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D E C I S I O N
of 16 September 1997

Case Number: T 0675/93 - 3.3.2

Application Number: 84304018.9

Publication Number: 0128782

IPC: C02F 1/46

Language of the proceedings: EN

Title of invention:
Water purification apparatus

Patentee:
Tarn-Pure Limited

Opponent:
Caribbean Clear International Ltd

Headword:
Water purification/TARN-PURE

Relevant legal provisions:
EPC Art. 56, 123(2)

Keyword:
"Inventive step - no"

Decisions cited:
-

Catchword:
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Boards of Appeal

Chambres de recours

Case Number: T 0675/93 - 3.3.2

D E C I S I O N
of the Technical Board of Appeal 3.3.2
of 16 September 1997

Appellant:
(Proprietor of the patent) Tarn-Pure Limited
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Representative: Crawford, Andrew Birkby
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Respondent:
(Opponent) Caribbean clear International Ltd

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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 12 May 1993
revoking European patent No. 0 128 782 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: P. A. M. Lançon
Members: G. J. Wassenaar
S. C. Perryman

Summary of Facts and Submissions

I. European patent No. 0 128 782 was granted in response to European patent application No. 84 304 018.9.

II. A Notice of Opposition was filed by the Respondent in which revocation of the patent in its entirety was requested on the grounds of lack of novelty, lack of inventive step, lack of industrial applicability and insufficient disclosure (Articles 52, 54, 57, 83, 100(a) and 100(b) EPC).

Amongst others, a brochure, disclosing the WOCO swimming pool purifier type VDS-1 (WOCO-device (D1)) and US-A-3 654 119 (D2) were filed as evidence.

III. The Opposition Division revoked the patent. The written decision was dated 12 May 1993. The decision was taken on the basis an amended set of claims 1 to 7, submitted during oral proceedings.

Claim 1 thereof reads as follows:

"1. Water purification apparatus comprising a chamber having an inlet for receiving water to be purified and an outlet for discharging purified water, electrodes in the chamber arranged to be connected to a power supply the electrodes containing a metal whose ions have purifying properties when present in water, and circuitry for maintaining a stable current between the said electrodes, the electrodes comprising two rods disposed with their axes parallel to one another and spaced apart on either side of a straight line joining the inlet and the outlet whereby there is formed an unimpeded flow path between the two electrodes for flow of water between the inlet and the outlet, characterised in that the circuitry is capable of supplying a current of up to 900 milliamps."

They considered that claim 1 lacked an inventive step with regard to the WOCO-device and the brochure relating thereto. The technical problem underlying the invention was regarded as "how to proceed in a case when the upper limit of the intensity scale is reached and the range of operating possibilities would still have to be extended". The claimed solution was considered to fall within the scope of the skilled person. The selection of a maximum current of up to 900 mA was given no special weight, since it was not associated with a particular effect.

- IV. The Appellant (Patentee) lodged an appeal against this decision by telefax on 21 July 1993. The appeal was signed by Andrew B. Crawford acting as representative for Tarn Pure Limited (Patentee). With the statement of grounds, filed by telefax on 22 September 1993, the Appellant disputed the reasoning of the Opposition Division. Essentially the following arguments were put forward:

The prior art WOCO-device had a maximum output of only 40 mA, which was incapable of producing sufficient copper or silver ions to prevent the growth of algae under practical conditions in outdoor swimming pools. The skilled person was thus faced with the problem of providing a device which prevents the growth of algae under practical conditions throughout the extended life of the apparatus. The skilled person was not aware of the reason why the WOCO-device and related devices failed in practice. There was no reason that the problem could be solved by increasing the current capacity to the level as now claimed. On the contrary, even by increasing the current capability by 6 times to 240 mA (Affidavit of Jerry Minchey dated 6 February 1992) the skilled person would find that it was

necessary to add chlorine in outdoor pools to achieve the desired kill rate of algae. The skilled person would therefore not regard a substantial increase in output current as a means to solve the problem.

- V. The Respondent replied that the appeal was not admissible as neither the Notice of Appeal nor the Statement of Grounds could be regarded as having been filed since the appeal was filed in the name of a company that did not exist, or by a legal entity having no standing in these proceedings, and the professional representatives acting for the appellants had not demonstrated their authority to act for the legal entity which is appealing against the decision to reject the patent in suit. Furthermore the Statement of the Grounds of Appeal bore a stamp of the European Patent Office with the date 23 September 1993 so that it was not filed in due time.

With regard to the rejected claim 1 it was argued that this claim contained added subject matter which should not be allowed under Article 123(2) and (3)EPC. Amended claim 1 now claimed a circuitry capable of delivering a substantial constant current of 900 mA for which there was no basis in the specification as originally filed. It was further argued that the subject matter of the claim 1 lacked novelty or did not involve an inventive step over the WOCO-device by itself or when considered in conjunction with D2.

- VI. Later in the proceedings the Appellant filed a copy of a confirmatory assignment of patents between Tarn Pure Limited (in Liquidation) and Tarn Pure Technology Corporation, Inc. dated 25 March 1992 and an authorisation for inter alia Andrew Birkby Crawford to represent Tarn Pure Limited (in Liquidation) in proceedings before the EPO, signed by the Liquidator. Also a copy of two pages from "FTC news" dated 10 June

1992 was filed. With a letter dated 30 January 1997, filed on 31 January 1997, the Appellant offered as an auxiliary request a further amendment of claim 1, wherein the value of 900 mA was replaced by the value of 500 mA.

Oral proceedings were held on 16 September 1997, at which the decision was announced that the appeal was dismissed. During the oral proceedings the Appellant put forward as additional argument that the problem of insufficient cleaning of swimming pools by electrolysis was not linked with the size of the pool but only with the reproduction rate of the organisms and that the basis of the invention was the finding that the production rate of the ions had to be higher than the reproduction rate of the algae and bacteria. Without this finding of the inventor the skilled person would not consider the claimed increase in current capacity.

VII. The Appellant requested that the decision under appeal be set aside and that the patent be maintained as main request on the basis of the amended claims, submitted at the oral proceedings on 2 March 1993 before the Opposition Division with the final feature of claim 1 reading "the circuitry is capable of supplying a current of up to 900 milliamps", or as auxiliary request on the basis of the same set of claims as the main request but the final feature of claim 1 reading "the circuitry is capable of supplying a current of up to 500 milliamps" as auxiliary request.

The Respondent had requested in writing that the appeal be dismissed.

Reasons for the Decision

1. *Admissibility of the appeal*

1.1 The written decision under appeal was posted on 12 May 1993 which means that it is deemed to be delivered ten days later on 22 May 1993 (Rule 78(3) EPC). The Statement of the Grounds of Appeal was received by the European Patent Office on 22 September 1993, i.e. within 4 months after the date of notification of the written decision as required by Article 108 EPC. The stamp dated 23 September 1993 indicates merely the date at which the telefax of 22 September 1993 arrived at the registry of the Boards of Appeal (General Directorate 3). Decisive for the filing date is, however, only the date at which the telefax was received by the Office. The telefax containing the Statement of Grounds was thus received in due time.

1.2 As no assignment has been registered with the EPO, the Appellant (Patentee) remains the registered company Tarn Pure Limited. The copy of the confirmatory assignment agreement of 25 March 1992 filed on 14 November 1994 in answer to a communication of the Board, and the earlier deed of assignment of 10 November 1989 referred to therein, indicate that Tarn Pure Limited are acting as bare trustee of the patent for Tarn Pure Technology Corporation, Inc. (TPTC). By clause 2.3 Tarn Pure Limited have inter alia undertaken to do all acts to vest in TPTC absolutely the full benefit of the inventions of the patents. This covers being a party to the appeal proceedings until such time as the assignment is recorded in the EPO. For an assignment to be recorded in the EPO, a request to that effect must be filed, and the administrative fee paid (see Rule 20 EPC). This is not the case here, so the Board can only treat Tarn Pure Limited as the

patentee and appellant at the date the appeal was lodged. Tarn Pure Limited being the party who was adversely affected by the decision under appeal had the right to appeal (Article 107 EPC). Since further Andrew Birkby Crawford was appointed by Tarn Pure Limited as its representative in all proceedings before the EPO, which appointment was never withdrawn and in fact confirmed by the Liquidator of Tarn Pure Limited, the Board considers the appeal signed by Andrew B. Crawford in the name of Tarn Pure Limited, to be admissible.

2. *Main request*

2.1 Amendments

Amended claim 1 differs from claim 1 as granted in that it contains the additional feature that the circuitry is capable of supplying a current of 900 milliamps (mA). Because claim 1 also requires that the water purification apparatus comprises a circuitry for maintaining a **stable** current between the electrodes, the additional feature implies in the context of claim 1 that the circuitry should be capable of supplying a **stable current of 900 mA**.

According to the description as originally filed, the output is at 34 to 36 volts and results in an output current of between 100 and 500 mA with a peak of 900 mA (page 4, lines 16 to 18). There is no other reference in the description to the current. According to claim 1 as originally filed the apparatus comprises a circuitry for maintaining a stable current between the electrodes. There is thus support for "a stable current up to 500 mA". According to the Appellant the word "peak" means in this context "maximum constant current" or "maximum stable current". The Board, however, can see no clear and unambiguous support for this

allegation. Since in the opinion of the Board a "peak current" is not the same as a "stable current", there is no support for "a stable current up to 900 mA". The main request, therefore, does not comply with Article 123(2) EPC and cannot be allowed.

3. *Auxiliary request*

3.1 Amendments

As indicated above, "a stable current of up to 500 mA" is based on the application as originally filed. The Board sees no objections under Article 123 EPC against the claims of the auxiliary request. Since such objections have in fact not been raised by the Respondent, the amendments can be accepted without further comment.

3.2 Novelty

3.2.1. The prior art before the Board does not reveal an apparatus having all the features of claim 1. The closest prior art is considered to be D1. This document is undated but by testimony of Mr Benjamin Riley in the affidavit dated 7 February 1992 filed on 17 February 1992, it is credible that it was in the public domain before the priority date of the patent in suit.

Moreover, in the Statement of Grounds of Appeal the Appellant explicitly stated that it was not contested that this document and the device disclosed therein were available to the public without any conditions of confidentiality before the priority date of the patent in suit.

3.2.2 D1 discloses all the features of present claim 1 except explicit information about the current that the described apparatus (WOCO-device) is able to supply.

Disclosed therein is an experiment in which the apparatus turned to full supplied an electric current of 40 mA. This does not mean that the WOCO-device was not able to supply higher currents since the current is dependent upon the conductivity of the water. On the other hand, there is no evidence that the WOCO-device could supply a current of up to 500 mA. Even if the Respondent's allegation that, the output current of the WOCO-device is controlled by a 15 amp transistor, were accepted, this does not mean that the circuitry as a whole was able to supply a stable current of 500 mA. Moreover, in the tests with the WOCO-device under various loads (Affidavit of Jerry Minchey dated 6 February 1992) provided by the Respondent on 17 February 1992, the current in the highest switch position was never higher than 240 mA.

In the absence of conclusive evidence to the contrary the Board cannot accept that the WOCO-device is able to supply a stable current of 500 mA. The subject matter of claim 1 must, therefore, considered to be novel.

3.3 Inventive step

- 3.3.1 It is undisputed that D1 represents the closest prior art. The WOCO-device disclosed therein is used to purify swimming pools by releasing copper and silver ions which prevent bacteria and algae from growing in water. According to D1 these ions rid the water of all algae and bacteria making the water so pure you can drink it and the electronic circuitry controls the release of copper and silver ions such that the swimming pool water keeps sterile with no chlorine. According to the Appellant the WOCO-device does not operate satisfactorily over long periods of time under

practical conditions because it does not supply sufficient energy to purify a substantial body of water and keep it purified (Appellant's letter filed 22 March 1996, page 5).

3.3.2 Starting from D1 the technical problem underlying the invention is considered to be to provide a more effective water purification apparatus which can purify a substantial body of water over long periods of time. According to claim 1 this problem is solved by providing an electrical circuitry capable of supplying a current of up to 500 mA. Although there are no comparative examples on file which unambiguously show that an apparatus according to claim 1 is more effective than the WOCO-device, it is credible that an apparatus according to claim 1, having more electrical power and providing more ions per time unit than the WOCO-device, is a more effective water purification apparatus. In fact, the Respondent never contested that an apparatus according to claim 1 would be able to purify a substantial body of water over a longer period. The Board is, therefore, satisfied that the said problem is actually solved by the claimed apparatus.

3.3.3 It remains to be decided whether, for solving the above stated problem, the claimed solution would have been obvious to a person skilled in the art.

The water purification effect obtained with electrical water purification devices such as the WOCO-device is based on the release of heavy metal ions such as copper and silver ions, which above a certain concentration kill algae and bacteria. On the evidence, ions are used up in killing bacteria and algae as these form clumps incorporating the ions, which clumps will be filtered out of the water system. The water purifying device must thus provide a sufficient current to initially

build up the ion concentration to a sufficient level at which the concentration of bacteria and algae is very low, and then be able to maintain this ion level even in conditions which favour the growth of bacteria or algae. The larger the pool the greater must be the risk that even the maximum possible rate of ion production of a particular device is easily matched by the rate of removal of ions in clumps of filtered bacteria and algae, so that no sufficient ion level builds up in the pool serving to keep bacteria and/or algae at an acceptably low level.

It is thus the Board's opinion that, if the cleaning effect of such an apparatus for a specific body of water such as an outdoor swimming pool is unsatisfactory, even if used in its highest capacity mode, a skilled person would consider increasing its capacity. Since the release of ions is proportional to the electric current, an increase in capacity requires the use of higher currents and thus a device which is capable of supplying higher currents. To what extent the capacity should be increased depends of course on its intended use. A larger pool would require a higher rate of ions than a smaller pool. In order to determine to what extent the capacity can be easily increased, the skilled person would consider the circuitry of related water purification apparatus known in the art.

3.3.4 D2 discloses a closely related apparatus, whereby the electrolytic cell differs from the cell in the WOCO-device only in the form and arrangement of the electrodes. The circuitry of the apparatus disclosed therein is capable of supplying a constant current at 1.80 A (column 4, lines 64 to 71). Since a circuitry with an output capacity of more than 1 A belongs to the

state of the art and has been used, or at least has been proposed for use in an electrical water purifier, it is obvious to increase the capacity of the WOCO device by replacing its circuitry by an upgraded circuitry which is capable of supplying at least 1 A.

- 3.3.5 The main argument against obviousness put forward by the Appellant was that the skilled person did not know why the WOCO-device failed so that he would not know what measure to take in order to solve the problem. This was allegedly demonstrated by the fact that Mr Minchey, an expert in the field of water purification, who has been involved in the treatment of swimming pool water since 1982 (Affidavit dated 6 February 1992) was allegedly not able to overcome the insufficiency of the WOCO-device (see FTC News dated 10 June 1992).

The Board cannot accept this argumentation for the following reasons.

There is no evidence before the Board that the WOCO-device would not work adequately to purify pools of a sufficiently small size. As on the evidence it was marketed for many years it seems inherently implausible that it did not work on some scale. The Board is unable to see any qualitative difference between what can be achieved by the WOCO-device and what can be achieved by the ~~now claimed device~~. There seems only a quantitative effect relating to the maximum size of pool or other body of water that can be kept purified. Even assuming that the brochure relating to the WOCO-device promised more than it actually could perform, and that the WOCO device is insufficient for large pools, this does not mean that the skilled person was not aware that the deficiency of the WOCO device was related to the insufficient capacity of the WOCO-device. The charges of the Federal Trade Commission in the United States of

America against Caribbean Clear, Inc. took place many years later than the priority date of the patent in suit. The fact that the said company tried to sell the WOCO-device with methods which were objected to by the said commission has no bearing on the question whether, at the priority date of the patent in suit, the skilled person was able to detect the ground for the failure of the WOCO-device when applied to outdoor pools of considerable size.

- 3.3.6 The Board also cannot accept the Appellant's argument that, since even a sixfold increase of the maximum current of 40 mA to 240 mA did not solve the problem the skilled person would not consider currents of up to 500 mA as now claimed, which are more than 10 times higher.

Although D1 does indeed disclose a test whereby the apparatus turned to the full gave an electric current of only 40 mA, this does not mean that the WOCO-device could not supply higher currents. The current is not only dependent upon the applied voltage but also on the conductivity of the water. Chemical analyses in the said test showed that after one hour 28 mg copper was released. D1 further discloses that it can be assumed that release of copper from the electrode is proportional to the electric current, so that a more rapid release of copper is obtained for water with high conductivity and that if the apparatus uses the maximum current recommended, 210 mg copper will be released per hour. The maximum current is not explicitly disclosed, but because of the indicated relationship between electrical current and release of copper, the maximum current can be calculated to be $210/28$ times $40 \text{ mA} = 300 \text{ mA}$. If 300 mA is still insufficient for killing the

algae, it is in the opinion of the Board obvious to increase the current, whereby a twofold increase to about 600 mA will reasonably be taken into consideration by the skilled person.

- 3.3.7. The Appellant's further argument that the problem is not linked with the size of the pool but only with the reproduction rate of the organisms and that the basis of the invention was the finding that the production rate of the ions had to be higher than the reproduction rate of the algae and bacteria, is not convincing either.

The reproduction rate of the organisms is reduced by the presence of the ions and thus dependent upon the concentration of the ions. The concentration of the ions is however directly related to the size of the pool. It is thus highly unlikely that the performance of electrical water purifiers is independent of the size of the pool. If the skilled person detects that the algae and bacteria are still reproducing at an undesirable rate despite the introduction of copper and silver ions in the pool he will try to increase the production rate of these ions because he knows that at a sufficiently high concentration of these ions those organisms will no longer reproduce but are killed. The only way of increasing the production rate of ions is to increase the current.

Claim 1 of the auxiliary request, therefore, lacks an inventive step in the meaning of Article 56 EPC.


- 3.3.8 The Board observes that the reasons above for lack of inventive step also had applied to claim 1 of the main request, had this claim satisfied Article 123 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:




P. Martorana

The Chairman:



P. A. M. Lançon

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