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(54) **Removable device for opening and closing sanitary fittings outlets**

(57) A removable device for opening and closing sanitary fitting outlets comprises a plug element including an opening and closing mechanism and provided for coupling to a drain assembly rigid with a sanitary fitting outlet hole.

Said plug element and opening and closing mechanism being coupled to the drain assembly through a coupling ring which allows the device to be easily assembled and removed, thereby allowing the outlet to be quickly cleaned and inspected.

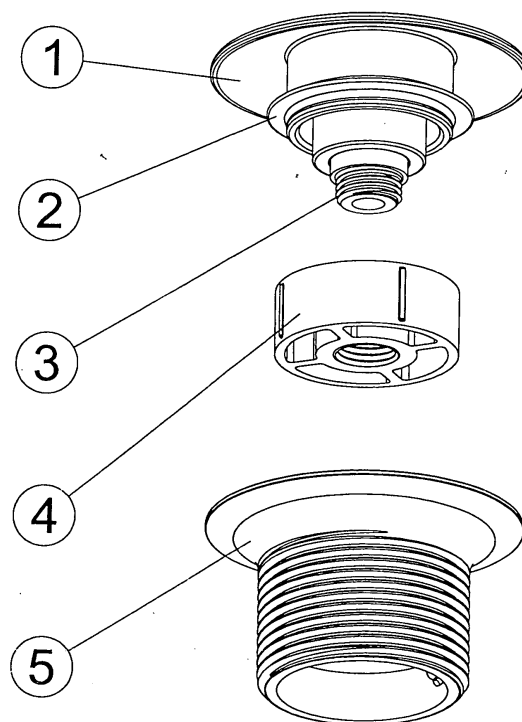


Fig. 1

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Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a removable device for opening and closing sanitary fitting outlets.

[0002] Plugs for washbasins, path tubs, bidets and so on, comprising a mushroom element which can be driven from outside by a lever system are already known.

[0003] Prior driving device for driving prior plugs are usually affected by the drawback that they require a perfect calibrating and a continuous adjustment since, because of corrosion phenomena, scales and other drawbacks, said plugs are not adapted to provide a perfect closure.

SUMMARY OF THE INVENTION

[0004] Accordingly, the aim of the present invention is to provide a device for opening and closing a plug for sanitary fittings, which is improved with respect to prior like devices.

[0005] Within the scope of the above mentioned aim, a main object of the present invention is to provide such device for opening and closing a plug for sanitary fittings which can be easily and quickly operated and which, moreover, does not require complex and unaesthetic linking systems.

[0006] Yet another object of the present invention is to provide such a device which can be easily applied to existing sanitary fittings.

[0007] Yet another object of the present invention is to provide such a device which is operatively very efficient, without requiring maintenance or servicing operations.

[0008] Yet another object of the present invention is to provide such a device for opening and closing sanitary fitting outlets, which can be easily assembled and removed and which, accordingly, allows the sanitary fitting outlet to be quickly and easily cleaned and serviced-inspected.

[0009] According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a removable device for opening and closing sanitary fitting outlets, comprising a plug including an opening and closing mechanism and adapted to be connected to a drain assembly rigid with an outlet hole of a sanitary fitting, characterized in that said plug and opening and closing mechanism are coupled to said drain assembly by a coupling ring.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] Further characteristics and advantages of the present invention will become more apparent hereinafter from the following detailed disclosure of a preferred, though not exclusive, embodiment of the invention

which is illustrated, by way of an indicative, but not limitative, example in the accompanying drawings, where:

Figure 1 is an exploded perspective view of the closing and opening device according to the present invention;

Figure 2 is a further perspective view of that same closing and opening device, being shown in an assembled condition thereof;

Figure 3 is a cross-sectioned elevation view of the device and an outlet, with a related drain assembly, to which said device can be applied;

Figure 4 is a partially cross-sectioned elevation view illustrating the subject device applied to the outlet and in a closure or closing position thereof;

Figure 5 is a partially cross-sectioned elevation view illustrating the subject device applied to the outlet and in an opening position thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0011] With reference to the number references of the above mentioned figures, the device according to the present invention comprises a plug 1, on which a gasket 2 is assembled, and a ring 4, to be affixed to the thread 3 of the plug opening and closing mechanism.

[0012] The ring 4 operates as a filter and seat for arranging the mechanism on the drain assembly 5.

[0013] In particular, the mechanism can be arranged in the drain assembly by merely causing it to bear on said drain assembly, without other operations.

[0014] Likewise, for removing the opening and closing mechanism, it is sufficient to raise it.

[0015] More specifically, the opening and closing mechanism can be made of any types of opening and closing mechanism, for example of the type constituting the subject matter of another patent application in the name of the same Applicant and comprising a movable part designed for connecting to the plug and slidably engaged with a fixed part which, in turn, can be assembled on the drain assembly associated with the outlet.

[0016] More particularly, said opening and closing mechanism comprises means which can be rotatively and translatorily displaced, operating against a respective elastic means, thereby allowing the plug to be displaced from an open or raised position to a closed or lowered position, by pressing on said plug.

[0017] The ring 4, allowing the opening and closing mechanism to be coupled to the drain assembly, comprises radially extending fins, and a water passage free region; the drain assembly 5, in turn, comprising a seat or recess for housing the device therein.

[0018] The device according to the present invention operates as thereinbelow disclosed.

[0019] The drain assembly 5 is assembled on the outlet hole of a sanitary fitting 6, and the subject device is arranged in said drain assembly 5.

[0020] At a closure position, as shown in figure 4, the

device has its gasket 2 in contact with the frustum of cone shaped wall of the drain assembly 5 thereby preventing water from flowing therethrough.

[0021] By pressing on the plug, said gasket 2 will be brought to a raised position.

[0022] In particular, said gasket will be disengaged from the drain assembly thereby allowing water A to pass therethrough and being discharged, as is clearly shown in figure 5.

[0023] The device can be easily removed for cleaning it and for inspecting the outlet, if desired or required.

[0024] It has been found that the invention fully achieves the intended aim and objects.

[0025] In fact, the invention provides a device for opening and closing sanitary fitting outlets, which can be easily assembled and removed, thereby allowing it to be quickly cleaned.

[0026] In practicing the invention, the used materials, as well as the contingent size and shapes, can be any, according to requirements and the status of the art.

Claims

1. A removable device for opening and closing an outlet of a sanitary fitting, comprising a plug including an opening and closing mechanism and adapted to be coupled to a drain assembly rigid with an outlet hole of a sanitary fitting, **characterized in that** said plug and opening and closing mechanism are coupled to said drain assembly by a coupling ring.
2. A device, according to claim 1, **characterized in that** a sealing gasket is assembled on said plug.
3. A device, according to claim 1 or 2, **characterized in that** said coupling ring is fixed to a thread included in the opening and closing mechanism, and is adapted to operate as a filter and a locating recess for arranging said opening and closing mechanism on said drain assembly.
4. A device, according to one or more of the preceding claims, **characterized in that** said device is arranged into said drain assembly by merely bearing said device on said drain assembly, without other coupling operations, and, likewise, said opening and closing mechanism being adapted to be removed by merely raising it.
5. A device, according to one or more of the preceding claims, **characterized in that** said opening and closing mechanism comprises a movable part, to be coupled to said plug and slidably engaging with a fixed part, in turn adapted to be mounted on said drain assembly associated with the outlet, said opening and closing mechanism comprising more-over means adapted to be driven with a rotary-

translatory movement and operating against an elastic means thereby allowing said plug to be displaced from an open position, or raised position thereof, to a closed or lowered position thereof, by pressing on said plug.

6. A device, according to one or more of the preceding claims, **characterized in that** said coupling ring comprises radially extending fins and a free region for allowing water to pass therethrough, said drain assembly including a seat for housing said device therein.
7. A device, according to one or more of the preceding claims, **characterized in that** said drain assembly is adapted to be mounted on an outlet hole of a sanitary fitting and said device being arranged in said drain assembly; in a closure or closing position thereof, said device having its gasket contacting a frustum of cone shaped wall of said drain assembly and preventing water from passing therethrough; by pressing on said plug, said gasket being raised thereby said gasket is disengaged from said drain assembly to allow water to pass therethrough and to be discharged therefrom.
8. A device, according to one or more of the preceding claims, **characterized in that** said device is adapted to be easily removed to clean it and to inspect the outlet thereof.
9. A device, according to one or more of the preceding claims, **characterized in that** said device comprises one or more of the disclosed and/or illustrated characteristics.

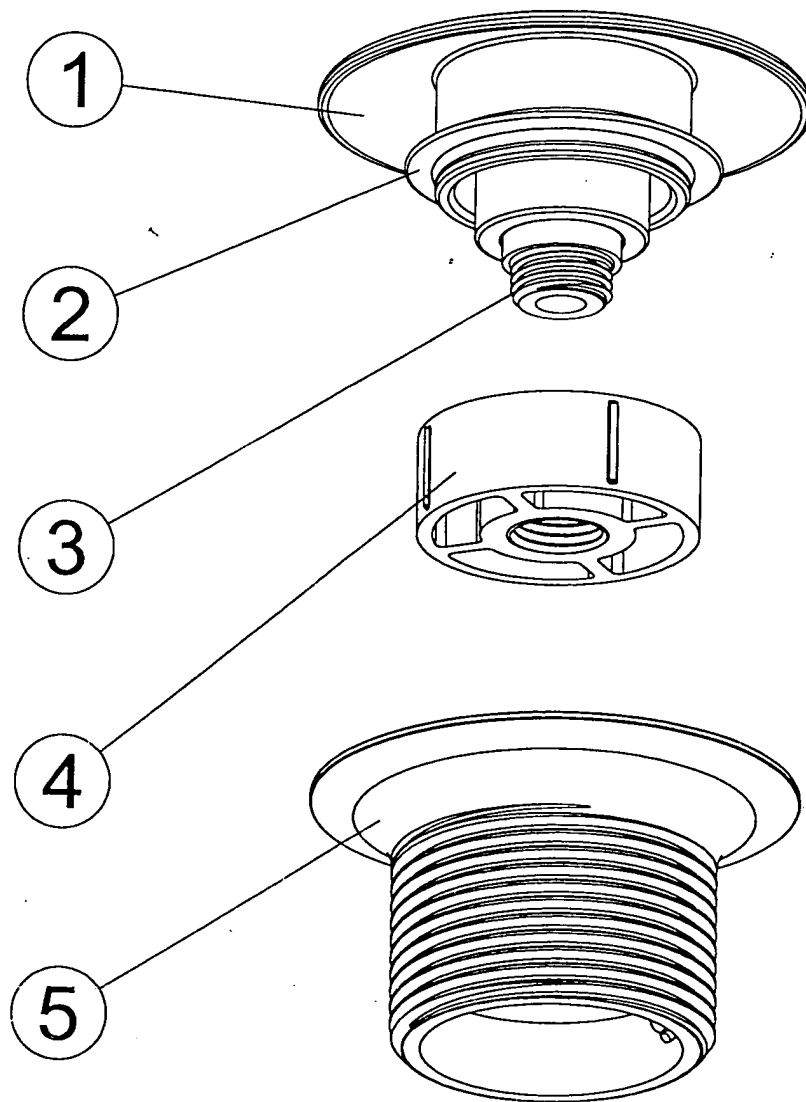


Fig. 1

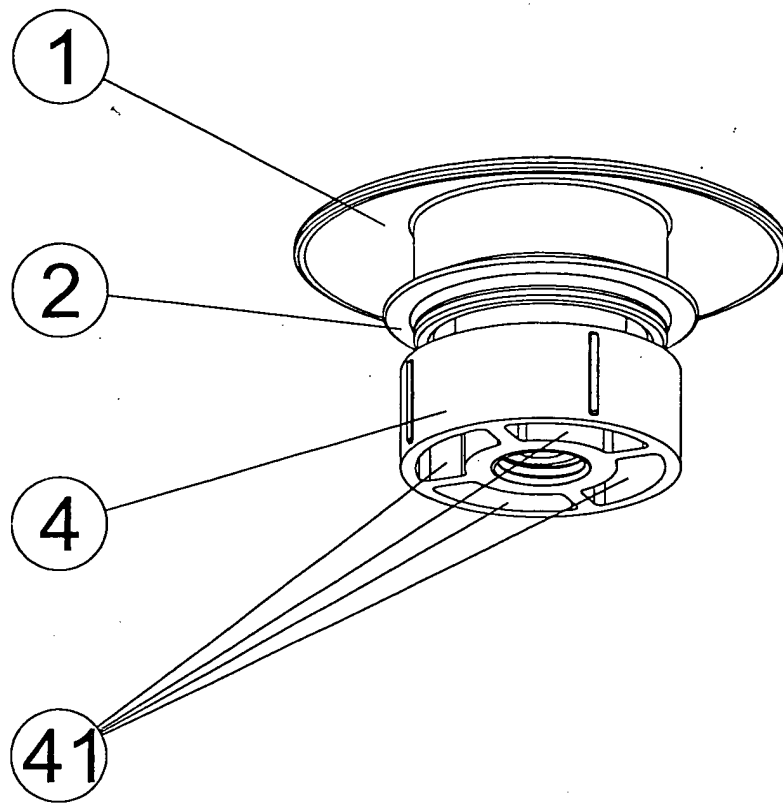


Fig. 2

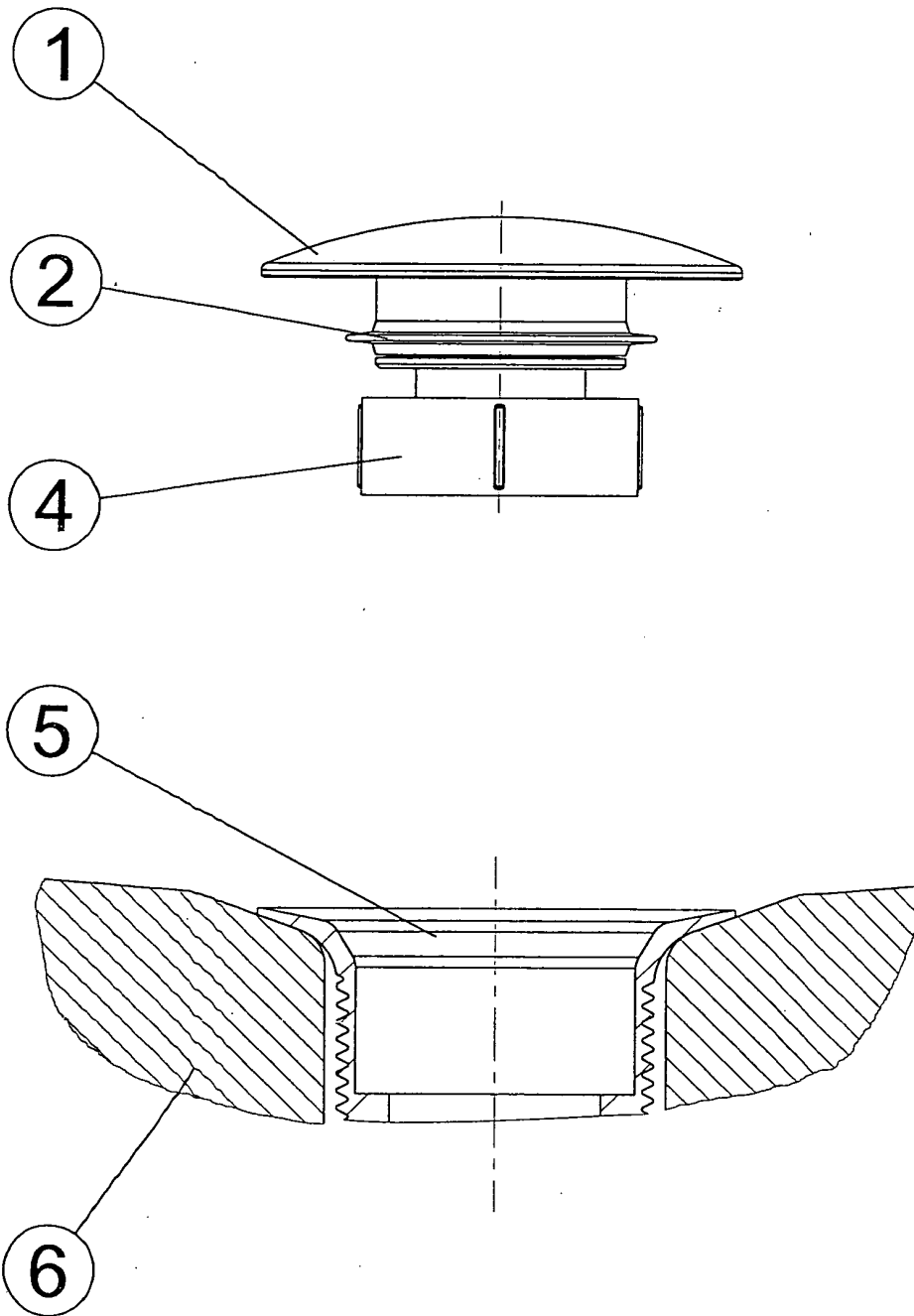


Fig. 3

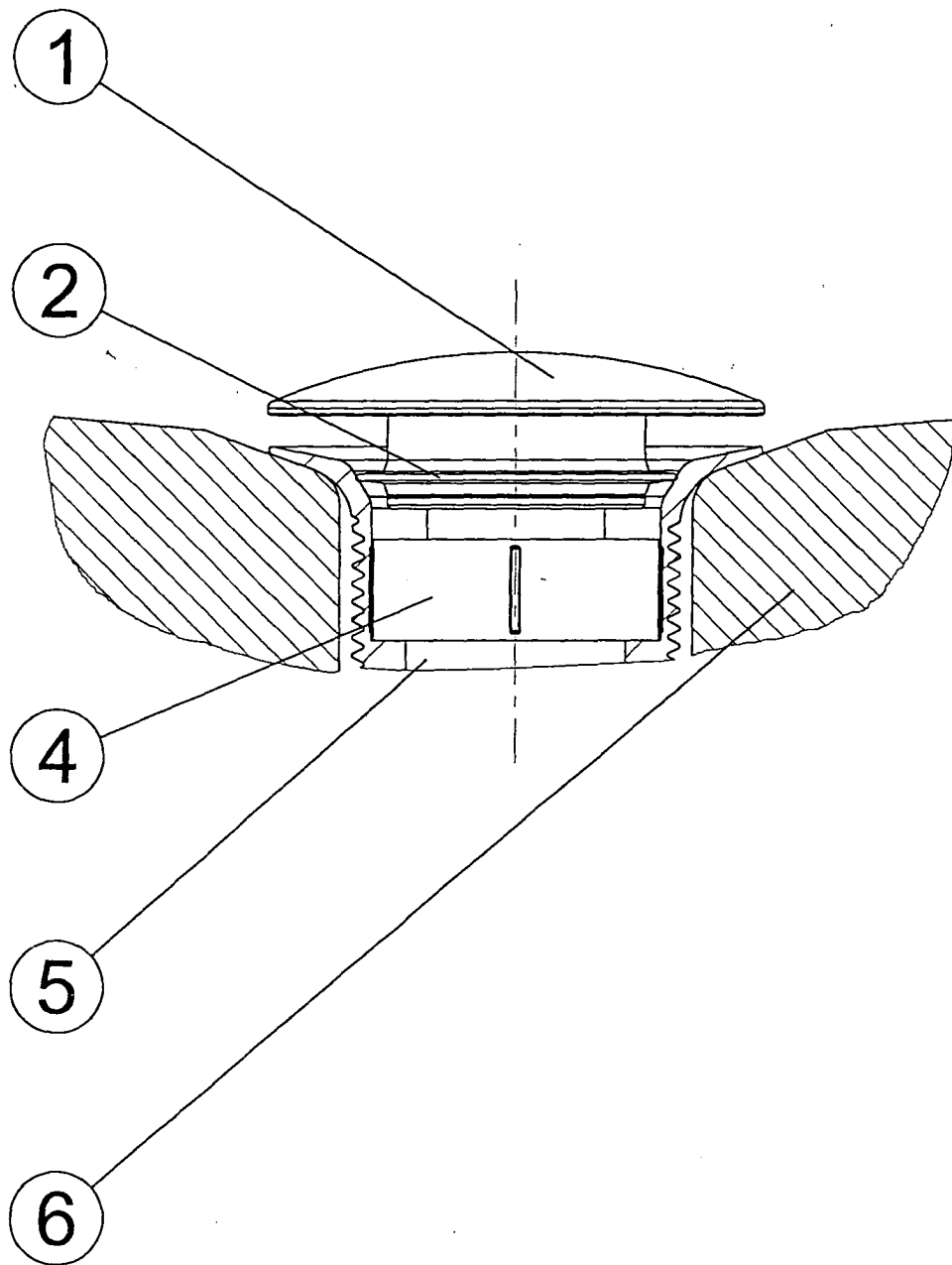


Fig. 4

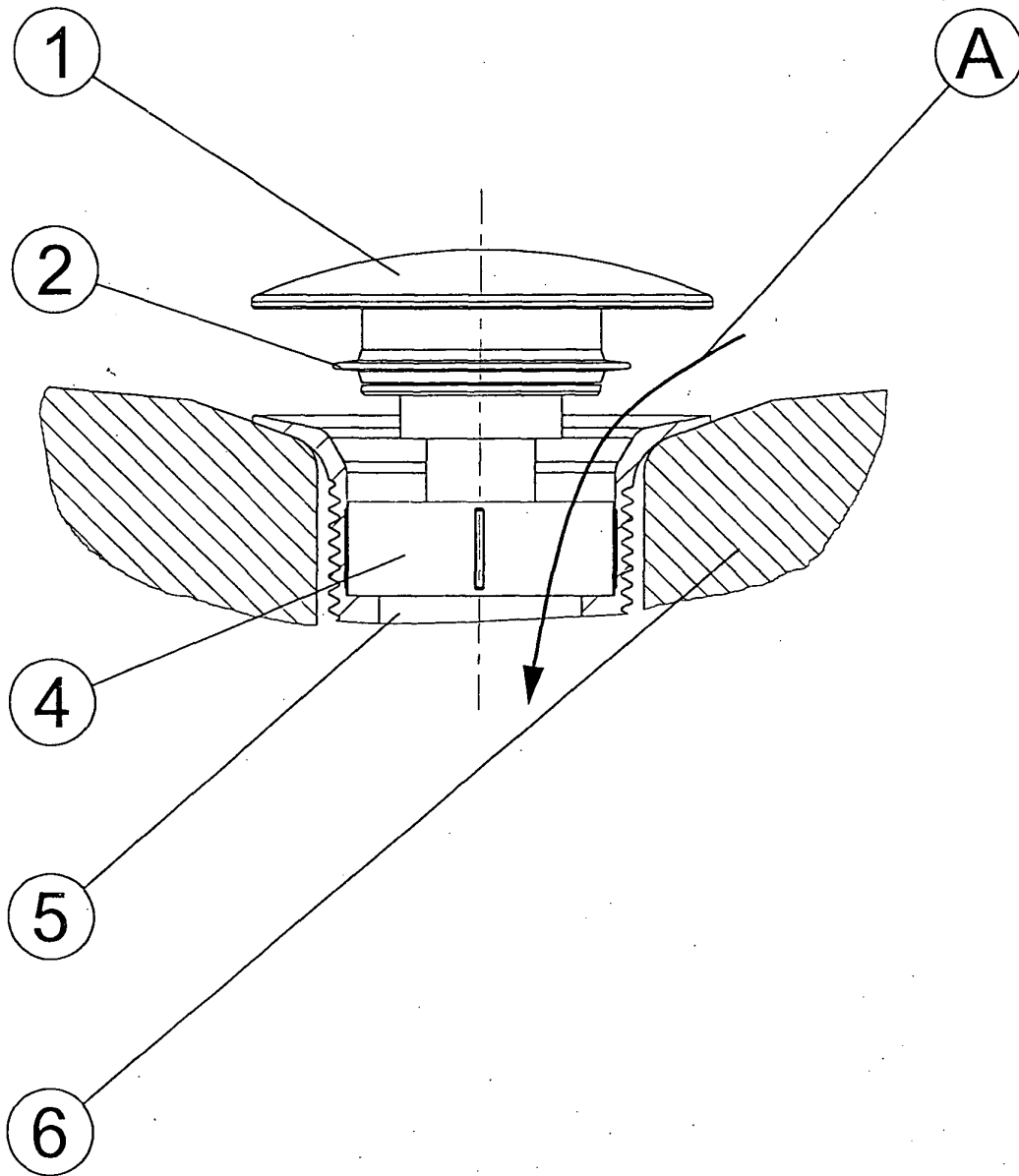


Fig. 5



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 04 02 1215

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 15 November 2004	Examiner Isailovski, M
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 (03.82) (P04001)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 04 02 1215

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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