(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 775 257 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
18.04.2007 Bulletin 2007/16

(51) Int Cl.:
B67D 1/06 *(2006.01)* ***B67D 1/08*** *(2006.01)*

(21) Application number: **06255297.1**

(22) Date of filing: **14.10.2006**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(30) Priority: **15.10.2005 GB 0521016**

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(54) Chilled beverage dispense apparatus with the formation of condensation on its outer surface

(57) Apparatus for dispensing a beverage such as beer comprises a body section (5) in the form of tube-in-tube assembly defining a chamber for circulating a coolant to form ice/condensation on an outer surface of the body section (5), and a head section (12) provided with a beverage dispense tap (13) with a thermal break (15) between the body section (5) and the head section (12) that restricts formation of ice/condensation to an area of the fitting separate from the dispense tap (13).

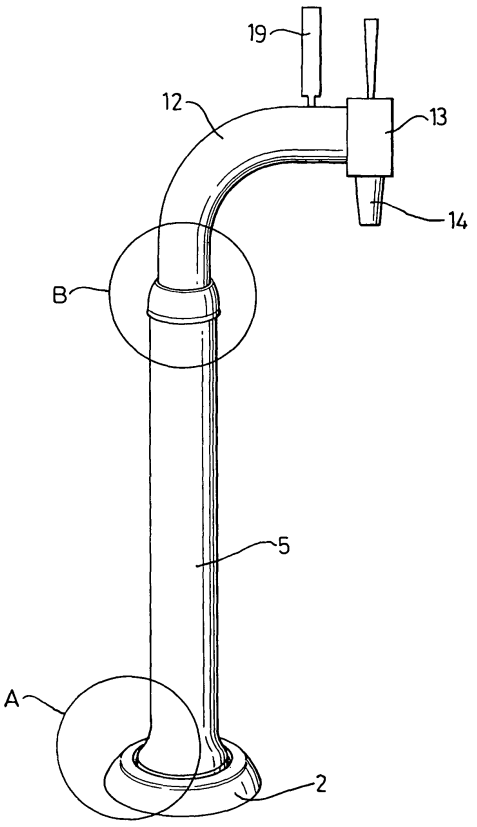

Fig. 1

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Description

[0001] This invention relates to beverage dispense apparatus, in particular, but not exclusively for dispensing beer, lager, cider and like beverages. More especially, the invention relates to counter-top fittings for dispensing such beverages. For convenience, where the term "beer" is used hereinafter to describe the invention it will be understood that the invention applies equally to lager, cider and like beverages.

[0002] Counter top fittings for dispensing beer typically employ a valve that can be operated manually or electrically to dispense the beer into a container placed under an outlet from the valve. Recently there has been a trend to dispense beer at low temperature and to provide counter-top fittings in which ice and/or condensation is formed on an outer surface of the fitting by circulating a coolant within the fitting. The coolant helps to prevent the beer warming up, especially between dispenses, and the formation of ice/condensation gives the impression to the customer that the beer is being dispensed at a low temperature.

[0003] For some designs of counter-top fittings, the formation of ice/condensation can create a problem if water formed by the ice melting or from condensation formed on the fitting can drip into a container placed under the outlet from the valve and contaminate beer dispensed from the fitting into the container.

[0004] Also, there is an increasing trend for retailers to provide greater choice to customers by introducing different beers - so called "guest beers" - on a regular basis. As a result, there is a need to adapt the counter-top fitting to change the branding when a different beer is to be dispensed.

[0005] The present invention has been made for a consideration of the foregoing and seeks to provide an improved counter-top fitting for dispensing beverages such as beer, lager, cider in which ice/condensation can form on part of the fitting.

[0006] According to a first aspect of the present invention, there is provided a counter-top fitting for dispensing a beverage comprising a first section provided with a dispense valve, a second section provided with a coolant chamber for circulating coolant such that ice/condensation can form on an outer surface of the second section, wherein a thermal break is provided to inhibit formation of ice/condensation on the first section.

[0007] By this first aspect of the invention, formation of ice/condensation on the outer surface of the fitting is restricted to an area separated from the dispense valve such that water produced when the ice melts and/or from the condensation cannot contaminate beverage dispensed from the fitting.

[0008] Preferably, the thermal break comprises a collar of low thermal conductivity material provided between the first section and the second section.

[0009] Preferably, the first and second sections are releasably connected to each other by a lock nut that fits over the collar.

[0010] Preferably, the second section is provided between the first section and a third section of the fitting providing a base for mounting the fitting on a support surface, wherein a thermal break is provided between the second section and the third section.

[0011] Preferably, the thermal break comprises a sealing gasket of low thermal conductivity material provided between the second section and the third section.

[0012] Preferably, the second section comprises an outer member, an inner member received within the outer member and sealed relative to the outer member at each end to define therewith the coolant chamber, wherein the outer member is removable and comprises a substantially cylindrical sleeve of high thermal conductivity material

[0013] Preferably, an inlet and an outlet for circulating coolant through the chamber are provided at opposite ends of the chamber and wherein, in use, the outlet is arranged at an upper end of the chamber and the inlet is arranged at a lower end.

[0014] Preferably, the inner member has one or more through bores for passage of one or more of a product line and a power supply line.

[0015] According to a second aspect of the present invention, there is provided a method of producing ice/condensation on a counter-top fitting for dispensing a beverage comprising the steps of circulating coolant through a chamber in a first section of the fitting to form ice/condensation on an outer surface of the first section, and providing a thermal break between the first section and at least one further section of the fitting.

[0016] By this second aspect of the invention, formation of ice/condensation is restricted to the outer surface of the first section.

[0017] Preferably, the thermal break is provided between the first section and a second section having a dispense valve for dispensing beverage such that ice/condensation is restricted to an area of the fitting separate from the dispense valve.

[0018] In this way, water produced when the ice melts and/or from the condensation cannot contaminate beverage dispensed from the fitting.

[0019] According to a third aspect of the present invention, there is provided a font having a dispense valve for dispensing a beverage on a first part of the font, and a coolant chamber for circulating coolant to form ice/condensation on an outer surface of a second part of the font and a thermal break between the first and second parts.

[0020] Preferably, the second part is provided between the first part and a third part of the font providing a base for mounting the font on a support surface with a thermal break between the second and third parts.

[0021] According to a fourth aspect of the present invention, there is provided a method of controlling formation of ice/condensation on an outer surface of a beverage dispense font by providing the font with a thermal break.

[0022] Preferably, the thermal break is arranged to confine ice/condensation to an area of the outer surface of the font separate from a dispense valve for dispending the beverage.

[0023] According to a fifth aspect of the present invention, there is provided a counter-top fitting for dispensing a beverage comprising a dispense valve, a coolant chamber defined between a tubular outer member and an inner member extending lengthwise of the outer member, means for circulating coolant in the chamber such that ice/condensation can form on an outer surface of the outer member, and the inner member having a through bore for passage of a product line to the dispense valve, wherein the outer member is removable.

[0024] By this fifth aspect of the invention, ice/condensation forms on a removable part of the fitting whereby the fitting can be adapted for dispensing different beverages by removing the outer member and replacing it with another member appropriate to the beverage to be dispensed.

[0025] Furthermore, by circulating coolant through a chamber between the outer member and the inner member, cooling of the outer member and hence formation of ice/condensation thereon is improved by direct contact between the coolant and the outer member.

[0026] According to a sixth aspect of the present invention, there is provided a method of producing ice/condensation on a counter-top fitting for dispensing a beverage comprising the steps of circulating coolant through a chamber defined between an outer member and an inner member such that the coolant directly contacts the outer member to form ice/condensation on an outer surface of the outer member which itself forms an outer surface of the fitting, and passing a product line through the inner member so that the coolant does not directly contact the product line, wherein the outer member is removable.

[0027] The invention will now be described in more detail by way of example only wherein:

Figure 1 is a perspective view of a counter-top fitting embodying the invention;

Figure 2 is a side view of component parts of the fitting shown in Figure 1;

Figure 3 is an end view of the parts shown in Figure 2;

Figure 4 shows details of the area A of Figure 1;

Figures 5,6 and 7 show details of the area B of Figure 1; and

Figure 8 is a sectional view of the area B of Figure 1.

[0028] Referring to the accompanying drawings, there is shown a counter-top fitting 1 according to the invention in the form of a swan-neck font for dispensing beer. The fitting 1 has a mounting base 2 with a counter bore 2a in the upper surface to receive a sealing gasket 3 and the lower end of a tube-in-tube assembly 4.

[0029] The tube-in-tube assembly 4 comprises a tubular outer sleeve 5 and tubular inner component 6 that fits within the outer sleeve 5 and defines therein a coolant chamber 7. In this embodiment, the outer sleeve 5 is made of a material having a high thermal conductivity, for example metals/alloys such as stainless steel, to improve heat transfer. The inner component 6 may be made of similar materials but this is not essential and the inner component 6 may be made of materials having a low thermal conductivity. For example, the inner component 6 may be made of plastics.

[0030] As shown, the outer sleeve 5 is cylindrical with a flared lower end 5a. The inner component 6 has a flared lower end 6a that is received within the flared lower end 5a of the outer sleeve. An O-ring 8 seated in an external annular groove 9 in the outer surface of the lower end 6a of the inner component 6 provides a fluid-tight seal between the inner component 6 and the outer sleeve 5 at the lower end of the assembly 4.

[0031] The inner component 6 has a cylindrical upper end 6b that is received within the upper end of the outer sleeve 5. An O-ring 10 seated in an annular recess 11 in the upper end 6b of the inner component 6 provides a fluid-tight seal between the inner component 6 and outer sleeve 5 at the upper end of the assembly 4.

[0032] Between the lower end 6a and the upper end 6b, the inner component 6 has a centre section 6c of reduced cross-section and the coolant chamber 7 is defined between the centre section 6c and the outer sleeve 5.

[0033] In this embodiment, the inner component 6 has three longitudinally extending through bores 6d, 6e, 6f that are aligned with holes 3a, 3b, 3c in the sealing gasket 3 for passage of one or more lines (not shown) such as a product line and a power supply line such that coolant in the chamber 7 does not directly contact the lines. It will be understood that the number and configuration of the bores may be altered according to the requirements of a particular fitting.

[0034] The lower end 6a of the inner component 6 has two holes 6g, 6h that align with holes 3d, 3e in the sealing gasket 3 and open to the coolant chamber 7 for passage of inlet and outlet tubes (not shown) for circulating coolant through the coolant chamber 7. The inlet tube terminates at the lower end of the chamber 7 and the outlet tube extends to the upper end of the chamber 7 so that, in use, the chamber 7 is filled with coolant. The tubes are sealed in the holes 6g, 6h by O-rings (not shown) or other suitable seals.

[0035] The lower end 6a of the inner component 6 is also provided with three internally threaded blind bores 6i, 6j, 6k that align with holes 3f, 3g, 3h in the sealing gasket 3 by means of which the inner component 6 is secured to the base 2 by screws (not shown) inserted into the bores 6i, 6j, 6k through aligned holes (not shown)

in the base 2.

[0036] The upper end of the tube-in-tube assembly 4 is releasably connected to one end of an L-shaped tubular sleeve 12 that forms the swan-neck. The other end of the sleeve 12 is connected to a manually operable dispense tap 13 provided with a valve (not shown) for controlling dispense of beverage through an outlet nozzle 14 into a glass or other container placed under the nozzle 14.

[0037] A collar 15 secured to the end of the sleeve 12 by pins 16 is a clearance fit in a counterbore 61 in the upper end 6b of the inner component 6 and is secured by a lock nut 17 that fits over the collar 15 and has an external screw thread 17a engageable with an internal screw thread 6m in the counterbore 61. On tightening the lock nut 17, an internal tapered portion of the locknut 17 engages an external tapered portion of the collar 15 to secure the sleeve 12. The locknut 17 also locates and retains the outer sleeve 5 on the inner component 6.

[0038] In this embodiment, the locknut 17 is provided with circumferentially spaced holes 17b for engagement with a tool (not shown) to fasten/release the locknut 17 and the holes 17b are concealed by a split ring 18 that fits around the locknut 17. In this way, accidental or unauthorised release of the locknut 17 is prevented.

[0039] The lines that pass through the inner component 6 are concealed within the L-shaped sleeve 12 for connecting a product line to the dispense tap 13 and a power supply line to illuminate a badge 19 displaying advertising or branding for the product.

[0040] In use, coolant circulated through the chamber 7 cools the outer sleeve 5 and causes ice and/or condensation to form on the outer surface of the outer sleeve 5. Any suitable coolant may be employed such as chilled water or an aqueous water/glycol mixture. Circulation of coolant may also provide cooling for beer in the product line passing through the inner component 6 where this is made of a high thermal conductivity material to prevent beer remaining in the product line between dispenses warming up to any appreciable extent.

[0041] In a modification (not shown), the chamber 7 is provided with one or more baffles or similar means that create turbulent flow within the chamber 7 to provide more uniform heat transfer through the outer sleeve 5.

[0042] The collar 15 is made of plastic and has low thermal conductivity that provides a thermal break between the tube-in-tube assembly 4 and the L-shaped sleeve 12 that prevents ice/condensation forming on the outer surface of the L-shaped sleeve 12 which could run down into a glass or similar container placed under the dispense tap 13.

[0043] Likewise, the sealing gasket 3 is made of rubber and has a low thermal conductivity that provides a thermal break between the tube-in-tube assembly 4 and the base 2 that inhibits ice/condensation forming on the base 2 and also prevents water penetrating between the base 2 and the tube-in-tube assembly 4.

[0044] In addition to the badge 19, the outer sleeve 5 of the tube-in-tube assembly 4 may carry advertising or branding relating to the product being dispensed. If the product is changed, the outer sleeve 5 can be removed and replaced by a different sleeve 5 carrying advertising/branding appropriate to the product.

[0045] To replace the outer sleeve 5, the circulation of coolant is stopped before disconnecting the L-shaped sleeve 12 by releasing the locknut 17 and disconnecting the product line and power line, for example by employing self-sealing quick release connectors (not shown) that engage/disengage automatically when the L-shaped sleeve 12 is connected/disconnected. The outer sleeve 5 can then be slid up and lifted off the inner component 6.

[0046] A new outer sleeve 5 can then be fitted over and slid down onto the inner component 6. The L-shaped sleeve 12 can then be re-connected and the locknut 17 tightened to effect a fluid-tight seal between the outer sleeve 5 and inner component 6 at the top and bottom of the tube-in-tube assembly 4 before re-starting circulation of coolant through the chamber 7.

[0047] As will be understood from the foregoing description of an exemplary embodiment, the present invention provides a counter-top fitting for dispensing a beverage in which ice/condensation forms on an outer surface of a part of the fitting that can be removed and replaced when changing the beverage to be dispensed and is separated from a part of the fitting on which the dispense tap is mounted by a thermal break that prevents ice/condensation forming on a part of the outer surface of the fitting where it could drip into a glass placed under the dispense tap.

[0048] Although the invention has been described with particular reference to a counter-top fitting for dispensing beverages in the form of a swan neck font, it will be understood that the invention is not limited to such fittings and that any of the features described herein could be employed in other dispense equipment and fittings where it is desired to provide a coolant chamber and/or to restrict the area over which ice/condensation may form.

[0049] It will also be understood that the invention is not limited to fittings for the dispense of alcoholic beverages such as beer, lager cider and the like and features of the invention may also be employed in fittings for the dispense of non-alcoholic beverages.

[0050] Furthermore, it will be appreciated that the invention is not limited to the embodiment above-described and that various changes may be made. For example, the outer sleeve may be of cylindrical shape as described or any other shape that allows the outer sleeve to be detached from the inner component to change the outer sleeve.

[0051] The outer sleeve may incorporate one or more windows that may be illuminated to produce different visual effects for the customer. Where provided a window may be in the form of a logo or brand name.

[0052] Other modifications will be apparent to those skilled in the art. The fitting may be provided with more than one dispense tap for dispensing the same or differ-

ent product. Other changes that can be made will be apparent to those skilled in the art.

Claims

1. A counter-top fitting (1) for dispensing a beverage comprising a first section (12) provided with a dispense valve (13), a second section (5) provided with a coolant chamber (7) for circulating coolant such that ice/condensation can form on an outer surface of the second section (5), wherein a thermal break (15) is provided to inhibit formation of ice/condensation on the first section (12).

2. A counter-top fitting according to claim 1 **characterised in that** the thermal break (15) comprises a collar of low thermal conductivity material provided between the first section (12) and the second section (5).

3. A counter-top fitting according to claim 2 **characterised in that** the first and second sections (12;5) are releasably connected to each other by a lock nut (17) that fits over the collar (15).

4. A counter-top fitting according to any preceding claim **characterised in that** the second section (12) is provided between the first section (12) and a third section (2) of the fitting providing a base for mounting the fitting (1) on a support surface, wherein a thermal break (3) is provided between the second section (5) and the third section (2).

5. A counter-top fitting according to claim 4 **characterised in that** the thermal break (3) comprises a sealing gasket (3) of low thermal conductivity material provided between the second section (5) and the third section (2).

6. A counter-top fitting according to any preceding claim **characterised in that** the second section (5) comprises an outer member (5), an inner member (6) received within the outer member (5) and sealed relative to the outer member (5) at each end to define therewith the coolant chamber (7), wherein the outer member (5) is removable and comprises a substantially cylindrical sleeve of high thermal conductivity material

7. A counter-top fitting according to claim 6 **characterised in that**, an inlet and an outlet for circulating coolant through the chamber (7) are provided at opposite ends of the chamber (7) and wherein, in use, the outlet is arranged at an upper end of the chamber (7) and the inlet is arranged at a lower end.

8. A counter-top fitting according to any of the preceding claims **characterised in that**, the inner member (6) has one or more through bores (6d,6e,6f) for passage of one or more of a product line and a power supply line.

9. A method of providing ice/condensation on a counter-top fitting (1) for dispensing a beverage comprising the steps of circulating coolant through a chamber (7) in a first section (5) of the fitting (1) to form ice/condensation on an outer surface of the first section (5), and providing a thermal break (3; 15) between the first section (5) and at least one further section (2;12) of the fitting (1).

10. A method according to claim 9 **characterised in that**, the thermal break (15) is provided between the first section (5) and a second section (12) having a dispense valve (13) for dispensing beverage such that ice/condensation is restricted to an area of the fitting (1) separate from the dispense valve (13).

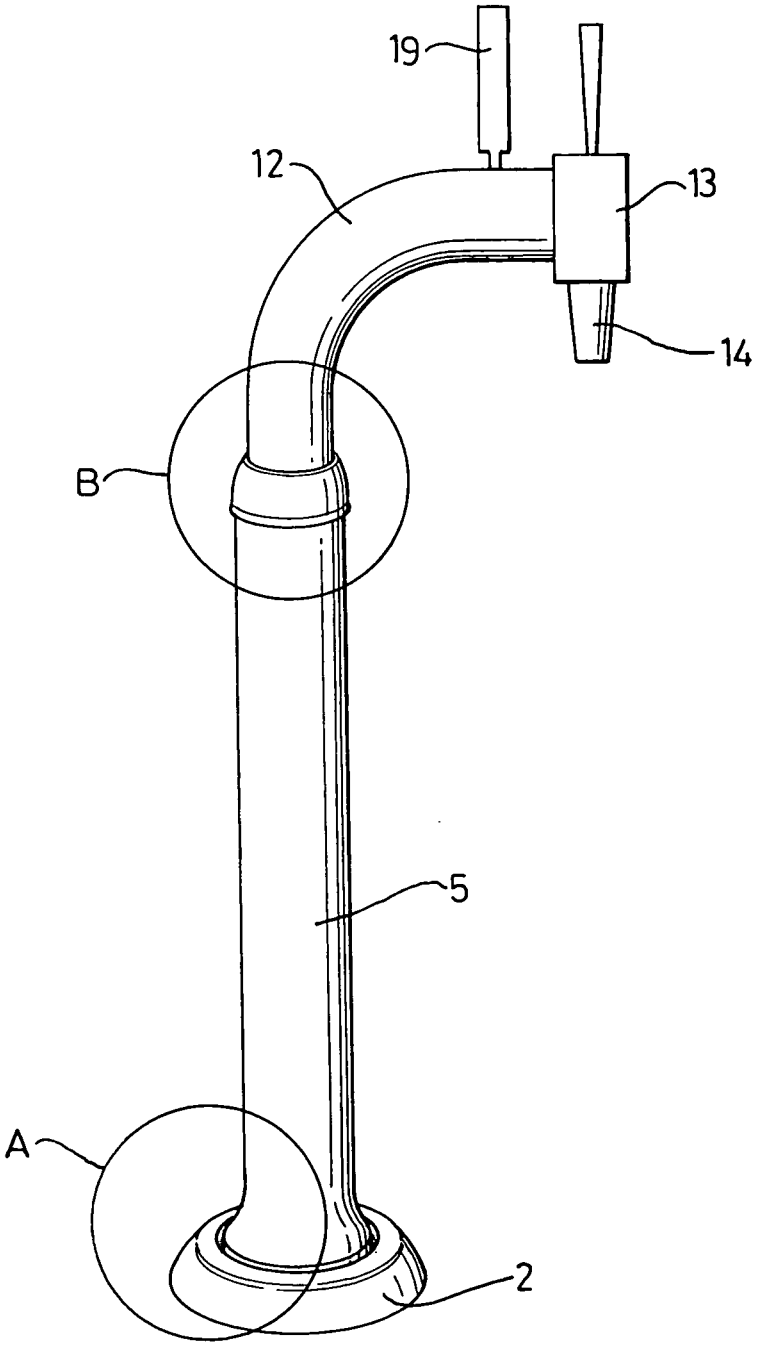

Fig. 1

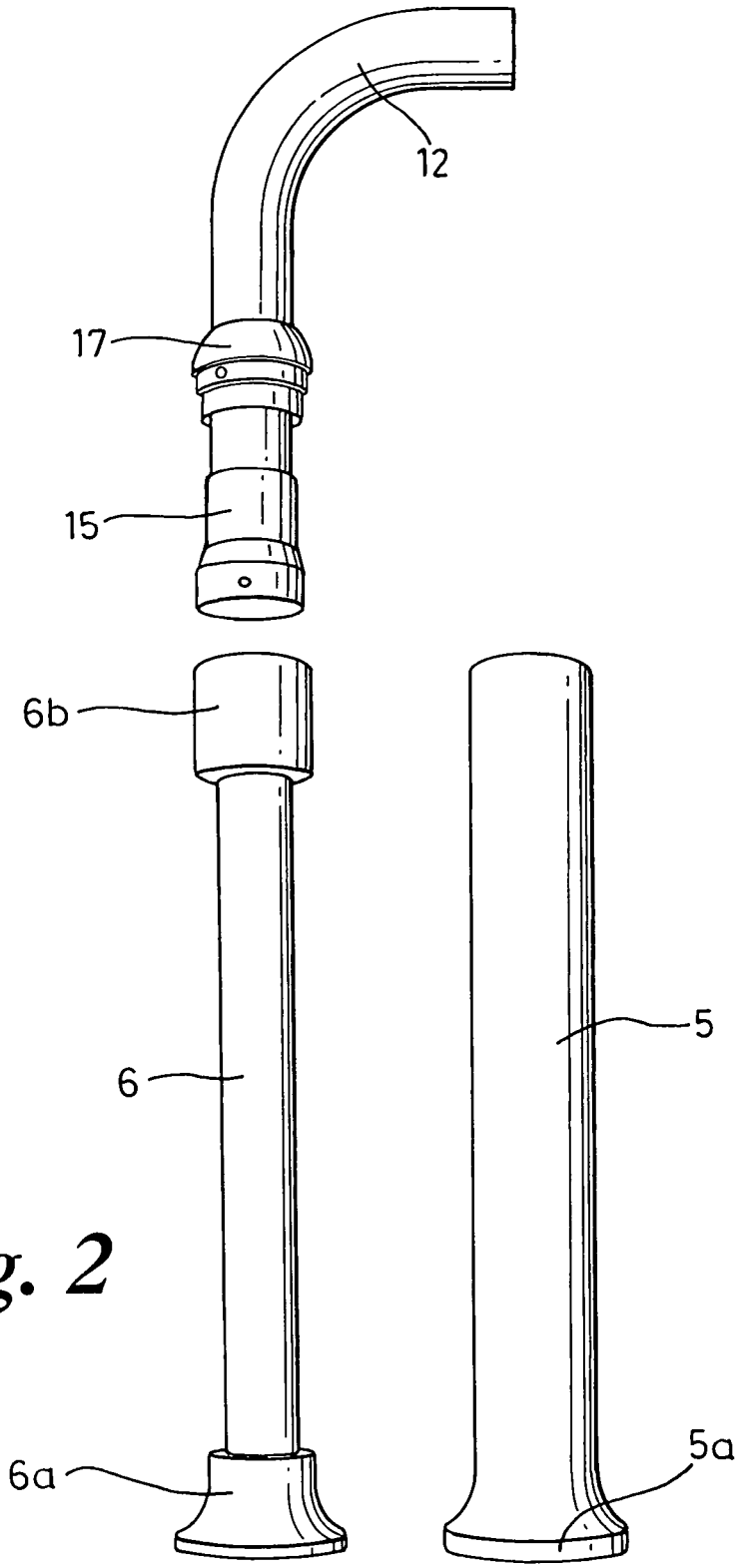

Fig. 2

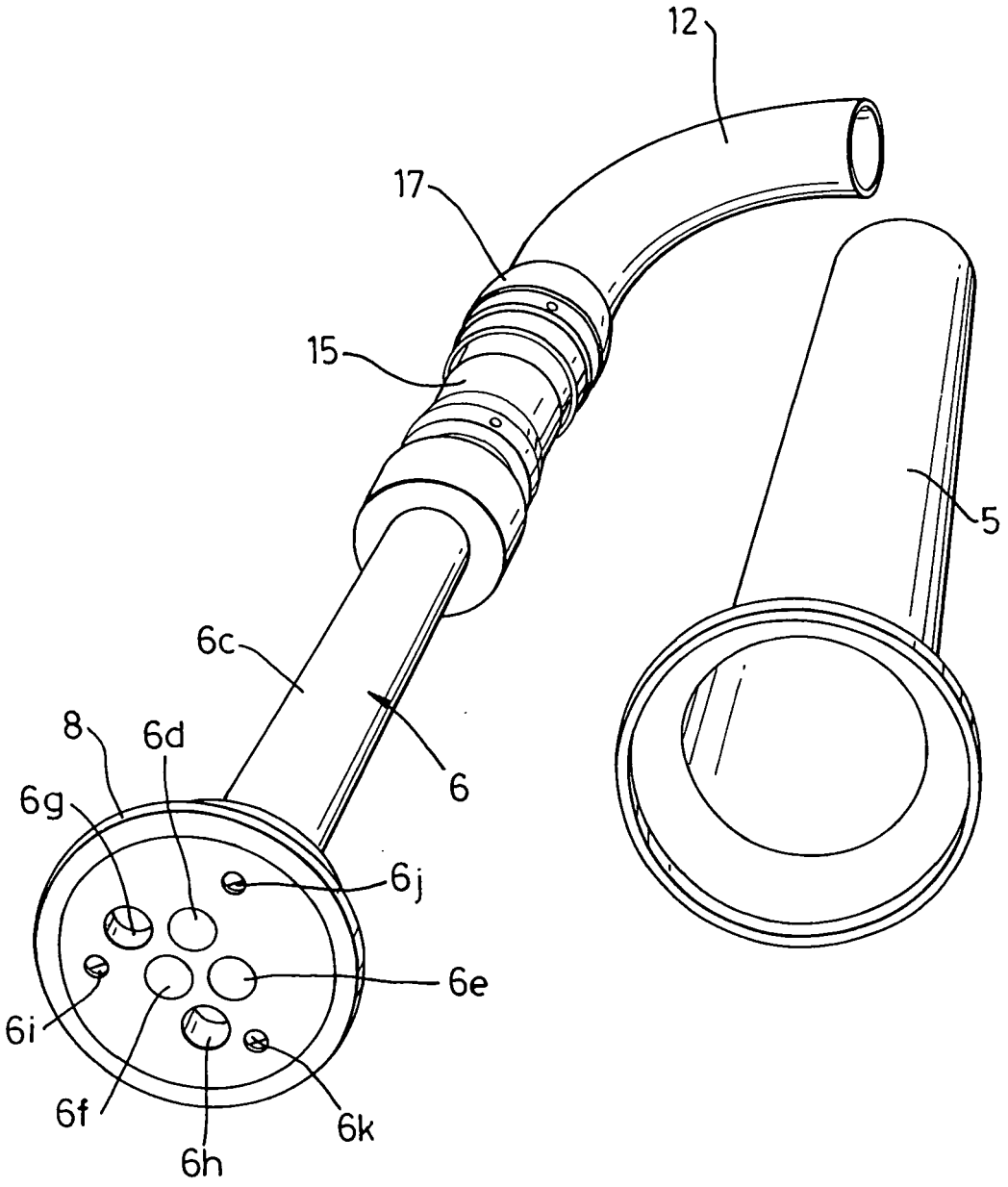

Fig. 3

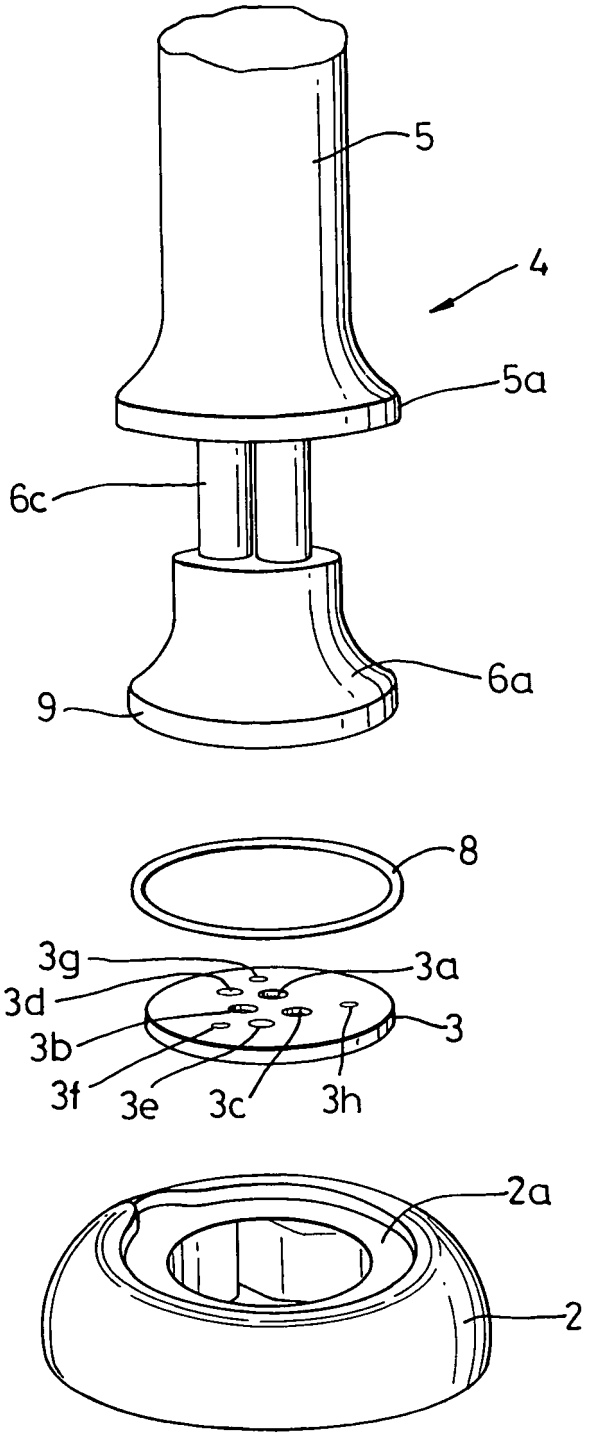

Fig. 4

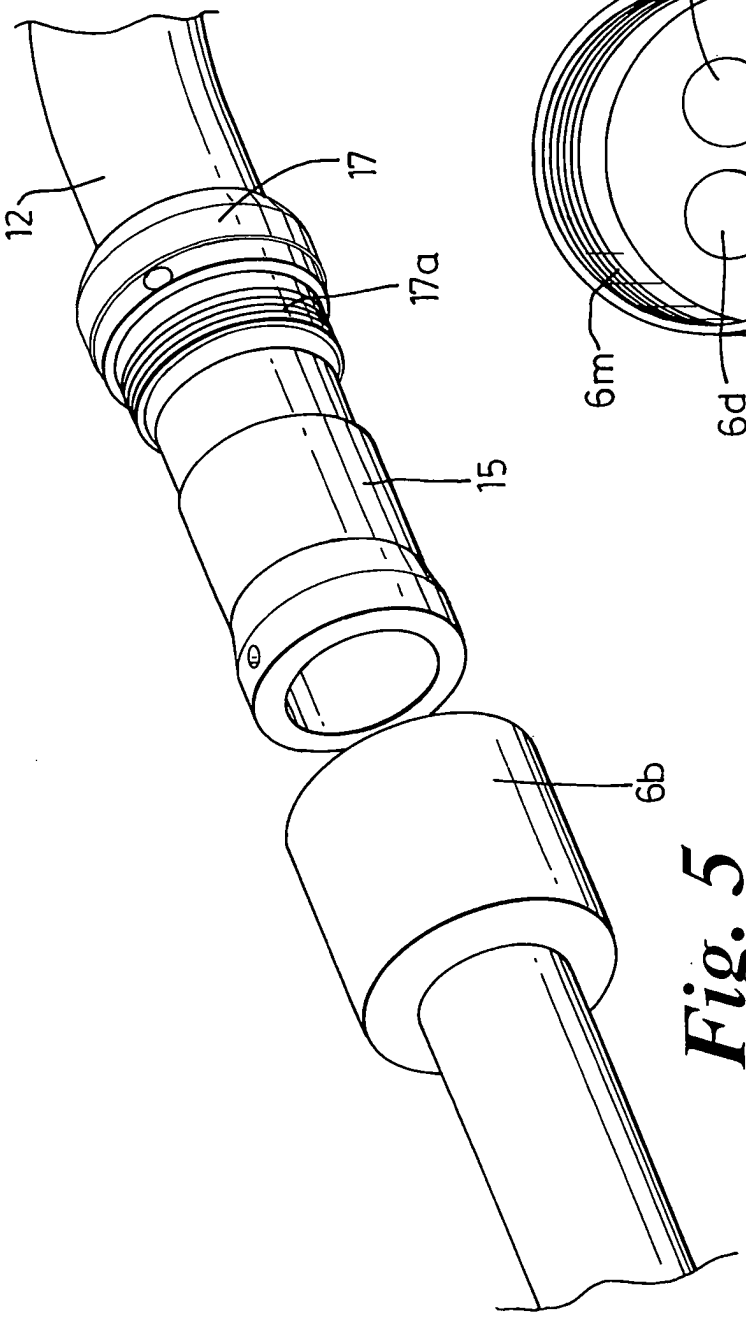

Fig. 5

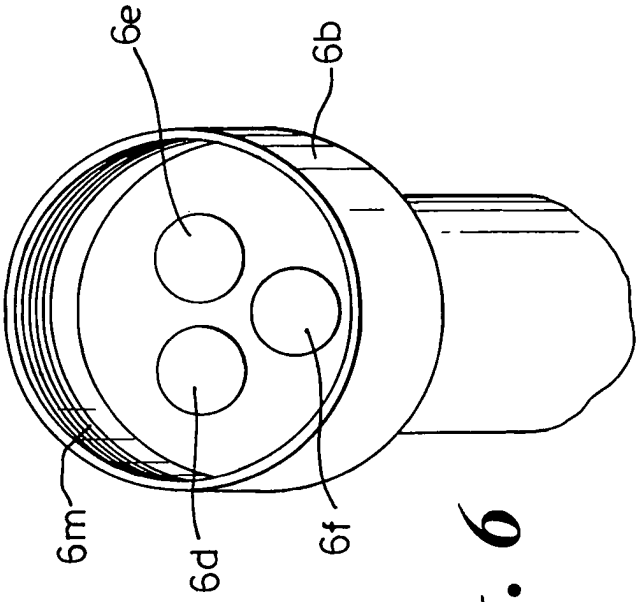

Fig. 6

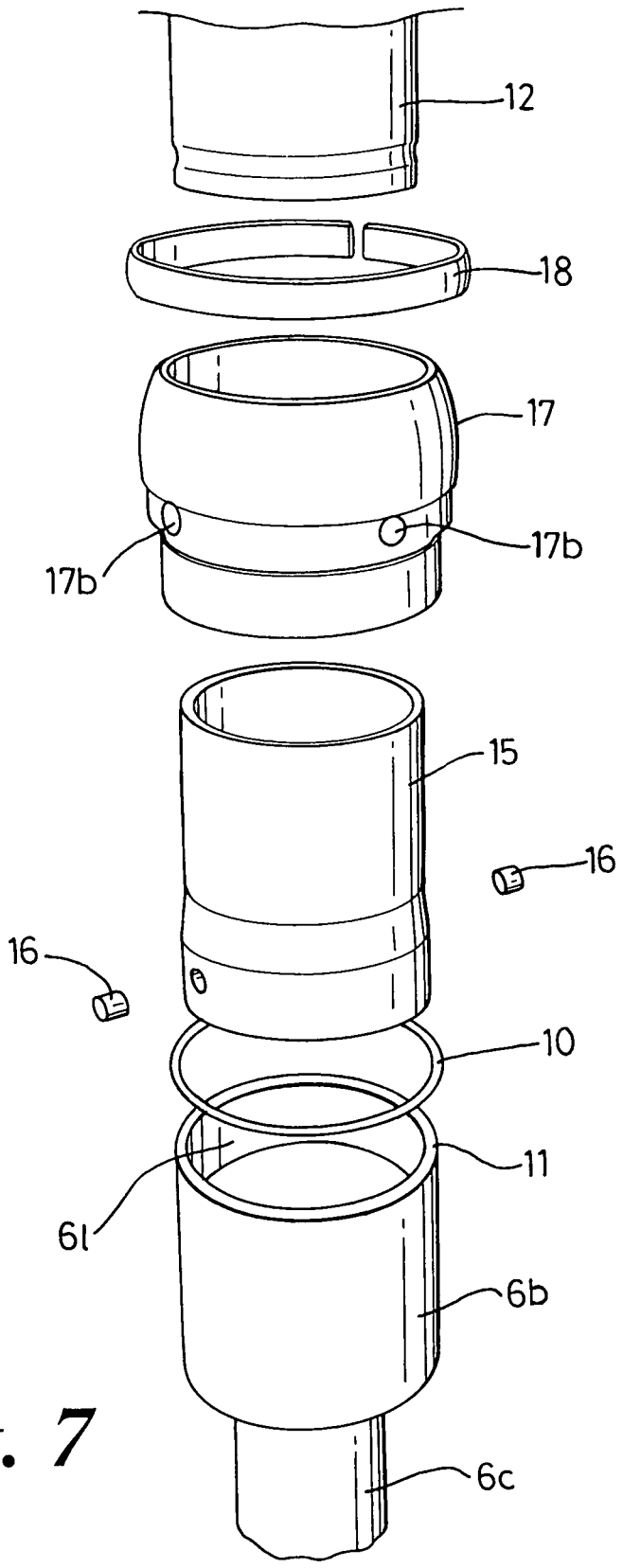

Fig. 7

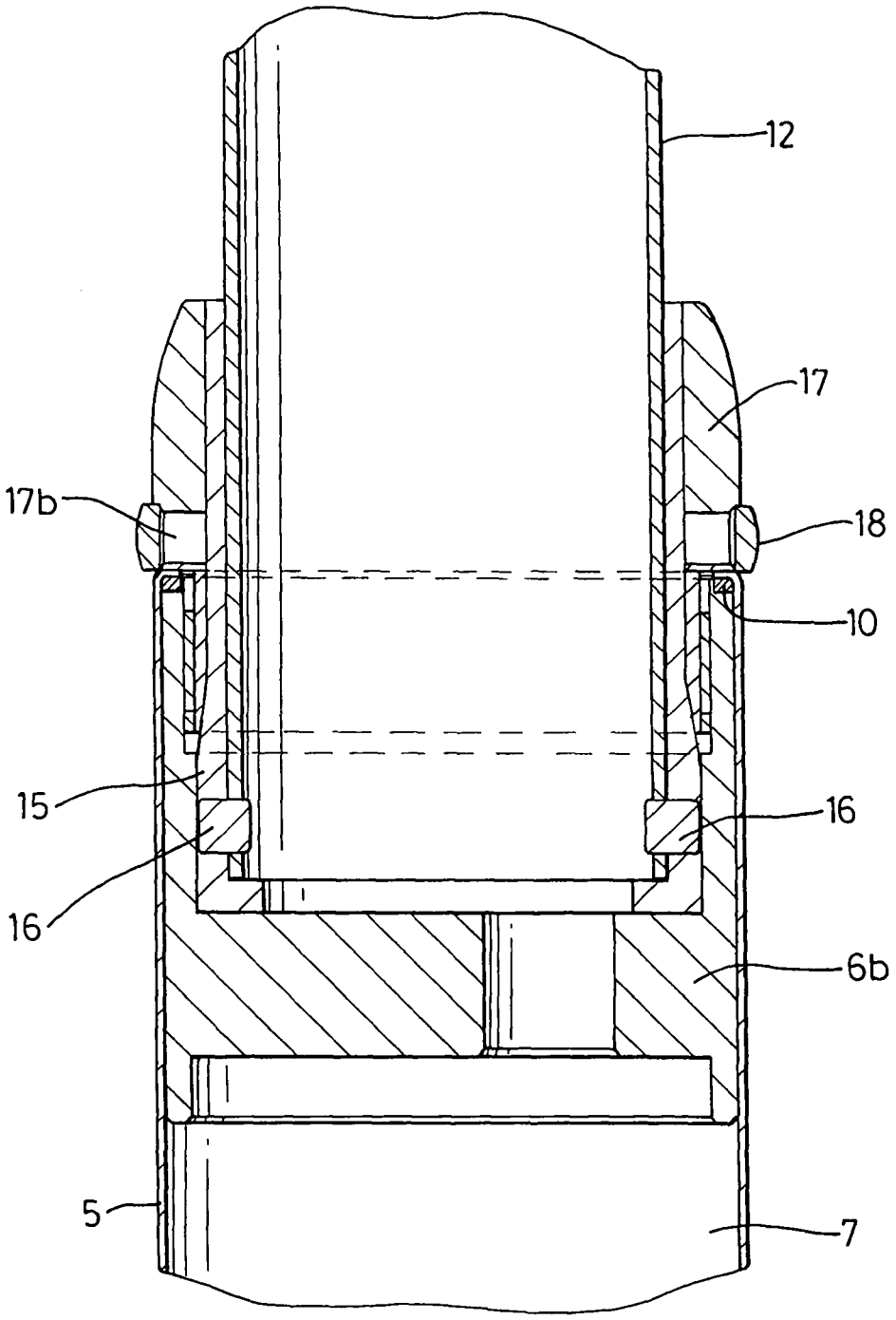

Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
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B67D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
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CATEGORY OF CITED DOCUMENTS

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