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Case Number: T 0092/23 - 3.2.04

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Language of the proceedings: EN

Title of invention:
MODULAR VALVE ASSEMBLY

Applicant:
Globe Fire Sprinkler Corporation

Headword:

Relevant legal provisions:
EPC Art. 56
RPBA 2020 Art. 12(6)

Keyword:
Inventive step - (no)
Late-filed request - should have been submitted in first-instance proceedings (not admitted)

Decisions cited:

Catchword:

Europäisches Patentamt
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Beschwerdekammern

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Case Number: T 0092/23 - 3.2.04

D E C I S I O N
of Technical Board of Appeal 3.2.04
of 12 June 2024

Appellant: (Applicant)	Globe Fire Sprinkler Corporation 4077 Airpark Drive Standish, MI 48658 (US)
Representative:	Petraz, Gilberto Luigi GLP S.r.l. Viale Europa Unita, 171 33100 Udine (IT)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 19 August 2022 refusing European patent application No. 17839950.7 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	G. Martin Gonzalez
Members:	C. Kujat
	C. Heath

Summary of Facts and Submissions

I. The appeal was filed by the appellant (applicant) against the decision of the examining division to refuse their patent application.

II. The examining division held inter-alia that neither the main request nor auxiliary request 5 before it (auxiliary request 3 in appeal) involved an inventive step.

III. In preparation for oral proceedings the board issued a communication setting out its provisional opinion on the relevant issues.

Oral proceedings before the Board were held by videoconference on 12 June 2024.

IV. The appellant requests that the decision under appeal be set aside and that a patent be granted according to the main request or one of auxiliary requests 1-4, all filed or re-filed with the statement of grounds of 21 December 2022. The main request and auxiliary request 3 correspond to the main request and auxiliary request 5 of the appealed decision.

V. Claim 1 of the requests relevant to this appeal reads as follows:

(a) Main request

"A wet piping system modular valve assembly (10, 310) comprising: an upstream control assembly (12) in series with a downstream check valve assembly (14),

the check valve assembly (14) defining a single piece valve body (34, 334) fluidly connecting or housing a check valve (30, 330), a test, drain and pressure relief single module (32) and a flow detection switch (28, 328);

the check valve (30, 330) comprising an endless valve seat (30a) within the valve body (34, 334) and a clapper disk (30b, 330b) removably and pivotably mounted within the valve body (34, 334), the check valve (30, 330) being movable between a closed position, wherein the clapper disk (30b, 330b) is in sealed engagement with the valve seat (30a), and an open position, wherein the clapper disk (30b, 330b) is spaced away from the valve seat (30a), according to a pressure differential across the check valve (30, 330);

a test valve, a drain valve and a pressure relief valve combined into the test, drain and pressure relief single module (32) removably mounted to the valve body (34, 334) and fluidly connected with the valve body (34, 334) downstream of the check valve (30, 330); and

the flow detection switch (28, 328) being a mechanically independent flow detection switch (28, 328) removably mounted to the valve body (34, 334) and fluidly connected with the valve body (34, 334) upstream of the drain valve and the check valve (30, 330), and

the control assembly (12) being in fluid communication with the check valve assembly (14), the control assembly (12) including a valve body (18) having a control valve (15) therein, and a selectively rotatable control arm (25) operatively coupled with the control valve (15) to move the control valve (15) between an open position, permitting fluid flow through the control valve (15), and a closed position, substantially preventing fluid flow through the control valve (15)."

(b) First auxiliary request

Claim 1 as in the main request with the following amendments (emphasis by the Board):

"...,

the check valve assembly (14) defining a single piece valve body (34, 334) ~~fluidly connecting or~~ housing a check valve (30, 330), and fluidly connecting a test, drain and pressure relief single module (32) and a flow detection switch (28, 328);

the check valve (30, 330) comprising an endless valve seat (30a) within the valve body (34, 334) and a clapper disk (30b, 330b) removably and pivotably mounted within the valve body (34, 334), the clapper disk (30b, 330b) ~~check valve (30, 330)~~ being movable between a closed position, wherein the clapper disk (30b, 330b) is in sealed engagement with the valve seat (30a), and an open position, wherein the clapper disk (30b, 330b) is spaced away from the valve seat (30a), according to a pressure differential across the clapper disk (30b, 330b) ~~check valve (30, 330)~~;

..., and

the control assembly (12) being in fluid communication with the check valve assembly (14), the control assembly (12) including a valve body (18) having a ~~control valve (15)~~ butterfly valve disk (19) therein, and a selectively rotatable control arm (25) operatively coupled with the ~~control valve (15)~~ butterfly valve disk (19) to ~~move~~ rotate the ~~control valve (15)~~ butterfly valve disk (19) between an open position, permitting fluid flow through the valve body (18) ~~control valve (15)~~, and a closed position, substantially preventing fluid flow through the valve body (18) ~~control valve (15),~~

wherein the valve body (34, 334) includes a pair of generally oppositely disposed ports (52a, 52b; 352a, 352b) extending through a sidewall of the valve body (34, 334) downstream of the flow detection switch (28, 328) and in fluid communication with an interior of the valve body (34, 334), and the test, drain and pressure relief single module (32) being removably mounted to either one of the pair of ports (52a, 52b; 352a, 352b),

wherein one port of the pair of ports (52a, 52b; 352a, 352b) that is not coupled with the test, drain and pressure relief single module (32) is sealed shut with a removably mounted sealing adapter (54, 354)."

(c) Second auxiliary request

Claim 1 as in the first auxiliary request with the following features added at the end of the claim:

"...wherein the valve body (34, 334) includes an opening in a sidewall thereof, the opening being sized and dimensioned to clear passage of the check valve (30, 330) therethrough, and the modular valve assembly (10, 310) further comprises a mounting plate (55, 355) removably and sealingly mountable on the valve body (34, 334) to cover the opening."

(d) Third auxiliary request

Claim 1 as in the first auxiliary request with the following features added at the end of the claim:

"...wherein the test, drain and pressure relief single module (32) includes three fluidly connectable ports (42, 44, 46), an internal ball valve (40) which directs the flow between the three fluidly connectable ports (42, 44, 46) and a lever (48) controlling the

ball valve (40), a first port (42) of the three fluidly connectable ports (42, 44, 46) being fluidly connected at an inlet side (42a) thereof to one of the pair of ports (52a, 52b; 352a, 352b) of the valve body (34, 334), a second port (44) of the three fluidly connectable ports (42, 44, 46) being fluidly connected at an outlet (44b) thereof with a pressure relief valve (45) and a third port (46) of the three fluidly connectable ports (42, 44, 46) being fluidly connected at an outlet (46b) thereof with a drainage pipe."

(e) Fourth auxiliary request

Claim 1 as in the third auxiliary request with the following features added at the end of the claim:

"...wherein the valve body (34, 334) includes an opening in a sidewall thereof, the opening being sized and dimensioned to clear passage of the check valve (30, 330) therethrough, and the modular valve assembly (10, 310) further comprises a mounting plate (55, 355) removably and sealingly mountable on the valve body (34, 334) to cover the opening."

VI. In the present decision, reference is made to the following documents:

(D1) JP 2003 149021 A
(D2) US 2012/0055686 A1
(D4) US 2002/0014270 A1
(D10) US 2,667,934

VII. The appellant's arguments can be summarised as follows:

Claim 1 of all requests involves an inventive step over the cited prior art. Auxiliary requests 2 and 4 are

admissible even if not submitted during the examination phase.

Reasons for the Decision

1. The appeal is admissible.

2. Background

The application is directed to a fluid flow valve assembly for a sprinkler wet standpipe used to monitor and optionally control water released to downstream sprinklers of a fire suppression system, see para 0001 of the application (PCT publication WO 2018/031074 A1). The invention is aimed at providing a modular valve assembly having a compact footprint, comprising a control valve, a check valve, a flow detection switch, a test valve and a pressure relief module, or some combination thereof, mounted thereto, thereby eliminating the large manifold of piping and the associated footprint, as well as minimizing the cost and time of manufacture and complex assembly thereof, see para 0006.

3. Main request - Inventive step

3.1 In the Board's opinion, claim 1 of the main request does not involve an inventive step, as determined by the examining division.

3.2 Figures 2 and 3 of D1 (the second embodiment of D1) provide a suitable starting point for assessing inventive step. These figures depict a modular valve assembly for a piping system, featuring a single-piece valve body, a butterfly check valve (40), and flow detection switches (10 and 11) located upstream of the

check valve. According to paragraph 0029 of that document, the check valve (40) operates by opening and closing in response to a pressure differential across it.

As described in paragraph 0038 of D1, in both the first and second embodiments, a control valve is generally positioned upstream of the valve body, with the second embodiment being the starting point for the inventive step assessment. This type of control valve is shown as part of the conventional related prior art in Figure 5 of D1, featuring a rotating handle (105) for opening and closing the valve, as mentioned in paragraph 0004 and the final two sentences of paragraph 0048. Additionally, a drain valve is mounted on the valve body, as shown in Figure 2 with the description "drainage" indicated in Japanese, and further explained in paragraphs 0045 and 0046 regarding the second embodiment.

3.3 Therefore the subject matter of claim 1 differs from this known arrangement in that:

1. The drain valve is combined into a removable test, drain, and pressure relief single module.

2. The detection switch is removably mounted.

3. The check valve is a clapper disk type valve.

3.4 The appellant argues in their statement of grounds that all features collectively contribute to the overarching objective of reducing the assembly's footprint. However, while combining a test, drain, and pressure relief valve into a single module indeed reduces the footprint, making the flow detection switch removable

or replacing the butterfly check valve with a clapper disk type does not contribute to this goal. A removable flow detection switch addresses maintenance concerns, and the clapper disk check valve simply provides an alternative to the butterfly type.

Therefore, there is no synergistic effect from combining these measures, and inventive step can be assessed independently for each feature.

3.5 The integration of a test and pressure relief valve with the drain valve into a single module provides additional functionality while maintaining a compact footprint (see paragraph 0006 of the published PCT application). The objective technical problem can thus be formulated as how to add functionality while preserving a compact footprint.

3.6 Document D4 teaches a combined test and drain valve (see Figs. 1-4B), which may include a pressure relief valve at outlet port 26, as described in paragraph 0047 of D4. Handle 52 allows manual switching between off (also pressure relief function), test, and drain (see paras. 0048-0051). The additional piping loop (44, 46, 44, 48, 50) with a remotely controlled solenoid valve 36 adds remote testing functionality (see para 0052), a function that is not foreseen in the present application.

It is readily evident to the skilled person that such a module, compared to just a drain valve, enhances functionality and can be implemented by connecting it to the existing outlet port of the D1 valve (see Fig. 2 of D1). It does so compactly by combining all functions into a single module, thus making its use in D1 an obvious solution to the posed problem. Additionally,

the module taught by D4 is designed to be removably connectable at inlet port 22.

3.7 The appellant argues that the skilled person would not use the D4 arrangement to solve the formulated technical problem because the additional piping loop for remote testing increases the module's footprint compared to the simpler modules in the application. This argument is unconvincing.

Claim 1 does not exclude additional functions, such as those in D4. While the D4 module has a larger footprint due to remote functionality, its manual switching structure mirrors that of the present application, including a valve body with three connectable ports (22, 24, 26 in D4; 42, 46, 44 in Fig. 4 of the application) and an internal ball valve (54 in D4; 40 in Fig. 4).

Thus, for the claimed functionalities, the D4 module is equally compact. Adding further functionality naturally increases footprint but does so compactly within a single module connected to a single port, making it an obvious solution to the formulated technical problem.

3.8 The appellant also argues that the skilled person would not consider using a more cumbersome module in a wet piping firefighting system, as claimed, due to stringent space constraints in stairwells and building interiors, where these type of systems are typically used. This argument is unconvincing. In the first place, D4 is described as a component of a wet piping system (see paras 0003 and 0004 of D4). The skilled person would therefore quite naturally and as a matter of obviousness consider it for wet piping systems. Additionally, while there may be scenarios, as those

described by the appellant, where using the module taught by D4 is inconvenient, the claimed wet piping system is not restricted to such scenarios either implicitly or explicitly.

3.9 Regarding the second differentiating feature, making the detection switch removable instead of fixed is a routine design choice known to the skilled person from their common general knowledge, particularly to improve maintenance.

This is especially clear in the context of D1, where Figure 2 shows the switch housing 11 as a separate component from the valve body, indicating that it was manufactured separately and then assembled. Making this assembly removable for maintenance purposes is an immediate and obvious choice for the skilled person, regardless of whether D1 specifically suggests it, as it is prompted by common general knowledge.

3.10 The appellant's objection that the skilled person would be prevented from making this change because the sensing paddle 10, with its fan-shaped tip 10a (see Fig. 3), would not pass through the valve housing aperture is unconvincing. The Board believes that modifying the paddle or aperture to allow dismantling (e.g., with a larger mounting aperture as shown in the embodiment of Fig. 4 of D1) falls within routine design practices and does not therefore confer an inventive step.

3.11 Regarding the third differentiating feature of providing a clapper disk type check valve, paragraph 0048 of D1 already states that the check valve is not limited to the butterfly or swing types (i.e. clapper disk type in the wording of the present application)

and that various other structures can be adopted, such as a lift type. It is thus immediately apparent to the skilled person that the check valve in D1 is not restricted to the butterfly type, with the swing (clapper disk) type being an obvious alternative.

The appellant argues that selecting a clapper disk type from several possible alternatives is not suggested by the prior art or common general knowledge and thus inventive. However, in the Board's view, the now claimed alternative is already mentioned in paragraph 0048 of D1. Choosing one obvious alternative from several obvious alternatives does not make the choice inventive.

3.12 The Board therefore concludes that claim 1 of the main request does not involve an inventive step.

4. Auxiliary request 1 - Inventive step

4.1 Claim 1 of this request also lacks inventive step when considering D1 as the starting point for the assessment.

4.2 This request is amended compared to the main request by adding the feature that the valve body has two generally oppositely disposed ports, where the test, drain, and pressure relief single module can be mounted, with the unused port being sealed with a sealing adaptor.

4.3 Having two oppositely disposed ports allows the corresponding module to be positioned on either side during installation, which is convenient as some building settings may only allow space for the module on one side of the check valve assembly. Additionally,

it allows for the convenient mounting of the module on the underside of the valve body for efficient drainage when the valve assembly is mounted in a horizontal orientation (see paragraphs 0051-0052 of the application). The related technical problem can thus be formulated as how to enhance convenience during installation. This problem is distinct from those previously analysed for the main request, so again, inventive step can be assessed independently. As explained above, the other differentiating features analysed for the main request are considered obvious.

4.4 Regarding the provision of two oppositely disposed connection ports, document D2, in paragraph 0037, teaches this structure. D2 describes two oppositely disposed connection ports 41 and 48 (see also the lower part of Fig. 1) for convenience during installation. Paragraph 0037 states, "[I]n this way, during installation, the detector and alarm arrangement 44 may be positioned on either side of the condensate collector arrangement 10, as desired or as convenient, to provide ready access to the detector and alarm arrangement." Thus, D2 provides the same technical advantage sought by the skilled person, who would find it highly relevant for solving the formulated problem. Therefore, in light of the teachings of D2, the skilled person would consider the provision of two mirrored connection ports for the connection of the drain module in D1 as an obvious solution to enhance convenience during installation.

4.5 The Board does not find the appellant's argument convincing that a skilled person would disregard the relevance of D2's teachings, which are directed at dry piping systems, for addressing a technical problem in a wet piping system like that of D1.

It is undisputed that the skilled person in this case is an engineer specialized in designing and developing wet piping fire suppression systems, with extensive knowledge in the broader field of fire suppression systems. Given their knowledge in that field, they are familiar with the developments in various types of fire suppression systems, including dry piping systems, and would naturally consider advancements and teachings across these domains.

4.6 The Board is also not persuaded by the appellant's assertion that it would not be obvious for the skilled person to apply the teaching from paragraph 0037 of D2. That paragraph discusses the connection of a detector and alarm arrangement to a lower valve of a condensate collector in a dry pipe system. In contrast the situation in D1 involves connecting a drain, test, and pressure relief module to a check valve housing in a wet pipe system. The appellant argues that these elements of D1 and D2 differ significantly in their technical nature and function. Additionally, they note that condensate collectors are typically installed at low points in the pipe system (para 0003 of D2), while check valves and associated test and drain valves for wet pipe systems are often located at different heights and positions within buildings, particularly in stairwells and interiors where space constraints are more stringent compared to the outdoor installations typical of dry pipe systems.

However, in the Board's view, it is well within the ordinary skills of comprehension and abstraction of the skilled person to recognize that the teachings in paragraph 0037 of D2 have broader applicability beyond dry pipe systems and are relevant for addressing

general pipe network installation problems, including those encountered with the check valve and the drain valve module of D1. The key takeaway from paragraph 0037 of D2 is that offering alternative connection points facilitates installation and addresses situations where one connection point may have limited access or is more convenient for some reason. It is immediately apparent to the skilled person from straightforward considerations that these principles apply universally to different types of pipework systems and elements, regardless of whether they are used or taught in dry or wet systems, their specific location within the pipe network or building, or the nature of the connected devices (whether a detector and alarm arrangement or a drain and test valve single module).

4.7 In view of the above, the Board concludes that claim 1 of auxiliary request 1 lacks an inventive step.

5. Auxiliary request 2 - Admission

5.1 Along with the statement of grounds of appeal, the appellant submitted an amended set of claims as auxiliary request 2. This request is new in appeal. According to Article 12(6), second sentence RPBA, the Board shall not admit new requests that should have been submitted during the examination proceedings unless the circumstances of the appeal justify their admittance.

5.2 Auxiliary request 2 includes the features of the original dependent claim 8, which should have been considered a straightforward backup option during the examination phase. Additionally, it introduces a new aspect of the invention: an opening in the sidewall of

the valve body, sized to clear a passage of the check valve for mounting or maintenance, and a removable plate covering it. This immediate fallback option incorporating a new aspect should have been submitted earlier for full consideration by the examining division.

5.3 During the oral proceedings before the Board, the appellant argued that they did not file this request before the examining division because they believed it had lower chances of success. The examining division opined that certain functional features, such as the system being a wet pipe system, were not limiting. Given this, combination teachings from documents related to dry pipe systems, such as D10, could have become more relevant, reducing the likelihood of overcoming an inventive step objection.

This argument is not convincing. If the Board admitted the second auxiliary request on appeal, it would need to decide on the substance of this request, which includes the new subject matter of original dependent claim 8. As the appellant purposefully avoided a decision on this subject matter in first instance, admission of auxiliary request 2 in appeal would mean that the Board of Appeal would have to deal with a fresh case that could very well have been brought before the first instance, while Article 12(6) RPBA aims to prevent such "forum shopping" between the first and second instances.

5.4 Therefore, the Board decided during the oral proceedings not to admit auxiliary request 2.

6. Auxiliary request 3 - Inventive step

This request is amended vis-a-vis auxiliary request 1 to further specify that the test, drain and pressure relief module includes three ports and an internal ball valve, with one port serving as the inlet port and the other two ports connected respectively to the pressure relief valve and to the drainage pipe.

These features are already disclosed by the module in D4, as illustrated in Figs. 2A-4B, in combination with paragraph 0047. Consequently, claim 1 lacks an inventive step for similar reasons as auxiliary request 1.

7. Auxiliary request 4 - Admission

This new request has been amended with respect to auxiliary request 3 to incorporate the features of original dependent claim 8. It was held inadmissible by the Board during the oral proceedings, Art 12(6) RPBA, for the reasons set out above for auxiliary request 2.

8. All of the appellant's requests either fail due to a lack of inventive step or are not admissible. Consequently, the appeal is dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

A. Chavinier G. Martin Gonzalez

Decision electronically authenticated