

IN THE MATTER OF an application
under Section 33 by Jungers
Verkstads AB for revocation of
Patent No 1559117 in the name
of Rockwool International A/S

INTERIM DECISION

The patent in suit was published on 16 January 1980 and is based on application 35463/76 filed by Rockwool International A/S ("the patentees") on 26 August 1976 and claiming the priority date of 1 September 1975 from Danish Convention Application 3916/75.

Revocation was originally sought on 4 June 1986 by Jungers Verkstads AB ("the applicants") on the following grounds:-

- (i) lack of novelty of claims 1-3 and/or 5 having regard to US patent specification 3785791 ("Perry") (section 32(1)(e));
- (ii) obviousness of claims 1-3 and/or 5 having regard to Perry (section 32(1)(f));
- (iii) that the patent was obtained on a false suggestion or representation (section 32(1)(j)).

With their counterstatement, filed on 24 October 1986, the patentees made an offer to amend the specification, which offer was subsequently clarified as being unconditional.

Further grounds for revocation were submitted on 10 April 1987 and were admitted. They were:-

- (iv) lack of novelty of claims 1 and/or 2 having regard to GB patent specification 867299 "Henriksen"

(section 32(1)(e));

(v) obviousness of claims 1 and/or 2 having regard to Henriksen (section 32(1)(f)).

Yet further grounds for revocation were submitted on 25 August 1988 which were prima facie directed to the patent in suit as proposed to be amended. Such grounds became the subject of a preliminary hearing on 10 November 1988, and I allowed their admission in a decision issued on 13 March 1989. These grounds are:-

(vi) the invention of at least claims 1 and 2 as sought to be amended is not useful (section 32(1)(g));

(vii) the complete specification does not sufficiently and fairly describe the invention or the method by which it is to be performed (section 32(1)(h));

(viii) the scope of at least claims 1 and 2 as sought to be amended is not sufficiently and clearly defined (section 32(1)(i)).

The patent in suit relates to the manufacture of mineral wool in which liquid melt from rock, slag, glass forming raw materials and other inorganic matter is fed to fast rotating rotors (usually two pairs of counter-rotating rotors) for "cascade" spinning into a "veil" of fibres thrown from the rotors. To cool the fibres as well as transport them to a conveyor for further processing into, for example, insulating slabs a flow of air is introduced along the periphery of the rotors from air supplying means. Such products have tended to have unsatisfactorily low tensile strength, probably as a result of non-uniform fibre distribution, with tufts of fibre separated by regions with low numbers of fibres. The stated

improvement is to introduce a tangential velocity component into the air flow, which apparently produces a more uniform density of fibres with decreased tufting. Figure 1 purports to show the principle of the improved method of air distribution, and two particular embodiments are shown in figures 2 and 4 and figures 3 and 5 respectively. In the first embodiment a flange of the rotor defines by its outer periphery an inner boundary of an annular slot for air delivery to the rotor. The outer boundary of the slot is provided by a wall of a distributing chamber. Axially extending blades are mounted on the flange so that the tangential velocity component of the air is provided by rotor rotation. In the second embodiment the annular slot for air delivery is defined entirely by the air distributing chamber. The slot has blades angled relative to the axial direction to provide the tangential air velocity component as well as its axial component.

Claim 1 reads as follows, with the proposed additions underlined and the proposed deletions shown in square brackets:-

"A method for the manufacture of mineral wool, in which method a flow of liquid melt is directed to the external peripheral surface of at least one fast rotating rotor in such a way that the melt adheres to the surface and is thrown therefrom in the form of fibres, which fibres are cooled and transported to a collecting means by a flow of air that is supplied through air supply means positioned around and behind [each] that rotor and in which the flow as it emerges from the air supply means has a forward component of velocity parallel with the axis of the rotor and a tangential component of velocity in the direction of rotation of the rotor and the air flows along the periphery of the rotor."

The other relevant claims, with insertions and deletions similarly indicated, read as follows:-

"2. An apparatus for carrying out the method according to claim 1, the apparatus comprising at least one rotor [arranged for fast rotation about its axis], positioned to receive a flow of liquid melt onto its external peripheral surface and arranged for fast rotation about its axis so as to throw fibres formed from the melt off its peripheral surface and an air supply means positioned around and behind each rotor and in which the flow, as it emerges from the air supply means, has a forward component of velocity parallel with the axis of the rotor and a tangential component of velocity in the direction of rotation of the rotor and the air flows along the periphery of the rotor."

"3. An apparatus according to claim 2 in which the air supply means comprise an annular slot in which are disposed blades and which is coaxial with the rotor and has an internal radius the same as the radius of the peripheral surface."

"5. An apparatus according to claim 3 [or claim 4] in which the slot leads from an air distribution chamber and the blades are mounted on the air distribution chamber so as to form an angle with respect to the axis of the rotor".

The proposed amendments also include corresponding changes to the statements of invention, and the deletion of figure 1 and its description on page 2 lines 85 to 87 and 97 to 121. The amendments in claims 1-3 and those referred to above on page 2 were described as disclaimer and/or explanation and that in claim 5 as correction and explanation. A further amendment, by insertion at page 2 line 65 of the words "Thus the inner radius of the slot is

the same as the radius of the flange and the periphery" in relation to the first embodiment (figures 2 and 4), was described as explanation.

The matter came before me at a hearing on 17 and 18 January 1990, when Mr J M B Chapple appeared as counsel for the applicants for revocation and the patentees were represented by their patent agent Mr P R B Lawrence.

The first issue for consideration is the allowability of the amendments, but as an essential preliminary to this I must attempt to construe the claims and determine what the specification discloses, both before and after amendment.

It emerged at the hearing that a key question was whether the invention is, and always was, directed to an apparatus and process in which the flow of air from around and behind the rotor "clings" to the surface of the rotor so as to follow a helical path, in the form of what Professor James Whitelaw, Professor of Convective Heat Transfer at Imperial College of Science and Technology, described as a "wall jet". Mr Lawrence argued that this is so, and he cited in support Professor Whitelaw's view that it was evident to him from the unamended patent specification that a wall jet was intended. He followed Professor Whitelaw's reasoning in arguing that the claim as proposed to be amended was "clearly restricted to a wall jet", and that "the patent before amendment was restricted to wall jets anyway". He referred to the evidence of Mr Verner Palmqvist who, as Verner Nielsen, was one of the inventors of the patent in suit, to the effect that it was his speculation that the presence of a wall jet (though he did not call it that) would improve the conditions for the formation of fibres, and hence lead to a stronger, less dense material, that gave rise to the invention. Mr Svend Grove-Rasmussen, Manager of the Wool Technology Branch of the patentees' Research and Development Department, described some experiments he carried out to examine the

air flow around the rotors of the present invention, but since he said merely that he "assumes" that there was a thin layer of air dragged round with the rotor, and expressly stated that this was not revealed in his measurements, this does not help me in deciding whether the wall jet is of significance.

Mr Chapple argued that the specification did not point to the presence of a wall jet, and that Professor Whitelaw had to construe the patent in order to come to the conclusion that he reached. While I do not accept Mr Chapple's stated contention that Professor Whitelaw's opinion cannot constitute evidence of what the patent means, I do consider that it is to the specification itself, albeit interpreted in terms of how the skilled man would have understood it, that I must go to determine the nature of the invention. I would add further that in my view I must go to the whole specification for this purpose, and it will emerge that I regard this as a consideration of some significance in the present case.

In the unamended specification there are only two uses of the words "along the periphery of the rotor(s)", the phrase that Mr Lawrence relies upon to show that a wall jet was always intended. One, to which Mr Lawrence turned for support for the proposed insertion into claims 1 and 2 of "and the air flows along the periphery of the rotor" ("Rider A"), is at lines 71 to 74 of the printed specification and reads:-

"With this arrangement it is possible to vary the flow of air and its direction along the periphery of the rotor ..."

I should observe that it is not entirely clear from the context whether "this arrangement" in this phrase refers in general to the arrangement of the invention as a whole, or to the specific arrangement of the second embodiment

(figures 3 and 5), in which the blades are mounted on the edge of the distributing chamber. I regard the second interpretation as a more natural reading of the wording, but this is not critical to my view of the main issue. The only other use of the phrase is at lines 37-43 of page 1 where, in the description of the prior art, the following sentence appears:-

"In order to cool the fibres as well as transport the fibres to a conveyor on which they are collected and transported to further processing into mats, slabs etc for thermal and acoustic insulation, a flow of air is introduced along the periphery of the rotors from air distributing means."

My inclination, if these were the only factors to which I could turn, would be to share Mr Chapple's doubts that the specification clearly directed the skilled reader to the conclusion that the invention required the presence of a wall jet. I cannot ignore Professor Whitelaw's comments, but I think that he is clearly too highly qualified and conversant with the underlying theory of air flow to be regarded as the ordinary skilled man. Mr Palmqvist's evidence is persuasive of what the inventors' intentions may have been, but does not help me in relation to the specification itself. Furthermore, the nearly identical use of the words "along the periphery" in both the prior art description and the description of at least one embodiment of the invention in my judgement gives the reader no reason to believe that a wall jet is present.

There is, however, a further and for me clinching consideration which persuades me that the original published specification did not direct the reader to the view that a wall jet was an element of the invention, and in this regard I refer back to my earlier observation that it is to the whole specification that I must look to determine the nature of the invention. Figure 1 of the

specification which, as Mr Chapple pointed out, is described as "showing the principle of the method according to the invention", is, for convenience, reproduced here.

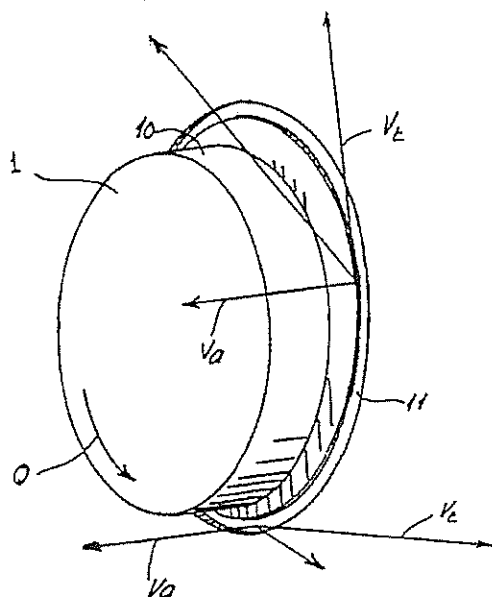


Fig.1

It shows, and is described as showing, air emerging from an annular slot 11 "along the external peripheral surface of the rotor ... around and behind the rotor (1)", and this air is shown as having "a forward velocity component V_a and a tangential component of velocity V_t in the rotational direction of the rotor". There was some discussion at the hearing of the significance of the word "tangential", which of course also appears in claim 1, but I conclude with Mr Chapple that there is nothing in the specification to cause a reader not to give this word its

natural meaning of a straight line touching a circle, and nothing, therefore, to cause the reader to interpret this word as pointing towards a helical flow of air around the rotor. Conversely, though, I accept Mr Lawrence's point that the figure shows only velocity components at the moment of emergence of the air from the slot, and does not purport to show the components of force operating on the air. It does not, therefore, necessarily show the path the air will follow after it leaves the slot. I cannot, however, interpret silence on this matter as evidence that the air follows a helical path.

But the most important characteristic of figure 1 for my present consideration, and one that Mr Lawrence frankly described as a "mystery" in view of the inventors' apparent intentions, is the clearly shown presence of a radial spacing between the rotor periphery and the air distribution slot. This contrasts with the figures illustrating the particular embodiments, in which the periphery of the rotor and the inner edge of the slot appear to be at least approximately of the same radius (I will return to this later). Mr Lawrence referred to Mr Palmqvist's comment that the draftsman who prepared figure 1 may have misunderstood the sketches made initially. I was not shown those sketches. Mr Lawrence accepted that figure 1 was not consistent with his general arguments on wall jets, but considered that it was merely diagrammatic. I must set against that the specification's description of the figure as showing "the principle of the method according to the invention".

It is clear from the arguments presented by Mr Lawrence and from the patentees' evidence that proximity of the inner edge of the slot to the peripheral rotor surface is critical to the existence of a wall jet. Professor Whitelaw did say in his evidence that a wall jet "could be obtained with a small distance between the inner limit of the slot [and the rotor surface] and this small distance

could be increased if the jet were directed at a low angle towards the axis and onto the surface of the rotor". However, figure 1 contains clear indication that there is no such angling of the jet in the present case, and there is equally no suggestion in the specification that the spacing shown in figure 1 is sufficiently small for Professor Whitelaw's point to be significant.

I am therefore led to conclude that the informed reader of the specification as published would have no reason to understand that a wall jet effect occurred around the rotor. Equally, in considering what impact the words of Rider A would have on the construction to be placed upon the invention in the specification as proposed to be amended, I cannot conclude that the insertion of "along the periphery of the rotor" would lead an informed reader to decide that a wall jet was an essential feature of the invention. It follows, of course, that if I had come to the opposite conclusion as to the effect of Rider A I would have had to conclude also that it added new disclosure to the specification.

Returning now to the allowability of the amendments, section 31(1) of the Patents Act 1949 states that no amendment can be allowed "except for the purpose of correcting an obvious mistake, the effect of which would be that the specification as amended would claim or describe matter not in substance disclosed in the specification before the amendment". For the deletion of figure 1 and its corresponding description to be the mere correction of an obvious mistake the error and solution must be clearly apparent. There is no evidence to persuade me that the presence of the radial gap in figure 1 constitutes an error in the drawing. Therefore I do not consider that the deletion of figure 1 and the description on page 2 lines 85 to 87 and 97 to 121 is the correction of an obvious mistake.

Figure 1 is stated to show "the principle of the method according to the invention" and, as I have already discussed, it plainly shows a radial gap between the rotor surface and the inner edge of the slot. The intended effect of the deletion of the figure and the insertion of Rider A has been stated to be to limit the invention to the occurrence of a wall jet effect, and, as I have previously noted, if these amendments indeed had this effect I would have to find them impermissible because they added new disclosure. I have, however, found that they did not have this effect, and need, therefore, to give some further thought to the question of their allowability.

Since figure 1 is stated as showing the principle of the method according to the invention, its proposed deletion is a matter of major importance. There is no other broad statement of such principle, except for claim 1 and the statement of invention, the construction of which is, as the preceding discussion shows, strongly influenced by figure 1 and its description. I therefore consider that deletion of the figure and the related passages on page 2 would result in the specification claiming or describing matter not in substance disclosed in the specification before amendment, and I therefore conclude that I must refuse to allow it under section 32(1).

The incorporation of Rider A, once I have decided that it does not have the intended effect, could perhaps not in itself be held to entail the addition of new subject matter. However, as will emerge from my discussion of the alleged grounds for revocation, it fails in my view to achieve its objective of distinguishing the invention from the prior art, and as such is not allowable.

The introduction into claim 2 of the requirement that the rotor is "positioned to receive a flow of liquid melt on its peripheral surface and arranged for fast rotation

about its axis so as to throw fibres formed from the melt off its peripheral surface" was not the subject of argument. I conclude that this amendment constitutes clarification of claim 2, and is unexceptionable in relation to section 31(1).

The applicants for revocation have not advanced any arguments against the proposed introduction into claim 3 of the requirement that the annular slot is coaxial with the rotor, and I consider this to be permissible as explanation.

The remaining amendment proposed to claim 3 and its corresponding statement on page 2 lines 56 to 59, and also that proposed on page 2 line 65, would have the effect of introducing the feature of the inner radius of the slot being the same as the radius of the flange and the periphery of the rotor. Mr Chapple argued that the embodiment of the description having non-rotating blades within the air distributing chamber gives no express indication that the internal radius of the chamber slot is the same as that of the rotor periphery. He pointed out that in the other, rotating-blade, embodiment, although the blades are mounted on a flange which rotates with the rotor, there is no express indication in the description that the flange radius is the same as that of the rotor periphery. Mr Lawrence referred to figures 2 and 3, which, he considered, showed the flange carrying the blades at the same radius as the rotor periphery, and the inner edge of the slot at the same radius as the rotor periphery. He also referred me to European Patent Office Decision T169/83, in which it was held that features which were originally only disclosed in the drawings may by amendment be included in the claims.

Although in both figures 2 and 3 the relevant lines designating the flange, rotor and slot locations appear to be broadly aligned, the alignments are not, in fact, on

close inspection, exact. I do not regard this in itself to be of great significance since, as both counsel acknowledged, drawings of this nature are plainly not intended to be subjected to such minute scrutiny and interpretation. I would be inclined to follow the reasoning used in EPO Decision T169/83 and accept the drawings as sufficient support for the requested amendments were it not for the presence of figure 1, showing "the principle of the method according to the invention" and also showing a clear radial difference between the rotor surface and the inner edge of the slot. In my judgement this points so firmly away from the idea of the alignment now sought to be introduced that I do not consider that I can apply the principle of the EPO decision, and I conclude that the group of amendments relating to equality of radius of slot, flange and rotor are not allowable under section 31(1) in that they would result in the specification disclosing matter not in substance disclosed in the specification before the amendment.

The insertion in claim 5 of the words "the slot leads from an air distribution chamber" has not been the subject of opposition by the applicants. This reference introduces a feature clearly apparent in the original specification and is thus unexceptionable.

The replacement in claim 1 and its corresponding statement of invention of "each" by "that", in relation to the rotor(s) around and behind which the flow of air is supplied, was objected to by the applicants as changing the meaning of the expression and therefore adding new matter. The earlier part of claim 1 refers to "at least one ... rotor". To the extent that this covers a plurality of rotors the original word "each" implies that all rotors necessarily have air supply means, whereas "that" could be interpreted as covering apparatus in which only one rotor need have air supply means. This would

introduce a potential construction not originally envisaged. In view of this interpretation I consider that such amendment is contrary to the provisions of section 31(1).

To summarise my findings in relation to the allowability of the amendments, I have found the deletion of figure 1 and its corresponding description on page 2 lines 85 to 87 and 97 to 121, the insertion in claim 3, its corresponding statement of invention on page 2 line 59 and at page 2 line 65 of reference to equality of radius of certain features, and the replacement in claim 1 and correspondingly at line 23 of page 2 of "each" by "that" to be impermissible. Amendments I have found to be allowable are those requested in claim 2 at lines 74 and 75 of page 3 and the corresponding statement on page 2 lines 48 and 49, that requested in claim 3 and correspondingly at line 59 of page 2 to the extent that it relates to the coaxial nature of the slot and the rotor, and that requested in claim 5. I have indicated that the insertion of Rider A into claims 1 and 2 and correspondingly on page 2 at line 28 and line 55 fails to distinguish the invention from the prior art, though I have not yet set out my reasoning on this.

The issue of whether, having decided that some at least of the requested amendments satisfied section 31(1), I should exercise my discretion to allow them to be made, was only briefly raised at the hearing, and Mr Lawrence considered it alongside the ground of "false suggestion or representation" raised by the applicants. Having found the main amendments to be impermissible under section 31(1), I do not deem it necessary for me to give separate consideration to this issue, and will deal with the "false suggestion" arguments in due course as part of my consideration of all the grounds raised for revocation.

I turn now to the grounds for revocation, considering them

in relation to the unamended claims except where I have held amendments to be allowable. It is convenient for me first to give a brief description of the disclosure in the two cited specifications.

Perry, which was published on 15 January 1974, discloses apparatus for the manufacture of mineral (particularly glass) fibre in which a flow of melt is fed to an internal surface of a rapidly spinning rotor from which it is thrown outwardly on to the inner surface of the outer wall of the rotor. Thereafter the melt discharges under centrifugal force through multiple orifices in the outer wall of the rotor in the form of molten filaments. A flame adjacent the outer rotor wall keeps the temperature of the wall close to that of the molten filaments, and there are further multiple gas jets attenuating the filaments into fine fibres. The jets are angled so that the gaseous blast has a velocity component tangential to the outer rotor wall, preferably in the direction of rotation of the rotor. This results in longer and finer fibres and less twisting.

In Henriksen, published on 3 May 1961, molten inorganic material is fed onto the outer surface of one of a series of high-speed rotors, from which it is flung in the form of fibres, as in the present invention. A gas blast from a slot located around and behind the rotor cools and transports the fibres therefrom. While it is stated that the best results are obtained when the blast direction is perpendicular to the plane of the rotor, there is also a passage which reads as follows:-

"The direction of the blast in the blast zone may be variously oriented in relation to the discs [ie rotors]. Thus the blast zone may be cone-shaped, the vertex of the cone being placed in front of or behind the disc in question, or the blast may have such a direction that it passes the disc peripheries at an

angle differing from a right angle in the same or opposite direction as the direction of the movement of the disc in question."

With regard to novelty, the applicants rely upon Perry and Henriksen to attack claims 1 and 2 and upon Perry alone to attack claims 3 and 5. Taking Perry first, Mr Chapple argued that the passage of material through the orifices implies that the melt "is directed to the external peripheral surface" of the rotor and that some adherence of the material must occur on the external surface around the orifices for the further attenuation by the air flow to occur. Although I accept that some adherence of the melt on the external peripheral surface may take place around the orifices in the Perry apparatus, I am not persuaded that the flow of melt through the orifices can properly be described as a flow of liquid melt "directed" to the external peripheral surface. This is sufficient reason, in my view, for me to reject Perry as a novelty anticipation of claim 1.

Since claim 2 is directed to apparatus "for carrying out the method according to claim 1" such apparatus, although not spelt out in claim 2, must be capable of directing liquid melt onto the external peripheral surface of the rotor. Since I do not consider that Perry discloses this, I must also reject Perry as a novelty citation against claim 2. Claims 3 and 5, being appendant to claim 2, likewise do not fail for lack of novelty in relation to Perry.

In relation to the attack of lack of novelty under Henriksen, Mr Lawrence's arguments were primarily directed to showing that this document did not disclose a wall jet. Since, however, I have concluded that none of the claims of the present patent, either amended or unamended, require a wall jet, I do not need to address this question. It was agreed that the Henriksen apparatus was

of the same general type as that of the present invention, reading directly on to the main features of claim 1 as unamended. I do not think, moreover, that I can reach any other conclusion than that the passage from Henriksen that I have quoted above plainly discloses that the air supply emerging from around and behind the rotor may have both axial and tangential velocity components. Thus I consider that claim 1, unamended by Rider A, is clearly lacking in novelty in relation to Henriksen. The same also applies to claim 2, and this is not affected by the incorporation into that claim of the requirement that the rotor is "positioned to receive a flow of liquid melt on to its external peripheral surface and arranged for fast rotation about its axis so as to throw fibres formed from the melt off its peripheral surface".

The effect of Rider A on the scopes of claims 1 and 2, once I have found that it does not require the presence of a wall jet, is not easy to determine, but I am unable to conclude that it has any bearing on the relationship of the claims to the disclosure of Henriksen. I cannot disagree with Mr Chapple's argument that the disclosure of Henriksen in relation to the option of a tangential air flow component satisfies the term "along" in Rider A, and that the cited document, in referring to the blast "being confined to a narrow zone adjacent to and following the periphery of the disc", reads on to the phrase "along the periphery". Therefore, as I have already briefly indicated, I find that the incorporation of Rider A into claims 1 and 2 fails to save either claim from the charge of lack of novelty in relation to Henriksen.

Although in the pleadings lack of novelty based on Henriksen was not raised in respect of claims 3 to 9, I will briefly consider it. Claim 3, and also claims 4 and 5 through their appendancies thereto, are limited to blades in the slot of the air supply means, which is absent from Henriksen, which indicates only orifices.

Since the drawings also clearly show blades in the air supply means, claims 7 and 9 are equally distinguished from Henriksen. Claim 6, on the other hand, appears to be anticipated by the reference on page 3 lines 17 and 18 of Henriksen to a "screen". Claim 8 also falls with claim 1. In summary, therefore, in relation to Henriksen, I find that the invention as set out in claims 1 and 2, whether or not amended by incorporation of Rider A, and also in claims 6 and 8, is not new with regard to Henriksen.

I turn next to the ground of obviousness. The applicants attack claims 1, 2, 3 and 5 in respect of Perry and claims 1 and 2 in respect of Henriksen. Since I have already found that at least claims 1 and 2 fail for lack of novelty in relation to Henriksen, I do not consider it necessary for me to spend long on this. I will, though, briefly consider whether, had I found that claims 1 and 2 survived the novelty attack under Henriksen, I would have found them obvious in the light of Henriksen and Perry taken together, as Mr Chapple argued I should.

In outline Mr Chapple's argument was that the invention of the patent in suit is 'an improvement on Henriksen because of the addition of the transverse component of velocity to the air blast close to the outer edge of the rotor, but whilst the possibility of such a component of velocity was mooted in Henriksen it was not preferred. Perry, he argued, had already introduced such a feature in the context of apparatus and process wherein melt is extruded through orifices to the external rotor periphery. He argued that applying that improvement to the process and apparatus of the Henriksen type was obvious.

Perry states that "the most important feature of the air blast design is the angle at which the nozzles are set". The air blast referred to provides further attenuation of the fibres extruded from the rotor orifices and transport for these fibres. Perry continues "in order to obtain the

longest fibres and with the least intertwining of fibres ... the blast has a component of its velocity which is tangential to the rotor wall movement and in the same direction". I note two things in particular. First, the stated improvements in the product appear to be those expressly aimed at in the patent in suit. Second, Perry leaves the reader in no doubt that a tangential air blast component is a desirable feature. Although it is true that the detailed process in Perry, using extrusion of filaments from inside a hollow rotor, differs from that of the patent in suit and Henriksen, using discharge of melt directly on to the outer surface of a rotor, it is apparent on the evidence, and as I believe conceded by Mr Lawrence, that the field of mineral wool production, be it rock or glass, has only a few participants. I accept Mr Chapple's contention that these participants would be expected to be fully aware of improvements in the industry at large, in both Perry- and Henriksen-type processes. I think it most unlikely that they would not readily investigate whether or not such improvements in one general process could be applied to the other. Returning to Henriksen, although the specification indicates a preference for purely axial air flow, there is no positive teaching against tangential air flow. Therefore I conclude, with Mr Chapple, that this particular feature of Perry can be applied to Henriksen to show that claims 1 and 2 of the patent in suit, whether or not amended by the addition of Rider A, lack an inventive step.

Proceeding to claim 3, and claim 5 appendant thereto, Perry, in column 9 lines 29 to 35, refers to a series of angled ridges, seen most clearly in figures 10 and 11, which ridges can be said effectively to form "blades" in the air supply slot as required in claims 3 and 5. Thus claims 3 and 5, I consider, add nothing inventive to claims 1 and 2 in relation to Perry and Henriksen.

The subject matter of claim 4, in which the blades are

mounted on a flange of the rotor, is not disclosed in either Perry or Henriksen, and I conclude that this claim does not fail for obviousness having regard to these documents.

The third broad ground for revocation is that the patent was obtained on a false suggestion or representation. In their statement the applicants alleged that at least during the latter part of the prosecution of the application for the patent between 1977 and 1980 the patentees were fully aware of the existence of Perry, which was one of many documents cited by the US Patent Office during prosecution of the application in the USA. Mr Chapple argued further that the patentees suppressed the knowledge of the state of the art embodied by the earlier patent Henriksen, particularly so since, as is acknowledged by the patentees, they were a subsidiary of the proprietors of Henriksen.

In their counterstatement the patentees acknowledged that they were aware of Perry at the time of grant, but they dispute whether Perry renders the claims of the patent in suit old or obvious. Mr Lawrence added that, in respect of Perry, at a meeting between himself, as the UK patent agent, Mr Schønning, the Danish patent agent, and Rockwool International in August 1986 he felt that amendment was not necessary but would be a good idea in order to make the claim clearer. He indicated that there was no reference at the meeting to Henriksen; only after the proposed amendments had been sent to the Patent Office did the applicants for revocation find Henriksen. However, he did refer to declarations by Mr Hauland-Christensen and Mr Nørgaard, employees of Rockwool International, the latter being their patents manager, which referred to a meeting held in 1978 to discuss objections based on Perry by the Danish Patent Office. A review was conducted and the specific reference to the "tangential" component of air flow in Henriksen was noticed. It was decided that

the Danish patent examiner should be informed about Henriksen, and their Danish Patent Agent was instructed to do so, as indicated in exhibit EN1. However, Mr Lawrence asserted that the UK patent agents were not informed of this and did not know of the reference since Henriksen had not been cited by the UK Patent Office.

It is clear on the evidence that, although the patentees have considered amendments to the claims in respect of Perry, they have never conceded that the claims were under strong attack by Perry. It might be argued that the claims were recognised by the patentees to be deficient with respect to Perry in view of the amendments made to the claims of the equivalent US Patent 4105425 to limit them only to the apparatus wherein the blades are mounted for rotation with the rotor. However, Perry was only one of a multiplicity of citations made by the US Patent Office, and I consider that there is insufficient evidence to point to the patentees clearly considering the original claims to be defective solely due to Perry. To this has to be added the evidence that the patentees did make amendments to the claims of the application in a prima facie attempt to overcome the UK Patent Office objection based on a patent GB 1025215 (Gustin-Bacon), somewhat similar to Perry. There is in my view no indication that the patentees have deliberately retained claims in their application having a scope which they knew and accepted to be unjustified with regard to Perry.

With regard to Henriksen, the patentees have admitted that they became aware of the reference to "tangential air" in Henriksen in 1978. I must decide whether they deliberately set out to suppress the knowledge of their earlier patent. Referring to exhibit EN1, in particular the English translation of a memo by Mr Hauland-Christensen, which states "... we should refer to our old air ring patent ..." in relation to a suggested response to the Danish examiner, the evidence points to a

willingness to disclose Henriksen rather than to suppress it. However, the information appears to have been lost in the communication to the UK patent agent. I do not consider that in the present context a failure in the lines of communication between patent agents makes the patentees culpable. Thus, although I have held that the claims of the patent in suit are of undue width in relation to Henriksen, the evidence does not suggest that the patentees deliberately suppressed knowledge of Henriksen in order to obtain such broad claims.

I therefore find that the patent does not fail on the grounds of false suggestion or representation.

I turn finally to the grounds of inutility, insufficiency and ambiguity, added to the proceedings by my preliminary decision of 13 March 1989. As to inutility, very little attention was given to this at the hearing, and I think I can deal with it equally briefly. The applicants raised two issues in this regard in their second supplementary statement. First, if the tangential component of air flow velocity exceeds an unstated proportion the apparatus will clog owing to the produced fibres not being removed, and second, there is nothing to prevent the melt being blown out of the apparatus before reaching the rotor. I am not convinced that these issues really relate to the question of inutility, and I note that Mr Chapple advanced no arguments in support of this ground. My understanding of inutility is that the objection arises if a claim covers a mechanism or process which is useless for the purpose indicated by the patentees. In the absence of an argument on this matter I find no substance in the allegation of inutility.

Under insufficiency the pleadings are that the specification contains no indication as to how closely the air blast must surround the rotor, and that there is no information as to the dimensions of the air supply slot or

the permissible ratios between the axial and tangential components of air flow velocity. Mr Lawrence referred me to Dual Manufacturing and Engineering Inc's Patent[1977] RPC 189, in which it was held that the sole question on an allegation of insufficiency was whether the description which had been given was sufficient to enable a person who was reasonably skilled in the particular field to make an embodiment of the invention which would have the features which could make it fall within the objects of the invention. Mr Chapple argued, very briefly, that, the patentees having ascertained that the nature of the product was dependent on the conditions under which it was made, and in view of the very wide possible margins, it was incumbent upon them to disclose what conditions they recommended.

I consider that there is no evidence to support a view that a person reasonably skilled in the particular field of mineral wool manufacture would at the date of publication of the specification of the patent in suit have had any special difficulty, beyond that entailed in the normal experimental, non-inventive process of trial-and-error variation of parameters, in making an embodiment of the invention as claimed. I therefore find no substance in the allegation of insufficiency. I would add that if, as arguably might have seemed more appropriate, the applicants had related their arguments under inutility to the charge of insufficiency, my finding on the latter would have been the same.

As to the charge of lack of clarity of claim, this relates solely, in the applicants second supplementary statement, to the Rider A phrase "the air flows along the periphery of the rotor". Since I have refused to allow this amendment to be effected I do not need to address the question of its clarity. However, I would observe that the fact that the patentees have seen this phrase as referring necessarily to the presence of a wall jet,

whereas I am unable to construe it in the context in this specific and narrow way, suggests that a further reason for my refusing to allow its inclusion would be that it lacks sufficient clarity.

In summary, my findings on the alleged grounds for revocation in relation to the specification amended to the extent that I have found permissible are as follows. Claims 1, 2, 6 and 8 are not new having regard to Henriksen (section 32(1)(e)). Claims 3 and 5 do not involve an inventive step having regard to Henriksen and Perry (section 32(1)(f)).

It appears to me that, in the light of these findings, and noting the progress of the corresponding patent in the USA, the patentees may consider that a form of amendment could be devised which could lead to a valid patent. I therefore allow the patentees a period of two months from the date of this decision within which to file a further request for amendment. Such proposed amendments should be shown in red ink on a printed copy of the specification, and such copy should show all requested amendments, including any in respect of which a request has already been made and a decision to allow given. A copy of the requested amendments should be sent to the applicants for revocation, who may, within one month of receipt thereof, submit in writing any comments they may wish to make thereon. In the event of such comments being forthcoming the patentees will have a further month within which to submit a reply. I will then issue a final decision or will otherwise direct proceedings as seems appropriate to me at the time. If no request for amendment is received within the prescribed period, I will issue a final decision revoking the patent.

I defer settlement of the question of costs until the final decision.

Dated this 11 day of June 1990



Dr P FERDINANDO
Superintending Examiner, acting for the Comptroller

THE PATENT OFFICE