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

(11) EP 1 086 926 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
28.03.2001 Bulletin 2001/13

(51) Int. Cl.[7]: **B67D 5/37**

(21) Application number: **00120451.0**

(22) Date of filing: **19.09.2000**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **21.09.1999 DE 19945293**

(71) Applicant:
Marconi Commerce Systems GmbH & Co.KG
33154 Salzkotten (DE)

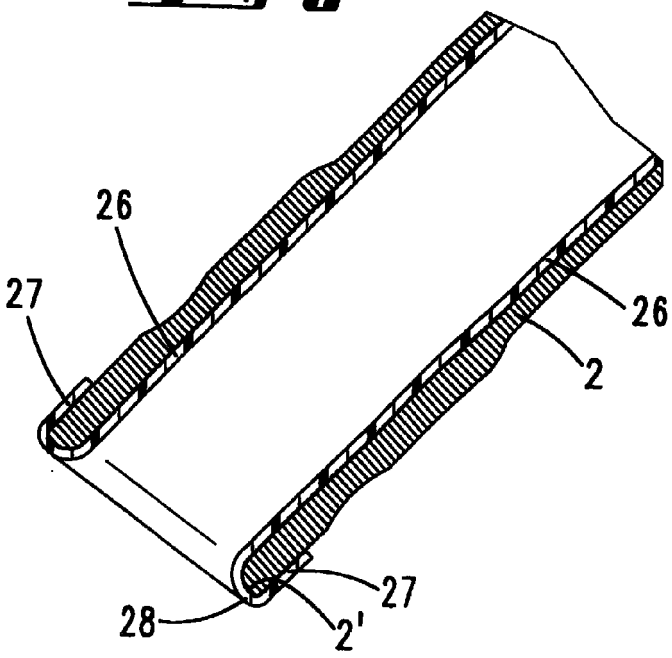
(72) Inventor: **Koslowsky, Uwe**
59590 Geseke (DE)

(74) Representative:
Fitchett, Stuart Paul
Marconi Intellectual Property
Waterhouse Lane
Chelmsford, Essex CM1 2QX (GB)

(54) Delivery nozzle with coated outlet pipe

(57) A fuel delivery nozzle (1) has an outlet pipe (2) with a non wetting coating (26) to which fuel does not adhere and this prevents drips after the nozzle has been removed from a filler neck of a receptacle, and prevents contamination between subsequent transactions.

Fig. 2



EP 1 086 926 A1

Description

[0001] The present invention concerns a delivery nozzle particularly for delivering fuel to a motor vehicle, the nozzle having an outlet pipe downstream of a fuel valve.

[0002] Such a delivery nozzle has been previously known from DE 19 71 586 8.4. The said delivery nozzle is capable of delivering different types of fuel, for which purpose the said delivery nozzle is connected to a multi-channel hose, so that different types of fuel are fed through different hose channels up to the fuel valve, downstream of the fuel valve the different fuel types pass through a common outlet pipe. After the termination of the fuelling process small residues of the fuel type last dispensed remain in the outlet pipe. After a fuelling process such residues could drip from the muzzle of the outlet pipe and could lead to contamination of the roadway or of the area around the filling station. In case of subsequent refuelling with a different type of fuel, residues could also contaminate the type of fuel drawn. This is of disadvantage especially in case of Diesel fuels.

[0003] According to the present invention there is provided a delivery nozzle incorporating a valve upstream of an outlet pipe, wherein at least the inner wall surface of the outlet pipe is coated with a material that can not be wetted, or that is manufactured from a material that can not be wetted.

[0004] When employing the present invention the inside of the outlet pipe is coated with a material which prevents wetting by fuel, or which is manufactured of such a material. As a result of such a design, residues form into droplets, which are repelled from the inner surface of the outlet pipe. Droplets are thereby prevented from adhering to the outlet pipe. Advantageously the coating extends around the muzzle of the outlet pipe onto its external surface. The coating material can be Teflon (PTFE) but other materials could be considered, such as PFA or a polyelectrolyte-tenside (PET) - complex. It is also suggested to use Sicon as a coating material. The coating may comprise several layers and it may be of advantage if the coating is electrically conducting.

[0005] The coating, or the material from which the outlet pipe is manufactured, should repel petrol and Diesel fuels. In a preferred arrangement the coating is applied to those delivery nozzles which are capable of delivering several different types of fuels that are taken to the said delivery nozzle by a multi-channel hose. For example, such a delivery nozzle is shown in the DE 19 71 586 8.4 and as far as the design of such a delivery hose is concerned, attention is drawn to that document. With this design a delivery nozzle, upstream of the valve, has several fuel channels connected. These fuel channels are preferably each closed by a non-return valve to prevent cross contamination of fuels. The invention is particularly advantageous when employed on a refuelling robot. By means of a programmed delay after fuelling, residues flow directly from the outlet pipe into the tank.

[0006] Where it is desired to employ a vapour recovery pipe arranged within the outlet pipe, or arranged alongside the outlet pipe, the wall surface of the said vapour recovery pipe is preferably also coated with a material that can not be wetted by fuel. Alternatively the vapour recovery pipe could also be made from a material which will not allow wetting by petrol and Diesel fuels.

[0007] One embodiment of the present invention is described below, by way of example only, with reference to the attached drawings of which:

Fig. 1 a delivery nozzle according to the invention,

Fig. 2 an enlarged cross sectional view through the outlet pipe of the nozzle of figure 1,

Fig. 3 a sectional view through the rear section of the delivery nozzle, containing the fuel valve,

Fig. 4 a sectional view through a multi-channel hose and

Fig. 5 a sectional view according to Fig. 2 with an integrated vapour recovery pipe.

[0008] Referring to figure 1a, delivery nozzle 1 comprises a knuckle bow 3, which contains an operating handle 4. Movement of the said handle 4 can open a fuel valve 25 contained in the delivery nozzle so that fuel exits from a multi-channel hose 5 (figure 3) through the outlet pipe 2.

[0009] The inside of outlet pipe 2 carries a coating 26, see figure 2, which extends from the muzzle 2' of outlet pipe 2 to the fuel valve 25 contained in the delivery nozzle. The said coating 26 also extends around the front face of muzzle 2' in a section 28 and continues along the outer surface of outlet pipe 2 in a section 27.

[0010] At the other end of the nozzle 1 an adapter 6 connects the nozzle to a multi-channel hose 5 to the delivery nozzle 1. The other end of the said multi-channel hose is connected to a delivery pump not shown. The adapter, depicted in Fig. 3 is described in detail in DE 19 71 586 8.4. The said adapter 6 comprises a fuel outlet section 23 which leads into the outlet pipe 2. The said fuel outlet section 23 is also coated and it terminates in the annular type fuel valve 25. Upstream of the fuel valve 25 the channel continues in sections 22 each of which leads to a non-return valve 20. Each of the fuel flow channels 16 of the multi-channel hose terminates in such a non-return valve 20 to prevent cross contamination of fuels.

[0011] In the example shown, a multi-channel hose 5 has a central vapour recovery channel 15 through which vapour, displaced by fuel entering the tank, can

be captured. The said channel 15 continues in a vapour channel section 24 of delivery nozzle 1 to a vapour recovery pipe 29 which emerges in the region of the outlet pipe 2. The vapour recovery pipe 29 also has a coating 30, which may be applied to its inner and outer surfaces. The vapour recovery pipe 29 may also be placed alongside the outlet pipe 2.

[0012] Suitable coating materials are Teflon (PTFE) or PFA or a polyelectrolyte-tenside (PET) - complex. Another suitable material is Sicon. The coating may comprise several layers and it is also envisaged, that either the vapour recovery pipe 29 or the complete outlet pipe 2 may be manufactured from a suitable material, which can not be wetted by Diesel- or Petrol fuel.

[0013] Various modifications will occur to the skilled practitioner which will be within the scope of the invention, as defined by the appended claims. More particularly in the attached drawings a manual, or hand held nozzle, has been illustrated, however it is specifically envisaged that the invention is equally applicable to the nozzle of a robotic fuel dispenser.

Claims

1. A fuel delivery nozzle (1) incorporating a valve (25) upstream of an outlet pipe (2), characterised in that at least the inner wall surface of the outlet pipe (2) is coated with a material (26) that can not be wetted, or in that it is manufactured from a material that can not be wetted.

2. A nozzle (1) according to claim 1, characterised in that the coating (26, 27, 28) extends around the muzzle (2') of the outlet pipe (2) and along at least a portion of its outer surface.

3. A nozzle (1) according to one or more of the previous claims, characterised in that the coating (26, 28) consists of PTFE, PFA, a PET-complex or Sicon.

4. A nozzle (1) according to one or more of the previous claims, characterised in that the coating may consist of several layers

5. A nozzle (1) according to one or more of the previous claims, characterised in that the coating is electrically conducting.

6. A nozzle (1) according to one or more of the previous claims, characterised in that the coating repels both Petrol and Diesel fuels.

7. A nozzle (1) according to one or more of the previous claims, characterised in that the coating extends up to the fuel valve (25), incorporated in the delivery nozzle (1).

8. A nozzle (1) according to one or more of the previous claims, characterised in that upstream of the fuel valve (25) several fuel flow channels (16) enter the nozzle.

9. A nozzle (1) according to one or more of the previous claims, characterised in that the said several fuel flow channels (16) are each closed by a non-return valve (20).

10. A nozzle (1) according to one or more of the previous claims, characterised in that the delivery nozzle (1) is arranged to be mounted on a fuelling robot.

11. A nozzle (1) according to one or more of the previous claims, characterised by a vapour recovery pipe placed within, or alongside, the outlet pipe (2), the inner and/or outer surface of the vapour recovery pipe also being provided with a coating (30) which has fuel repelling properties.

Fig: 1

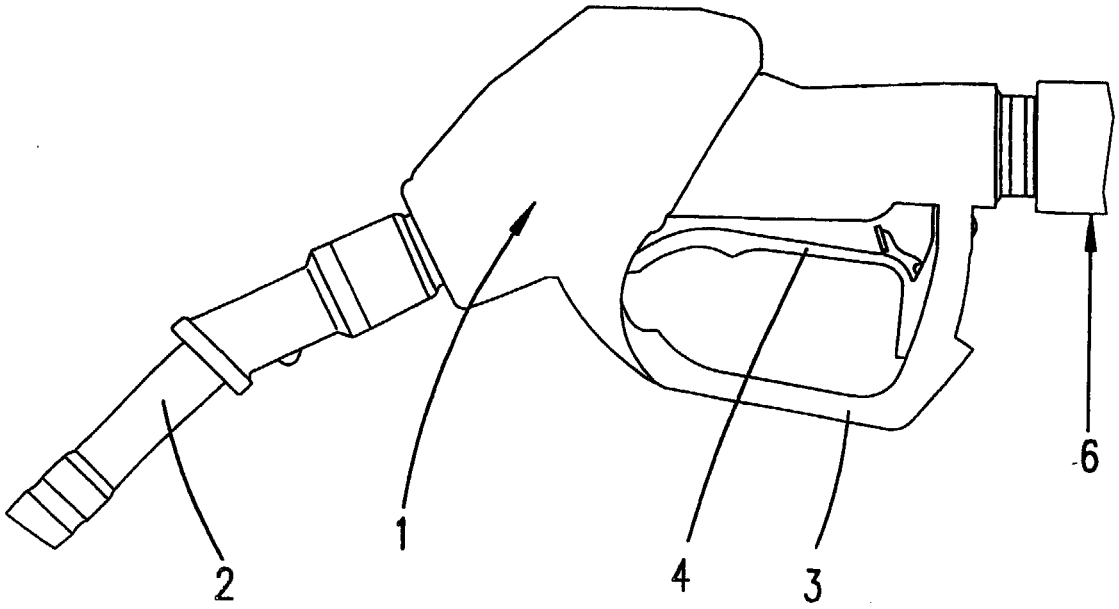
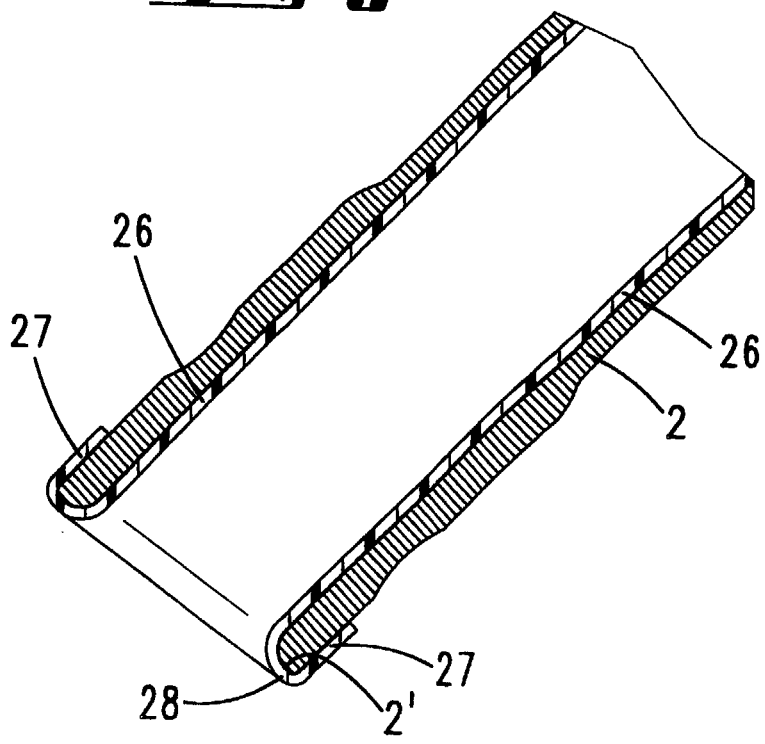


Fig: 2



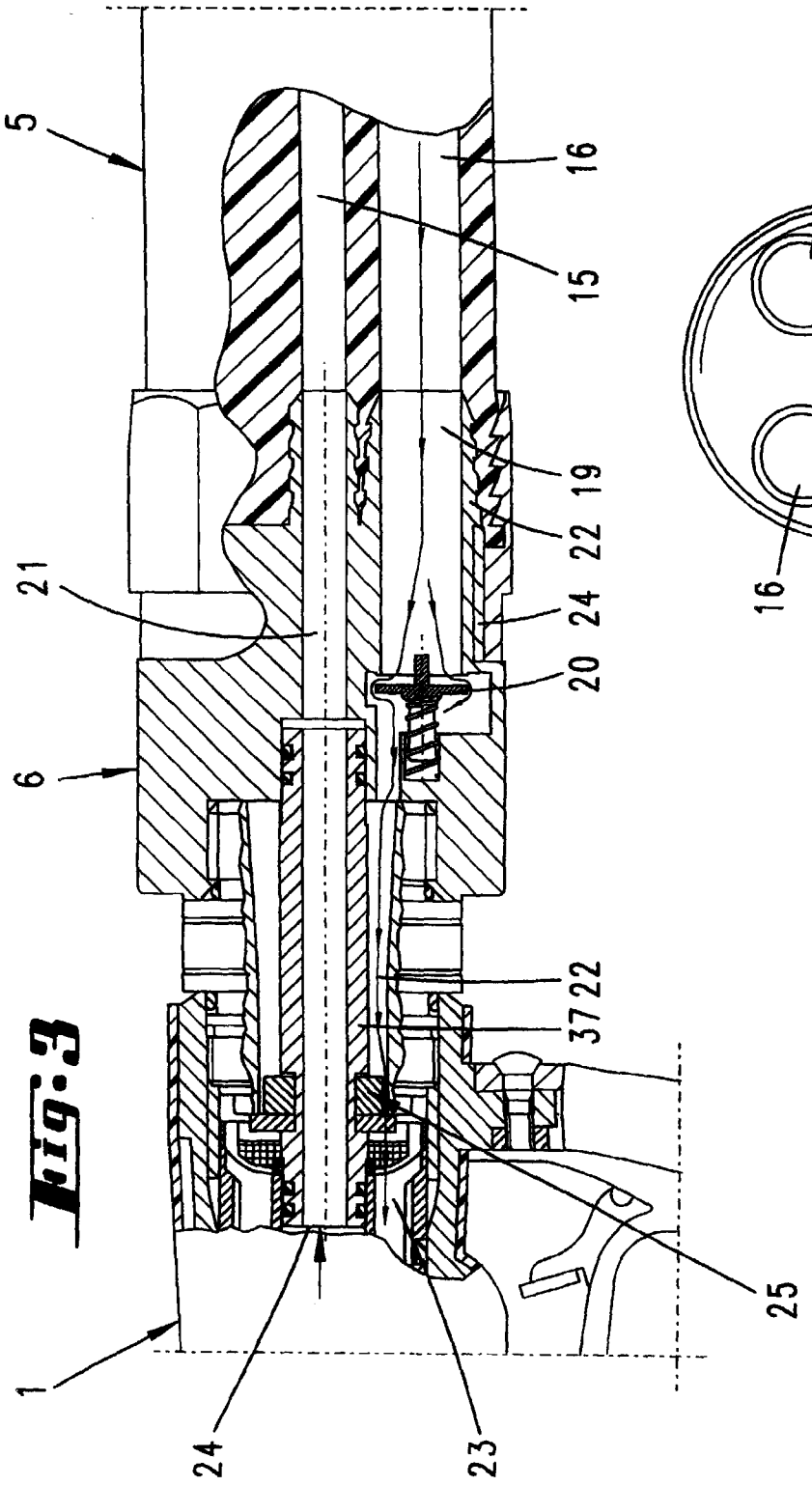


Fig:3

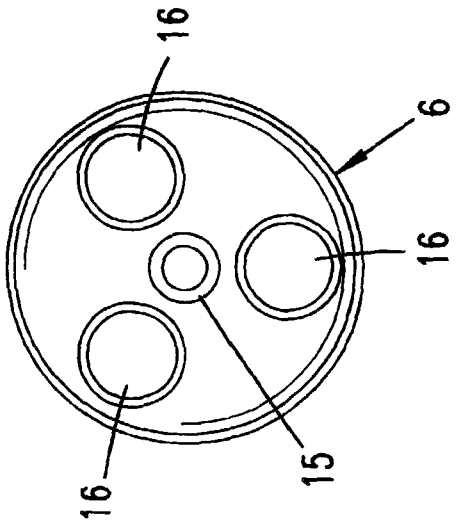
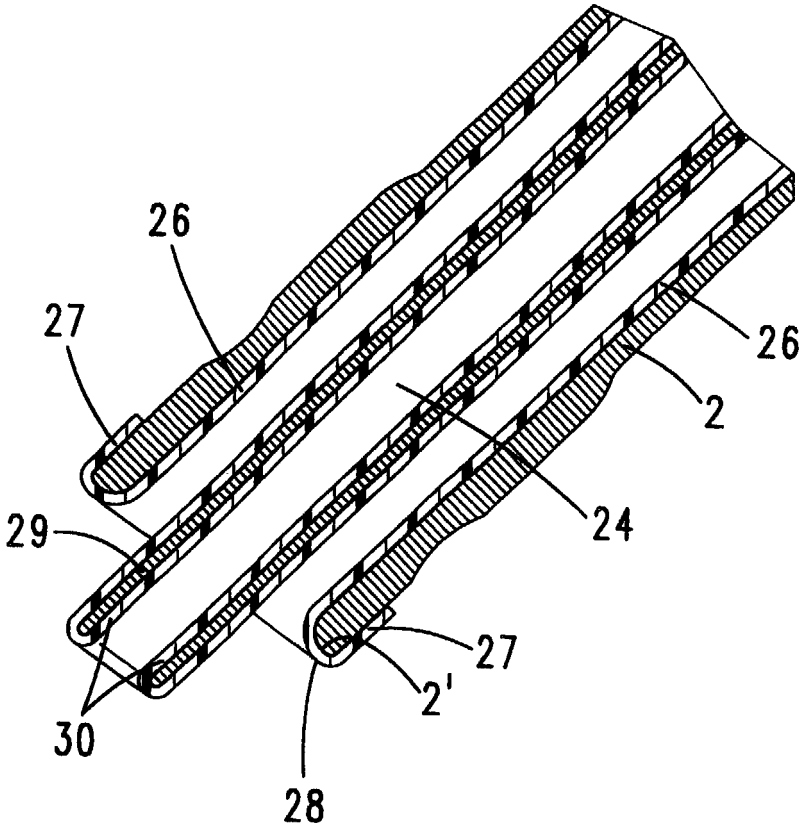


Fig:4

Fig: 5



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 12 0451

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	FR 2 714 900 A (COQUEREL ET AL.) 13 July 1995 (1995-07-13) * claims 1,8,9; figures 2,3 *	1-4,6-9	B67D5/37
Y		5,11	
Y	US 5 765 609 A (DALHART ET AL.) 16 June 1998 (1998-06-16) * column 13, line 62 - column 14, line 30; figure 18 *	5,11	
D,A	DE 197 15 868 A (KÖPL) 22 October 1998 (1998-10-22) * claims 1,4; figure 2 *	8,9	
A	FR 2 088 758 A (PORTANIER) 7 January 1972 (1972-01-07)		
A	DE 38 11 492 A (GROSS) 19 October 1989 (1989-10-19)		

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B67D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	16 November 2000	Deutsch, J.-P.

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 12 0451

This annex lists the patent family membersrelating 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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

16-11-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2714900 A	13-07-1995	NONE	
US 5765609 A	16-06-1998	US 5813443 A	29-09-1998
		EP 0747317 A	11-12-1996
		US 5620030 A	15-04-1997
		US 5620031 A	15-04-1997
DE 19715868 A	22-10-1998	NONE	
FR 2088758 A	07-01-1972	NONE	
DE 3811492 A	19-10-1989	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82