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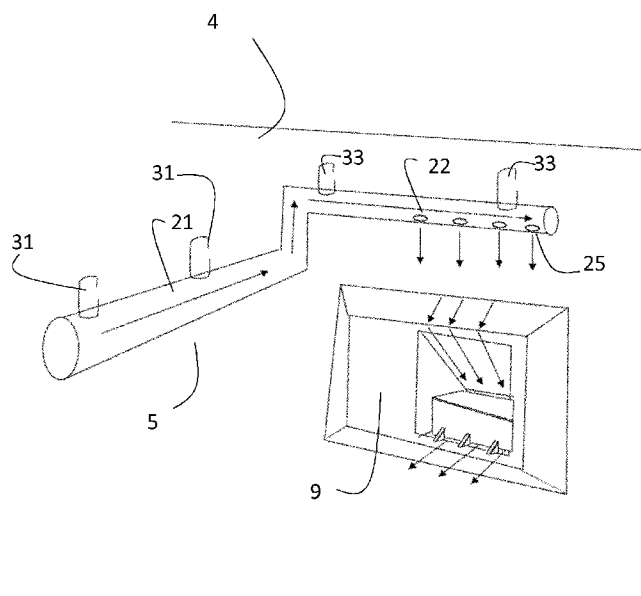


Fig. 2

(57) Abstract: The invention relates to an arrangement for a dishwasher. The arrangement comprises a detergent dispenser (9). The detergent dispenser comprises a set of tablet restraints (24) for retaining a detergent tablet in a cavity of the detergent dispenser; and a water outlet (22) configured to release water to a top section of the detergent dispenser. Hereby water can be sprayed on to the detergent dispenser in a controlled manner.



## **DISHWASHER WITH DETERGENT DISPENSER**

### **TECHNICAL FIELD**

The invention relates to a dishwasher. In particular the present invention  
5 relates to a dishwasher having a detergent dispenser. The invention also  
relates to an arrangement comprising a detergent dispenser and to a  
detergent dispenser for a dishwasher.

### **BACKGROUND**

10 Dishwashers typically have detergent dispensers that are arranged on the  
inner wall of the door of the dishwasher. The detergent dispensers are  
containers provided with a lid that is automatically opened during washing so  
as to output the detergent for washing crockery.

Detergent tablets are often used for washing crockery. The tablet is inserted  
15 manually into the detergent dispenser and, after the lid connected to the  
detergent dispenser is opened, falls into a zone of the dishwasher in which  
the washing water dissolves the tablet to wash the crockery.

However, the tablet, after the lid is opened, often does not fall into a zone of  
the dishwasher that is suitable for the complete dissolution thereof. Thus, at  
20 the end of the washing step, the tablet is not completely dissolved, with  
unpleasant consequences due to the poor washing of the crockery.

EP2138088 describes a detergent dispenser where the tablet is prevented  
from falling into the dishwasher by a grille or by two vertical elements.

There is a constant desire to improve the dishwashers and to make the  
25 washing in dishwashers more efficient. Hence, there is a need for a  
dishwasher that improves upon how the detergent tablet is dissolved.

**SUMMARY**

It is an object of the present invention to provide an improved dishwasher and in particular an improved dishwasher having a detergent dispenser.

- 5 These objects and other are obtained by an arrangement, a detergent dispenser for a dishwasher and a dishwasher as set out in the appended claims.

In accordance with a first aspect of the present invention, an arrangement for a dishwasher is provided. The arrangement comprises a detergent dispenser.

- 10 The detergent dispenser comprises a set of tablet restraints for retaining a detergent tablet in a cavity of the detergent dispenser; and a water outlet configured to release water to a top section of the detergent dispenser.

Hereby water can be supplied to the detergent dispenser in a controlled manner. For example, when a lid of the detergent dispenser is opened, water  
15 can flow onto the detergent tablet placed in the detergent dispenser from the water outlet above the detergent dispenser, which outlet releases water onto the door or the top of the dispenser in a controlled manner. The detergent tablet can thereby be dissolved completely in a controlled manner while kept in the detergent dispenser.

20

In accordance with one embodiment, the tablet restraints are located at a bottom surface of the cavity in the detergent dispenser. Hereby the restraints can be made small and the detergent tablet can be easily placed in the detergent dispenser.

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In accordance with one embodiment, the bottom surface has a sloped surface. Hereby the risk that the detergent tablet leaves residues in the detergent dispenser is reduced.

In accordance with one embodiment, the tablet restraints are formed as teeth provided with an upwards facing portion forming an acute angle. The upwards facing portion is adapted to form a support against which a  
5 detergent tablet can rest when placed in the cavity of the detergent dispenser. Hereby the risk that the detergent tablet leaves residues in the detergent dispenser is reduced.

In accordance with a second aspect of the invention, a detergent dispenser for  
10 a dishwasher is provided. The detergent dispenser has a set of teeth located at a bottom surface of the detergent dispenser for retaining a detergent tablet in the detergent dispenser. The teeth are provided with an upwards facing portion forming an acute angle, wherein said upwards facing portion is adapted to form a support against which a detergent tablet can rest when  
15 placed in the detergent dispenser. Hereby the risk that the detergent tablet leaves residues in the detergent dispenser is reduced.

In accordance with one embodiment, the bottom section of the detergent dispenser has a sloped surface.

20

In accordance with one embodiment a top section with openings for allowing water to enter the detergent dispenser is provided in the detergent dispenser.

In accordance with one embodiment, rails are located on the bottom section  
25 of the detergent dispenser.

The invention also extends to a dishwasher comprising an arrangement or a detergent dispenser according to the above.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

- 5 The invention will now be described in more detail, by way of example, and with reference to the accompanying drawings, in which:

Fig. 1 is a view of a dishwasher,

Fig. 2 is a view of an arrangement for spraying water on the door of a dishwasher,

- 10 Fig. 3 is a cross-sectional view of a door of a dishwasher,

Fig. 4 is a view of a detergent dispenser, and

Fig. 5 is a view of a cavity of a detergent dispenser.

### **DETAILED DESCRIPTION**

- 15 The invention will now be described more fully hereinafter with reference to the accompanying drawings, in which certain embodiments of the invention are shown. The invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided by way of example so that  
20 this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. For example, like or similar components of different embodiments can be exchanged between different embodiments. Some components can be omitted from different embodiments. Like numbers refer to like elements throughout the  
25 description.

In Fig. 1, a dishwasher 1 is shown. The exemplary dishwasher 1 comprises a washing compartment or tub 2, a door 4 configured to close and seal the

washing compartment 2, a spraying system having a lower spray arm 3 and an upper spray arm 5, a lower rack 6 and an upper rack 7. Additionally, it may comprise a specific top rack for cutlery (not shown). A controller 11 such as a microprocessor can typically be arranged in the interior of the  
5 dishwasher for controlling washing programs and is communicatively connected to an interface 8 via which a user can select washing programs.

The door 4 of the exemplary dishwasher 1 of Fig. 1 is further on its inside arranged with a detergent dispenser 9. The dispenser 9 can in some embodiments have a lid 10 being controllably opened and closed by the  
10 controller 11 for dispensing detergent from the dispenser 9 into the tub 2. In the dispenser a detergent tablet or similar can be placed. The term detergent tablet used herein refers to any type of unit with detergent such as a detergent pad or a detergent capsule or similar.

In Fig. 2 a partial view from inside the tub 2 is depicted viewing the door 4  
15 with the detergent dispenser 9. The detergent dispenser 9 can be supplied with water via a water conduit 21. The water flow is indicated by arrow in Fig. 2. The water conduit 21 can be connected to a water conduit system of the dishwasher via a coupling at the upper spray arm 5. In accordance with one embodiment, the water conduit 21 can be attached to the upper rack 7 with  
20 clips 31, or other means. At the door 4 a water outlet 22 is arranged to supply water to the topside of the detergent dispenser 9. The topside of the detergent dispenser typically being the upper side of the detergent dispenser when the door 4 is closed and the dishwasher is in use. Hereby water can be supplied to the topside of the detergent dispenser 9 and water can flow through the  
25 detergent dispenser 9. The water outlet 22 can also be attached to the upper rack via clips 33, or other means. In an alternative embodiment, the water outlet 22 is mounted on the door 4 and connects via a coupling to the water conduit 21. The water outlet 22 can have multiple nozzles 25 arranged thereon to output water to the detergent dispenser 9. This will typically  
30 increase the amount of water that flows through the detergent dispenser and also the water flow in the detergent dispenser can be better controlled and

thereby the risk for residues being left in the detergent dispenser or that the detergent tablet is not fully dissolved is reduced.

In Fig. 3 a partial cross-sectional view from the side of the door 4 is shown. Fig. 3 shows the detergent dispenser 9 and the lid 10. Fig. 3 also shows the  
5 water outlet 22 located at a top section of the detergent dispenser. The water outlet, which is fed with water via the water conduit 21, is arranged to output water to the detergent dispenser 9. The water can be released via several laterally displaced nozzles such the water will pass all across the width of the detergent dispenser. The water passing through the dispenser is generally  
10 indicated by the arrows in Fig. 3. The water will dissolve a detergent tablet 20 placed in the detergent dispenser. The tablet 20 can rest against a tablet restraint 24 inside the detergent dispenser as will be described in more detail below. In other words, water can flow directly from a water feed of the dishwasher to the surface of the door 4. The water is sprayed onto the door or  
15 released right above the detergent dispenser. The water flows down and enter the detergent cavity washing over the detergent tablet. In accordance with one exemplary embodiment the dishwasher can be controlled to start spraying water via the water outlet when the lid is opened. By spraying water for a pre-determined time and/ or with a pre-determined amount via the  
20 water outlet 22 it can be assured that the detergent tablet is completely dissolved.

In Fig. 4, a view of an exemplary detergent dispenser 9 is shown. In the embodiment of Fig. 4 the detergent dispenser 9 is shown with the lid open. Under the lid, a cavity 30 is formed to receive a detergent tablet. The cavity  
25 30 has a number of tablet restraints 24 located therein. The tablet restraints 24 are configured to keep the detergent tablet in the cavity 30 while the detergent tablet is dissolved when water is flushed in the detergent dispenser from the water outlet 22 shown in Fig. 3. The tablet restraints 24 can be located on a bottom surface 26 of the cavity 30. The bottom surface 26 can be  
30 sloped such that water will exit the cavity when water is in the cavity. Also, rails 28 can be formed on the bottom surface. The rails 28 can act to facilitate detergent from leaving the cavity and also to prevent the detergent tablet to

stick to the bottom surface. Also, a top section of the detergent dispenser can in some embodiments be provided with openings (not shown) for receiving water from the water outlet.

In Fig. 5 the tablet restraints 24 are shown in more detail. In the embodiment of Fig. 5 a multitude of tablet restraints, at least three, are provided. The tablet restraints 24 can in accordance with some embodiments be formed as teeth. The teeth can have a height of about 1 cm or less. Hereby it become easier to place the tablet inside the cavity. Also, the teeth can be provided with an upwards facing portion 32 forming an acute angle. The upwards facing portion is adapted to form a support against which a detergent tablet can rest when placed in the detergent dispenser. By providing such a structure where the tablet can rest on a sharp portion of the tablet restraints tablet residues are less likely to be left inside the cavity when the tablet is dissolved. In accordance with some embodiments the top portion of the teeth can be provided with a beveled edge 34. Hereby the risk for residues being formed in the cavity can be even further reduced.

**CLAIMS**

1. An arrangement for a dishwasher comprising:

- a detergent dispenser (9), the detergent dispenser comprising a set of tablet  
5 restraints (24) for retaining a detergent tablet in a cavity (30) of the detergent  
dispenser; and
- a water outlet (22) configured to release water to a top section of the  
detergent dispenser.

10 2. The arrangement according to claim 1, wherein the tablet restraints (24)  
are located at a bottom surface (26) of the cavity (30) in the detergent  
dispenser.

15 3. The arrangement according to claim 2, wherein the bottom surface (26)  
has a sloped surface.

4. The arrangement according to any one of claims 1 - 3, wherein the tablet  
restraints (24) are formed as teeth provided with an upwards facing portion  
(32) forming an acute angle, wherein said upwards facing portion is adapted  
20 to form a support against which a detergent tablet can rest when placed in the  
cavity (30) of the detergent dispenser.

5. The arrangement according to any one of claims 1 - 4, wherein a top  
section of the detergent dispenser is provided with openings for allowing  
water to enter the detergent dispenser.

6. A detergent dispenser (9) for a dishwasher having a set of teeth located at a bottom surface (26) of the detergent dispenser for retaining a detergent tablet in the detergent dispenser,

5 wherein the teeth are provided with an upwards facing portion (32) forming an acute angle, wherein said upwards facing portion is adapted to form a support against which a detergent tablet can rest when placed in the detergent dispenser.

7. The detergent dispenser according to claim 6, wherein the bottom surface  
10 (26) of the detergent dispenser has a sloped surface.

8. The detergent dispenser according to any one of claims 6 - 7, comprising rails located on the bottom section of the detergent dispenser.

15 9. The detergent dispenser according to any one of claims 6 - 8, wherein a top section of the detergent dispenser is provided with openings for allowing water to enter the detergent dispenser.

10 20 10. A dishwasher (1) comprising an arrangement according to any one of claims 1- 5 or a detergent dispenser according to any one of claims 6 - 9.

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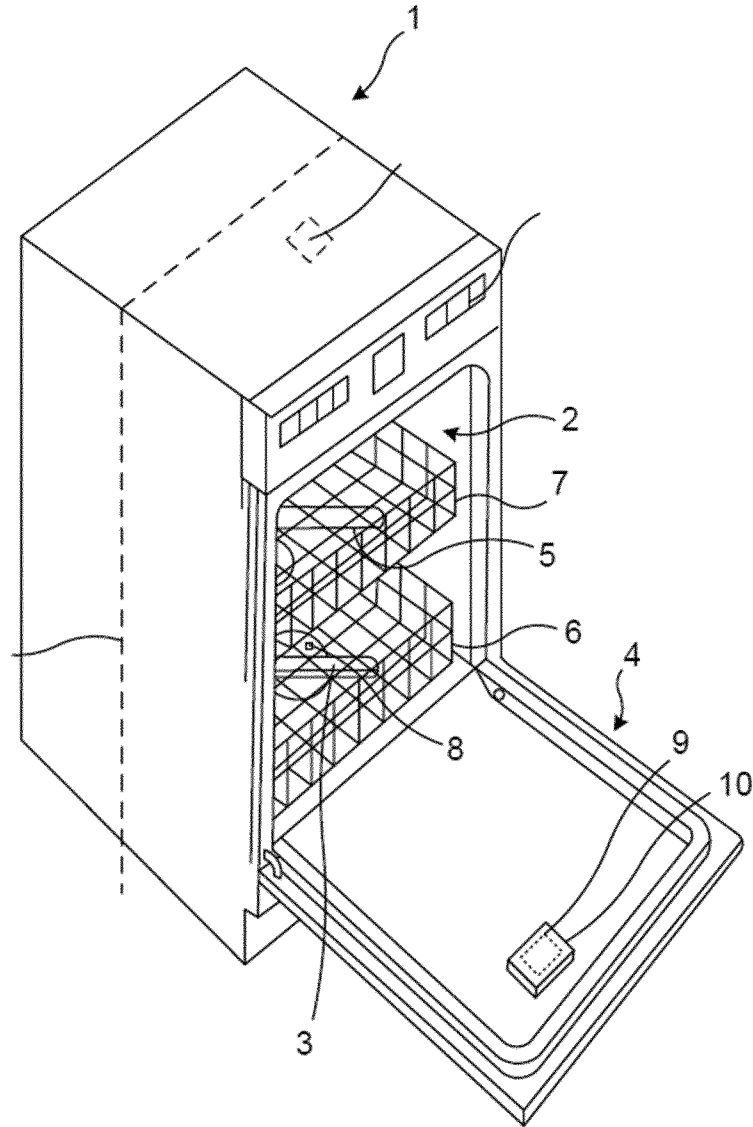


Fig. 1

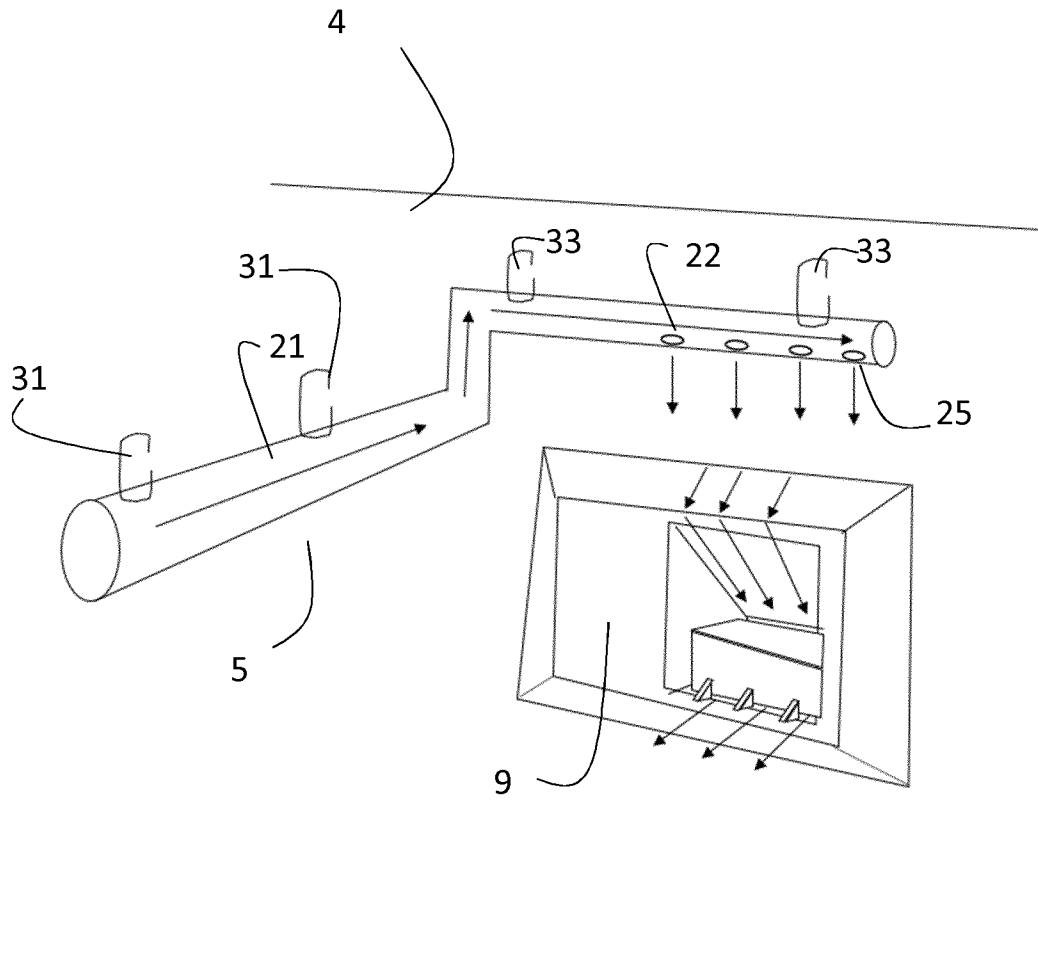


Fig. 2

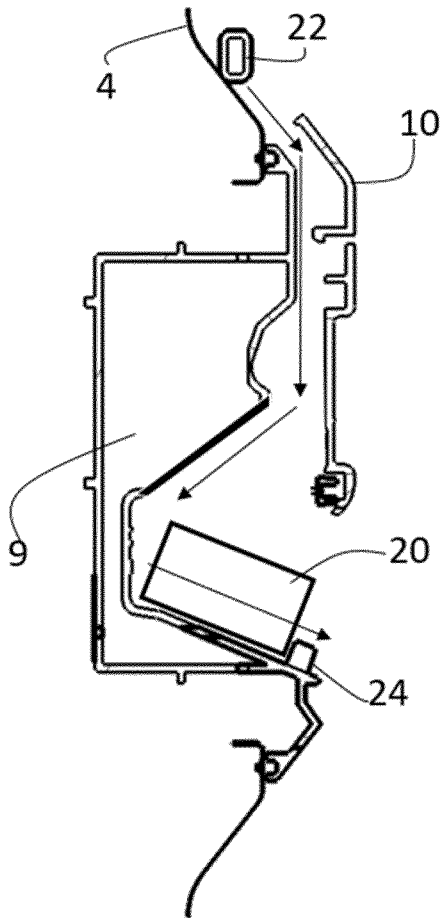


Fig. 3

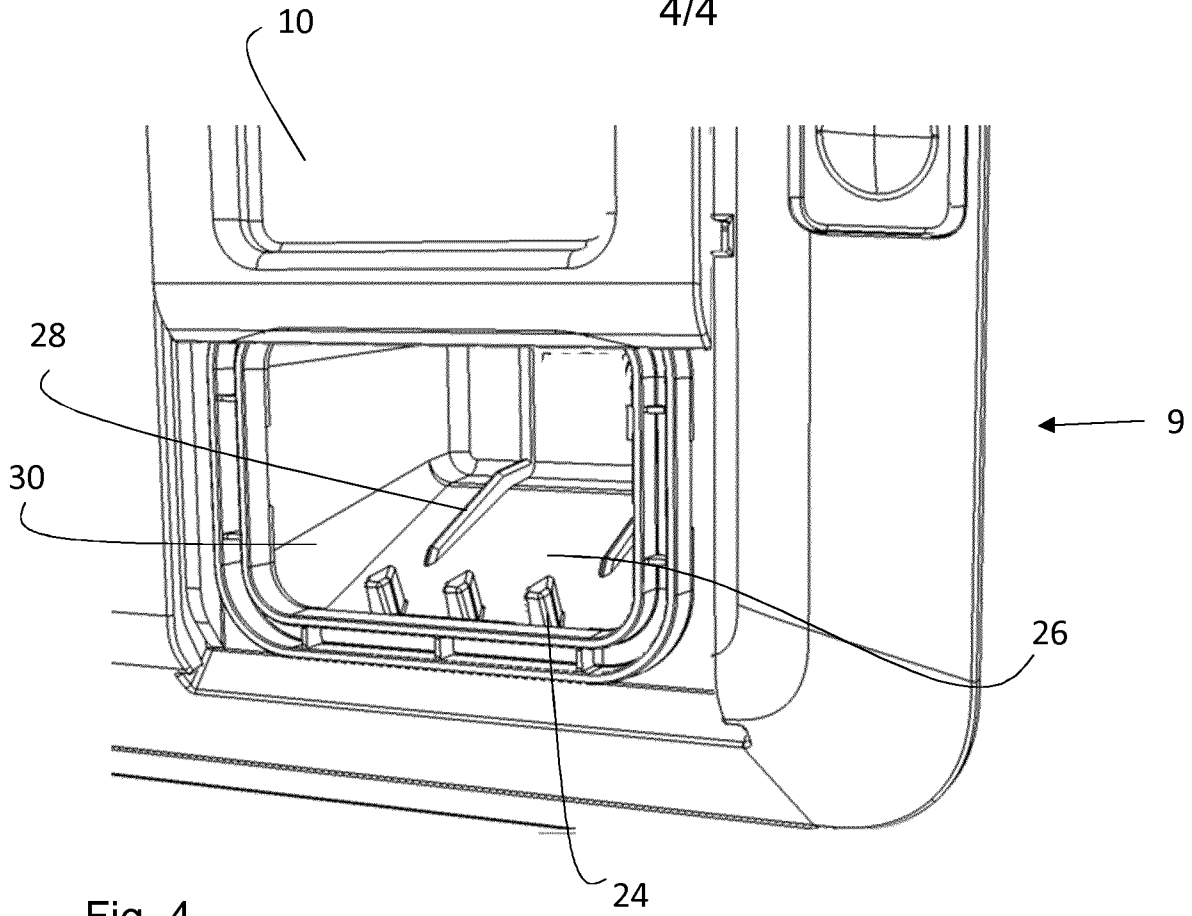


Fig. 4

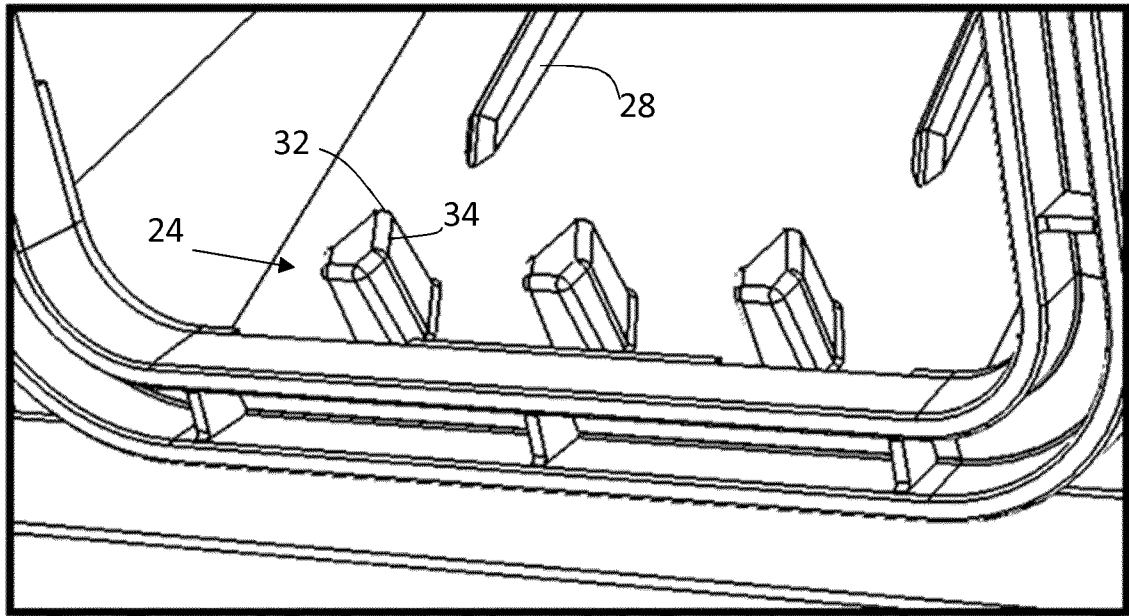


Fig. 5

INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2018/086678

A. CLASSIFICATION OF SUBJECT MATTER  
INV. A47L15/44  
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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2016/075644 A1 (BITRON SPA [IT]) 19 May 2016 (2016-05-19) page 3, line 21 - page 5, line 9 page 6, line 7 - page 7, line 23 figures 1-4	1-10
X	DE 25 08 730 A1 (MIELE & CIE) 9 September 1976 (1976-09-09) page 2, line 20 - page 3, line 6 figures 1-3	1-3,10
A	US 2016/220094 A1 (DURHAM KYLE EDWARD [US] ET AL) 4 August 2016 (2016-08-04) paragraphs [0026], [0033] paragraphs [0042] - [0051] figures 1-3, 5-9	1,5,6,9, 10
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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

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

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Date of the actual completion of the international search  14 August 2019	Date of mailing of the international search report  23/08/2019
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  Weidner, Maximilian

## INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2018/086678

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 603 431 A (TULLER BARRY E [US]) 18 February 1997 (1997-02-18) column 2, line 49 - column 3, line 35 figures 1-4 -----	1,6,10

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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