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# Datasheet for the decision of 15 January 2008

**Case Number:** T 0131/06 - 3.2.04

**Application Number:** 00124392.2

**Publication Number:** 1103285

**IPC:** A62C 3/02

**Language of the proceedings:** EN

**Title of invention:**
Method and apparatus for reducing the consequences of a fire in a tunnel

**Patentee:**
Apt Engineering S.r.l.

**Opponent:**
Marioff OY

**Headword:**
-

**Relevant legal provisions:**
EPC Art. 100(a), 111(1)
RPBA Art. 13(1)

**Keyword:**
"Main request - novelty (no)"
"Auxiliary requests 3-5 - inventive step (no)"
"Auxiliary requests filed for the first time during the oral proceedings - not admissible"
"Remittal to the first instance (no)"

**Decisions cited:**
T 0133/87

**Catchword:**
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

**Case Number:** T 0131/06 **-** 3.2.04

# D E C I S I O N
**of the Technical Board of Appeal 3.2.04**
**of 15 January 2008**

**Appellant:** (Patent Proprietor)
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**Decision under appeal:**
**Decision of the Opposition Division of the European Patent Office posted 2 December 2005 revoking European patent No. 1103285 pursuant to Article 102(1) EPC.**

**Composition of the Board:**

**Chairman:** M. Ceyte
**Members:** C. Scheibling
T. Bokor

## Summary of Facts and Submissions

I. By its decision dated 2 December 2005 the Opposition Division revoked the patent. On 26 January 2006 the Appellant (patentee) filed an appeal and paid the appeal fee simultaneously. The statement setting out the grounds of appeal was received on 12 April 2006.

III. The opposition was filed on the grounds based on Article 100a) and b) EPC.
The Opposition Division revoked the patent on the grounds of lack of novelty and inventive step (main request, first and third auxiliary requests) and of added subject-matter (second auxiliary request).

III. The following documents played a role in the present proceedings:
D1: JP-U-05 828660 and its translation into English
D7: US-A-3 109 593
D10: Patent abstract of Japan JP-A-09 106489 and its translation into English.
D11: US-A-5 680 329
D13: "Sprinkler Systems Planning and Installation" prevention specification; Comité Européen des Assurances 1995, pages 36 to 42.

IV. Oral proceedings took place on 15 January 2008 before the Board of Appeal.

The Appellant requested as main request that the decision under appeal be set aside and that the patent be maintained as granted, or that the patent be maintained in amended form on the basis of the set of claims filed as auxiliary request 1 with the grounds of

appeal dated 12 April 2006 or on the basis of one of the sets of claims filed as auxiliary requests 2 to 6 at the beginning of the oral proceedings.
He also requested that the Board remits the case to the first instance for consideration of the auxiliary requests 2 to 6, if the main or first auxiliary request were not allowable.

Claim 1 of the main request (as granted) reads as follows:
"1. A method for reducing the consequences of a fire in a tunnel (3), consisting in generating, inside the tunnel, a wall (2) of non-flammable liquid upstream of a region affected by the fire and a wall (2) of non-flammable liquid downstream of said region, said walls (2) being arranged transversely to the longitudinal extension of the tunnel (3) and being adapted to prevent or substantially limit the spreading of the fumes, gases and heat produced by the fire to the regions that are contiguous to the region affected by the fire, people fleeing the region affected by the fire being able to pass through said walls."

Claim 1 according to the first auxiliary request reads as follows:

"1. A method for reducing the consequences of a fire in a tunnel (3), consisting in:
- providing means (1) for dispensing a non-flammable liquid which are mutually spaced along the longitudinal extension of tunnel (3) and which are adapted to generate walls (2) of non-flammable liquid lying on planes which are transverse with respect to the longitudinal extension of the tunnel (3), and detection

means for monitoring the inside of the tunnel (3) and for reporting to an operator or to an automatic control apparatus fire start information and information on the starting point/starting region of a fire along the tunnel (3);
- detecting the starting point/ starting region of a fire and reporting to the operator or automatic control apparatus fire start information and information on the starting point/starting region of a fire along the tunnel (3); and
- actuating, in base of the information reported, the two dispensing means (1) that are located respectively directly upstream and directly downstream of the region affected by the fire for generating, inside the tunnel, a wall (2) of non-flammable liquid directly upstream of a region affected by the fire and a wall (2) of non-flammable liquid directly downstream of said region, said walls (2) being arranged transversely to the longitudinal extension of the tunnel (3) and being adapted to prevent or substantially limit the spreading of the fumes, gases and heat produced by the fire to the regions that are contiguous to the region affected by the fire, people fleeing the region affected by the fire being able to pass through said walls."

Claim 1 of the second auxiliary request is a combination of claims 5, 6, 9 and 10 as granted.

Claim 1 according to the third auxiliary request is a combination of claims 5, 14 and 17 as granted.

Claim 1 according to the fourth auxiliary request reads as follows:

"1. An apparatus for reducing the consequences of a fire in a tunnel, characterized in that it comprising means for dispensing a non-flammable liquid which are adapted to generate walls of non-flammable liquid which lie on planes which are transverse with respect to the longitudinal extension of the tunnel, said dispensing means being mutually spaced along the longitudinal extension of the tunnel, means for feeding a non-flammable liquid to said wall generation means being provided which can be activated on command according to the location of a fire along the tunnel, said feeder means comprising a duct (5) for feeding said non-flammable liquid, said feed duct (5) running longitudinally along the tunnel (3), branches (6) being provided along the extension of said feed duct (5), at intervals of preset length, in order to connect said feed duct (5) to said means (1) for dispensing a non-flammable liquid, a remotely controllable valve (7) being provided along each one of said branches (3) in order to connect, on command, said duct (5) for feeding said non-flammable liquid to said dispensing means (1), the apparatus further comprising: an electrically-powered pump (10) which is connected, by means of its delivery, to said feed duct (5); an emergency pump (11) which is driven by an internal-combustion engine and is connected, by means of its delivery, to said feed duct, said pumps (10, 11) being actuatable alternatively with respect to each other, in addition to said pumps (10, 11), a compensation pump (12) which is connected, by means of its delivery, to the feed duct (5) in order to keep under pressure the non-flammable liquid in said feed duct (5) when said at pumps (10, 11) are not activated, said pumps (10, 11) being activatable by a sudden pressure drop in said feed duct (5); detection

means for monitoring the inside of the tunnel (3) which are adapted to report to an operator or to an automatic control apparatus the starting point of a fire along the tunnel (3); wind speed and direction detection means which are located proximate to the inlets of the tunnel (3), said automatic control apparatus being operatively connected to said controllable valves (7) in order to open the controllable valves that are located on the branches (6) of said feed duct (5) of the two dispensing means (1) that are located respectively directly upstream and directly downstream of the starting point of the fire."

Claim 1 of the fifth auxiliary request is a combination of claims 5, 6, 7, 9, 10, 14, 16 and 17 as granted.

Claim 1 of the sixth auxiliary request reads as follows: "1. A method for reducing the consequences of a fire in a tunnel (3), consisting in generating, inside the tunnel, a wall (2) of non-flammable liquid directly upstream of a region affected by the fire and a wall (2) of non-flammable liquid directly downstream of said region, said walls (2) being arranged transversely to the longitudinal extension of the tunnel (3) and being adapted to prevent or substantially limit the spreading of the fumes, gases and heat produced by the fire to the regions that are contiguous to the region affected by the fire and the method comprising limiting the diffusion of the fumes, gases and heat to the regions of the tunnel that are contiguous to the region where the fire has developed, and the said step of generating of the walls (2) being such that people fleeing the region affected by the fire being able to pass through said walls and moving away from the region affected by the

fire without suffering or suffering to a much lesser extent the effects of the fumes, gas and heat produced by the fire, and the method comprising the step of protecting the people from the damaging effect of the fumes, gas and heat, and maintaining for a sufficient time, inside the tunnel, conditions which are adapted to allow the intervention of rescue teams, and the step of generating the walls comprising feeding a non-flammable liquid in a feed duct by way of at least one pump that is connected thereto by means of its delivery and the method further comprising keeping the non-flammable liquid under pressure in said feed duct when said at least one pump is not activated by means of a compensation pump."

The Appellant mainly argued as follows:
The patent in suit addresses the problem of reducing the consequences of a fire by limiting the diffusion of fumes, gases and heat. This problem is not solved by the water walls of D1. Claim 1 of the first auxiliary request further requires detection means reporting to an automatic control apparatus and actuation of the dispensing means located directly upstream and directly downstream of the fire starting point. These features are neither disclosed nor suggested by D1. The set of auxiliary requests presented at the beginning of the oral proceedings have been filed in reaction to the last filing of the Opponent and are thus admissible. The auxiliary requests introduce additional features which all contribute to improve safety either by detecting the location of the fire more accurately, by increasing reliability of the pumping system, or by providing dispensing means able to produce walls of liquid that effectively stop the diffusion of fumes, gases and heat.

The cited documents do not give any hint to combine these features in the claimed manner.

The Respondent (Opponent) contested the arguments of the Appellant and submitted that the subject-matter of claim 1 as granted (main request) is not new with respect to D1 and that the subject matter of claim 1 of the auxiliary requests is rendered obvious by a combination of the disclosures of D1, D13, D11, D10 and D7.

The Respondent requested that the appeal be dismissed.

## Reasons for the Decision

1. The appeal is admissible.

2. *Main request - novelty:*

2.1 D1 (see part of the translation entitled "detailed description of the invention"; figure) discloses a method and an apparatus for reducing the consequences of a fire in a tunnel, consisting in generating, inside the tunnel, a wall of non-flammable liquid upstream of a region affected by the fire and a wall of non-flammable liquid downstream of said region, said walls being arranged transversely to the longitudinal extension of the tunnel and being adapted to prevent or substantially limit the spreading of the fumes, gases and heat produced by the fire to the regions that are contiguous to the region affected by the fire, people fleeing the region affected by the fire being able to pass through said walls.

2.2 The Appellant argued that D1 does not aim at reducing the consequences of a fire in the meaning of the patent in suit. In the light of the description especially of paragraphs [0010] and [0011] "reducing the consequences of a fire" has to be construed as meaning "limiting as much as possible the spreading of the fumes, gases and heat produced by the fire". There is no indication in D1 that the water curtains referred to therein, would be able to limit the spreading of fumes, gases and heat, since not any water curtain is able to produce this effect.

2.3 As a matter of fact, D1 relates to a fire extinguisher for tunnels. However, it is clear that extinguishing a fire also reduces the consequences that such a fire could have.
Furthermore, in the first paragraph of the detailed description of the invention of D1 it is stated "It is known that when there is a fire in a tunnel the entrance and exit of the tunnel are shielded by water curtains for preventing emission of hot air and smoke…"
In the sixth paragraph of the description, it is then indicated that "the water curtain forming nozzles used in this invention are well known as such."
A skilled person would derive from these passages that the invention of D1 uses known nozzles to form water curtains to prevent emission of hot air and smoke.

2.4 Consequently, the subject-matter of claim 1 of the main request is not new (Article 54 EPC).

3. *First auxiliary request - inventive step:*

3.1 D1 (see paragraphs 4 and 12 of the "detailed description of the invention"; figure) also discloses means (1) for dispensing a non-flammable liquid which are mutually spaced along the longitudinal extension of tunnel and which are adapted to generate walls of non-flammable liquid lying on planes which are transverse with respect to the longitudinal extension of the tunnel, and detection means (D) for monitoring the inside of the tunnel actuating, in base of the information reported, the two dispensing means (1) that are located respectively directly upstream and directly downstream of the region affected by the fire.

3.2 The Appellant submitted that the wording of claim 1 implies that only two dispensing means are actuated. This is however not the case. Claim 1 solely requires that the two dispensing means that are located respectively directly upstream and directly downstream of the region affected by the fire are actuated. There is no indication whether or not a dispensing means located within the region affected by the fire can be activated too.
D1 does not disclose any reporting of the fire starting point.

3.3 Thus, the method according to claim 1 of the first auxiliary request differs from that of D1 in that the detecting means report to an operator or an automatic control apparatus fire start information and information on the starting point/starting region of a fire along the tunnel.

3.4 The problem to be solved by these features may be seen in increasing safety, i.e. limiting the injury to people during evacuation (see paragraph [0012] of the patent in suit).

3.5 In D1 information on the location of the starting point of a fire is given by the fire detectors which generate a signal used to actuate the dispensing means. However there is no indication whether said information is reported to an operator or an automatic control apparatus. It is however common understanding for a skilled person that such information has to be made available to the fire brigade and rescue teams. Thus, it is obvious that a fire fighting system for a tunnel comprises means for reporting such information to either an operator or an automatic control apparatus.

3.6 Accordingly, the subject-matter of claim 1 of the first auxiliary request does not involve an inventive step (Article 56 EPC).

4. *Remittal to the first instance:*

4.1 The Appellant argued that remittal to the first instance for consideration of the auxiliary request 2 to 6 was justified given that the translations of D1 and D10 filed by the Opponent contradict the appraisal of these documents by the Opposition Division and that new documents D11 and D13 have been filed, so that the factual framework of the contested decision has changed.

4.2 In the present case, the translations of D1 and D10 do not contradict information contained in the abstracts already on file. D11 and D13 filed with the reply to the

grounds of appeal, indicate which requirements were standard for fire pump systems, and thus, illustrate the common knowledge of the skilled person in the technical field of pumping systems for preventing and fighting fire.

Thus, the factual framework of the contested decision has not changed. Furthermore, the Appellant has had an adequate opportunity to assess these translations.

Finally Article 111(1) EPC establishes no absolute right for parties to have all matter raised in appeal proceedings examined by two successive instances; on the contrary, it leaves the Board of Appeal to decide, in the light of the circumstances of the case, whether or not to remit it to the department of first instance, see inter alia T 133/87, point 2 of the reasons.

4.3 Accordingly, since the filing of these translations did not change the factual framework and taking into consideration the procedural efficiency as well as the public interest in a speedy and streamlined procedure, the Board considers that it is not appropriate to remit the present case to the opposition division for further consideration, but to decide the case itself under Article 111(1) EPC.

5. *Admissibility of the auxiliary requests 2 to 6:*

5.1 Auxiliary requests 3 to 5 correspond respectively to former auxiliary requests 5, 4 and 6 filed with the grounds of appeal. These requests have been prompted by the reasons of the decision under appeal. It is also observed that the Appellant introduced these requests at the earliest possible moment, i.e. with the grounds of appeal, and that the Respondent has had an adequate

opportunity to assess them. For these reasons the Board admits the auxiliary requests 3 to 5 into the proceedings.

5.2 Auxiliary request 2 is a combination of claims 5, 6, 9 and 10 as granted. The Appellant argued that this request was filed in reaction to the filing of the complete translations of D1 and D10, since he realised that his requests were too restrictive in view of the genuine disclosure of these documents.

However, the translations the Appellant refers to were filed in November 2006, thus more than one year before the oral proceedings. Therefore, the Appellant was clearly in a position to make these submissions earlier than during the oral proceedings before the Board. The Respondent (opponent) was not aware of the Appellant's intention to optionally file such auxiliary requests. In particular he could not expect a request on the basis of granted claims 5, 6, 9 and 10. It would have been unfair to the Respondent to confront him with the new auxiliary requests during the oral proceedings.

Auxiliary request 6 corresponds to auxiliary request 2 rejected in opposition proceedings. The Appellant submitted that this request should not be rejected as late filed, because a patent proprietor has the right to have the rejected requests reconsidered by the board of appeal.

5.3 The board does not accept this argument. The substantive content of the proceedings before the department of first instance - here the opposition proceedings before the opposition department - does not constitute a

reservoir for any of the parties, from which a party may, at any time and without any procedural restriction, bring issues before the board. Not only would this *de facto* extend the time limit for appeal for such subject-matter, but this would be at odds with the object and purpose of Rule 13(1) RPBA.

According to Article 13 (1) RPBA "Any amendment to a party's case after it has filed its grounds of appeal or reply may be admitted and considered at the Board's discretion. The discretion shall be exercised in view of inter alia the complexity of the new subject-matter submitted, the current state of the proceedings and the need for procedural economy".

Furthermore, the Appellant has entirely ignored the Board's express invitation in its communication pursuant to Article 11(1) RPBA dated 7 August 2007 to file amended claims at least one month before the date fixed for the oral proceedings.

Thus, having regard to the current state of the proceedings, the complexity of the new subject-matter and the fact that there is no proper justification for this late filing, the Board decided not to admit auxiliary requests 2 and 6 into the proceedings.

6. *Third auxiliary request - inventive step:*

6.1 With respect to claim 1 of the first auxiliary request this claim refers to an apparatus instead of a method and mainly adds that the apparatus further comprises wind speed and direction detection means which are located proximate to the inlets of the tunnel.

6.2 The problem to be solved by these additional features can be seen in detecting in a most effective manner the location where the fire has started.

6.3 D10 (see paragraphs [0003], [0006], [0008], [0010], [0011], [0048], [0049], [0065] of the translation) refers inter alia to the problem of extinguishing a fire in a tunnel according to the correct position of the fire taking into account wind speed and wind direction inside the tunnel (abstract). It is further stated that in known systems sensor are disposed at a plurality of points in the tunnel, making it possible to identify the position of the fire occurrence. However, in conventional systems the temperature distribution changes because of the direction and speed of the hot air flow inside the tunnel. This can lead to an error in the recognition of the position of the fire occurrence. Therefore it is an object of the invention to determine the correct position of the fire considering the direction and speed of the hot air. Conversion coefficients are calculated on the basis of experimental measurements. Accordingly, the position of a fire source can be determined and the amount of heat in the tunnel and the amount of heat generated can be estimated from the experimental data **if measurements of the direction and speed of the hot air flow at the site of the actual fire occurrence are made by a wind speed gauge or similar**.

6.4 The Appellant argued that D10 does not disclose to locate the wind speed and detection means proximate to the inlet of the tunnel.

However, a skilled reader derives from this citation the necessity to have wind speed detectors mutually spaced along the extension of the tunnel (to carry out measurements at the site of the actual fire) and thus also proximate to the inlets of the tunnel.

The Appellant also submitted that wind speed and direction detectors are solely used to determine the experimental coefficient but not in a real environment. This statement is not in line with paragraph [0065] of D10 where the position of the fire source is said to be determined on the basis of the experimental data and the direction and speed of the hot air flow at the site of the actual fire occurrence.

The Appellant further argued that there is no suggestion in the state of the art that could lead a skilled person to provide a system according to D1 with a wind speed and direction detector according to D10.
However, this last citation teaches that the position of the fire source detected by the detecting means can be determined more accurately when taking into account the direction and speed of the wind inside the tunnel. It thus clearly solves the problem of detecting the starting point of a fire in a more effective manner. It is therefore obvious for a skilled person to provide an apparatus according to D1 with wind speed and direction detectors as taught in D10 and thus to arrive at the subject-matter of claim 1 of the third auxiliary request.

6.5 Consequently, the subject-matter of claim 1 of the third auxiliary request does not involve an inventive step (Article 56 EPC).

7. *Fourth auxiliary request - inventive step:*

7.1 With respect to claim 1 of the third auxiliary request this claim mainly adds the features that there is provided an electrically-powered pump which is connected, by means of its delivery, to said feed duct; an emergency pump which is driven by an internal-combustion engine and is connected, by means of its delivery, to said feed duct, said pumps being actuatable alternatively with respect to each other by a sudden pressure drop in said feed duct, in addition to said pumps, a compensation pump which is connected, by means of its delivery, to the feed duct in order to keep under pressure the non-flammable liquid in said feed duct when said at pumps are not activated.

7.2 D11 and D13 describe standard requirements of the "National Fire Protection Association" (NFPA) and the "Prevention Specifications" of the fire committee of the European Committee of Assurances. The NFPA standard (D11, column 1, line 62 to column 2, line 3) requires a compensation pump and the actuation of the main pumps by a pressure drop in the system that overcomes the possibilities of the compensation pump. D13 (sections 8.6.2(c), 9.1, 9.2, 9.4.6.2) teaches that more than one pump can be used, that the pumps can be driven either by an electric motor or a diesel engine and that when more than one pump are used only one is driven by an electric motor. Furthermore, each pump shall be capable of providing independently the required flow and pressure. The electric pump is activated when the pressure in the feed duct falls below 0.8 P (P being the pressure when the pumps are churning) the second diesel powered pump

is activated when the pressure in the feed duct falls below 0.6 P.

These standards thus disclose the use of an electric pump, a diesel powered emergency pump, both activated by a pressure drop and a compensation pump, all pumps being connected to the feed duct.

7.3 The Appellant argued that these standards apply to installations using sprinklers in buildings where the pipes are not subject to freezing and therefore would not be considered by the skilled person trying to improve an apparatus generating water curtains in a tunnel. This point of view cannot be shared, since the safety requirements of the water supply system are not dependent on the way the water under pressure will finally be used (in sprinklers or other dispensing means). Furthermore, even in a tunnel the pump house can be maintained above freezing temperature and in the contested patent no measures are taken to prevent the pipes from freezing, other than keeping the feed duct under pressure, which is likewise obtained by the systems of the cited standards.

The Appellant further submitted that according to D13 the main and emergency pumps run in parallel and not alternately.
It has to be noted that in the contested patent as well as in D13, the pumps are connected to the feed duct in parallel and solely the possibility to actuate them alternately is given according to claim 1. In D13 it is stated that the first pump is actuated when the pressure in the feed duct falls below 0.8 P and that the second pump is started when the pressure in the feed duct falls

below 0.6 P. Thus, at the beginning solely the first pump is actuated. However, if the pressure falls below a threshold which can be considered to constitute an emergency situation (0.6 P), i.e. the first pump is no longer able to function properly or even fails, then the second pump is started. This means that the second pump is then delivering the required pressure alternately to the first pump. This situation is exactly the one considered in claim 1.

7.4 The Appellant further submitted that there is no suggestion in the state of the art of combining the features claimed, especially of combining the claimed pumping system with wind speed and direction detection means.

However, there is no interrelationship between the pumps and the wind speed and direction detection means which are thus a mere aggregation of features solving partial problems that must be distinguished from a combination invention.
In the present case it is clear that the type of pumping system does not influence information gained from the wind speed and direction detectors or the treatment of this information or vice versa.

7.5 It follows that since the standards cited in D11 and D13 reflect those requirements which fire fighting apparatus must usually comply with, these standard requirements are part of the common knowledge of the skilled person, who would therefore apply such standard requirements whenever he designs a fire fighting system.

Consequently, the subject-matter of claim 1 of the fourth auxiliary request does not involve an inventive step (Article 56 EPC).

8. *Fifth auxiliary request - inventive step:*

8.1 With respect to claim 1 of the fourth auxiliary request this claim mainly adds the features that the dispenser is provided with an outlet whose dispensing direction faces a substantially flat screen which is arranged substantially at right angles to the dispensing direction.

8.2 Such a dispenser is known from D7 (column 1, lines 16 to 23; figures). This known dispenser comprises an outlet whose dispensing direction faces a substantially flat screen which is arranged substantially at right angles to the dispensing direction and which is able to form a fan-shaped water curtain to limit the spreading of heat and fire.

8.3 The Appellant argued that D7 does not teach to place such dispensers proximate to the top of a tunnel and that there is no suggestion in the prior art of combining such a dispenser with the pumping system and wind speed and direction detectors as claimed.

This line of argument cannot be followed. Indeed D1 already teaches to use dispensers of a known type and to arrange them proximate to the top of the tunnel. D7 describes a dispenser adapted to limit spreading of fire and heat, thus also of hot fumes. It is therefore suitable to be used in an apparatus as disclosed in D1.

For the same reasons as given in point 7.4 above, claim 1 of this request too is merely an aggregation of features solving partial problems. Indeed there is no functional interdependence between the type of pumping system, the wind speed and direction detectors and the specific type of dispenser used.

8.4 Thus, the partial problem to be solved by the additional features of claim 1 of the fifth auxiliary request can be seen in defining a suitable dispenser for forming a wall of non-flammable liquid.

The dispenser according to D7 is suitable for producing such a liquid wall. Therefore a skilled person would find it obvious to use a corresponding dispenser to form the liquid wall in an apparatus according to D1.

8.5 Accordingly, the subject-matter of claim 1 of the fifth auxiliary request does not involve an inventive step (Article 56 EPC).

9. Since the subject-matter of claim 1 of all auxiliary requests lacks inventive step, answering the question whether or not the claims of these requests comply with the other requirements of the EPC such as those of Articles 84 and 123(2) EPC is irrelevant for the present decision.

## Order

## For these reasons it is decided that:

The appeal is dismissed.

The registrar: The Chairman:

G. Magouliotis M. Ceyte