



(51) International Patent Classification:

A47L 9/14 (2006.01)

(21) International Application Number:

PCT/EP2016/060313

(22) International Filing Date:

09 May 2016 (09.05.2016)

(25) Filing Language:

English

(26) Publication Language:

English

(71) Applicant: AKTIEBOLAGET ELECTROLUX

[SE/SE]; S:t Göransgatan 143, 10545 Stockholm (SE).

(72) Inventors: SCHEUFEN, Bert; Henneberger Str. 17, 90475

Nürnberg (DE). WERIUS, Patrik; Kungsholms strand 171, 11248 Stockholm (SE).

(74) Agent: BODIN, Henrik; S:t Göransgatan 143, 105 45

Stockholm (SE).

(81) Designated States (unless otherwise indicated, for every

kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every

kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,

MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: METHOD FOR PRODUCING A DUST CONTAINER, AND A CONNECTOR PLATE THEREOF

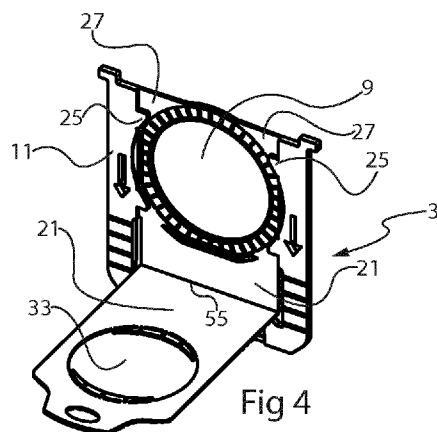


Fig 4

(57) Abstract: The present disclosure relates to a method for producing a connector plate for a vacuum cleaner dust container, more particularly a connector plate (3) surrounding an opening (9) in a dust bag (5). The connector plate (3) can position the opening (9) within a vacuum cleaner and is produced by injection molding a plastic material in a tool such that the connector plate extends in a main plane. The connector plate comprises a flexible shutter (21) formed in one piece with the connector plate, and in the tool, the shutter is formed to extend out of the main plane of the connector plate. This allows the shutter to extend in the same direction from a central portion of the connector plate as does another portion (13) of the connector plate.



METHOD FOR PRODUCING A DUST CONTAINER, AND A CONNECTOR PLATE
THEREOF

Technical field

5 The present disclosure relates to a method for producing a dust container connector plate for a vacuum cleaner.

More specifically, the dust container produced comprises a dust bag, made of an air permeable material, and a connector plate, surrounding an opening in the dust bag, such that the connector plate can correctly position the opening within a vacuum
10 cleaner by the connector plate being inserted in a holder of the vacuum cleaner.

Background

An example of such a container is disclosed for instance in DE-102008037409-A1, which suggests producing the connector plate by means of injection molding a plastic material. Thanks to the connector plate, the opening of the dust bag can be reliably
15 positioned and oriented to receive a flow of dust laden air from the vacuum cleaner inlet. Further, the connector plate can trigger a feedback switch in the holder of the vacuum cleaner to verify that a dust container has been correctly installed in the holder, 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
20 cleaner by injecting heavily dust laden air into a fan/motor arrangement.

One problem associated with dust containers of this type is how to make their use easier for and end user, as well as how to allow efficient production.

Summary

One object of the present disclosure is therefore to provide a method that allows
25 efficient production of a dust container with improved features allowing easy use of the end product. This object is achieved by means of a method as defined in claim 1. More specifically, in a method as initially mentioned, the connector plate is produced by injection molding a plastic material in a tool such that the connector plate extends in a main plane. The connector plate further comprises a flexible shutter formed in
30 one piece with the connector plate, and in the tool, the shutter is formed at least partly to extend out of the main plane of the connector plate. This means that a shutter can be provided together with other features in an area of the connector

plate, without interfering with such other features during production. In this way generally a greater freedom in configuring the connector plate can be achieved.

For instance, the connector plate may comprise a central portion, surrounding the opening, and an extending portion, comprising lateral arm portions extending from the central portion and a bridge portion interconnecting the arms at their distal ends. The flexible shutter may be attached to the central portion in between the arm portions. This configuration allows a shutter to be folded over the central portion and to close an opening in the central portion by being slid away from the bridge portion. A locking feature, keeping the connector plate in a holder, may be provided in the bridge portion, and it can be made sure that the opening is fully closed when this locking feature releases the connector plate.

Such a locking feature may be provided in the bridge portion as locking openings.

The connector plate may comprise guide tabs at either side of the opening, and the shutter may in a subsequent step be inserted behind the guide tabs.

The shutter may extend out of the main plane of the connector plate by being bent at a fold. This may facilitate the further processing of the connector plate, making it easier to fold the shutter correctly over the connector plate.

The shutter may have a ribbed structure that guides the bending of the shutter, with ribs running transversal to the direction that the shutter extends from the remainder of the connector plate.

The distal end of the shutter may comprise a handle to facilitate use, and the connector plate may be made in polypropylene, PP.

The present disclosure also relates to producing a dust container comprising such a connector plate, and further to a connector plate or a dust container produced accordingly.

Brief description of the drawings

Fig 1 shows a dust container for a vacuum cleaner.

Fig 2 shows a connector plate for a dust container.

Fig 3 shows a perspective view of a connector plate where a shutter is employed.

Fig 4 shows a perspective view of a connector plate where a shutter has not yet been folded over the opening of the connector plate.

Fig 5 shows a side view corresponding to fig 4.

Fig 6 shows an enlarged portion of fig 5.

5 Detailed description

The present disclosure relates to a dust container 1 for a vacuum cleaner, as illustrated with an example in fig 1. The dust container 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 coinciding with an opening in the dust bag 5, such that the opening of the connector plate also becomes the opening of the dust bag as a whole. The connector plate 3 is configured to position the opening 9 of the dust bag 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 into a holder or socket in the vacuum cleaner. This operation positions the opening 9 to receive a flow of dust laden air which thereby enters the bag which is capable to remove 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 bag 9.

Fig 2 shows a plan view of a connector plate 3. In the present disclosure, the connector plate 3 comprises a central portion 11, which is central with respect to the opening 9 which it surrounds, and may be substantially flat and rectangular. Further, the connector plate 3 comprises an extending portion 13, which may project from an edge of the central portion 11.

When used in a vacuum cleaner, the connector plate 3 may be slid into a holder in the vacuum cleaner with the extending portion leading in the direction of insertion and the central portion as a trailing portion. The width of the central portion 11 and the extending portion 13 may be substantially uniform width from a distal edge 29 of the extending portion, being inserted first, to the edge 31 of the central portion 11 opposite to the distal edge 29. This allows the holder to guide the insertion of the connector plate. Tabs 14 extending laterally from the central portion 11 at the corners

most distant from the extending portion 13 may be provided to rest on the exterior of the holder at its entry point.

The central and the extending portions 11, 13, may extend in a common plane, and may be made in one piece, for instance by injection molding polypropylene, PP.

- 5 Together, the central and extending portions 11, 13 provide a reliable fixation of the dust bag opening 9 in the vacuum cleaner. Additionally, the extending portion 13 may provide a locking function that retains the connector plate in the holder, and an indicating function, triggering a sensor or switch in the holder, that makes the vacuum cleaner aware of a dust bag being correctly inserted, thereby allowing the vacuum
10 cleaner to disable use of a suction function unless a dust bag is correctly fitted.

As is further illustrated in fig 2, the extending portion 13 may comprise lateral arm portions 17, extending from the central portion 11 and a bridge portion 15, interconnecting the arms at their distal ends. This serves to leave a free space in between the arm portions 17, which may be used by a shutter arrangement, as will be shown.

- 15 The bridge portion 15 may comprise locking openings 19, which interact with a locking arrangement of the holder, snapping into the openings when the connector plate is fitted, thereby requiring a predetermined pulling force, in the direction opposite to the insertion direction, in order to remove the dust bag. Thereby, the dust bag is not removed inadvertently.

- 20 The present disclosure relates to a shutter 21 that can be used to close the opening 9, once the dust bag 5 is full and the dust container 1 is to be replaced. As the shutter 21 substantially seals the opening 9, it can be prevented to a great extent that collected dust leaks out of the dust bag when handled to be disposed.

- In the present disclosure, the shutter is connected to the central portion 11 in between the lateral arm portions 17, and is made in one piece with the remainder of the
25 connector plate. With reference to figs 3 and 4, the shutter 21 has an opening 33, and is folded on top of the central portion 11 such that the shutter opening 33 coincides with the opening 9 of the dust bag 5, which is the state illustrated in fig 2. The shutter is tucked in under guide tabs 25 provided at both sides of the opening and
30 remains slidable, guided by the guide tabs 25 and the rear surface 27 behind the guide tabs. The shutter can thus be slid upwards in fig 2, such that the shutter opening 33 moves away from the dust bag opening 9, thereby effectively closing this

opening. This state is shown in a perspective view in fig 3. The distal end of the shutter may comprise a handle 23 to facilitate this operation.

5 The present disclosure relates to a manufacturing method suitable for producing a dust container with a connector plate as shown in fig 2. Fig 4 shows a perspective view of a connector plate 3 where a shutter has not yet been folded over the opening of the connector plate. This is the state in which the connector plate is produced, i.e. reflects the shape of the used injection molding tool. As is evident from fig 4, the connector plate 3 extends in a main plane, and the flexible shutter 21 is formed in one piece with the remainder of the connector plate 3. The shutter 21 when produced
10 extends out of the main plane of the connector plate. In the illustrated case, the shutter is produced with a fold 55 about 90 degrees out of the main plane close to the location where it would otherwise interfere with the bridge.

In general there is disclosed a method for producing a dust container with a connector plate 3, surrounding an opening 9 in a dust bag 5, wherein the connector
15 plate 3 is produced by injection molding a plastic material in a tool such that the connector plate extends in a main plane, and wherein the connector plate further comprises a flexible shutter 21 formed in one piece with the connector plate, and wherein in the tool, the shutter is formed to at least partly extend out of the main plane of the connector plate.

20 One advantage with this method is, with reference to fig 2, that there can for instance be obtained a connector plate where the shutter 21 is activated, closing the opening 9, by pulling the shutter 21 away from the extending portion 13 with the bridge portion 15 that locks the connector plate 3 in the holder. This means that the opening can be fully closed without beginning to remove the connector plate 3 from the holder. The
25 shutter 21 sliding resistance can be lower than the force needed to unlock the bridge portion 15 from the holder. Therefore, when a user pulls the handle 23, the connector plate 3 is not moved out of the holder until the opening is fully closed, thereby preventing that dust leaves the dust bag, which could otherwise be the result from removing the dust container.

30 Fig 5 shows a side view corresponding to fig 4. As shown, the fold 55 is provided close to the bridge portion 15. One advantage with this configuration that the fold 55 can be used to finish the connector plate 3 by folding the shutter 21 further at this fold

55 and attach the distal part of the shutter 21 at the central portion 11 using the guide tabs, as previously mentioned.

However, a fold can be provided also closer to the central portion 11, even if this may require a bigger tool as the shutter extends more from said main plane, and may
5 require that the shutter is folded also at another location when finishing production of the connector plate 3.

In fig 5, the fold 55 is provided to be about 90° from the main plane of the connector plate 3. However, it is possible to allow the shutter to be inclined at a different angle from the main plane, for instance at 60°.

10 Fig 6 shows an enlarged portion of fig 5. As shown, the shutter may have a ribbed structure that guides the bending of the shutter in the direction it is deformed when the shutter is slid over the central portion. Thus, the ribs run transversal to the direction that the shutter 21 extends from the remainder of the connector plate 3.

The present disclosure is not limited to the examples described above, and may be
15 varied and altered in different ways within the scope of the appended claims. For instance, other plastic materials can be suitable for this purpose, such as polyethylene, PE.

CLAIMS

1. Method for producing a connector plate (3) of a dust container (1) for a vacuum cleaner, where the dust container comprises a dust bag (5), made of an air permeable material, and the connector plate (3), surrounds an opening (9) in the dust bag (5) and the connector plate, whereby the connector plate (3) can correctly position the opening (9) within a vacuum cleaner by the connector plate being inserted in a holder of the vacuum cleaner, characterized by the connector plate (3) being produced by injection molding a plastic material in a tool such that the connector plate extends in a main plane, wherein the connector plate further comprises a flexible shutter (21) formed in one piece with the connector plate, and wherein in the tool, the shutter is formed to extend out of the main plane of the connector plate.

2. Method according to claim 1, wherein the connector plate comprises a central portion (11), surrounding the opening (9), and an extending portion (13), comprising lateral arm portions (17) extending from the central portion (11) and a bridge portion (15) interconnecting the arms at their distal ends, wherein the flexible shutter (21) is attached to the central portion in between the arm portions (17).

3. Method according to claim 2, wherein the bridge portion comprises locking openings (19).

4. Method according to any of the preceding claims, wherein the connector plate comprises guide tabs (25) at either side of the opening (9), the shutter (21) in a subsequent step being inserted behind the guide tabs.

5. Method according to any of the preceding claims, wherein the shutter extends out of the main plane of the connector plate by being bent at a fold (55).

6. Method according to any of the preceding claims, wherein the shutter (21) has a ribbed structure that guides the bending of the shutter, the ribs running transversal to the direction that the shutter extends from the remainder of the connector plate (3).

7. Method according to any of the preceding claims, wherein the distal end of the shutter comprises a handle (23).

8. Method according to any of the preceding claims, wherein the connector plate is made in polypropylene, PP.

9. Method for producing a dust container (1) for a vacuum cleaner, the dust container comprising a dust bag (5), made of an air permeable material, and a
5 connector plate (3) produced with a method according to any of the preceding claims, surrounding an opening (9) in the dust bag (5).

10. A connector plate for a vacuum cleaner dust container, wherein the connector plate is produced according to any of claims 1-8

11. A dust container for a vacuum cleaner, wherein the dust container is
10 produced according to claim 9.

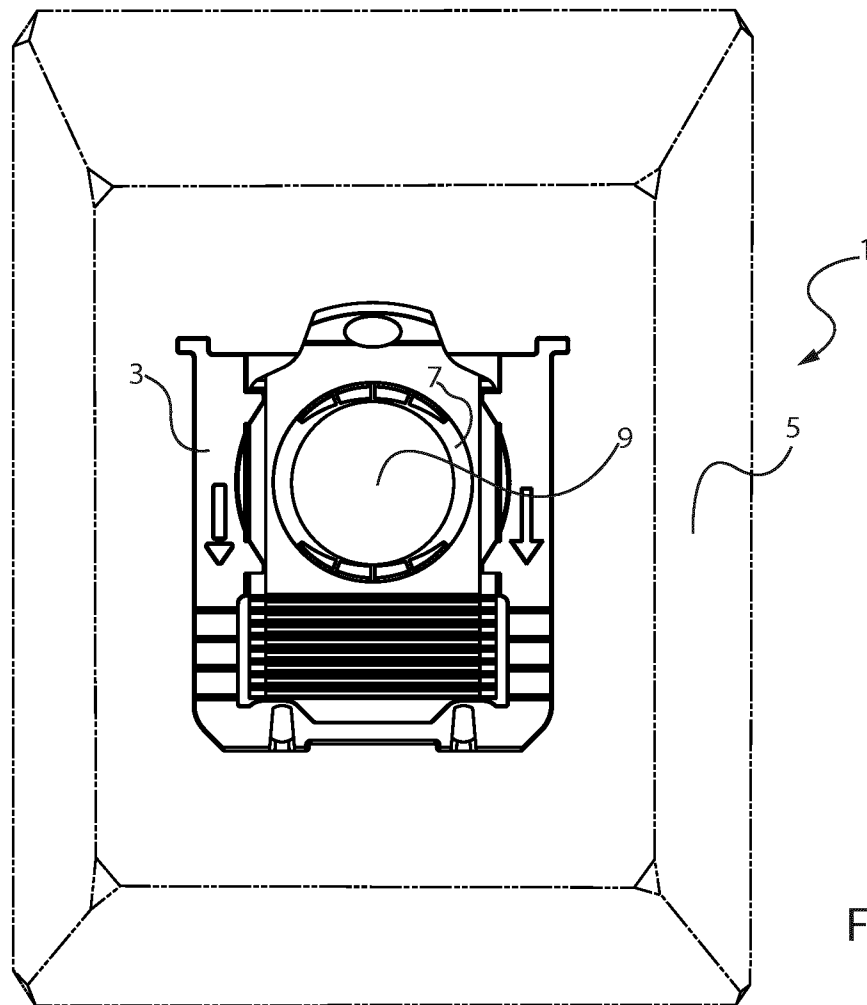


Fig 1

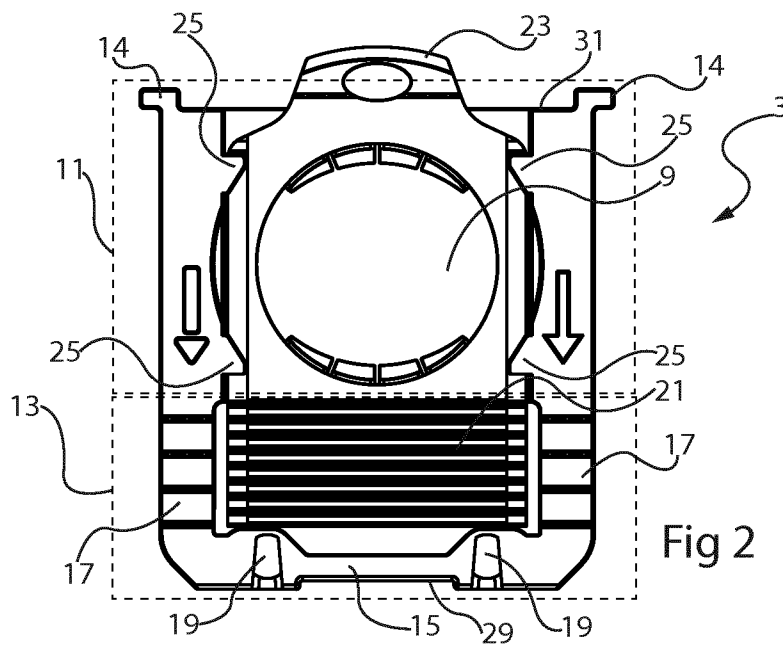


Fig 2

Fig 3

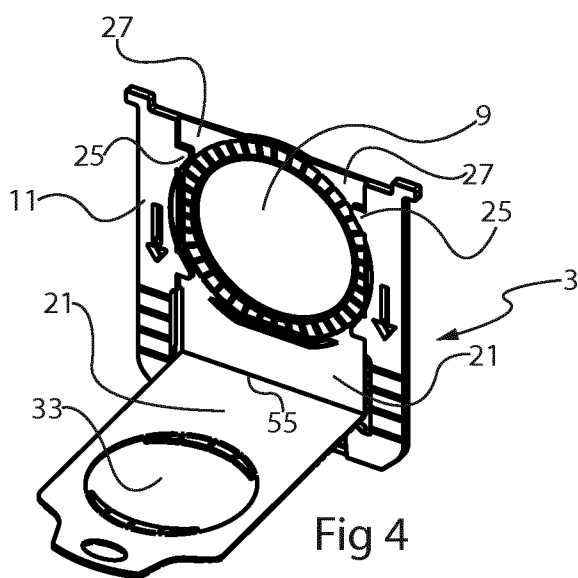
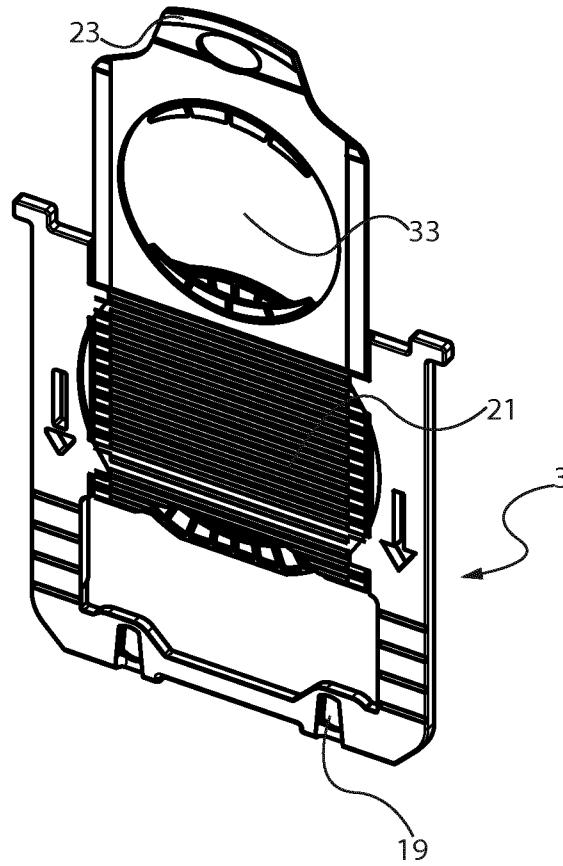


Fig 4

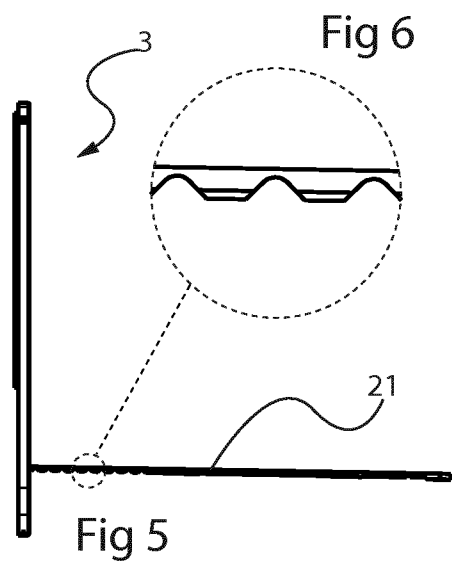


Fig 5

Fig 6

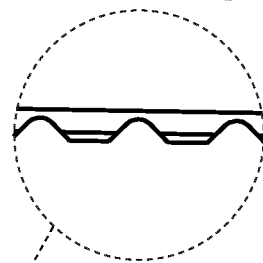


Fig 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2016/060313

A. CLASSIFICATION OF SUBJECT MATTER
INV. A47L9/14
ADD.

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)
A47L

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)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 94 03 970 U1 (AICHNER PAUL [DE]) 5 May 1994 (1994-05-05)	1,5-11
A	page 3, line 31 - page 4, line 35; figures 1-3	2-4
A	----- DE 94 08 349 U1 (WOLF GMBH [DE]) 21 July 1994 (1994-07-21)	1-11
A	page 3, line 18 - page 4, line 21; figures 1,2	
A	----- DE 20 2004 008972 U1 (BRANOFILTER GMBH [DE]) 12 August 2004 (2004-08-12)	1-11
	paragraph [0014] - paragraph [0032]; figures 1-3	



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

6 December 2016

Date of mailing of the international search report

14/12/2016

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Blumenberg, Claus

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2016/060313

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 9403970	U1	05-05-1994	AT 160270 T 15-12-1997
		DE 9403970 U1	05-05-1994
		EP 0671142 A2	13-09-1995
		ES 2110270 T3	01-02-1998
DE 9408349	U1	21-07-1994	DE 9408349 U1 21-07-1994
		EP 0682908 A1	22-11-1995
DE 202004008972	U1	12-08-2004	NONE