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(71) Applicant: **Aktiebolaget Electrolux**
105 45 Stockholm (SE)

(72) Inventor: **WERIUS, Patrik**
11248 Stockholm (SE)

(74) Representative: **Electrolux Group Patents**
AB Electrolux
Group Patents
105 45 Stockholm (SE)

(54) DEVICES OF A VACUUM CLEANER DUST CONTAINER

(57) The present disclosure relates to a combination of a connector plate adapter (11) and a connector plate (3), for a vacuum cleaner dust container (1), the connector plate (3) comprising a central opening (9) and being adapted to be connected to a dust bag to correctly position the dust bag opening within a vacuum cleaner by the connector plate being slid into a holding device of the vacuum cleaner. The connector plate adapter (11) and the connector plate (3) have substantially corresponding widths, such that the connector plate adapter and the connector plate can be slid into a common holding device, and the connector plate adapter is removable or separate from the connector plate. This means that the connector plate (3) can be fitted also in a shorter holding device where there is no room for the adapter (11).

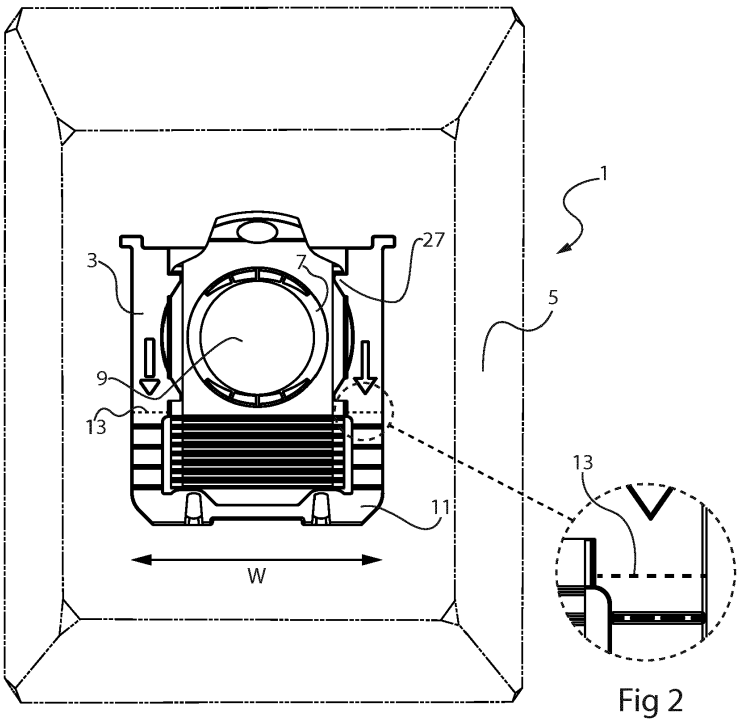

Fig 1

Fig 2

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Description

Technical field

[0001] The present disclosure relates to dust containers for vacuum cleaners, the dust containers having connector plates which can be slid into a holding device of the vacuum cleaner.

Background

[0002] An example of such a container is disclosed for instance in WO-02/24046-A1. Thanks to the connector plate, the opening of the dust bag can be reliably positioned and oriented to receive a flow of dust laden air from the vacuum cleaner inlet. Further, the connector plate can for instance trigger a feedback switch in the receiving holding device of the vacuum cleaner to verify that a dust container has been correctly installed in the receiving device, thus enabling the vacuum cleaner to prevent use in case of an absent or incorrectly installed dust container. Such use could otherwise damage the vacuum cleaner by injecting heavily dust laden air into a fan/motor arrangement.

[0003] One problem associated with dust containers of this type is how to make the dust container more versatile, and operable with even more efficient and compact vacuum cleaners.

Summary

[0004] One object of the present disclosure is therefore to obtain a more versatile dust container. This object is achieved by means of a combination of a connector plate adapter and a connector plate, for a vacuum cleaner dust container as defined in claim 1. More specifically in such a combination, the connector plate has an opening and is adapted to be connected to a dust bag to correctly position the dust bag opening within a vacuum cleaner by the connector plate being slid into a holding device of the vacuum cleaner. The connector plate adapter and the connector plate have substantially corresponding widths, such that the connector plate adapter and the connector plate can be slid into a common holding device. The connector plate adapter is removable or separate from the connector plate. This means that the connector plate together with the connector plate adapter can be used in a holding device which is extended to provide for instance a feedback function at a distance from the dust bag opening. Such a feedback function can for instance assess that a dust container has been correctly fitted in the vacuum cleaner before allowing the vacuum cleaner to start. The dust container can however also be used in older types of vacuum cleaners with shorter holding devices simply by separating or not using the adapter.

[0005] The connector plate adapter may comprise stiffness reducing features, configured to provide a decreased bending stiffness about an axis perpendicular to the direction in which it is adapted to be inserted into a holding device. This may be achieved by providing a plurality of living hinges, allowing the connector plate adapter to be bent into a step-wise curvature. Living hinges may be provided at 3-6 locations along the direction that the connector plate adapter extends from the connector plate.

[0006] More generally, the connector plate adapter may comprise bending zones reducing its bending stiffness about an axis perpendicular to the axis in which it is adapted to be inserted into a socket. Such bending zones may, in addition to living hinges, include features from the group of perforations and reduced thickness portions.

[0007] The connector plate and the connector plate adapter may comprise connection means to be attached to each other, such as a dovetail connection.

[0008] The connector plate adapter may be U-shaped, comprising lateral arm portions and a bridge portion interconnecting the arms at their distal ends. This provides a room for a shutter arrangement that can be used to close the dust container after use. At least one locking opening may be provided in the bridge portion to interact with a locking function in a holding device. In alternative versions, at least one dent is provided in the edge of the connector plate adapter facing away from the connector plate to allow the connector plate adapter to be fitted in such a holding device even if the locking function is not used.

[0009] The connector plate adapter and/or the connector plate may comprise injection molded plastic, such as polypropylene, PP, or may alternatively be made from e. g. cardboard or paperboard.

[0010] A lateral abutment may be provided on at least one corner of the connector plate facing away from the connector plate adapter. Such an abutment can rest on the rim of the holding device to further stabilize and position the connector plate therein.

[0011] A dust container comprising a dust bag and such a combination of a connector plate adapter and a connector plate is also considered.

[0012] Further a connector plate adapter for a vacuum cleaner dust container connector plate is considered, wherein the adapter comprises means for interacting with a device in a vacuum cleaner holding device, and stiffness reducing features, such as living hinges, perforations or reduced thickness portions, configured to provide a decreased bending stiffness about an axis perpendicular to the direction in which it is adapted to be inserted into a holding device.

Brief description of the drawings

[0013]

Fig 1 illustrates a dust container.

Fig 2 shows an enlarged portion of a connector plate

and a connector plate adapter in fig 1.

Fig 3 shows a dust container connector plate with a removed adapter.

Fig 4 shows a perspective view of an example of a connector plate and a connector plate adapter formed as when inserted in a holding device.

Fig 5 shows an enlarged portion of fig 4.

Fig 6 shows a side view of one alternative connector plate configuration.

Fig 7 shows an enlarged portion of fig 6.

Fig 8 shows a simplified version of a connector plate and a connector plate adapter

Detailed description

[0014] The present disclosure relates to a combination of a connector plate adapter and a connector plate for a dust container, as well as corresponding dust containers and adapters.

[0015] Fig 1 illustrates an example of a dust container 1 for a vacuum cleaner. The dust container 1 has a dust bag 5, which is schematically indicated and is made of an air permeable material, as is well known per se. A connector plate 3 is attached to the dust bag 5, for instance by being glued thereto, and has an opening 9 that coincides with an opening in the dust bag 5. The connector plate 3 is configured to position the opening 9 in a correct manner in relation to an air inlet in the body of a vacuum cleaner. This can be carried out by sliding the connector plate 3 into a socket or holding device in the vacuum cleaner. This operation positions the opening 9 correctly, such that the dust bag 5 receives a flow of dust laden air, whereby the dust bag is capable of removing most of the dust from the air flow. A gasket 7 may be attached to the connector plate 3 at the opening 9 so as to provide a sealing function, reducing leaks in the flow from an inlet hose to the dust bag 5.

[0016] The applicant's previous application PCT/EP2016/060308 describes a dust container connector plate which is adapted to a vacuum cleaner with improved usage of the interior space inside the vacuum cleaner. That connector plate comprises a central portion, including the aforementioned opening, and a portion that extends from the central opening. The extending portion has a lower stiffness than the central portion and can therefore be bent out of the plane of the remainder of the connector plate without bending the central portion. Such a connector plate can be inserted in a vacuum cleaner holding device which is not flat but curved and thus can follow the curvature of the inner wall of the vacuum cleaner. Better use can be made of the interior space, and the vacuum cleaner can therefore be more efficient. The end of the extending portion can be used to activate functions in the vacuum cleaner, for instance indicating that a dust container is correctly installed to enable use of the vacuum cleaner. Such indicating functions in the holding device can, thanks to the length of the extending portion be located at some distance from the opening in the bag/connector part. The extending portion also helps keeping the dust connector in place in the holding device. Edges of the connector plate 3 become supported by the holding device.

[0017] The presently disclosed dust container can be used with a vacuum cleaner having such a curved holding device, but can also be used together with older types of vacuum cleaners that lack this feature and have much shorter holding devices.

[0018] With reference to fig 1, the connector plate 3 of fig 1 comprises a removable adapter 11. The adapter 11 makes up an extending portion that extends from one edge of the connector plate 3. In the embodiment illustrated in fig 1, the connector plate 3 comprises line-shaped perforations 13, more clearly visible in the enlarged portion shown in fig 2. If the connector plate 3 with the attached adapter 11 are made in one piece for instance in injection molded polypropylene, PP, the perforations may be used to separate the adapter 11 from the connector plate 3, by folding the connector plate 3 at the perforations 13 a couple of times and subsequently tearing the adapter 11 off, as illustrated in fig 3. The dust container with the fitted connector plate 3 may now also be used in a vacuum cleaner with a much shorter holding device only allowing connector plates with the length L.

[0019] It should be noted that the adapter 11 may be provided as a part separate from the connector plate 3 to start with. A separate adapter, similar to as illustrated in fig 3, could be inserted into a vacuum cleaner holding device in advance in order to activate any functions therein, and the connector plate 3 can be inserted afterwards in order to correctly position a dust container opening. While this does not give the advantage of the adapter 11 helping stabilizing the connector plate 3 in the holding device, it means that the adapter can be installed permanently in the holding device if desired, thus saving material. In general, the connector plate 3 and the adapter 11 may have the same width W (cf. fig 1) along the insertion direction in which they are inserted in the holding device, at least along a part thereof. The connector plate 3 may be provided with lateral abutments 31 that extend further laterally and thus rest on the rim of the vacuum cleaner holding device opening to further stabilize the connector plate 3 in the holding device when inserted.

[0020] Figs 4-7 illustrate two other embodiments where a connector plate 3 and an adapter can be temporarily connected to each other, such that a connector plate adapter 11 can be reused together with a number of connector plates 3 and still helps with stabilizing the connector plate 3 in a holding device.

[0021] Fig 4 shows a perspective view of a connector plate 3 and a connector plate adapter 11. In the illustrated

example, the connector plate 3 and its adapter 11 are interconnected by means of dovetail couplings 15, with tongues and grooves formed in the face of the connector plate 3 and the adapter 11, as shown in the enlarged portion of fig 5, such that the adapter 11 can be released and reused, snapped together with another connector plate when the dust bag of the present connector plate 3 is full.

[0022] Fig 6 shows a side view of one alternative connector plate configuration. In this example, a dovetail connection 17 is instead arranged along an edge in the connector plate 3 and a corresponding edge in the connector plate adapter 11, such that the dovetail connection is visible from the side of the connector plate and adapter combination as shown in fig 7. The tongue of the connector plate 3 is slid into the groove of the connector plate adapter 11.

[0023] Needless to say, the skilled person can accomplish other ways of connecting a connector plate to an adapter 3 such as other snap-fitting variations.

[0024] By using a combination as described in figs 4 and 5 or figs 6 and 7, a combination where the adapter 11 can be reused together with a number of connector plates 3 is achieved. At the same time, the adapter 11 contributes with keeping the dust container correctly located in the vacuum cleaner.

[0025] With reference again to fig 3, the adapter 11 may comprise lateral arm portions 19, extending from the connector plate 3, and a bridge portion 21, interconnecting the arms at their distal ends, i.e. distant from the connector plate 3. This arrangement serves to leave a free space in between the arm portions 19, which may be used e.g. by an optional shutter arrangement 23. The bridge portion 21 may comprise locking openings 25, which interact with a locking arrangement in the vacuum cleaner holding device, which snaps into the openings when the connector plate 3 is fitted, thereby requiring a predetermined pulling force, in the direction opposite to the insertion direction, in order to remove the dust bag if the connector plate 3 and the adapter 11 are not separated. Thereby, the dust bag is not removed inadvertently.

[0026] The shutter arrangement 23 may generally be designed as soft flexible sheet with an opening that initially coincides with the opening 9 of the connector plate 3. When the bag is full, the shutter arrangement 23 is pulled such that its opening moves away from the opening 9 in the connector plate 3 and closes the bag. The shutter arrangement 23 may be guided by tabs 27 in the connector plate 3.

[0027] The adapter 11 may have a decreased bending stiffness compared to the connector plate 3. More specifically, the bending stiffness, about an axis perpendicular to the direction along which the adapter 11 and the connector plate 3 are inserted in the holding device, is made lower by means of stiffness reducing features. This makes bending of the adapter 11 easier when inserted in a curved holding device.

[0028] Figs 4 and 6 illustrated the connector plate 3 and adapter 11 combination where the adapter 11 is bent as if inserted into a holding device Typically, the adapter 11 may be configured to be more easily bent backwards, towards the dust bag, as this is how the dust container would best fit inside a vacuum cleaner. This can be accomplished as illustrated in figs 4 and 6 by means of living hinges 29. Fig 6 shows a side view of the connector plate 3 and adapter 11 combination. As illustrated, living hinges 29 may be provided on the adapter 11 at four locations along the direction in which the combination is inserted in a holding device. Those living hinges 29 provide joints that are bent to an extent determined by the curvature of the holding device, and need not be uniformly bent, as illustrated in fig 5. Needless to say, fewer or more than four joints may be provided, although the adapter 11 should be bent at a plurality of locations along the insertion direction to provide a step-wise curvature. 3-6 locations may be considered a suitable number.

[0029] Alternatively, a lower bending stiffness of the adapter 11 may be achieved by providing an adapter 11 that is thinner or comprises a material with a lower modulus of elasticity than the connector plate 3. It would also be possible to provide an adapter 11 which is configured to have a lower bending stiffness by means of a number of perforations being provided along its length, or another geometric feature that lowers the stiffness, such as reduced thickness portions.

[0030] The connector plate and the adapter can be produced by injection molding a plastic, such as polypropylene, PP, either as one piece or in two separate pieces as discussed above. The connector plate and the adapter could also be produced in cardboard/paperboard, optionally laminated with a plastic material.

[0031] Fig 8 shows a simplified version of a connector plate 3 and a connector plate adapter 11 combination. This combination can be produced in cardboard or paperboard, and has no shutter arrangement. The connector plate 3 and the connector plate adapter 11 may be produced in one piece to be separated e.g. by means of a tear line 35, or may be produced as two separate pieces. The connector plate has an opening 9 and may be provided with a gasket 7. To provide bending zones, reducing the connector plate adapter's 11 bending stiffness about an axis perpendicular to the direction in which it is inserted into a holding device, linear perforations 37 may be provided thereon.

[0032] The connector plate 3 may be provided with lateral abutments 31 that rest on the rim of the vacuum cleaner holding device opening to further stabilize the connector plate 3 in the holding device when inserted. There may be provided a handle 39 that is produced in one piece with the connector plate 3 and facilitates removal of the latter. Even if locking openings of the type shown in fig 3 are not used, dents 33 may be provided in the edge of the connector plate adapter 11 facing away from the connector plate 3, such that the connector plate adapter easily can be fitted in a holding device provided

with that type of locking function.

[0033] The present disclosure is not limited to the examples described above, and may be varied and altered in different ways within the scope of the appended claims. For instance, other plastic materials than polypropylene may be considered.

Claims

1. A combination of a connector plate adapter (11) and a connector plate (3), for a vacuum cleaner dust container (1), the connector plate (3) comprising an opening (9) and being adapted to be connected to a dust bag to correctly position a dust bag opening within a vacuum cleaner by the connector plate being slid into a holding device of the vacuum cleaner, wherein the connector plate adapter (11) and the connector plate have substantially corresponding widths, such that the connector plate adapter and the connector plate can be slid into a common holding device, and wherein the connector plate adapter (11) is removable or separate from the connector plate (3).

2. Combination according to claim 1, wherein the connector plate adapter (11) comprises stiffness reducing features, configured to provide a decreased bending stiffness about an axis perpendicular to the direction in which it is adapted to be inserted into a holding device.

3. Combination according to claim 2, wherein the stiffness reducing features comprise a plurality of living hinges (29), allowing the connector plate adapter (11) to be bent into a step-wise curvature.

4. Combination according to claim 3, wherein living hinges are provided at 3-6 locations along the direction that the connector plate adapter (11) is adapted to extend from the connector plate (3).

5. Combination according to claim 2, wherein the stiffness reducing features include features from a group including: perforations, and reduced thickness portions.

6. Combination according to any of the preceding claims, wherein the connector plate (3) and the connector plate adapter (11) comprises connection means (15, 17) to be attached to each other.

7. Combination according to claim 6, wherein connection means (15, 17) comprise a dovetail connection.

8. Combination according to any of the preceding claims, wherein the connector plate adapter is U-shaped (11), comprising lateral arm portions (19) and a bridge portion (21) interconnecting the arms at their distal ends.

9. Combination according to claim 8, wherein at least one locking opening (25) is provided in the bridge portion (21).

10. Combination according to any of the preceding claims, wherein the connector plate adapter and/or the connector plate (3) consist of injection molded plastic, such as polypropylene, PP.

11. Combination according to any of claims 1-9, wherein the connector plate adapter and/or the connector plate (3) consist of cardboard or paperboard.

12. Combination according to any of claims 1-8, wherein at least one dent (33) is provided in the edge of the connector plate adapter (11) facing away from the connector plate (3).

13. Combination according to any of the preceding claims, wherein a lateral abutment (31) is provided on at least one corner of the connector plate (3) facing away from the connector plate adapter (11).

14. Dust container comprising a dust bag (5) and a combination of a connector plate adapter (11) and a connector plate (3) according to any of claims 1-13.

15. Connector plate adapter (11) for a vacuum cleaner dust container connector plate (3), wherein the adapter comprises means (25) for interacting with a device in a vacuum cleaner holding device, and stiffness reducing features, such as living hinges, perforations or reduced thickness portions, configured to provide a decreased bending stiffness about an axis perpendicular to the direction in which it is adapted to be inserted into a holding device.

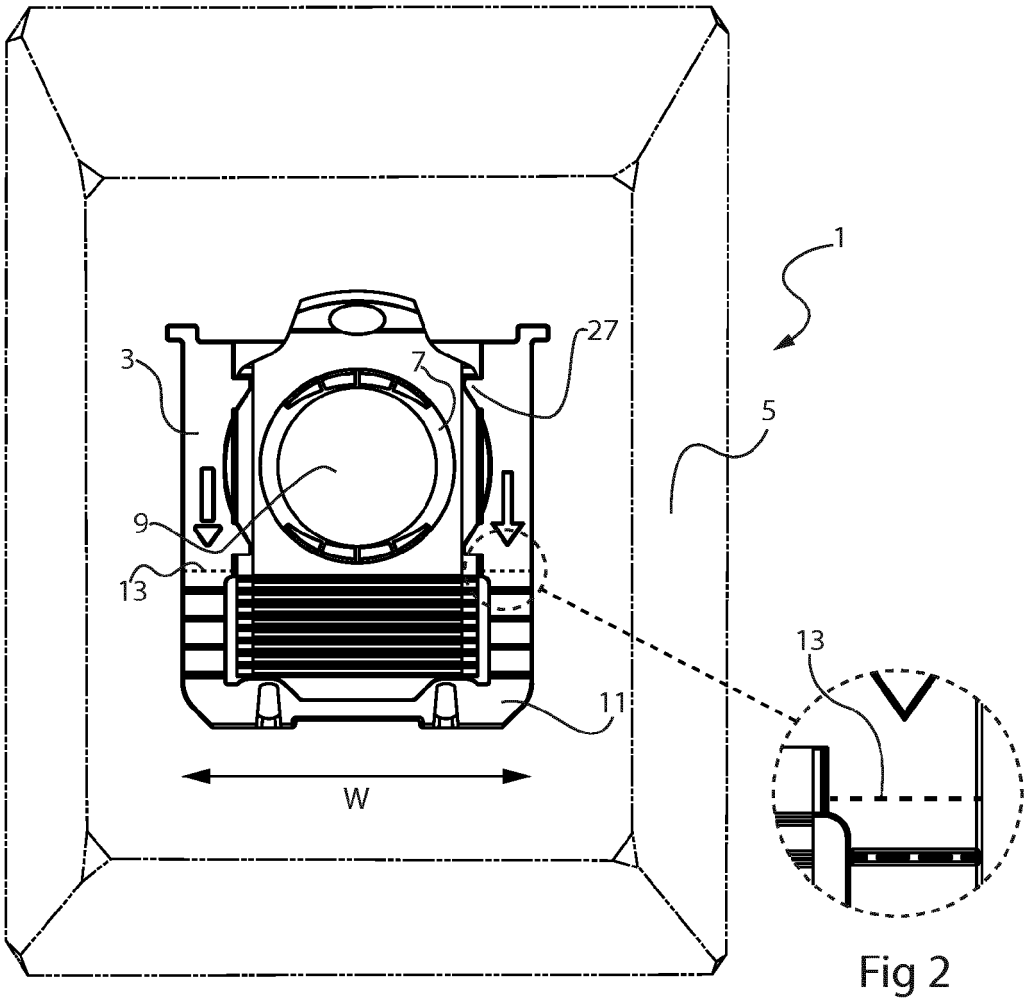

Fig 1

Fig 2

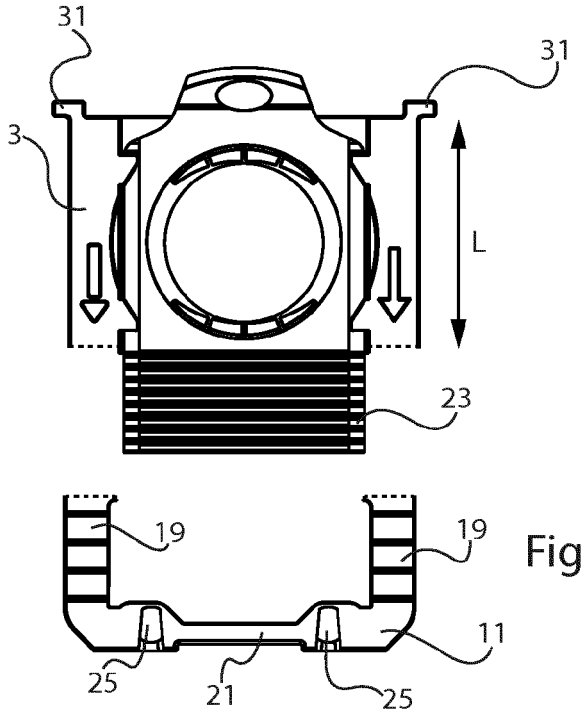

Fig 3

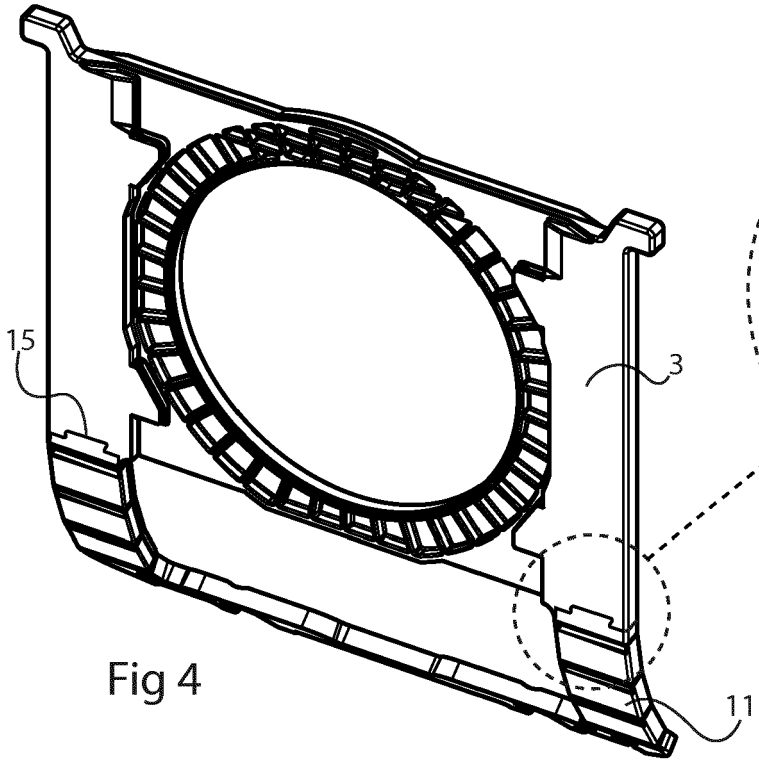

Fig 4

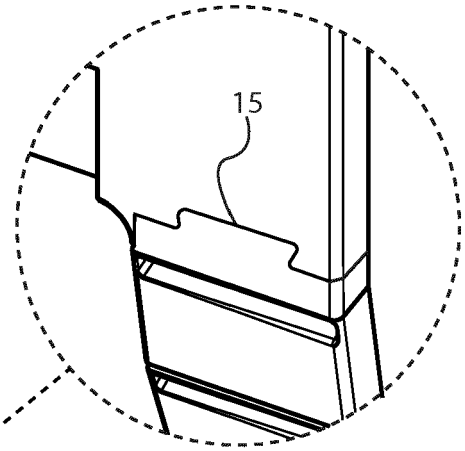

Fig 5

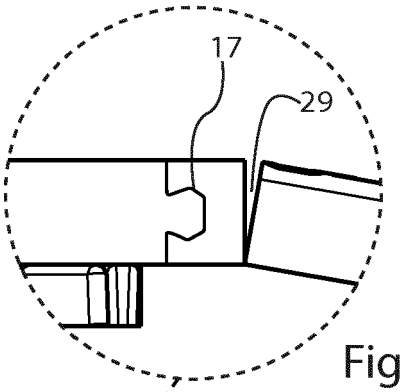

Fig 7

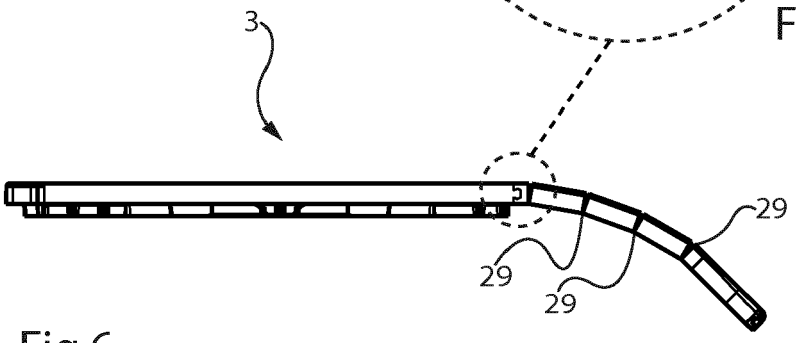

Fig 6

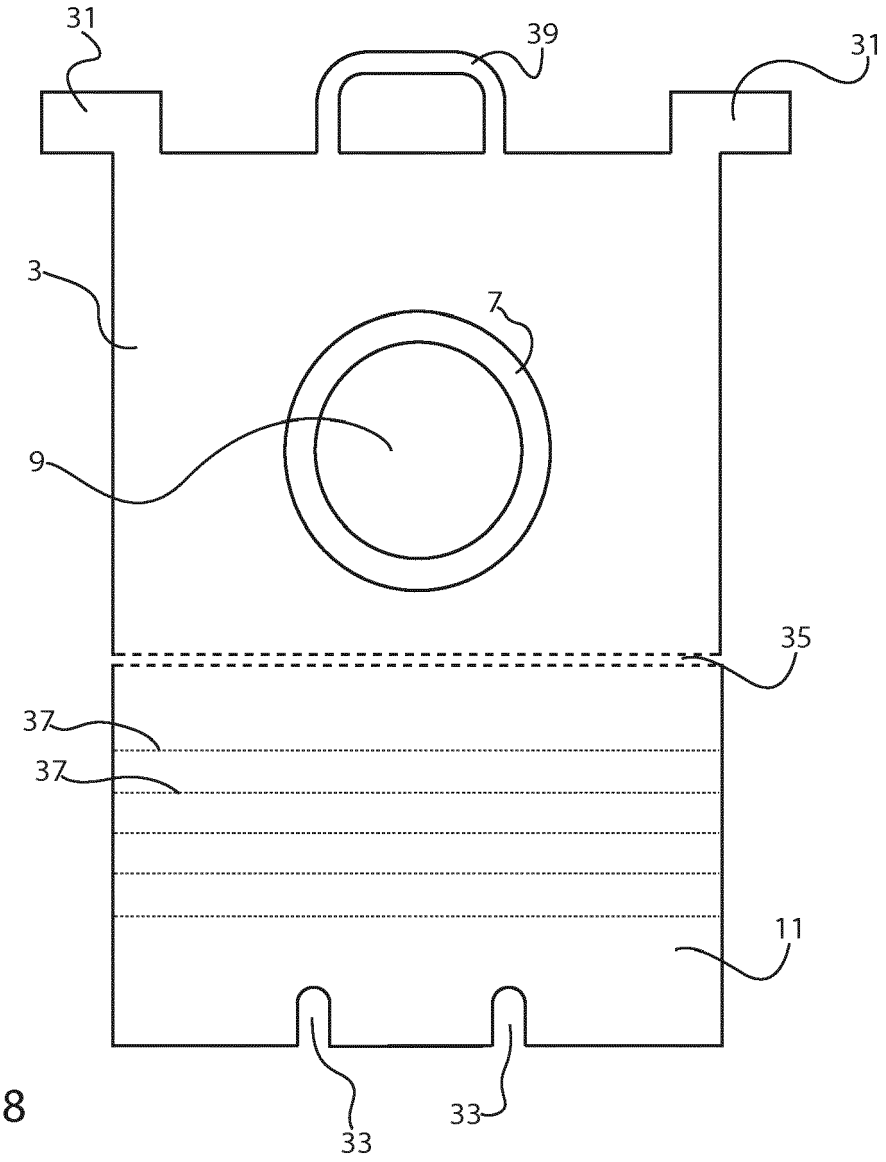

Fig 8

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EUROPEAN SEARCH REPORT

Application Number
EP 16 20 0163

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TECHNICAL FIELDS SEARCHED (IPC)

A47L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	9 May 2017	Trimarchi, Roberto

CATEGORY OF CITED DOCUMENTS

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