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D E C I S I O N
of 15 March 2002

Case Number: T 0779/00 - 3.2.4

Application Number: 93922563.7

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Language of the proceedings: EN

Title of invention:

Method and installation for fighting fire

Patentee:

Sundholm, Göran

Opponent:

FOGTEC Brandschutz GmbH

Headword:

-

Relevant legal provisions:

EPC Art. 54, 56

Keyword:

"Novelty (yes)"
"Inventive step (yes)"

Decisions cited:

-

Catchword:

-



Case Number: T 0779/00 - 3.2.4

D E C I S I O N
of the Technical Board of Appeal 3.2.4
of 15 March 2002

Appellant: FOGTEC Brandschutz GmbH
(Opponent) Schanzenstraße 35
D-51063 Köln (DE)

Representative: Simons, Johannes
COHAUSZ & FLORACK
Postfach 33 02 29A
D-40435 Düsseldorf (DE)

Respondent: Sundholm, Göran
(Proprietor of the patent) Ilmari Kiannonkuja 3
FIN-04310 Tuusula (FI)

Representative: Jenkins, Peter David
PAGE WHITE & FARRER
54 Doughty Street
London WC1N 2LS (GB)

Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 22 May 2000
rejecting the opposition filed against European
patent No. 0 665 760 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: C. A. J. Andries
Members: R. E. Gryc
H. Preglau

Summary of Facts and Submissions

I. The appellant (opponent) lodged an appeal, received at the EPO on 14 July 2000, against the decision of the Opposition Division rejecting the opposition dispatched on 22 May 2000.

The appeal fee was paid simultaneously and the statement setting out the grounds of appeal was received at the EPO on 22 September 2000.

II. The opposition was filed against the patent as a whole and based on lack of inventive step of its subject-matter (Articles 100(a) and 56 EPC) mainly in view of the following documents:

D1: Article "Hi-fog now also for engine rooms",
Shipping World & Shipbuilder, September 1992,
pages 35 and 36.

D2: DD-B-148 858,

D3: Article "Der Einfluß der Tropfengröße bei der
Brandbekämpfung", Lechler Apparatebau Nachrichten
Nr. 237, March 1956 (four pages), and

D3a: Article "Flüssigkeitszerstäubung mittels Düsen",
Lechler Apparatebau KG, Separatdruck aus
"Technica" Nr 13/1965, pages 1161 to 1166.

The Opposition Division held that the grounds for opposition did not prejudice the maintenance of the patent as granted and rejected the opposition.

III. In his statement setting out the grounds of appeal, the

appellant (opponent) contended that Claim 1 was not restricted to a fixed system but covered also the use of hand-held devices and neither gave a concrete definition of the nature of the sprayed liquid nor laid down that a stationary installation was concerned particularly. Moreover, the appellant asserted that the device for fighting fire disclosed by D2 used any extinguishing fluid and expelled it at a high pressure in the form of a full jet in the first stage of its operation and in the form of fine droplets in its second stage i.e. in the same way as the nozzles of the installation of Claim 1. The appellant acknowledged that the subject-matter of Claim 1 differed from the teaching of D2 in that, in the first stage of operation, the device of D2 expelled a full jet of liquid whereas the nozzles of Claim 1 produced a fog-like liquid spray. However, the appellant was of the opinion that the expression "full jet" was understood by the skilled person as a jet formed with tight concentrated droplets.

The appellant also contended that D2 disclosed the closest prior art and that it was obvious for the skilled person to combine the teachings of D3 or D3a with that of D2 in order to arrive at the subject-matter of Claim 1 since D3 brought not only the same solution as the invention to the problem posed by D2 but also all the needed technical means. According to the appellant, the skilled person would have got the same result by using the tips given in D1.

As regards the installation of Claim 6, the appellant contended that when a nozzle according to D3/D3a was operated at high pressure, a Venturi effect was created behind the nozzle and a high concentration of the jets

would necessarily result therefrom. Therefore, according to the appellant, mounting a nozzle according to D3 on the device of D2 would result in an installation comprising all the features of Claim 1.

In reply, the respondent (patentee) contradicted all the arguments of the appellant.

IV. Oral proceedings took place on 15 March 2002.

The appellant did not dispute novelty of the subject-matter of the two independent claims 1 and 6 of the opposed patent.

He considered that the state of the art closest to the subject-matter of Claim 1 was disclosed by D2 which gave the basic information whereas D3 brought the solution to improve the installation so that it could reach all the corners of the room to be protected against fire.

The appellant pointed out that Claim 1 did not define the meaning of the expression "high pressure" used in the claim so that the required pressure range was completely open. He contended also that D3 gave the hint: "the higher the pressure, the better the penetration of the spray into the fire", and that D3a disclosed how to increase the pressure.

As regards the installation claimed in Claim 6, the appellant considered the state of the art disclosed in D1 as the closest and argued that the problem of improving it was solved by using the nozzles described in D2.

The appellant emphasized that Claim 6 was not particularly directed to a fixed installation, that a single location of the nozzle was not described therein and that D3a explained exactly what should be done for improving the extinguishing potential of the spray-heads, in particular the optimum configuration of the nozzles.

In the respondent's opinion, the device of D2 operated in an opposite way as the method of Claim 1 and was not the closest prior art. He argued also that the nozzle of D3 was not suitable for providing the same type of spray as that according to the invention. Moreover, the respondent pointed out that neither D2 nor D3 disclose a "concentrated fog-like spray" or a "high pressure" in the meaning of the invention.

As regards the subject-matter of Claim 6, the respondent asserted that the skilled person would unlikely combine the teaching of D1 with that of D2 and that, even if they do it, many features of Claim 6 would still be missing in the resulting installation.

- V. At the end of the oral proceedings the appellant requested that the decision under appeal be set aside and that the European patent be revoked.

The respondent requested that the appeal be dismissed and that the patent be maintained as granted.

- VI. Method Claim 1 reads as follows:

"A method for fighting fire, in particular in a room, said method comprising the steps of forming a liquid spray (4) having comparatively large droplets and a

good penetration power for at least suppressing a fire, and forming a scattered spray (4a, 4b) comprising a mixture of liquid and a non-combustible gas for extinguishing smouldering fire seats; characterized in that in said first step a high pressure of up to 300 bar is used for forming the liquid spray, the droplets are sprayed as a concentrated fog-like liquid spray (4) that is generated by a plurality of nozzles (3) having such a combination of mutual separation, spray direction and outlet configuration, which together with the high pressure produces a suction which is such that the fog-like liquid sprays of the nozzles (3) together form the concentrated fog-like liquid spray (4), and in that in said second step the spraying of the concentrated fog-like liquid spray (4) is stopped by lowering the high pressure and by intermixing the non-combustible gas with the liquid to be sprayed from the nozzles (3), whereby a scattered spray (4a, 4b) in the form of a turbulent liquid fog (9) is formed."

Apparatus Claim 6 reads as follows:

"An installation for fighting fire, in particular in a room, said installation comprising a spray head (2) for producing a liquid spray and a drive-unit including at least one hydraulic accumulator (11; 31) having an outlet (14; 35) connected to the spray head (2), the at least one hydraulic accumulator (11, 31) comprising a liquid space (20), a gas space (19), and a tube (15; 32) which extends from the bottom portion of the liquid space (20) through the gas space (19) to the outlet (14; 35), the tube (15; 32) having at least one aperture (17, 18) in its wall, at a predetermined distance from the outlet end of the tube (15; 32) and with a predetermined diameter, so that drive gas flows

into the tube (15; 32) through the at least one aperture (17, 18) in the wall when the level of the liquid in the at least one hydraulic accumulator (11; 31) has fallen to that of the at least one aperture (17, 18) thereby intermixing with the liquid and producing a scattered spray (4a, 4b); characterized in that the spray head (2) has a plurality of nozzles (3) each adapted to generate a fog-like spray at a high operating pressure, the nozzles (3) having such a combination of mutual separation, spray direction and outlet configuration, which together with a high pressure of up to 300 bar produces a suction that is such that the fog-like liquid sprays of the nozzles (3) together form a concentrated fog-like liquid spray (4) with a good penetration power."

Reasons for the Decision

1. Admissibility of the appeal

The appeal is admissible.

2. Interpretation of claims 1 and 6

According to the description of the patent specification, the following expressions present in the two independent claims have to be interpreted as follows:

- 2.1 "high pressure" (see column 8, lines 7 to 8, 13 and 19 and column 9, lines 6 and 9): this should be interpreted as designating a pressure from about 30 bar up to about 300 bar (see the specification: column 2, lines 21 to 23).

2.2 "fog-like liquid spray" (see column 8, lines 10, 14, 15, 16 and 18 and column 9: lines 5, 6, 10, 11 and 12): this should be interpreted as designating a spray of small droplets having a diameter of from 30 to 150 microns preferably set in a strong whirling motion (see the specification: column 2, lines 18 to 20).

3. *Novelty of the subject-matter of claims 1 and 6 (Article 54 EPC)*

Lack of novelty was objected by the appellant neither in his statement setting out the grounds of appeal nor at the oral proceedings. Since moreover the Board has, a priori, no particular reason to doubt about novelty, the subject-matter of Claim 1 and Claim 6 is considered as novel in the meaning of Article 54 EPC.

4. *The state of the art closest to the subject-matter of claims 1 and 6*

4.1 Claim 1

4.1.1 Considering the high level of the operating pressure used in the method according to Claim 1 i.e. "from about 30 bar up to about 300 bar" (see section 2.1 above), the Board is of the opinion that, contrarily to the appellant's contention, this method is not suitable for hand-held devices but for stationary (i.e. not hand-held) installations, in particular because of the heavy devices needed for producing and keeping such a high pressure. Therefore, "the fixed fire extinguishing system" disclosed by D1 (see D1: page 36, left-hand column, line 2) appears to be the state of the art closest not only to the method of Claim 1 but also to the installation of Claim 6.

4.1.2. The method of Claim 1 differs from the Hi-fog method of D1 in that:

- the liquid spray formed in the first step of the claimed method is a "concentrated fog-like liquid spray" with "comparatively large droplets" the diameter of which ranges between 30 and 150 microns (see section 2.2 above) whereas, in D1, the water droplets produced by the Hi-fog spray heads are described as having a "small size" (see D1: page 36, left-hand column, line 8) and no limits are stated for their diameters;
- the high pressure used in the first step of the claimed method ranges "from about 30 bar up to about 300 bar" (see section 2.1 above) whereas D1 gives no indication as regards the pressure range;
- the formation of the concentrated fog-like liquid spray is due to a suction produced by a combination of mutual separation, spray direction and outlet configuration of a plurality of nozzles together with the high pressure whereas D1 does not even mention that parameters must be combined for generating the spray to blast into the combustion areas;
- a scattered spray in the form of a turbulent liquid fog is generated during the second step of the claimed method, whereas D1 just describes that, in the second step of the method, a constant flow of low pressure water fog is provided (see D1: page 36, left-hand column, lines 28 to 30).

4.2 Claim 6

The subject-matter of Claim 6 differs from the disclosure of D1 in that it comprises features related to:

- the inner structure of the hydraulic accumulator (i.e. liquid and gas spaces, tube having at least one aperture);
- the functioning of the installation;
- using a plurality of nozzles adapted to operate at high pressure;
- setting parameters for said nozzles (i.e. mutual separation, spray direction and outlet configuration) to be combined with said high pressure and
- means for forming a concentrated fog-like liquid spray.

5. *Problem and solution*

Starting from D1 and taking into account the differences mentioned in sections 4.2 and 4.3 above, the problem to be solved by the skilled person appears to be to improve the method and the installation for fighting fires used in D1 including difficult smouldering fires (see the patent specification: column 1, lines 52 to 54).

The Board is satisfied that the combination claimed in Claim 1 does solve this problem.

6. *Inventive step (Article 56 EPC)*

6.1 As according to the invention, D1 relates to a fixed fire extinguishing system and discloses, in general terms, the basic principle of extinguishing a fire in two successive steps i.e. during a first step, to extinguish the fire by a discharge at high pressure of a fog-like liquid spray into the combustion area and, during a second step, to cool and to control the fire with a constant flow of water fog provided by lowering the pressure.

However, as pointed out in section 4.1.2. above, D1 mentions neither generating, during the first step, a concentrated fog-like spray in the meaning of the invention (see section 2.2 above) by combining the fog-like sprays of a plurality of nozzles nor using a high operating pressure from 30 to 300 bar in combination with a specific adjustment of said nozzles as regards their mutual separation, spray direction and outlet configuration.

Also D1 specifies neither what should be understood by the "small size" of the water droplets produced during the first step by the spray heads of D1 (see D1: page 36, left-hand column, line 8) nor if the low pressure water fog created during the second step is a turbulent fog coming from a scattered spray.

6.2 D2 relates to a hand-held fire extinguisher which operates automatically in order, in a first step, to expell at high pressure a full jet (Vollstrahl) of extinguishing liquid into the fire areas and, in a second step, to produce a liquid spray (Sprühstrahl) for extinguishing smouldering fire seats.

The "full jet" (i.e. a solid stream) of liquid expelled, during the first step, from the single nozzle of the device according to D2 is necessarily different from a concentrated fog-like liquid spray formed by a multiplicity of fog-like sprays expelled by a plurality of nozzles and brought together.

D2 describes that the full jet is discharged at a "high pressure" but does not give any indication about the pressure range. Considering that the device of D2 is a hand-held device, the Board doubts that the said "high pressure" of D2 might be of the same level as the operating pressure according to the invention i.e. from 30 to 300 bar (see section 2.1 above).

Moreover, the nozzle of the device known from D2 being unique, the skilled person cannot expect from D2 any hint about combining different parameters of a plurality of nozzles with a "high pressure" as according to the invention.

Also, there is no indication in D2 allowing the skilled person to consider the spray (Sprühstrahl) formed during the second stage of D2 and having enough kinetic energy for entering the seat of the fire as being similar with the scattered spray having the form of a turbulent fog according to the invention.

- 6.3 Therefore, at first sight, the skilled person starting from the fixed fire extinguishing system described in D1 with the aim to improve the way of fighting fires with such fixed installations would have, a priori and without any hint, absolutely no reason for consulting a document like D2 which does not concern a fixed installation but a hand-held device. At second sight,

supposing that he would nevertheless do so and would be inclined to combine the teachings of D1 and D2, the resulting combinations concerning the method and the installation would still lack at least the features enumerated respectively in sections 4.1.2 and 4.2 above.

Taking into account the number and the variety of these lacking features, at the priority date, the skilled person could arrive neither at the method according to Claim 1 nor at the installation claimed in Claim 6 by a mere transposition of the features disclosed in D2 to the fixed fire extinguishing system of D1 and additional essential adaptations involving the exercise of a skill beyond that expected of the skilled person would still be necessary.

6.4 As regards the disclosures of D3 and D3a, the appellant and the respondent gave different and sometimes contradictory interpretations about the functioning of the nozzles disclosed in said prior art documents and about the resulting effects and sprays obtained with such nozzles when operated at high pressure.

It must be reminded that the Board has not to imagine what might be obtained by using the said nozzles on an installation or a device according to respectively D1 or D2 but to examine which features are common to D3/D3a and to the invention, whether they are clearly and unambiguously disclosed, whether it would be obvious for the skilled person to transfer said features on the installation or device known from D1 or D2 and whether, after having transferred all the common features, the skilled person would actually arrive at the invention or, on the contrary, whether some

features would still be lacking and whether some additional adaptations still be needed.

Examination of D3/D3a shows that features such as, for example, a high pressure or a concentrated fog-like spray in the meaning of the invention (see respectively sections 2.1 and 2.2 above), the mutual separation, spray direction and outlet configuration of the nozzles of the spray heads or a scattered spray in the form of a turbulent liquid fog are even not suggested in these documents.

On the contrary, droplet diameters of 350 to 500 microns or even 1000 microns, as well as pressures of 4 bar or up to 30 bar are described in D3.

Therefore, it appears useless to make unverifiable suppositions seeing that the combination of the teachings of D3/D3a with the teaching of either D1 or D2, in any case, would not lead completely to a method or an installation as claimed respectively in Claim 1 and 6.

7. For the foregoing reasons, the Board considers that the invention as claimed in claims 1 and 6 involves an inventive step in the meaning of Article 56 EPC and that the reasons given by the appellant do not prejudice the maintenance of the patent as granted.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

G. Magouliotis

C. Andries