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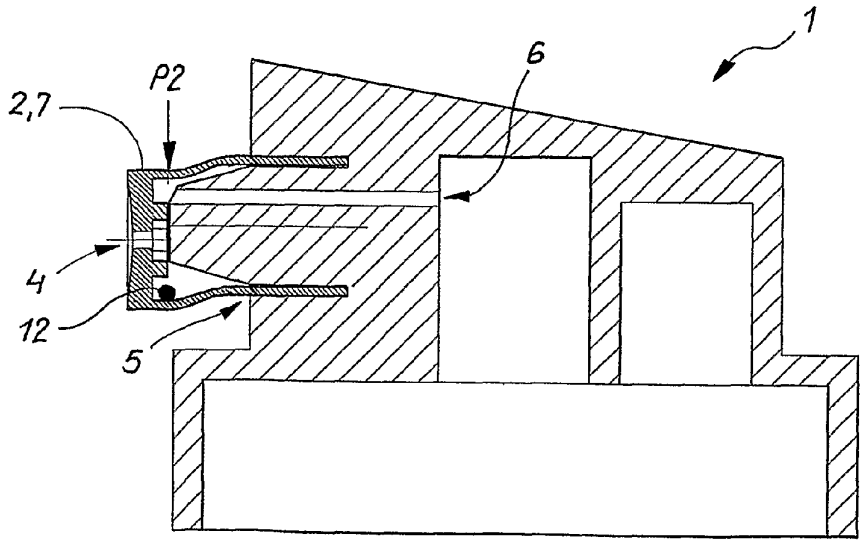
(54) Title: SPRAY HEAD WITH A FLEXIBLE NOZZLE INSERT



(57) Abstract: A spray head (1) with a nozzle insert (2) for atomizing a fluid, which tends to gum up or harden, from a reservoir, wherein the nozzle insert (2) is substantially designed as a hollow cylinder that is open on one side and has, on the other side, a nozzle opening (4) towards the outside, and the nozzle insert (2) is connected to a nozzle insert receptacle (5) , which has a channel (6) for the fluid, wherein the channel (6) corresponds to the nozzle opening (4). The nozzle insert (2) consists of an elastic material (7) and, in this manner, is connected to the nozzle insert receptacle (5) so that an external, free section of the nozzle insert (2) along with the nozzle opening (4) is at least partially manually compressible and/or is designed to be manually bendable from its standby position, whereby hardened resin residue (12) can be removed from the nozzle opening (4).

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

SPRAY HEAD WITH A FLEXIBLE NOZZLE INSERT

The invention relates to a spray head with a nozzle insert for atomizing a fluid, which tends to gum up or harden, from a reservoir, wherein the nozzle insert is substantially designed as a hollow cylinder that is open on one side and has, on the other side, a nozzle opening towards the outside, and the nozzle insert is connected to a nozzle insert receptacle, which has a channel for the fluid, wherein the channel corresponds to the nozzle opening.

Normal hair spray nozzles tend to gum up or harden with formulations for strong hair setting; this problem normally cannot be corrected by the user.

A reference herein to a patent document or other matter which is given as prior art is not to be taken as an admission that that document or matter was known or that the information it contains was part of the common general knowledge as at the priority date of any of the claims.

Throughout the description and claims of the specification, the word "comprise" and variations of the word, such as "comprising" and "comprises", is not intended to exclude other additives, components, integers or steps.

Thus, an aspect of the invention is to obtain a spray head with a nozzle with which it is easy to correct the gumming up/hardening of the nozzle via simple design measures while still maintaining the spray properties.

In one aspect, the present invention provides a spray head with a nozzle insert to atomize a fluid which is a hair-setting agent, from a reservoir, wherein the nozzle insert is substantially designed as a hollow cylinder open on one side and has, on the other side, a nozzle opening directed outwards, and the nozzle insert is connected to a nozzle insert receptacle, which has a channel for the fluid, wherein the channel corresponds to the nozzle opening, wherein the nozzle insert consists of an elastic material and, in this manner, is connected to the nozzle insert receptacle so that an external, free section of the nozzle insert along with the nozzle opening is at least partially manually compressible and/or is designed to be manually bendable from its standby position, wherein the nozzle insert receptacle has a protruding taper on the exterior, wherein the nozzle opening is placed

on one end of the protruding taper, wherein the nozzle insert defines an inflow chamber between the protruding taper and the free section and wherein the nozzle insert can communicate with the inflow chamber when the free section is compressed and/or bent.

In another aspect, the present invention provides a spray head with a nozzle insert to atomize a fluid which is a hair-setting agent, from a reservoir, wherein the nozzle insert is substantially designed as a hollow cylinder open on one side and has, on the other side, a nozzle opening directed outwards, and the nozzle insert is connected to a nozzle insert receptacle, which has a channel for the fluid, wherein the channel corresponds to the nozzle opening, wherein the nozzle insert consists of an elastic material and, in this manner, is connected to the nozzle insert receptacle so that an external, free section of the nozzle insert along with the nozzle opening is at least partially manually compressible and/or is designed to be manually bendable from its standby position, wherein the nozzle insert receptacle has a protruding taper on the exterior, wherein the nozzle opening is placed to one end of the protruding taper with a space, wherein the nozzle insert defines an inflow chamber between the protruding taper and the free section , and wherein the space between the nozzle insert and the one end of the protruding taper is expandable when the free section is compressed and/or bent.

An aspect of the invention is achieved in that the nozzle insert consists of an elastic material and, in this manner, is connected to the nozzle insert receptacle so that an external, free section of the nozzle insert along with the nozzle opening is at least partially manually compressible and/or is designed to be manually bendable from its standby position.

If the nozzle is gummed up with resin, then the user can remove the hard resin residue from the soft nozzle by lightly deforming the nozzle, and the function will then be restored to the nozzle.

The invention is explained in more detail by means of two exemplary embodiments.

The following is shown:

Fig. 1 shows a sectional side view of a spray head with a nozzle insert as a first exemplary embodiment, wherein the nozzle insert is in the standby position;

Fig. 2 shows a sectional side view of the exemplary embodiment according to Fig. 1, wherein the nozzle insert can be bent or moved by the application of force;

Fig. 3 shows a top view of the spray head according to Fig. 1;

Fig. 4 shows section IV-IV of the nozzle insert according to Fig. 1;

Fig. 5 shows a sectional side view of a spray head with a nozzle insert as a second exemplary embodiment, wherein the nozzle insert is in the standby position; and

Fig. 6 shows a sectional side view of the exemplary embodiment according to Fig. 5, wherein the nozzle insert can be bent or moved by the application of force.

Fig. 1 shows a spray head 1 with a nozzle insert 2 to atomize a fluid, which tends to gum up/harden, from a reservoir, wherein the nozzle insert 2 is substantially designed as a hollow cylinder 3 open on one side and has, on the other side, a nozzle opening 4 directed outwards. The nozzle insert 2 is connected, in a fluid-impermeable manner, to a nozzle insert receptacle 5, which has a channel 6 for the fluid, wherein the channel 6 corresponds to the nozzle opening 4. The nozzle insert 2 consists of an elastic material 7 manufactured as a single injection molded part and, in this manner, is connected to the nozzle insert receptacle 5 so that an external, free section 8 of the nozzle insert 2 along with the nozzle opening 4 is at least partially manually compressible and/or is designed to be manually bendable from its standby position R. The nozzle insert receptacle 5 has a protruding taper 9 on the outside, whereby the external, free section 8 of the nozzle insert 2 along with the nozzle opening 4 is at least partially manually compressible and/or is designed to be manually bendable from its standby position R via the application of force P2. Fig. 2 illustrates this condition. By manually compressing and/or bending the free section 8 of the

nozzle insert 2 or by slightly deforming the nozzle opening 4, the user can remove the resin residue 12 from the soft nozzle opening 4, with which the function is restored to the nozzle insert 2. The resin residue 12 that is removed either escapes from the nozzle opening 4 towards the outside or it falls into an inflow chamber 13 and thus is harmless.

The nozzle opening 4 has a swirl chamber 10, which is positioned on one end 11 of the protruding taper 9.

Fig. 3 shows a top view of the spray head 1 according to Fig. 1, wherein a manual compression of the external, free section 8 or of the nozzle opening 4 is induced by the application of force (arrows P3, P4).

Fig. 4 shows section IV-IV, which is the nozzle insert 2 according to Fig. 1. The swirl chamber 10 consists of four swirl channels 16.

Fig. 5 shows a sectional side view of a spray head 1 with a nozzle insert 2 as a second exemplary embodiment, wherein the nozzle insert 2 is in the standby position. The nozzle opening 4 has a swirl chamber 10, which is arranged with a thin distance A to one end 11 of the protruding taper 9. This enables an even stronger manual compression and/or bending (application of force P5 / Fig. 6) of the free section 8, which, in turn, facilitates even better removal or loosening of hard resin residue 12 from the nozzle opening 4 or from the swirl chamber 10.

Fig. 6 shows a sectional side view of the exemplary embodiment according to Fig. 5, wherein the nozzle insert 2 can be bent or moved by the application of force (arrow P5).

Pressure buildup to atomize a fluid can occur, for example, using pressurized gas packaging 14 indicated by the dotted outline 14 (Fig. 1) or using a displacement pump 15 indicated by the dotted line (Fig. 1), wherein atomization is activated via manual pressure (arrow P1/Fig. 1) applied to the spray head 1.

A hair-setting agent is used as the fluid.

The use of the spray head 1 has proven to be especially advantageous because the fluid that is used is a hair-setting agent (containing resin).

REFERENCE LIST

1	Spray head
2	Nozzle insert
3	Hollow cylinder
4	Nozzle opening
5	Nozzle insert receptacle
6	Channel
7	Elastic material
8	External, free section
9	Taper
10	Swirl chamber
11	End/Taper 9
12	Hard resin residue
13	Inflow chamber
14	Pressurized gas packaging
15	Displacement pump
16	Swirl channel
A	Distance
P1-5	Application of force
R	Standby position

The claims defining the invention are as follows:

1. A spray head with a nozzle insert to atomize a fluid which is a hair-setting agent, from a reservoir, wherein the nozzle insert is substantially designed as a hollow cylinder open on one side and has, on the other side, a nozzle opening directed outwards, and the nozzle insert is connected to a nozzle insert receptacle, which has a channel for the fluid, wherein the channel corresponds to the nozzle opening, wherein the nozzle insert consists of an elastic material and, in this manner, is connected to the nozzle insert receptacle so that an external, free section of the nozzle insert along with the nozzle opening is at least partially manually compressible and/or is designed to be manually bendable from its standby position, wherein the nozzle insert receptacle has a protruding taper on the exterior, wherein the nozzle opening is placed on one end of the protruding taper, wherein the nozzle insert defines an inflow chamber between the protruding taper and the free section, and
wherein the nozzle insert can communicate with the inflow chamber when the free section is compressed and/or bent.

2. A spray head with a nozzle insert to atomize a fluid which is a hair-setting agent, from a reservoir, wherein the nozzle insert is substantially designed as a hollow cylinder open on one side and has, on the other side, a nozzle opening directed outwards, and the nozzle insert is connected to a nozzle insert receptacle, which has a channel for the fluid, wherein the channel corresponds to the nozzle opening, wherein the nozzle insert consists of an elastic material and, in this manner, is connected to the nozzle insert receptacle so that an external, free section of the nozzle insert along with the nozzle opening is at least partially manually compressible and/or is designed to be manually bendable from its standby position,
wherein the nozzle insert receptacle has a protruding taper on the exterior, wherein the nozzle opening is placed to one end of the protruding taper with a space,
wherein the nozzle insert defines an inflow chamber between the protruding taper and the free section, and
wherein the space between the nozzle insert and the one end of the protruding taper is expandable when the free section is compressed and/or bent

3. The spray head according to Claim 1, wherein the nozzle opening has a swirl

chamber, which is placed on the one end of the protruding taper.

4. The spray head according to Claim 2, wherein the nozzle opening has a swirl chamber, which is arranged with a thin distance to the one end of the protruding taper.

5. The spray head according to any one of the preceding claims, substantially as hereinbefore described with reference to the Examples.

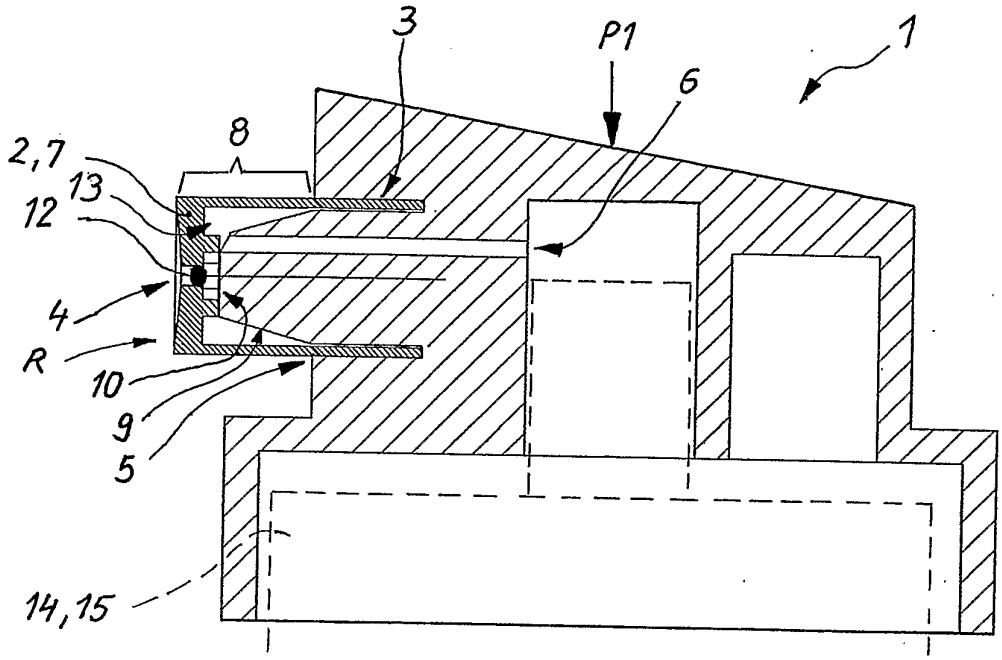

FIG. 1

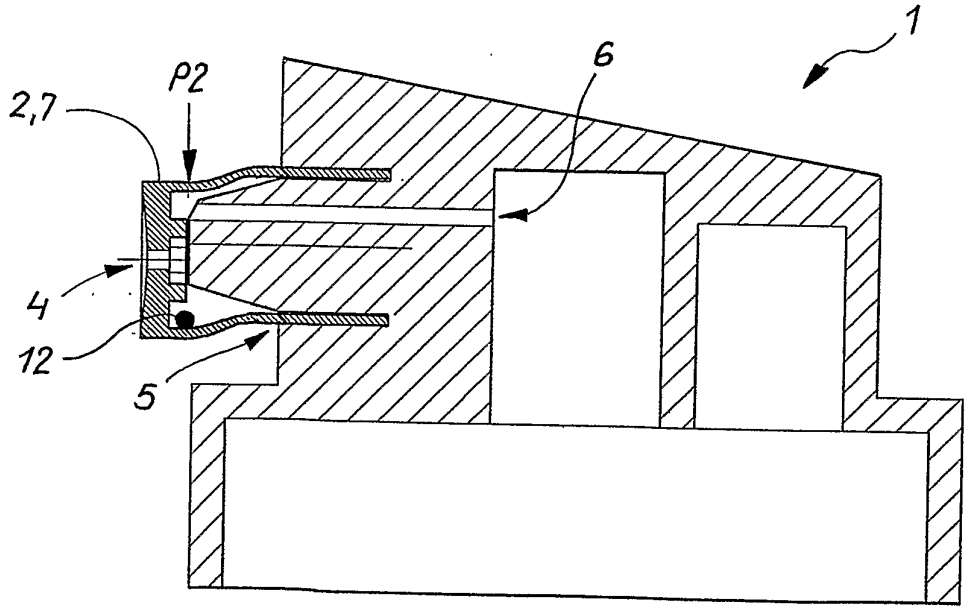

FIG. 2

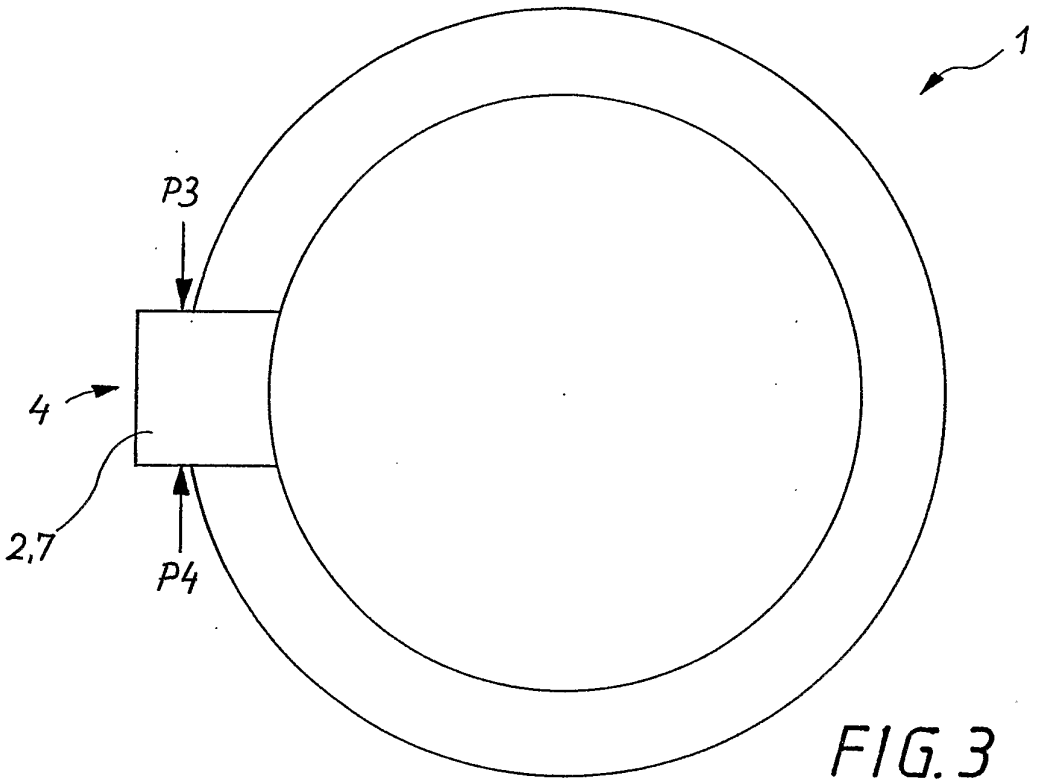

FIG. 3

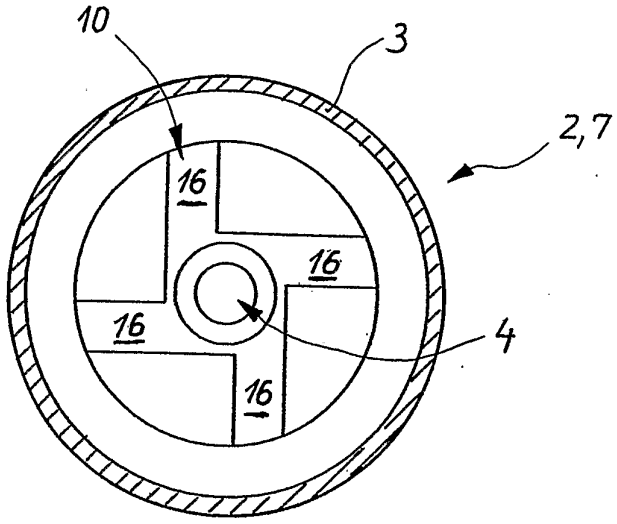

FIG. 4

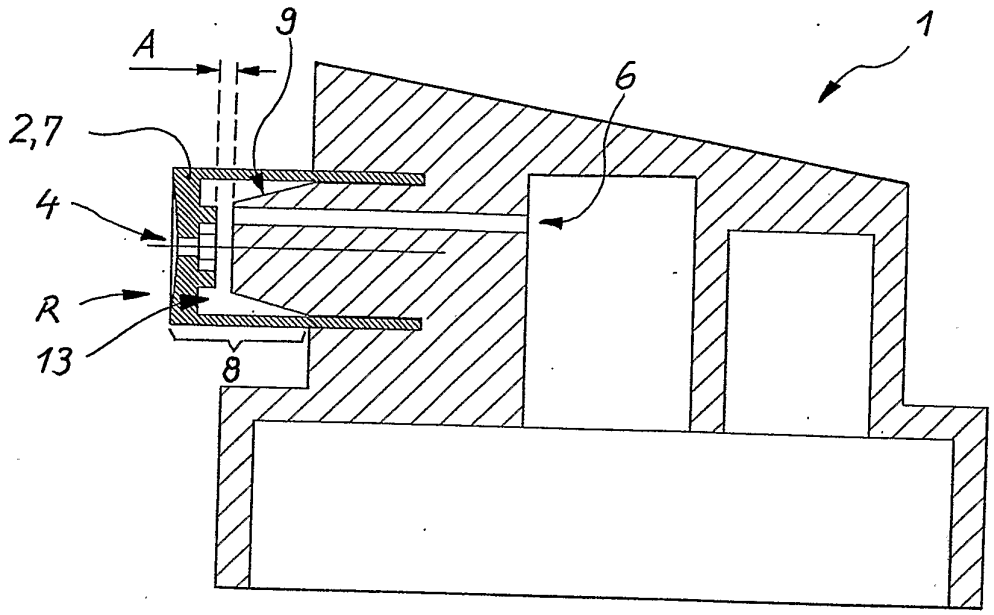

FIG. 5

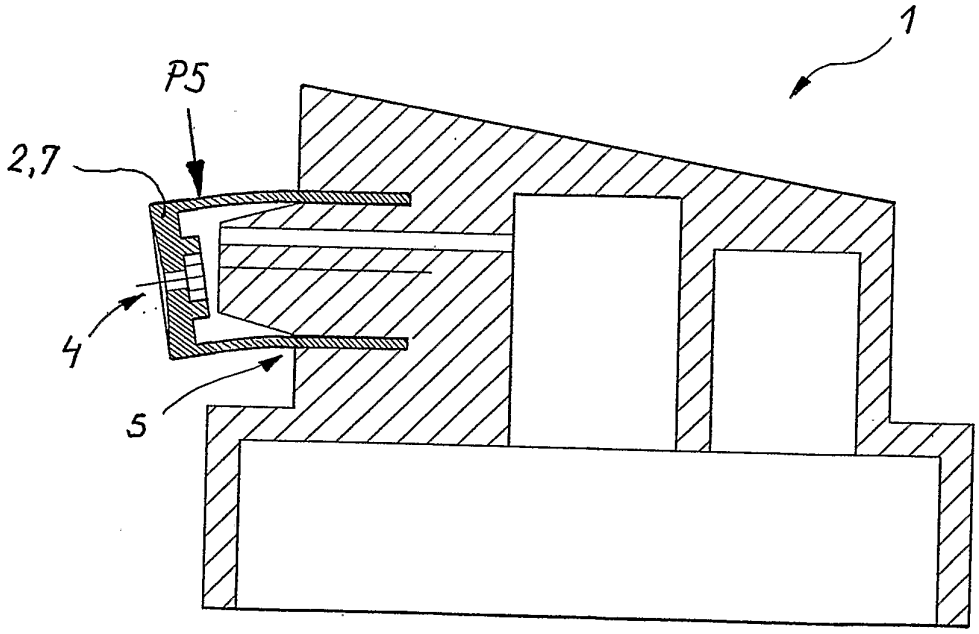

FIG. 6