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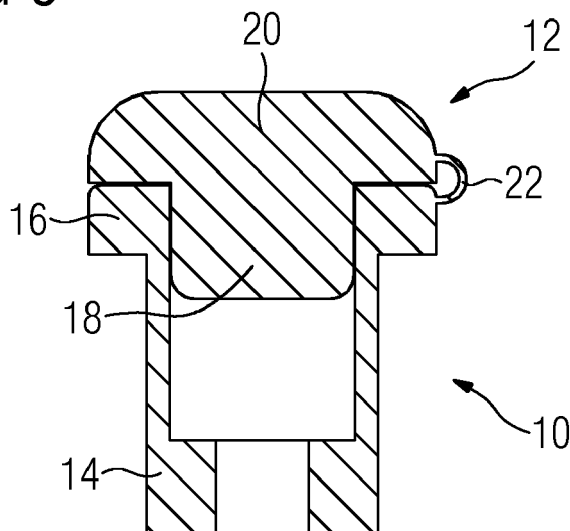
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(54) **SET OF SPACER ELEMENT AND BUFFER ELEMENT FOR DOMESTIC APPLIANCE**

(57) The present invention relates to a set of a spacer element (10) and a buffer element (12) for a domestic appliance. The spacer element (10) includes a base part (14) and a flange (16). The buffer element (12) includes a head piece (20) and at least one prolongation (18; 24). The spacer element (10) includes at least one recess

(16; 26) for receiving a complementary prolongation (18; 24) of the buffer element (12), so that the head piece (20) of the buffer element (12) can be aligned to the flange (16) of the spacer element (10). Further, the present invention relates to a domestic appliance, particularly a cooking oven.

FIG 6



Description

[0001] The present invention relates to a set of a spacer element and a buffer element for a domestic appliance. Further, the present invention relates to a domestic appliance, particularly a cooking oven.

[0002] In a domestic appliance spacer elements and buffer elements are often used. The spacer element is arranged at the domestic appliance and provides a distance between a front frame and a furniture. Said front frame encloses a front opening of a cavity. Usually, two to four spacer elements are used for one domestic appliance. Preferably, the spacer element is screwed with the furniture. For example, the spacer element is a moulded plastic part. The buffer element is made of an elastic material, e.g. rubber, and mounted to the front frame. The buffer element avoids that an inner glass panel of a door is smashed at the front frame, if said door is closed. Moreover, the buffer element keeps distance between the door and the front frame in the closed state of said door.

[0003] FIG 10 illustrates a schematic sectional side view of the spacer element 10 and the buffer element 12 according to the prior art. The spacer element 10 is fixed at the furniture 30 by a screw 28. The spacer element 10 includes a base part 14 and a flange 16. The base part 14 is formed as a pipe section having two different inner diameters. The smaller inner diameter is penetrated by the shaft of the screw 28, while the head of said screw 28 is arranged within the bigger inner diameter of the base part 14. The base part 14 of the spacer element 10 penetrates a hole of a front frame 32. The flange of the spacer element 10 is aligned at an outer side of said front frame 32. The outer side of the front frame 32 is opposite to the furniture 30. The front frame 32 is in contact with the furniture 30 at other positions which are not shown in FIG 10. The spacer element 10 avoids that the domestic appliance is pulled out of the furniture 30 by mistake. The buffer element 12 has the shape of a mushroom and includes a shaft 18 and a head piece 20. The shaft 18 of the buffer element 12 penetrates a further hole in the front frame 32. The head piece 20 of the buffer element 12 is aligned at the outer side of the front frame 32. The head piece 20 of the buffer element 12 is provided for supporting an inner panel 34 of the door in the closed state.

[0004] However, when the door is opened, then the screw 28 is visible. Further, assembling of the spacer element 10 and the buffer element 12 is very complex.

[0005] It is an object of the present invention to provide a set of a spacer element and a buffer element for a domestic appliance, which allows an improved design and is mountable by low complexity.

[0006] The object of the present invention is achieved by the set of the spacer element and the buffer element for a domestic appliance according to claim 1.

[0007] According to the present invention a set of a spacer element and a buffer element for a domestic ap-

pliance is provided, wherein:

- the spacer element includes a base part and a flange,
- the buffer element includes a head piece and at least one prolongation, and
- the spacer element includes at least one recess for receiving a complementary prolongation of the buffer element, so that
- the head piece of the buffer element can be aligned to the flange of the spacer element.

[0008] The core of the present invention is that the spacer element and the buffer element are connectable to each other. The spacer element allows predefined positions of stationary parts of the domestic appliance. Further, the spacer element avoids that the domestic appliance can pulled out of an enclosing device. The buffer element allows a distance between a stationary part and a moveable part of the domestic appliance.

[0009] Preferably, the spacer element is a moulded plastic part.

[0010] In contrast, the buffer element may be made of at least one elastic material, preferably rubber.

[0011] Further, the base part of the spacer element may be a pipe section, wherein preferably said pipe section includes one outer diameter and two different inner diameters. This allows an easy fixation of the spacer element.

[0012] Particularly, a bigger inner diameter of the base part is arranged beside the flange, while a smaller inner diameter of said base part is arranged opposite to the flange.

[0013] For example, a portion of the bigger inner diameter of the base part is provided for receiving a head of a screw, while a portion of the smaller inner diameter of the base part is provided for receiving a shaft of said screw.

[0014] Additionally, the spacer element and the buffer element may be connected by at least one hinge element.

[0015] Preferably, the buffer element has the shape of a mushroom and includes the head piece and a shaft, wherein said shaft is inserted in or insertable into the spacer element.

[0016] Further, the shaft may be inserted or insertable through the flange of the spacer element.

[0017] Moreover, the shaft may be inserted in or insertable into the base part of the spacer element.

[0018] Alternatively, the head piece includes at least one appendix, while the flange includes at least one recess for receiving said appendix.

[0019] Particularly, the appendix of the head piece and the recess of the flange are arranged opposite to the hinge element.

[0020] Further, the present invention relates to a domestic appliance comprising at least one set mentioned above, wherein the spacer element is provided for supporting a front frame of said domestic appliance.

[0021] Preferably, the buffer element is provided for

keeping a distance between the front frame and a door of the domestic appliance.

[0022] At last, the spacer element may be fixed or fixable to a furniture by at least one screw.

[0023] Novel and inventive features of the present invention are set forth in the appended claims.

[0024] The present invention will be described in further detail with reference to the drawings, in which

FIG 1 illustrates a schematic side view and perspective view of a spacer element according to a first embodiment of the present invention,

FIG 2 illustrates a schematic side view and perspective view of a buffer element according to the first embodiment of the present invention,

FIG 3 illustrates a schematic perspective view of the composite spacer element and buffer element according to the first embodiment of the present invention,

FIG 4 illustrates a schematic sectional side view of the composite spacer element and buffer element according to the first embodiment of the present invention,

FIG 5 illustrates a schematic side view of the spacer element and buffer element according to a second embodiment of the present invention,

FIG 6 illustrates a schematic sectional side view of the composite spacer element and buffer element according to the second embodiment of the present invention,

FIG 7 illustrates a schematic side view of the spacer element and buffer element according to a third embodiment of the present invention,

FIG 8 illustrates a schematic perspective view of the spacer element and buffer element according to the third embodiment of the present invention,

FIG 9 illustrates a schematic sectional side view of the composite spacer element and buffer element according to the third embodiment of the present invention, and

FIG 10 illustrates a schematic sectional side view of the spacer element and buffer element according to the prior art.

[0025] FIG 1 illustrates a schematic side view and perspective view of a spacer element 10 according to a first embodiment of the present invention. The spacer element 10 includes a base part 14 and a flange 16. The

base part 14 is formed as a pipe section. The flange 16 is arranged at one end of the base part 14. In this example, the spacer element 10 is a moulded plastic part.

[0026] FIG 2 illustrates a schematic side view and perspective view of a buffer element 12 according to the first embodiment of the present invention. The buffer element 12 includes a shaft 18 and a head piece 20. The buffer element 12 has the shape of a mushroom. The buffer element 12 is made of an elastic material. Preferably, the buffer element is made of rubber.

[0027] FIG 3 illustrates a schematic perspective view of the composite spacer element 10 and buffer element 12 according to the first embodiment of the present invention. The shaft 18 of the buffer element 12 is penetrated in the spacer element 10. Thus, the spacer element 10 and the buffer element 12 form one part.

[0028] FIG 4 illustrates a schematic sectional side view of the composite spacer element 10 and buffer element 12 according to the first embodiment of the present invention. The shaft 18 of the buffer element 12 is penetrated through the flange 16 of the spacer element 10 and in the base part 14 of said spacer element 10. The base part 14 has two different inner diameters, wherein the shaft 18 of the buffer element 12 penetrates in that portion of the base part 14 having the bigger inner diameter. The smaller inner diameter of the base part 14 is provided for the shaft of a screw 28, while the bigger inner diameter of the base part 14 is provided for receiving the head of said screw 28. Moreover, the bigger inner diameter of the base part 14 is provided for receiving the shaft 18 of the buffer element 12. The bigger inner diameter of the base part 14 is marginally bigger than the outer diameter of the shaft 18 of the buffer element 12.

[0029] FIG 5 illustrates a schematic side view of the spacer element 10 and buffer element 12 according to a second embodiment of the present invention. The spacer element 10 includes the base part 14 and the flange 16. The base part 14 is formed as the pipe section. The flange 16 is arranged at one end of the base part 14. The buffer element 12 includes the shaft 18 and the head piece 20. The buffer element 12 has the shape of the mushroom and is made of elastic material. Preferably, the buffer element is made of rubber, while the spacer element 10 is a moulded plastic part. For example, the hinge element 22 is made of plastics.

[0030] Additionally, the spacer element 10 and the buffer element 12 of the second embodiment are connected by a hinge element 22. Said hinge element 22 extends between the circumferential side of the flange 16 of the spacer element 10 and the circumferential side of the head piece 20 of the buffer element 12. The hinge element 22 allows a permanent connection between the spacer element 10 and the corresponding buffer element 12. The hinge element 22 is not removable from the spacer element 10 and the buffer element 12.

[0031] FIG 6 illustrates a schematic sectional side view of the composite spacer element 10 and buffer element 12 according to the second embodiment of the present

invention. The shaft 18 of the buffer element 12 penetrates through the flange 16 and in the base part 14 of said spacer element 10. The base part 14 has two different inner diameters, wherein the shaft 18 of the buffer element 12 penetrates in that portion of the base part 14 with the bigger inner diameter. The smaller inner diameter of the base part 14 is provided for the shaft of the screw 28, while the bigger inner diameter of the base part 14 is provided for receiving the head of said screw 28.

[0032] FIG 7 illustrates a schematic side view of the spacer element 10 and buffer element 12 according to a third embodiment of the present invention. The spacer element 10 includes the base part 14 and the flange 16, wherein the base part 14 is formed as the pipe section and the flange 16 is arranged at one end of said base part 14. Further, the spacer element 10 and the buffer element 12 are connected by the hinge element 22, wherein said hinge element 22 extends between the circumferential side of the flange 16 of the spacer element 10 and the circumferential side of the head piece 20 of the buffer element 12. The buffer element 12 includes only the head piece 20 of the mushroom, but not the shaft 18. Preferably, the spacer element 10 is a moulded plastic part, while the buffer element 12 is made of elastic material, e.g. rubber. The hinge element 22 may be made of plastics. The hinge element 22 allows a permanent connection between the spacer element 10 and the corresponding buffer element 12. The hinge element 22 is not removable from the spacer element 10 and the buffer element 12.

[0033] FIG 8 illustrates a schematic perspective view of the spacer element 10 and buffer element 12 according to the third embodiment of the present invention. Moreover, the buffer element 12 includes an appendix 24, while the flange 16 of the spacer element 10 includes a recess 26. Said recess 26 is provided for receiving the appendix 24, when the buffer element 12 is aligned at the flange 16 of the spacer element 10. The appendix 24 and the recess 26 are arranged opposite to the hinge element 22. The appendix 24, the recess 26 and the hinge element 22 provide a strong connection between the spacer element 10 and the buffer element 12.

[0034] FIG 9 illustrates a schematic sectional side view of the composite spacer element 10 and buffer element 12 according to the third embodiment of the present invention. In FIG 9 the buffer element 12 is aligned at the flange 16 of the spacer element 10, wherein the appendix 24 of the buffer element 12 is received by the recess 26 of the spacer element 10.

[0035] The present invention combines the spacer element 10 and the buffer element 12 to one unit. The gap between the spacer element 10 and the door is filled with elastic material, i.e. the buffer element 12. The buffer element 12 can be clipped and pressed into the spacer element 10. Either the buffer element 12 is a separate part or connected to the spacer element 10 by the hinge element 22. Alternatively, the buffer element 12 is shaped as the head piece 20 and may open and close the spacer

element 10.

[0036] When the domestic appliance is delivered to the customer, then the buffer element 12 has to be removed by the customer or the service, so that the domestic appliance can be fixed to a furniture 30 by the screw 28. Then, the buffer element 12 is inserted into the spacer element 10 again. The friction between the spacer element 10 and the buffer element 12 keeps said buffer element 12 in position. Alternatively, the buffer element 12 may be fixed by a small clip element. Preferably, said clip element is made of the same elastic material as the buffer element 12.

[0037] For example, the clip element bears the buffer element 12 by friction.

[0038] FIG 10 illustrates a schematic sectional side view of the spacer element 10 and buffer element 12 according to the prior art. The spacer element 10 is fixed at the furniture 30 by the screw 28. The spacer element 10 includes the base part 14 and the flange 16. The base part 14 is formed as the pipe section having two different inner diameters. The smaller inner diameter is penetrated by the shaft of the screw 28, while the head of said screw 28 is arranged within the bigger inner diameter of the base part 14. The base part 14 of the spacer element 10 penetrates the hole of the front frame 32. The flange 16 of the spacer element 10 is aligned at the outer side of said front frame 32. The outer side of the front frame 32 is opposite to the furniture 30. The buffer element 12 has the shape of the mushroom and includes the shaft 18 and the head piece 20. The shaft 18 of the buffer element 12 penetrates a further hole in the front frame 32. The head piece 20 of the buffer element 12 is aligned at the outer side of the front frame 32. The head piece 20 of the buffer element 12 is provided for supporting an inner panel 34 of the door in the closed state. However, when the door is opened, then the screw 28 is visible. Further, the spacer element 10 and the buffer element 12 are separate parts in different positions. The separate spacer element 10 and the buffer element 12 are more complex.

[0039] Although illustrative embodiments of the present invention have been described herein with reference to the accompanying drawings, it is to be understood that the present invention is not limited to those precise embodiments, and that various other changes and modifications may be affected therein by one skilled in the art without departing from the scope or spirit of the invention. All such changes and modifications are intended to be included within the scope of the invention as defined by the appended claims.

List of reference numerals

[0040]

10	spacer element
12	buffer element
14	base part
16	flange

- 18 shaft
- 20 head piece
- 22 hinge element
- 24 appendix
- 26 recess
- 28 screw
- 30 furniture
- 32 front frame
- 34 inner glass panel

Claims

1. A set of a spacer element (10) and a buffer element (12) for a domestic appliance, wherein:
 - the spacer element (10) includes a base part (14) and a flange (16),
 - the buffer element (12) includes a head piece (20) and at least one prolongation (18; 24), and
 - the spacer element (10) includes at least one recess (16; 26) for receiving a complementary prolongation (18; 24) of the buffer element (12), so that
 - the head piece (20) of the buffer element (12) can be aligned to the flange (16) of the spacer element (10).

2. The set according to claim 1, **characterised in that** the spacer element (10) is a moulded plastic part.

3. The set according to claim 1 or 2, **characterised in that** the buffer element (12) is made of at least one elastic material, preferably rubber.

4. The set according to any one of the preceding claims, **characterised in that** the base part (14) of the spacer element (10) is a pipe section, wherein preferably said pipe section includes one outer diameter and two different inner diameters.

5. The set according to any one of the preceding claims, **characterised in that** a bigger inner diameter of the base part (14) is arranged beside the flange (16), while a smaller inner diameter of said base part (14) is arranged opposite to the flange (16).

6. The set according to claim 4 or 5, **characterised in that** a portion of the bigger inner diameter of the base part (14) is provided for receiving a head of a screw (28), while a portion of the smaller inner diameter of the base part (14) is provided for receiving a shaft of said screw (28).

7. The set according to any one of the preceding claims, **characterised in that** the spacer element (10) and the buffer element (12) are connected by at least one hinge element (22).

8. The set according to any one of the preceding claims, **characterised in that** the buffer element (12) has the shape of a mushroom and includes the head piece (20) and a shaft (18), wherein said shaft (18) is inserted in or insertable into the spacer element (10).

9. The set according to any one of the preceding claims, **characterised in that** the shaft (18) is inserted or insertable through the flange (16) of the spacer element (10).

10. The set according to any one of the preceding claims, **characterised in that** the shaft (18) is inserted in or insertable into the base part (14) of the spacer element (10).

11. The set according to any one of the claims 1 to 7, **characterised in that** the head piece (20) includes at least one appendix (24), while the flange (16) includes at least one recess (26) for receiving said appendix (24).

12. The set according to claim 11, **characterised in that** the appendix (24) of the head piece (20) and the recess (26) of the flange (16) are arranged opposite to the hinge element (22).

13. A domestic appliance comprising at least one set according to any one of the preceding claims, **characterised in that** the spacer element (10) is provided for supporting a front frame (32) of said domestic appliance.

14. The domestic appliance according to claim 13, **characterised in that** the buffer element (12) is provided for keeping a distance between the front frame (32) and a door (34) of the domestic appliance.

15. The domestic appliance according to claim 13 or 14, **characterised in that** the spacer element (10) is fixed or fixable to a furniture (30) by at least one screw (28).

FIG 1

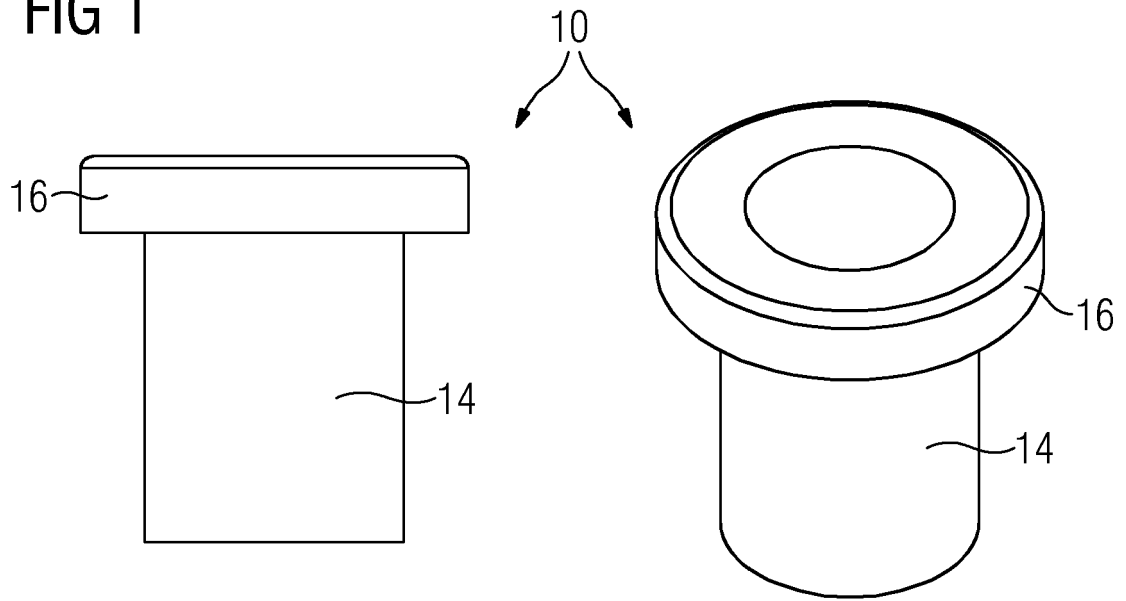


FIG 2

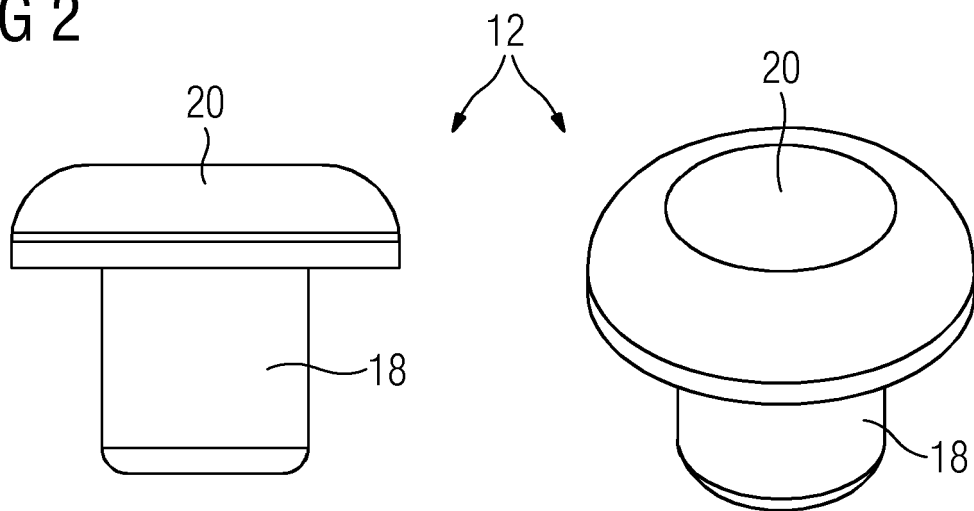


FIG 3

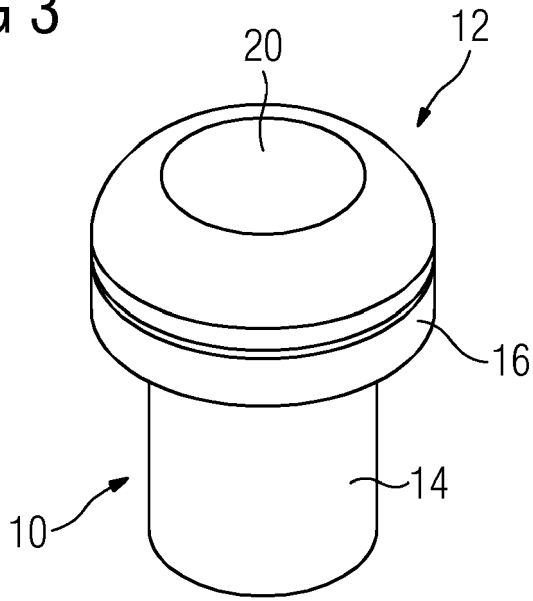


FIG 4

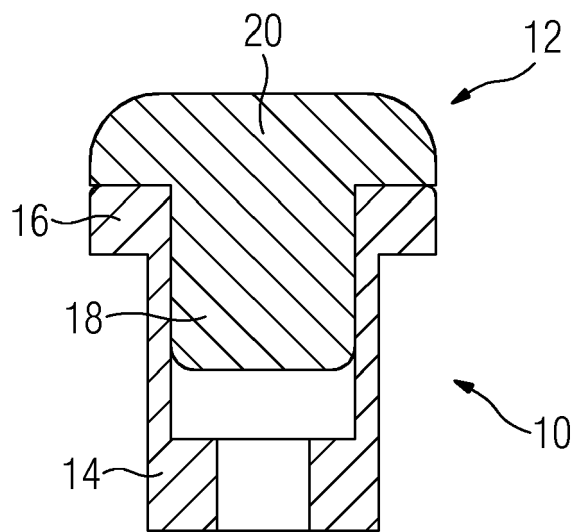


FIG 5

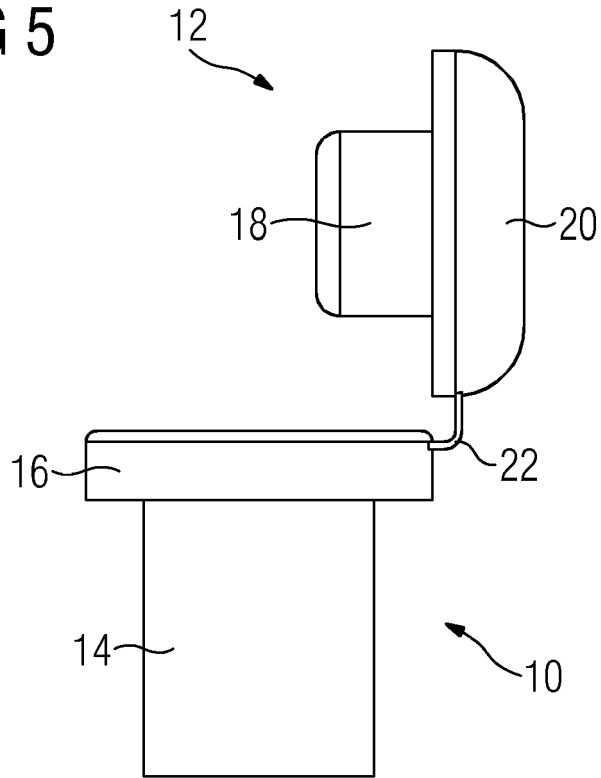


FIG 6

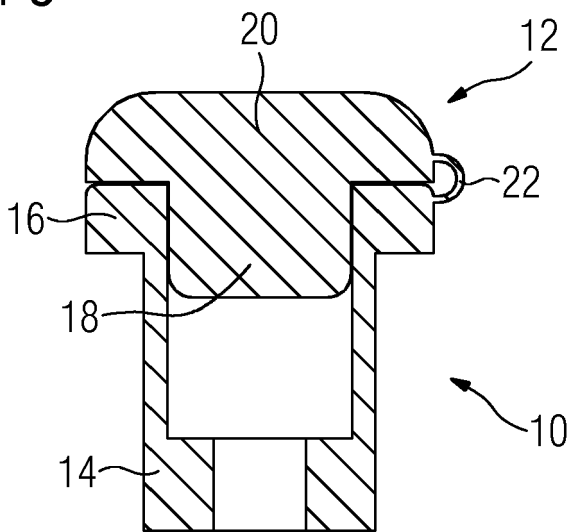


FIG 7

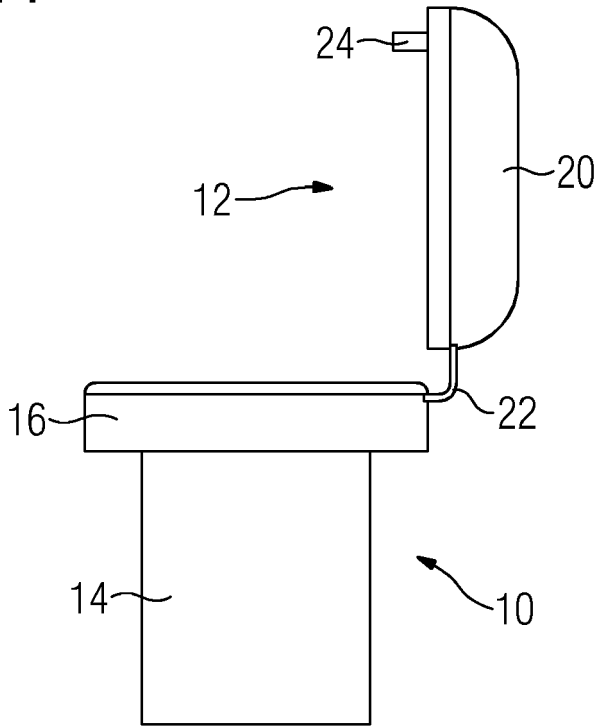


FIG 8

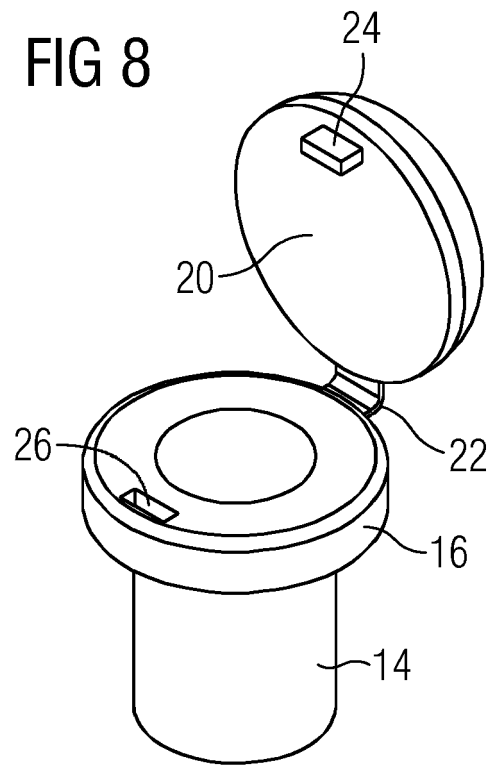


FIG 9

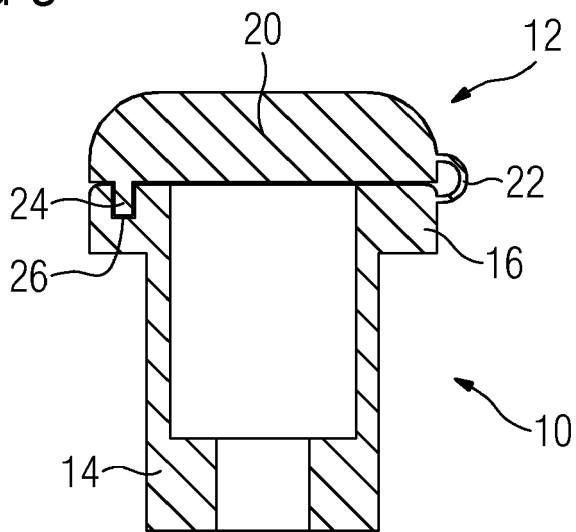
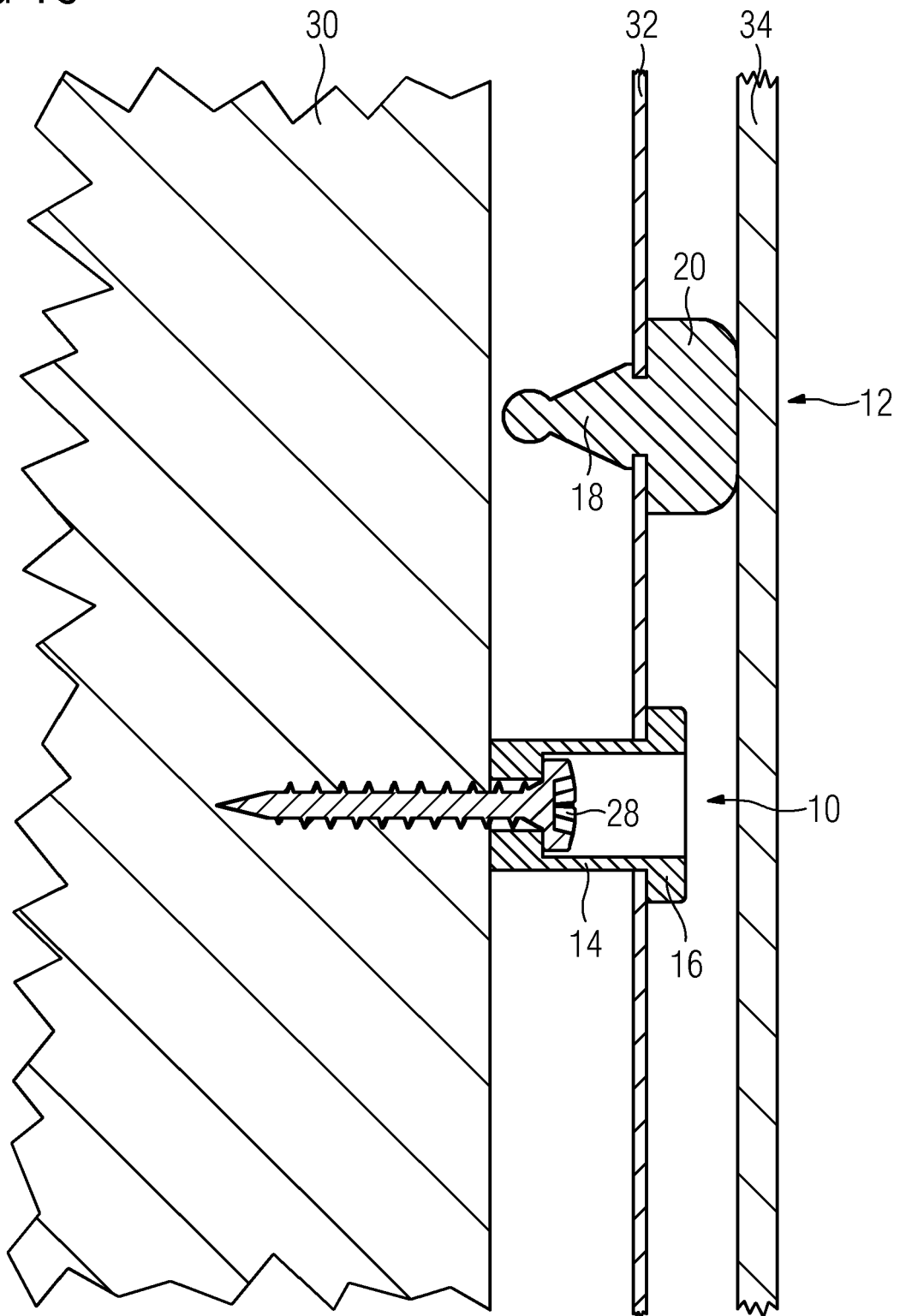


FIG 10





EUROPEAN SEARCH REPORT

Application Number
EP 18 17 5877

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DOCUMENTS CONSIDERED TO BE RELEVANT			
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Y	* paragraphs [0027], [0061]; figures 1,5 *	6,13-15	
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			TECHNICAL FIELDS SEARCHED (IPC)
			F24C E05G E05F F25D A47L D06F
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		11 December 2018	Rodriguez, Alexander
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 18 17 5877

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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