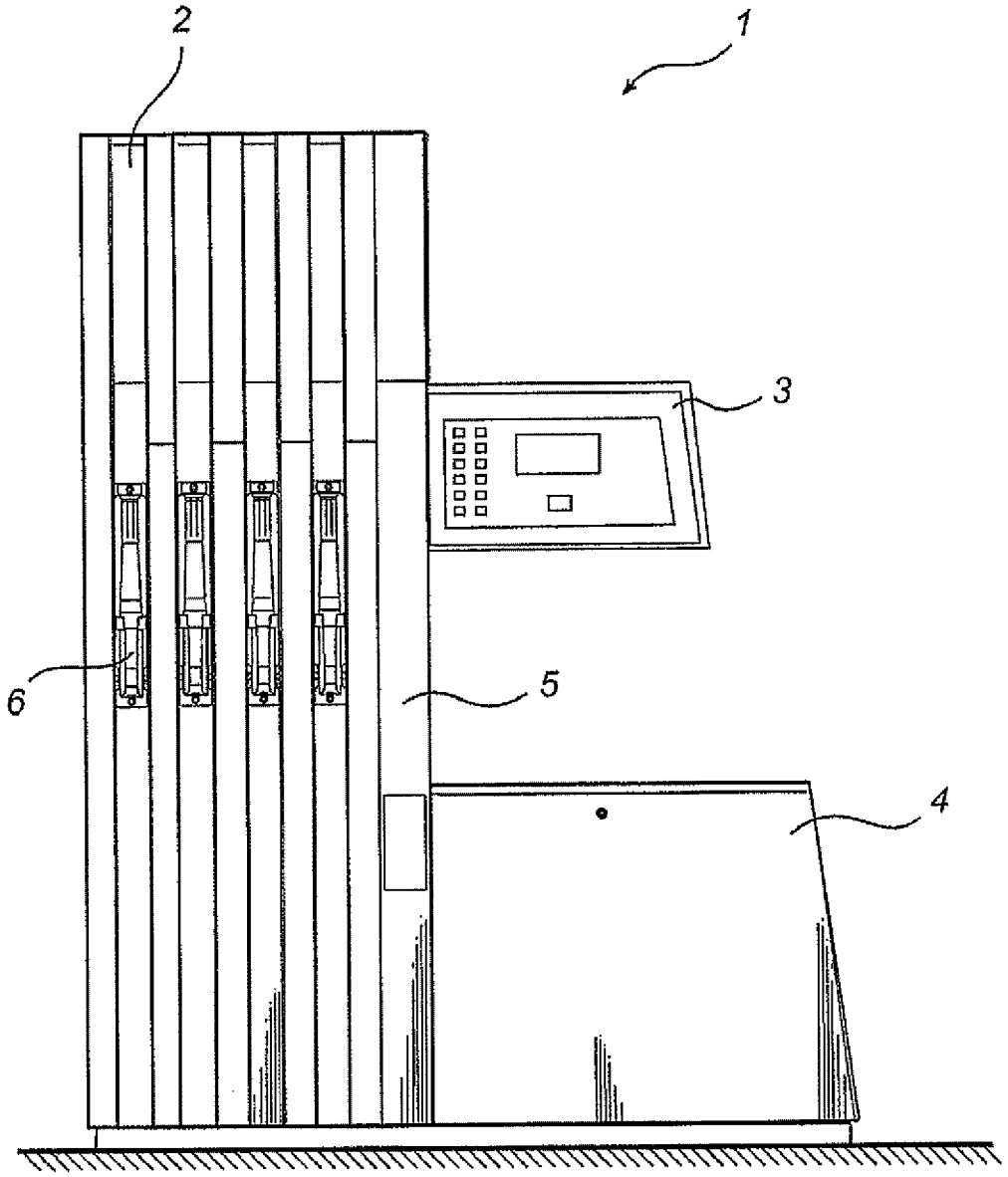


Fig. 1

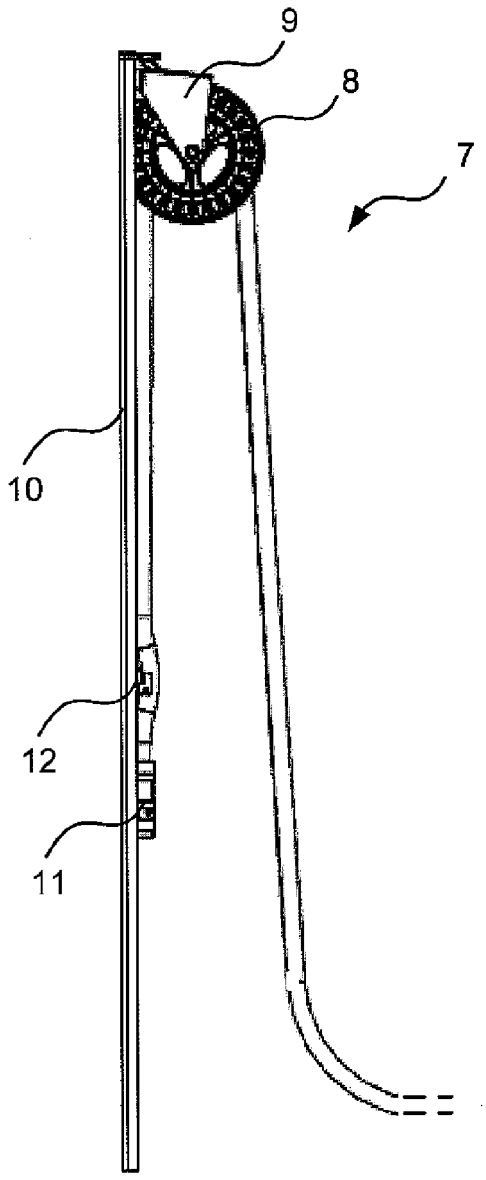
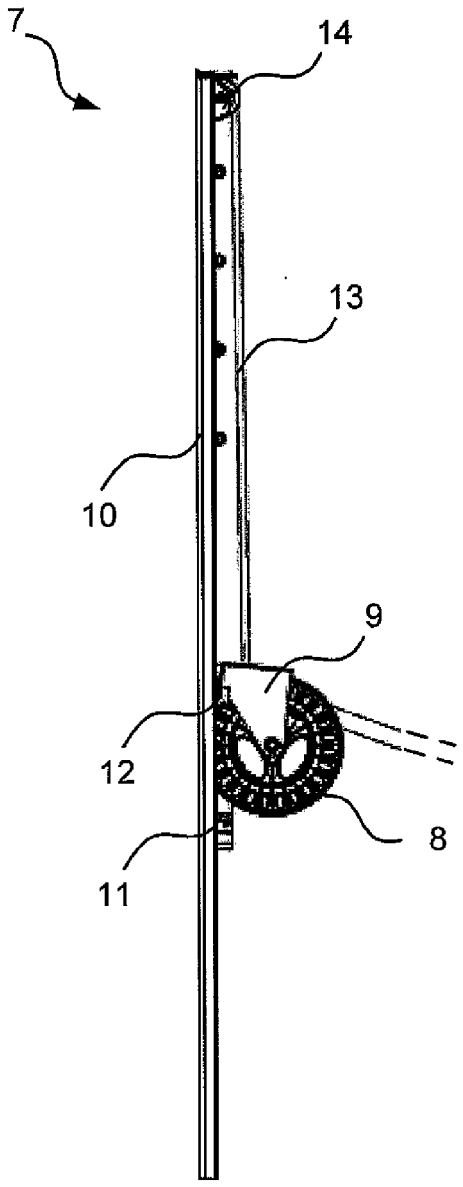


Fig. 2a

Fig. 2b



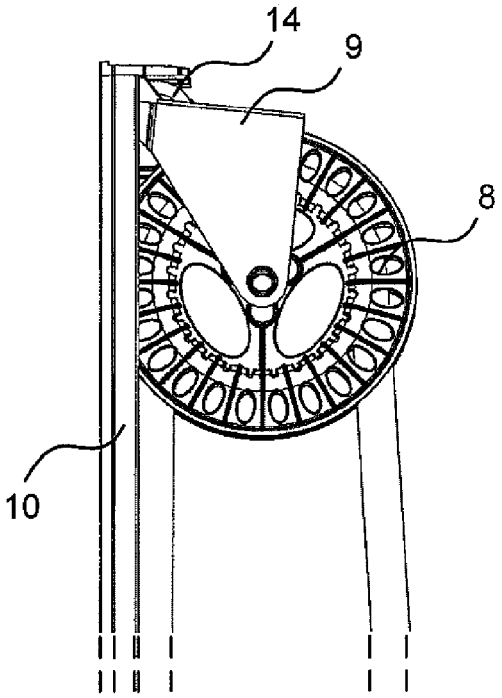


Fig. 2c

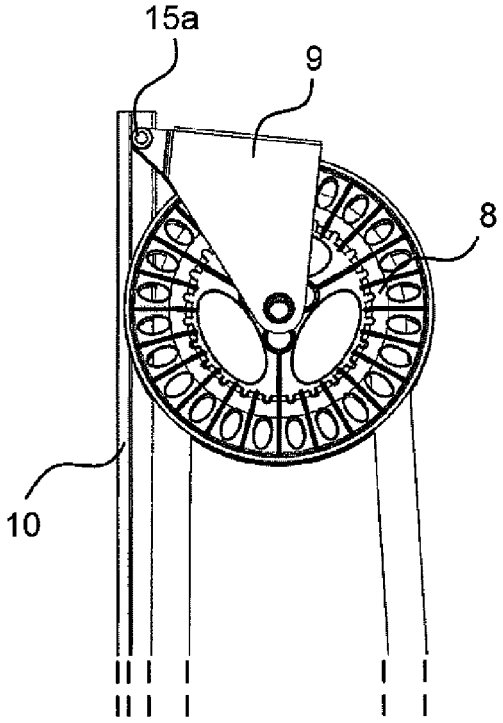


Fig. 2d

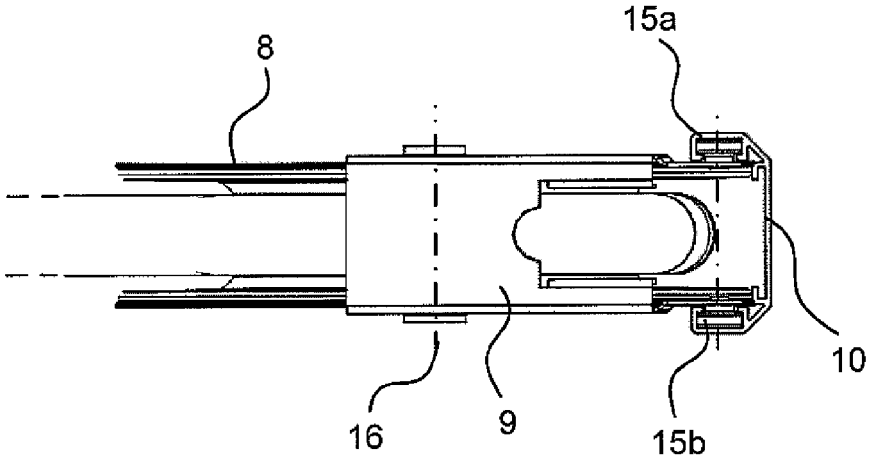


Fig. 2e

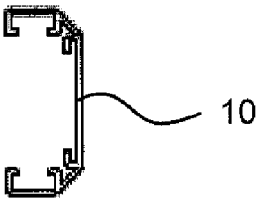


Fig. 3

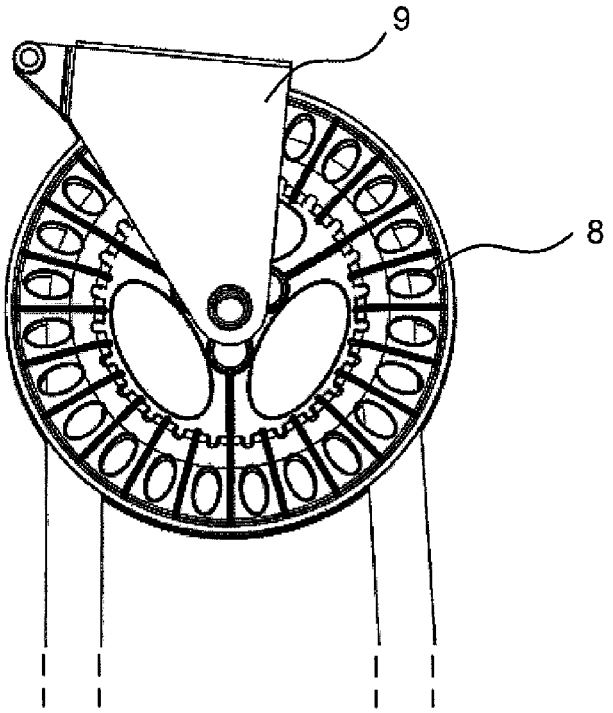


Fig. 4a

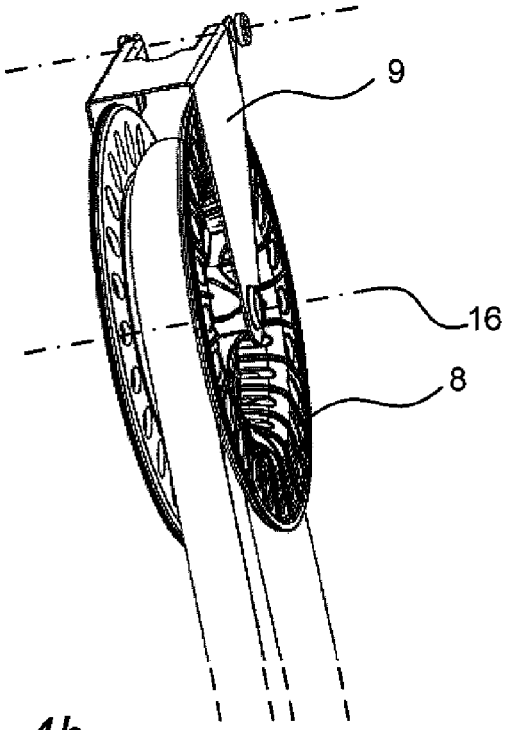


Fig. 4b

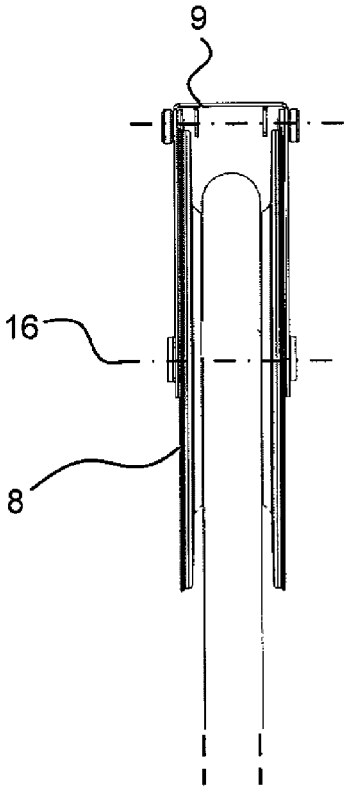


Fig. 4c

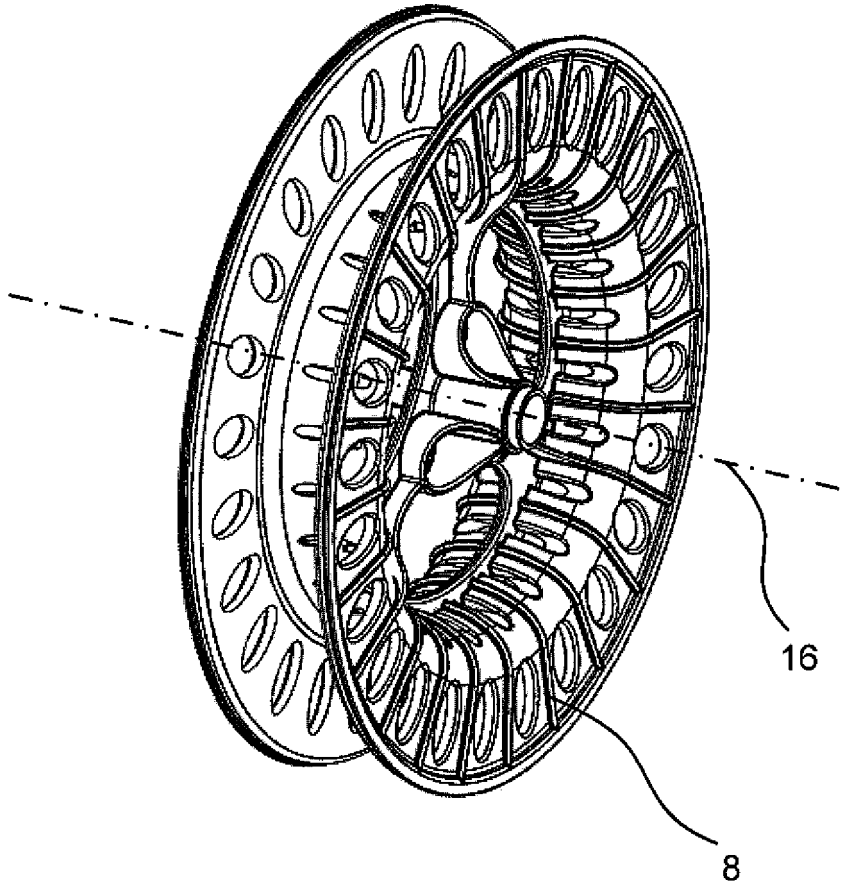


Fig. 5a

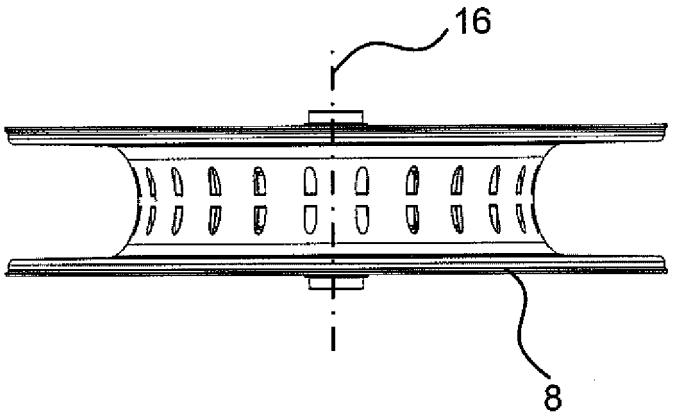


Fig. 5b

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EUROPEAN SEARCH REPORT

Application Number
EP 08 17 2407

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	6 May 2009	Ferrien, Yann

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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