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Datasheet for the decision of 5 May 2017

Case Number: T 2417/13 - 3.2.05

Application Number: 05718576.1

Publication Number: 1737622

IPC: F17C13/04

Language of the proceedings: EN

Title of invention:
In-Can Fuel Cell Metering Valve

Patent Proprietor:
Illinois Tool Works Inc.

Opponent:
OK Befestigung GmbH & Co. KG

Relevant legal provisions:
EPC 1973 Art. 56

Keyword:
Inventive step - (no)

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European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 2417/13 - 3.2.05

D E C I S I O N
of Technical Board of Appeal 3.2.05
of 5 May 2017

Appellant: (Opponent)	OK Befestigung GmbH & Co. KG Liesentorweg 19 A 47802 Krefeld (DE)
Representative:	Samson & Partner Patentanwälte mbB Widenmayerstraße 6 80538 München (DE)
Respondent: (Patent Proprietor)	Illinois Tool Works Inc. 155 Harlem Avenue Glenview, IL 60025 (US)
Representative:	Ole Trinks Meissner Bolte Patentanwälte Rechtsanwälte Partnerschaft mbB Postfach 10 26 05 86016 Augsburg (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 25 October 2013 concerning maintenance of the European Patent No. 1737622 in amended form.**

Composition of the Board:

Chairman	M. Poock
Members:	S. Bridge
	D. Rogers

Summary of Facts and Submissions

I. The opponent lodged an appeal against the interlocutory decision of the opposition division stating that European patent No. 1 737 622 in amended form according to the then main request meets the requirements of the European Patent Convention (EPC).

II. The opposition was filed against the patent as a whole based on Article 100(a) EPC (lack of novelty, Article 54 EPC 1973 and lack of inventive step, Article 56 EPC 1973).

III. Oral proceedings were held before the board of appeal on 5 May 2017.

IV. The requests of the appellant (opponent) were to set aside the decision under appeal and to revoke the patent.

V. The requests of the respondent (patent proprietor) were, as main request, to dismiss the appeal, or alternatively to set aside the decision under appeal and to maintain the patent upon the basis of the claims of either the first auxiliary request, filed under cover of a letter dated 10 July 2014, or upon the basis of the claims of the second auxiliary request, filed under cover of a letter dated 5 April 2017.

VI. Claim 1 according to the respondent's main request (amended patent deemed by the opposition division to meet the requirements of the EPC) reads as follows:

"A fuel cell (10) for use with a combustion tool, comprising:

. a housing (12) defining an open end (14) enclosed by a closure (16);
. a main valve stem (26) having an outlet (28), disposed in operational relationship to said open end and reciprocating relative to said housing at least between a closed position wherein said stem is relatively extended, and an open position wherein said stem is relatively retracted;
. a fuel metering valve (25) associated with said main valve stem, including a fuel metering chamber (38) disposed in close proximity to said closure and configured so that when said stem is in said open position, only a measured amount of fuel is dispensed through said outlet;

wherein said housing includes a separate fuel container (22), and wherein said fuel metering valve (25) is located within said housing (12) and includes a valve body (34) having a second end opposite said fuel metering chamber (38) located within said container (22), characterized in that,
the main valve stem (26) and said fuel metering chamber (38) are configured for movement of said main valve stem to a container filling position whereby said stem is retracted further than in said open position, and a fluid passageway is defined from said outlet to a container located within said housing."

VII. Claim 1 according to the first auxiliary request only differs from claim 1 according to the main request in that the following text is added at the end of the claim:

"wherein said main valve stem (26) has a radially enlarged portion (52), and said fuel metering chamber (38) is provided with a lip seal (46) constructed and arranged to engage said enlarged portion in said open

position, but defining a fuel passage therebetween in said closed position and filling position".

VIII. Claim 1 according to the second auxiliary request only differs from claim 1 according to the first auxiliary request in that the following text is added at the end of the claim:

"further including a clamp ring (76) for sandwiching a portion of said container (22) between said valve body (34) and said clamp ring; and
wherein said fuel metering valve (25) includes a main seal (42), and said main valve stem (26) includes a radial projection (50) for engaging said main seal in said closed position".

IX. The following documents are referred to in this decision:

D3: DE 202 12 802 U1;
D11: US 5,115,944;
D11a: EP 0 471 503 A2;
D16: DE 1 279 564 A1.

Documents D11 and D11a belong to the same patent family and were referred to interchangeably by both parties.

X. The arguments of the appellant in the written and oral proceedings can be summarised as follows:

Main request

Document D3 starts from prior art such as document D11a (belonging to the same patent family as document D11) and which discloses dispensing a fluid, such as, for example, a hydrocarbon fuel (document D11a, lines 1 to

5). In consequence, the skilled person concludes that the apparatus of document D3 is also suitable for dispensing hydrocarbon fuels which are used with combustion-gas powered tools. There are no explicit technical features in claim 1 related to the use for fuel for use with a combustion tool. Like all such pressurised dispensers, document D3 is concerned with effective sealing (page 3, lines 32 to 35). Since document D3 concerns the same technical area, namely, dispensing pressurised liquids and is suitable for dispensing hydrocarbon fuels to combustion-gas powered tools, document D3 forms the closest prior art.

The valve shown in the embodiment of figure 1 of document D3 only has a closed position and an open position in which a fluid passageway is defined from said outlet to a container located within said housing. The cell of document D3 is filled in the usual manner via the valve (page 3, lines 22 to 25).

The subject-matter of claim 1 only differs from the cell of document D3 in that the valve is for dispensing a metered amount of fuel. The objective problem is thus to dispense a metered amount. Document D3 explicitly discloses using a known metering valve as an alternative (page 3, lines 29 to 31). This motivates the skilled person to seek such known metering valves. Document D16 discloses such a metering valve for dispensing liquids. By using the metering valve of document D16 in the cell of document D3, the skilled person immediately arrives at the subject-matter of claim 1 according to the main request which therefore lacks an inventive step.

First auxiliary request

The additional feature of claim 1 according to the first auxiliary request is known from the embodiment of figure 4 of document D16. The subject-matter of claim 1 according to the first auxiliary request thus lacks an inventive step.

Second auxiliary request

The additional features of claim 1 according to the second auxiliary request are already known from documents D11 and D16 and the same reasoning still applies. The subject-matter of claim 1 according to the second auxiliary request thus lacks an inventive step.

XI. The arguments of the respondent in the written and oral proceedings can be summarised as follows:

Main request

The closest prior art should be a document which serves the same purpose or which aims for the same goal as the patent in suit and which should have many technical features in common with the invention so as to require only few changes. A similar technical objective is a further criterion to be considered.

Document D3 cannot be considered as closest prior art, because it does not involve dispensing an organic medium: The organic medium constitutes the propellant. Furthermore, the application as fuel cell for use with a combustion tool implies being adapted for handling the loads generated when the tool is being used. This is not the case for the pressurised container of document D3 which only dispenses an aerosol. The addi-

tional requirements for use with a combustion tool imply:

(i) operating in any position, such as overhead;
(ii) operating over a large temperature range;
(iii) reliably dispensing the metered amount in view of (i) and (ii) above;
(iv) particular safety requirements;
(v) minimising leakage in a rough working environment given the aggressive nature of the fuel and its additives;
(vi) preventing the propellant and fuel from mixing; and
(vii) conforming to particular standards such as EN 792-13: 200 & A1: 2008.

These requirements are set out in paragraphs [0003] and [0004] of the patent in suit.
The pressurised dispenser of document D3 may be filled by inserting an already filled bag into the container and assembling the container as set out on page 2, lines 16 and following. In consequence, document D3 cannot constitute the closest prior art.

The subject-matter of claim 1 differs from document D3 in that:

- the pressurised dispenser is for use as a fuel cell for use with combustion tools;
- the valve dispenses a metered amount of fuel;
- the valve stem can be retracted further than in the open position such that a fluid passageway is defined from said outlet to the container located in the housing, this position constituting a container filling position.

The respondent no longer contests the admissibility of document D16 into the appeal proceedings (see minutes).

The skilled person requires hindsight to arrive at the subject-matter of claim 1 starting from document D3 and would not consider document D16, because it does not disclose a fuel cell, does not have a separate fuel container and involves a more complex valve. The subject-matter of claim 1 according to the main request therefore involves an inventive step.

First auxiliary request

The additional feature of claim 1 according to the first auxiliary request further distinguishes the subject-matter of claim 1 from the prior art. The subject-matter of claim 1 according to the first auxiliary request therefore involves an inventive step.

Second auxiliary request

The additional feature of the clamp ring for attaching the bag onto the valve makes document D3 unsuitable as closest prior art, because document D3 requires welding the bag to the valve. Document D11 forms the closest prior art instead. Document D11 discloses all features of the preamble of granted claim 1 and further discloses the clamp ring and main seal arrangements.

The subject-matter of claim 1 according to the second auxiliary request thus differs therefrom in that the valve is a metering valve with a filling position. This allows the fuel cell to be filled after assembly.

Document D16 does not disclose any of:
- the use as fuel cell,
- a separate container for the fuel and
- the clamp ring arrangement.

The skilled person thus requires hindsight to arrive at the subject-matter of claim 1 starting from document D11 since he would not consider document D16.

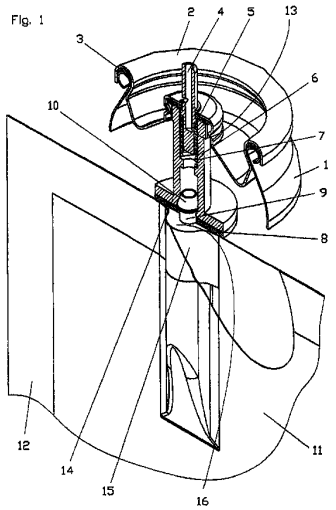
The subject-matter of claim 1 according to the second auxiliary request therefore involves an inventive step.

Reasons for the Decision

1. *Main request - Inventive step*

1.1 Closest prior art

1.1.1 Document D3 concerns a dispensing valve and bag for pressurised liquids (page 1, lines 3 to 5, figure 1). The fact that the device of document D3 may also be used for foams or gels does not make it unsuitable for use with liquids in general.



Document D3 further discloses that such valve assemblies are known from various prior art documents including document D11a (page 1, lines 6 and 7). Document D11a (and corresponding document D11) relates to a dispenser for a fluid, such as, for example, a hydrocarbon fuel (document D11a, column 1, lines 1 to 5;

document D11, column 1, lines 6 to 12) and further discloses that "*it is known to use a dispenser of the type noted above to dispense a hydrocarbon fuel to a combustion gas-powered tool, such as, for example, a combustion gas-powered fastener-driving tool*" and that the "*dispenser 10 may be advantageously employed in a combustion gas-powered fastener-driving tool…*"(document D11a, column 1, lines 8 to 17; column 3, lines 5 to 10; document D11, column 1, lines 18 to 22; column 3, lines 25 to 28). In consequence, the introductory passage of document D3 implies that the dispensing valve and bag for pressurised liquids of document D3 also relates to the kind of device disclosed in document D11a. In consequence, the board concludes that the apparatus of document D3 must also be suitable for dispensing a liquid hydrocarbon fuel for use with a combustion tool.

The respondent contested that document D3 discloses an organic medium as the substance being dispensed from the bag 11. However, document D3 discloses page 3, lines 32 to 34 that the exchange of organic media between the bag and the inside of the container is prevented: Thus contrary to the position of the respondent, document D3 implies that the bag may also contain an organic medium to be dispensed via the valve. It was not contested that a "*liquefied hydrocarbon fuel*" (patent in suit, column 4, lines 9 to 13) is a type of liquid "*organic medium*".

This also implies that the pressurised liquid dispenser of document D3 will meet any particular additional requirements associated with the use for a combustion tool. Of these requirements, the only ones which are explicitly disclosed in paragraphs [0003] and [0004] of the patent in suit are the prevention of leakage generally associated with aerosol containers (paragraph

[0003]) and the need for dispensing a desired amount of fuel (paragraph [0004]). Since document D11a/D11, which explicitly concerns dispensing a hydrocarbon fuel used with combustion-gas powered tools (document D11a, column 1, lines 8 to 17; column 3, lines 5 to 10; document D11, column 1, lines 18 to 22; column 3, lines 25 to 28), has a valve which only has an open position providing a continuous supply of fuel, the requirement for dispensing a metered amount of fuel is not necessarily universal to all fuel cells for use with a combustion tool. Thus the only remaining particular requirement explicitly mentioned in the patent in suit is the prevention of leakage. Even this is described in the patent in suit as being generally associated with aerosol containers (column 1, lines 33 and 34) and document D3 is similarly concerned with sealing (page 1, line 33 to page 2, line 1; page 3, lines 12 to 16 and 32 to 35).

Although it was advanced on behalf of the respondent, that the container of document D3 might involve assembling an already filled bag into the container, document D3 actually discloses that both the contents of the container and the contents of the bag are introduced in the usual manner via the valve (page 3, lines 22 to 25).

Since document D3 concerns the same technical area, namely dispensing pressurised liquids, and discloses a pressurised liquid dispenser that is suitable for dispensing liquid hydrocarbon fuels to combustion-gas powered tools, document D3 can be considered as the closest prior art.

1.1.2 It was argued on behalf of the respondent that the subject-matter of claim 1 differs from the pressurised dispenser of document D3 in that:

(a) the device is to be used as a fuel cell for use with combustion tools;

(b) the valve is for dispensing a metered amount of fuel;

(c) the valve stem can be retracted further than in the open position such that a fluid passageway is defined from said outlet to a container located within said housing, this position constituting a container filling position.

Difference (a) does not constitute a technical difference of the pressurised dispenser of document D3 as such, because it only relates to a manner of using the dispenser of document D3 for one of the uses for which it is already known to be suitable (see arguments above).

Difference (c) is already disclosed in document D3 which has a valve with such a continuous open position (page 2, lines 26 to 29, figure 1) and which is furthermore to be filled via the valve (page 3, lines 22 to 25).

Thus the subject-matter of claim 1 only differs from the pressurised dispenser of document D3 in that the valve dispenses a metered amount of fuel.

1.2 The technical effect of this difference is that the pressurised dispenser dispenses a metered amount and the corresponding objective technical problem is to modify the device of document D3 to dispense a metered amount.

1.3 This objective corresponds to the design criterion set out in paragraph [0004] of the patent in suit.

It follows that document D3 constitutes a valid choice of closest prior art for the subject-matter of claim 1, since it is suitable for serving the same purpose, aims for the same technical objective of reduced leakage as the patent in suit and has many technical features in common with the claimed invention.

1.4 Document D3 further explicitly discloses that, depending on requirements, known metering valves are to be used instead of the valve shown in figure 1 (page 3, lines 29 to 31). The skilled person is thus motivated to consider a known metering valve when addressing the above objective problem.

1.5 Document D16

Document D16 discloses a valve dispensing a measured amount of liquid from a pressurised container (column 1, lines 1 to 20). Figures 1 to 3 respectively disclose the closed position, the open (dispensing) position and the fully open "*filling position*" (column 3, lines 54 to 60).

FIG.1

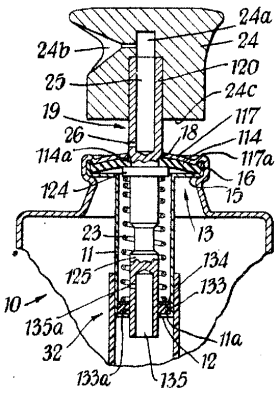


FIG.2

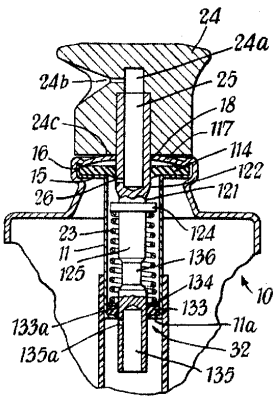
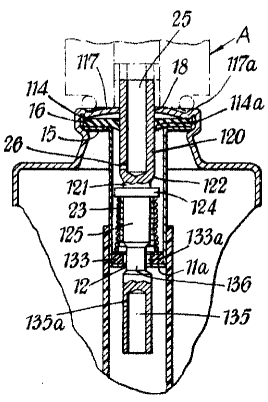


FIG. 3



In the closed position (figure 1), the metering chamber is connected to the interior of the container via chan-

nels 135 and 135a in the base 125 of the valve stem. In the dispensing position (figure 2), the metering chamber is sealed from the interior of the container, because channel 135a has been displaced below lip seal 133 (column 5, lines 29 to 41, figures 1 and 2).

When the stem is retracted further than in the open position of figure 2, a fluid passageway is defined from said outlet to the interior, because the narrowed part 136 of the stem has been moved to the level of seal 133 (column 5, lines 42 to 50, figure 3).

1.6 The skilled person starting from document D3 and seeking to add a metering valve to the device disclosed in document D3 would replace the continuous dispensing valve of figure 1 of document D3 with the metering valve according to document D16 and thereby immediately arrive at the subject-matter of claim 1 without performing an inventive step.

1.7 It was argued on behalf of the respondent that the skilled person would not consider document D16, because that document:

- does not disclose the use as a fuel cell for use with a combustion tool,
- does not disclose a separate fuel container and
- involves a more complex valve.

This argument cannot be followed. The objective problem starting from document D3 only concerns the type of valve: the use of a separate fuel container is an issue which is independent of the valve, since it only concerns the manner in which the valve is used, in particular, in terms of what is connected to the valve. In addition, the skilled person seeking a metering valve expects that such a valve will necessarily be more complex than a simple open/closed type of valve and

this is not as such a reason for disregarding known metering valves contrary to the suggestion of document D3. Furthermore, there are no explicit additional requirements resulting from the use as a fuel cell for use with a combustion tool set out in claim 1. As was already pointed out in the annex to the summons (point 7.4), the person skilled in the art of pressurised dispensers (such as the one disclosed in document D3) necessarily has to take into account the nature of the "*organic medium*" to be dispensed: The skilled person has to go through the same design considerations in terms of choosing suitable materials and dimensions, whether the "*organic medium*" is a cleaning fluid, a lubricant, a pesticide, a disinfectant, a paint or a fuel.

1.8 In consequence, the subject-matter of claim 1 according to the main request does not meet the requirements of articles 100(a) and 56 EPC 1973.

2. *First auxiliary request - Inventive step*

2.1 The additional feature of claim 1 according to the first auxiliary request with respect to claim 1 according to the main request concerns the configuration of the valve stem and metering chamber in that the "*main valve stem (26) has a radially enlarged portion (52), and said fuel metering chamber (38) is provided with a lip seal (46) constructed and arranged to engage said enlarged portion in said open position, but defining a fuel passage therebetween in said closed position and filling position*".

In view of the above discussion of the main request, the purpose of this added feature is to distinguish the claimed invention from known metering valves (such as

the one in figures 1 to 3 of document D16) in that the fuel passage can be achieved without the need for a cross bore 135a or a hollow interior 135 of the valve stem (as shown, for example, in figures 1 to 3 of document D16): the technical effect of this added feature is to have a simpler valve stem.

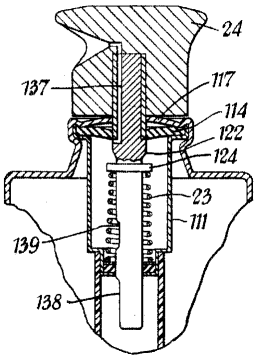
2.2 Document D3 still constitutes the closest prior art (see above discussion in the context of the main request).

2.3 The subject-matter of claim 1 according to the first auxiliary request differs therefrom in that the valve dispenses a metered amount of fuel whereby the valve stem (as defined by the added feature set out above) is of a simple design.

2.4 The corresponding objective problem is thus to modify the device of document D3 to dispense a metered amount with a simple design.

2.5 Document D16 discloses as an alternative to the embodiment of figures 1 to 3 that the channels 136, 135 and 135a of that embodiment may instead be formed by narrowed portions 138 and 139 of the valve stem (column 5, lines 51 to 58, figure 4).

FIG. 4



According to this alternative, the valve stem has a radially enlarged portion (between the narrowed parts 139 and 138, figure 4) and the lip seal 133 is constructed and arranged to engage said enlarged portion in said open position (figure 4), but defining a fuel passage therebetween in the closed position (figure 1) and in the filling position (figure 3).

2.6 The skilled person starting from document D3 and seeking to add a metering valve with a simple valve (i.e. without cross bores and not hollowed out) to the device disclosed in document D3 would follow the teaching of document D16 (column 5, lines 51 to 58, figure 4) and thereby immediately arrive at the subject-matter of claim 1 according to the first auxiliary request without performing an inventive step.

2.7 In consequence, the subject-matter of claim 1 according to the first auxiliary request does not meet the requirements of articles 100(a) and 56 EPC 1973.

3. *Second auxiliary request - Inventive step*

3.1 The respondent argued that document D11/D11a should be considered as the closest prior art since it addresses the same intended use and the subject-matter of claim 1 according to the second auxiliary request only differs therefrom in terms of a simple metering valve with a filling position. The board has no reasons to disagree.

3.2 In consequence, the same reasoning applies as set out in the context of the main request:

The technical effect of the differences is that the pressurised dispenser dispenses a metered amount and the corresponding objective technical problem is again

to modify the valve of document D11 to dispense a metered amount.

The arguments concerning the metering valves known from document D16 are set out above in the context of the higher ranking requests. These arguments apply likewise to the second auxiliary request when the skilled person starting from document D11 seeks a simple metering valve with a filling position and finds such a valve in figure 4 of document D16. In particular, the arguments against document D16 advanced on behalf of the respondent correspond to those already addressed in the context of the main request and have been dealt with there. In addition, it is not clear why the respondent would require the skilled person to find additional features from document D11 (such as the use as fuel cell, a separate container for the fuel and the clamp ring arrangement) to be duplicated in document D16 as a prerequisite for considering the metering valve of document D16 when solving the objective problem, in particular as these features are independent of the configuration of the valve as such.

The skilled person starting from document D11 and seeking to produce a simple metering valve with a filling position would follow the teaching of document D16 (column 5, lines 51 to 58, figure 4) and thereby immediately arrive at the subject-matter of claim 1 according to the second auxiliary request without performing an inventive step.

In consequence, the subject-matter of claim 1 according to the second auxiliary request does not meet the requirements of articles 100(a) and 56 EPC 1973.

Order

For these reasons it is decided that:

The decision under appeal is set aside.

The patent is revoked.

The Registrar: The Chairman:

D. Meyfarth M. Poock

Decision electronically authenticated