THE SUPREME COURT OF APPEAL OF SOUTH AFRICA

JUDGMENT

Reportable

Case no: 879/2018

In the matter between:

SANDVIK INTELLECTUAL PROPERTY AB **APPELLANT**

and

OUTOKUMPU OYJ **FIRST RESPONDENT**

OUTOTEC OYJ **SECOND RESPONDENT**

Neutral citation: *Sandvik v Outokumpu OYJ & another* (879/2018) [2019] ZASCA 115 (18 September 2019)

Coram: Navsa, Tshiqi, Swain, Molemela and Plasket JJA

Heard: 30 August 2019

Delivered: 18 September 2019

Summary: Patents – application for revocation of patent – invention obvious to a person skilled in the art and thus not involving an inventive step in terms of ss 25(1) and (10) of the Patents Act 57 of 1978.

ORDER

On appeal from: Court of the Commissioner of Patents, Pretoria (Makgoka J sitting as court of first instance):

(a) The appeal is upheld with costs.

(b) The judgment in the court below is set aside and substituted as follows:

'1 South African Patent No. 2002/58267 is revoked.

2 The applicant is granted the costs of revocation, including the costs relating to the respondent's application for the joinder of the second respondent in the application for revocation.'

JUDGMENT

Navsa JA (Tshiqi, Swain, Molemela and Plasket JJA concurring):

[1] In this appeal the question for consideration is whether the appellant's application in the Court of the Commissioner of Patents (Makgoka J), for the revocation of South African Patent 2002/5826 (the patent), entitled 'Belt for the thermal treatment of a continuously operated material bed', was correctly refused. The appeal is before us with the leave of that court. The patent involves a belt used in a continuously operated conveyor-type thermal treatment of a material bed in a sintering process. Before us, an attack on novelty having been abandoned, the challenge in the appellant's heads of argument to the patent was based on: (a) claims 1 to 9 of the complete specification not being clear; or (b) not being fairly based on the matter disclosed in the application; and (c) the invention not involving an inventive step. As will become apparent, claim 1 of the patent was the focus of this appeal.

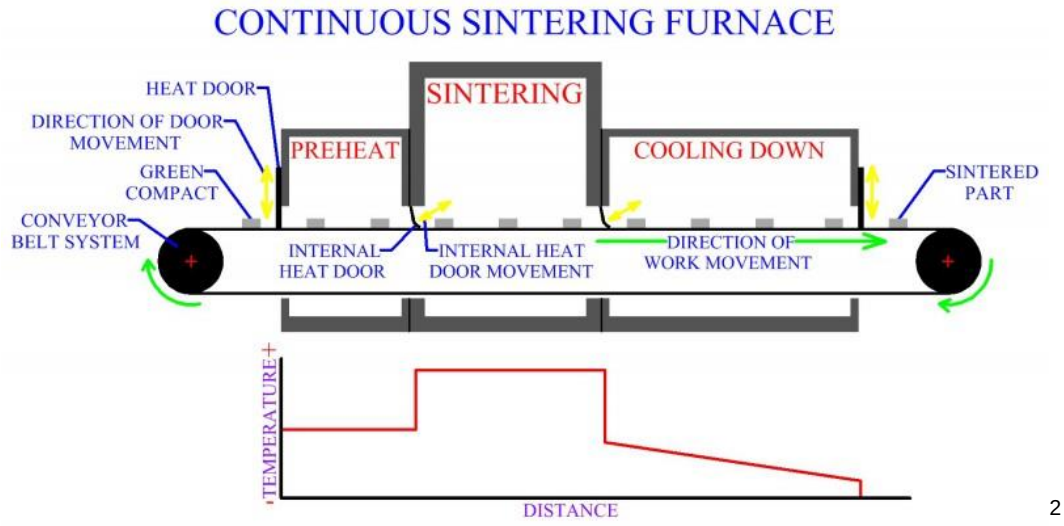
[2] The thermal treatment referred to in the patent is a sintering process. Sintering is defined, inter alia, as follows:

'Sintering consists in mixing metal powders having different melting-points, and then heating the mixture to a temperature approximately the lowest m.p. of any metal included.'[1]

'Sinter' is defined in the *Concise Oxford English Dictionary* 12ed (2011), inter alia, as follows:

'[S]olid material which has been sintered – coalesce form powder into solid by heating (and usually also by compression).'

The pictorial depiction of a sintering plant set out hereafter will facilitate an understanding of the issues in this case:



[2]

The belt in question is envisaged for use on a conveyor system illustrated above.

[3] The appellant, Sandvik Intellectual AB (Sandvik), is a Swedish Corporation, with limited liability, with its headquarters in Sandviken, Sweden. The patentee is Outukumpu OYJ (OT), the first respondent, a company with limited liability, incorporated in Finland, with its headquarters at Riihitontutie, Finland. The patent was later assigned to the second respondent, Outotec OYJ, also a Finnish company. The detailed background is set out hereafter.

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[1] See T C Collocott & A B Dobson (eds) *Chambers Dictionary of Science and Technology* revised ed (1974) 1076.

[2] Pressing and Sintering of Powder Parts, https://thelibraryofmanufacturing.com/pressing_sintering.html (accessed 29 August 2019).

[4] OT lodged a Patent Cooperation Treaty (PCT) patent application on 24 January 2001, claiming priority from a Finnish patent application filed on 31 January 2000. The initial patent application included nine claims. It had only one independent claim, namely claim 1. An initial search report, which is part of a PCT application process, revealed material prior art, which were 'of particular relevance'. It went on to state: 'the claimed invention cannot be considered novel or cannot be considered to involve an inventive step'. On 20 March 2002 OT lodged an amended set of 8 claims. The amended PCT application contained only one independent claim, claim 1. It is this claim that is at the centre of the present dispute. A comparison between the initial claim 1 and the amended claim 1 is shown below, with the underlined wording reflecting the amended wording and the wording that is struck through reflecting that which was deleted by way of the amendment.

'A conveyor belt for a continuously operated conveyor-type thermal treatment, i.e. sintering, of a material bed, said conveyor belt being provided with perforations in order to allow the gasses that are used for heating and possibly cooling the material bed to flow through the material bed and the conveyor belt, and said conveyor being based on elements connected to each other, characterised in that the conveyor belt is made of a perforated, at least one-part element ~~(1, 11, 21)~~ made of a metal piece and allowing the gas to flow through, ~~said element being mechanically connected to the preceding and successive element (1, 11, 21) in the proceeding direction (5, 15, 28) of the conveyor belt by means of a junction made in the lateral direction of the conveyor belt,~~ and that the perforations ~~(2, 13, 14, 26, 27)~~ are arranged in zones alternating with perforation-free element parts, and that the area of the perforations is about 20 – 60% of the total area of the conveyor belt.'

A PCT examination report regarded the amended claims as novel, but obvious, and in that regard it referred to prior art.

[5] OT lodged a Brazilian patent application in terms of the PCT nationalisation phase, once again claiming priority from the Finnish patent application. This resulted in Brazilian Patent No. PI 0107924-7. OT, similarly, lodged a South African patent application, in terms of the PCT nationalisation phase, claiming priority from the Finnish patent. The South African patent application incorporated the amended PCT claims set out in the preceding paragraph with a ninth claim added in the form of an omnibus claim. As stated earlier, it is the amended claim 1 that is the focus of this appeal.

[6] The integers of claim 1 are as follows:

A. A conveyor belt for a continuously operated conveyor-type thermal treatment, i.e. sintering, of a material bed,

B. said conveyor belt being provided with perforations in order to allow the gasses that are used for heating and possibly cooling the material bed to flow through the material bed and the conveyor belt, and

C. said conveyor being based on elements connected to each other, characterised in that

D. the conveyor belt is made of a perforated, at least one-part element made of a metal piece allowing the gas to flow through, and

E. that the perforations are arranged in zones alternating with perforation-free element parts, and

F. that the area of the perforations is about 20 – 60% of the total area of the conveyor belt.

[7] The application for the revocation of the patent was filed on 6 May 2013. The application was brought on the basis that the invention as claimed was not new, lacked clarity, lacked a fair basis and did not involve an inventive step 'as required in terms of s 25(1) of the Patents Act 57 of 1978 (the Act), read with subsection (6) & (10),[3] in that the inventions were obvious to a person skilled in the art, having regard to all matter which formed, immediately before the priority date of the inventions, part of the state of the art by virtue only of subsection (6)'. This appeal turns on the last-mentioned ground, namely, lack of an inventive step.

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[3] The relevant subsections of s 25 read as follows:

'(1) A patent may, subject to the provision of this section, be granted for any new invention which involves an inventive step and which is capable of being used or applied in trade or industry or agriculture.

. . .

(6) The state of the art shall comprise all matter (whether a product, a process, information about either, or anything else) which has been made available to the public (whether in the Republic or elsewhere) by written or oral description, by use or in any other way.

. . .

(10) Subject to the provisions of section 39(6), an invention shall be deemed to involve an inventive step if it is not obvious to a person skilled in the art, having regard to any matter which forms, immediately before the priority date of the invention, part of the state of the art by virtue only of subsection (6) (and disregarding subsections (7) and (8)).'

[8] OT opposed the application for revocation. In respect of lack of clarity, it took the view that the integers when viewed individually and collectively can clearly be understood and that, in essence, what was envisaged was that the conveyor belt is made up of elements connected to each other, constituted by perforated zones alternating with non-perforated zones. OT denied that there was lack of a fair basis. In respect of lack of novelty, OT was adamant that the prior art, properly construed, did not disclose all the integers of claim 1. In relation to Sandvik's assertion of lack of an inventive step, OT said the following:

'[I]t is submitted that the inventive step in the conveyor belt of the invention is that the conveyor belt is made of perforated, at least one-part elements formed from a metal piece, having perforations on each at least one-part element which are specifically arranged in zones which alternate with perforation-free zones on the at least one-part element, and with the area of the perforations being about 20 – 60% of the total area of the conveyor belt.'

[9] Sandvik cited matter that formed part of the prior art immediately before the priority date of 31 January 2000. The prior matter was admitted by OT. The following constituted Sandvik's list:

'a. DE 2742100 A1 (Polysius AG), 29 March 1979, figures 2a and 5;

b. US 3735858 A (Walter J. Hartwig), 29 May 1973, column 7, lines 23 to 29;

c. US 4316718 A (Roland Drugge), 23 February 1982, figures 2 and 4, and claim 1;

d. US 3756380 A (Ronald Tunstall Ackroyed et al), 4 September 1973, figures 1, 3 and 10; and

e. US 4024610 A (Reinhard Korting), 31 May 1977, column 1, line 68, to column 2, line 3, figure 1, and claim 13.'

However, OT denied that the prior art supported Sandvik's claim for revocation.

[10] For a better appreciation of the issues and the findings of the court below, it is necessary to have regard to illustrations of the three preferred embodiments of the invention in question:

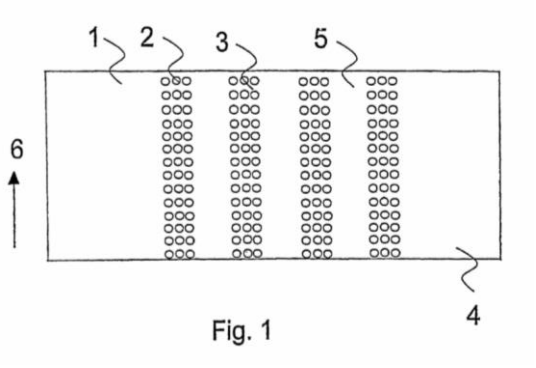

Fig. 1

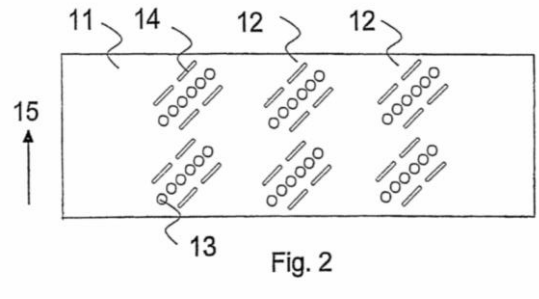

Fig. 2

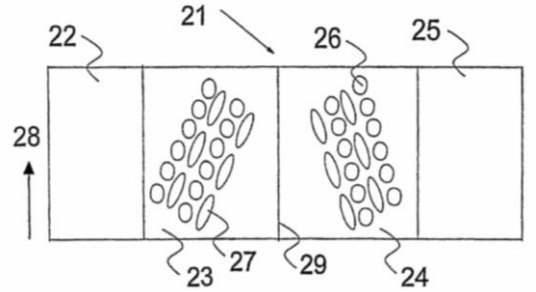

Fig. 3

These figures depict variations of metal elements that are linked together as part of the complete belt that passes through the conveyor system. They are the three preferred embodiments of the invention. Figures 1 and 2 are illustrative of integers D, E and F in that they show metal elements having perforations arranged in zones which alternate with perforations-free zones and with the area of the perforations being about 20-60% of the conveyor belt. Figure 3, however, unlike figures 1 and 2, has two perforated zones alongside each other flanked by two non-perforated zones.

[11] In the court below, Makgoka J, took the view that Sandvik had abandoned ‘reliance on the prior art’ and, consequently, ignored the prior art in adjudicating whether the invention was new. The attack by Sandvik on lack of novelty was rejected. Makgoka J said the following, at para 27 of his judgment:

'The patent specification makes it clear that the specific total area occupied by the perforations is an important aspect of the invention. To achieve one of the primary advantages of the invention, the patent teaches that it is the combination of (i) the specific area occupied by the perforations; and (ii) the alternating perforation-containing zones and perforation-free parts of the element that together allow the conveyor belt.'

He went on to hold as follows:

'In the ultimate end, as counsel for the respondents submitted, the invention of the patent balances the requirements of (i) effective heat transfer through the belt (which occurs primarily in the central region of the belt); and (ii) limiting thermal and tensile stresses on the belt. Hartwig discloses integers E or F of claim 1. In the result I conclude that the attack based on novelty should fail.'[4]

[12] Turning, finally, to the question of lack of an inventive step, which entails dealing with obviousness, the court below had regard to the provisions of s 25(10), referred to earlier in this judgment. Makgoka J considered the approach of this court in dealing with the question of obviousness as set out in *Ensign-Bickford (South Africa) (Pty) Ltd & others v AECI Explosives and Chemicals Ltd* 1999 (1) SA 70 (SCA), at 79I-80J:

'As is pointed out in *Roman Roller CC & another v Speedmark Holdings (Pty) Ltd* 1996 (1) SA 405 (A) at 413, in order to apply these provisions to a particular case it is necessary to determine what the art or science to which the patent relates is, who the person skilled in the art is and what the state of the art at the relevant date was. But the inquiry, in my view, must then proceed further. After those factors have been determined, a more structured inquiry must be undertaken. . . Four steps are identified. They include or restate in part what has been said above but may be taken to conveniently list the inquiries to be made:

(1) What is the inventive step said to be involved in the patent in suit?

(2) What was, at the priority date, the state of the art (as statutorily defined) relevant to that step?

(3) In what respect does the step go beyond, or differ from, that state of the art?

(4) Having regard to such development or differences, would the taking of this step be obvious to the skilled man?'

[13] Makgoka J had regard to integers D to F of claim 1 which, it was contended, identified the inventive step. It bears restating:

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[4] Para 30.

'[T]he conveyor belt is made of a perforated, at least one-part element made of a metal piece and allowing the gas to flow through; the perforations are arranged in zones alternating with perforation-free elements parts; and the area of the perforations is about 20-60 % of the total area of the conveyor belt.'[5]

He went on to consider the prior art. In his view the integers set out in the preceding paragraph were not to be found in the prior art and concluded as follows:

'In sum, the applicant has failed to discharge the onus resting on it to prove that the patent is invalid on any of the grounds relied on. The application accordingly falls to fail. An order should be made in terms of section 74 of the Act certifying the validity of the patent.'[6]

The following order was made:

'1. The application for revocation of South African patent number 2002/5826 is dismissed with costs;

2. Each of the claims of South African patent number 2002/5826 are certified as being valid in terms of section 74 of the Patent Act 57 of 1978.'[7]

It is against these orders that the present appeal is directed.

[14] Before us the dispute was narrowed. On behalf of Sandvik, it was accepted that the appeal should succeed or fail on the basis of whether there was a lack of an inventive step. It is clear that the onus to show that a patent is invalid rests on an applicant for revocation and that the onus is discharged on a balance of probabilities. In this regard, see *Marine 3 Technologies Holdings (Pty) Ltd v Afrigroup Investments (Pty) Ltd & another* 2015 (2) SA 387 (SCA). Thus, the onus to show that the patent is invalid on the basis of lack of an inventive step rested on Sandvik.

[15] In *Ensign-Bickford* this court referred to what it said earlier in *Power Steel Construction Co (Pty) Ltd v African Batignolles Construction (Pty) Ltd* 1955 (4) SA 215 (a) at 224E-F:

'A claim is a portion of the specification which fulfils a separate and distinct function. It, and it alone, defines the monopoly; and the patentee is under a statutory obligation to state in the claims clearly and distinctly what is the invention which it desires to protect.'[8]

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[5] Para 38.
[6] Para 44.
[7] Para 48.
[8] In this regard the famous dictum of Lord Russel in *Electrical Musical Industries v Lissen* 56 R.P.C 23, 39

In *Kirin-Amgen Inc. & others v Hoechst Marion Roussel Limited & others* [2005] 1 All ER 677; [2004] UKHL 46, the House of Lords held as follows:

'The best-known statement of the status of the claims in UK law is by Lord Russel of Killowen in *Electric and Musical Industries Ltd v Lissen Ltd* (1983) 56 RPC 23, 39:

"The function of the claims is to define clearly and with precision the monopoly claimed, so that others may know the exact boundaries of the area within which they will be trespassers. Their primary object is to limit, and not to extend, the monopoly. What is not claimed is disclaimed. The claims must undoubtedly be read as part of the entire document, and not as a separate document. Nevertheless, the forbidden field must be found in the language of the claims and not elsewhere."'

[16] Counsel on behalf of OT rightly did not seek to place any reliance on the body of the specification where the object of the invention was said to be 'to eliminate the draw-backs of the prior art' in that it resulted in economy in manufacturing costs and enabled the belt to be replaced in parts. Similarly, reliance was not placed on that part of the body of the specification which cites as an advantage, the transversal or parallel arrangement of the perforations. Before us, OT was constrained to restrict the inventive step to integers D, E and F. In relation thereto, it was submitted that the inventive step involved alternating the perforated areas with the non-perforated areas and that the percentage of the perforated areas in the range 20-60% was so as to establish, in the words of counsel, a 'sweet spot' for optimal thermal treatment.

[17] In addressing the first three steps referred to in *Ensign-Bickford*, as set out in para 12 above, it is necessary to have regard to the evidence presented in the court below. Before doing so, I pause to consider the value of expert evidence. In *Schlumberger Logelco Inc v Coflexip SA* 2003 (1) SA 16 (SCA) this court clarified the position as follows:

'It is the technical evidence by expert witnesses in respect of the nature of the step claimed to have been inventive, the state of the art as at the priority date relevant to that step and the respect or respects in which the step goes beyond or differs from that state of the art which constitutes the primary evidence. It is clear from a reading of the *Ensign-Bickford* case, at 81D-83A, that the Court considered the question of obviousness on that basis. The technical evidence of the witnesses was considered without any reference to their opinions as to whether the invention was

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was being cited.

obvious. Expert witnesses who are either of the opinion that the invention is obvious or that it is not obvious would almost invariably give the primary technical evidence. In these circumstances it may sometimes be difficult to avoid them expressing the conclusion that the step is either obvious or not obvious, but that would do no harm so long as it is borne in mind that that conclusion is immaterial.'[9]

[18] The evidence placed before the court below by Sandvik was that of Mr Anders Bodin who obtained an MSc in Engineering Physics from Uppsala University in 1986. From that time until 2001 he gained experience and knowledge in steel and metallurgy. From 2001 until the time of the litigation in the court below, he gained extensive experience in the development of steel belts of the kind in question.

[19] In relation to the question of lack of an inventive step, Mr Bodin had regard to the prior art listed by Sandvik and admitted by OT. According to him integers A, B, C and D were all present in the prior art. Integers E and F, as referred to above, involve perforated parts of elements of the belt being arranged in zones alternating with perforation-free parts, with the extent of the area of the perforations being 20-60% of the total area of the conveyor belt. In Mr Bodin's view, the prior art encompassed perforated zones alternating with non-perforated zones. In relation to the stated percentages of perforated areas referred to above, Mr Bodin took the view that integer F does not recognise any advantage, preference or importance related to the percentages. That the range is so broad, in his view, negated any argument about any advantage or an inventive step.

[20] Mr Pekka Santala provided evidence in support of OT's case. He obtained a M.Sc. Eng. in 1980 from the Technical University of Helsinki, Department of Mining and Metallurgical Technology, Espoo, Finland. During 1981 and 1982 he developed experience as a research engineer in a metallurgical laboratory. Between 1982 and 1985 he was employed as a metallurgist in process development. From 1985 to 1989 Mr Santala was employed as a process engineer; and from 1989 to 1991 as a process metallurgist. Mr Santala has extensive experience in belt sintering and has been involved in the manufacturing of steel belts, which are important components of a steel belt

[9] Para 34.

sintering furnace. He identified the inventive step as those contained in integers D, E and F. He took the view that the prior art did not disclose perforations arranged in zones, alternating with perforation-free parts. Furthermore, there was no disclosure of the area of perforations being 20-60%. Mr Santala, in identifying the inventive steps of the invention in question, placed reliance on that part of the specification referred to above which indicated that the object of the invention was to promote economy in manufacturing costs and to enable replacement of parts of the belt, rather than the whole. In addition, he also indicated as an advantage of the invention that the different configurations of the perforations promoted optimal thermal-treatment. As stated earlier, these latter two grounds, absent as they are from claim 1, were not relied on by counsel on behalf of OT and the dispute was restricted to integers D, E and F.

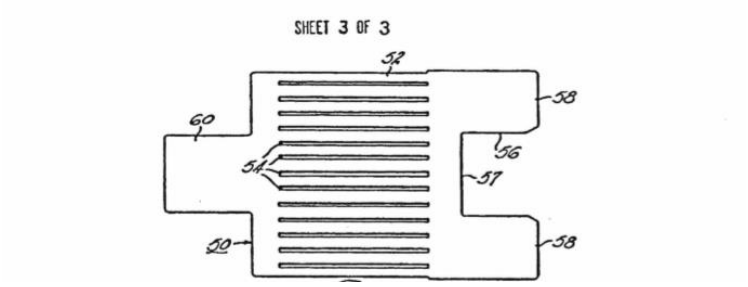
[21] I interpose to record that in the court below it was submitted on behalf of OT that Mr Bodin's evidence was not admissible or had no value because he was not skilled in the art of the patent as he had no experience of steel belts at the priority date. This submission was based on a statement in a judgement of this court, namely, *Ausplow v Northpark Trading*[10] [2011] ZASCA 123, where Harms AP said the following at para 41:

'The inventor's (Mr Ryan's) evidence that the invention solved the problems set out under the quoted "Background" was met by what fairly may be called a bald denial by Mr Steyn *who was in any event not an agricultural engineer at the effective date of the patent*.'

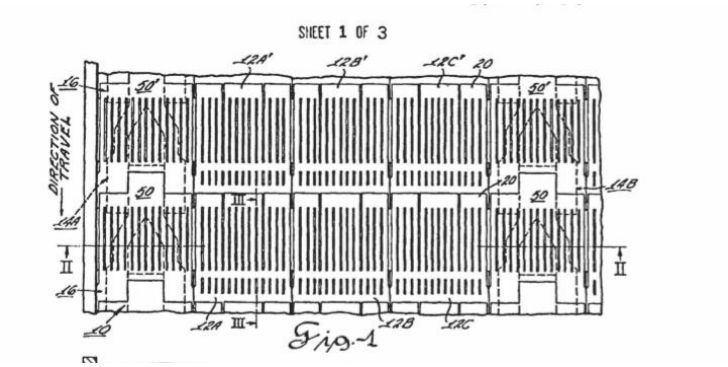
The latter part of the quote was not relevant to the result in that case and it should not be construed as authority for the proposition that an expert properly qualified cannot be of assistance to the court in the manner contemplated in *Schlumberger* because he or she was not such an expert at the priority date of the patent. The court below rejected this submission on behalf of OT. Counsel on behalf of OT rightly did not, in oral argument before us, persist in that submission.

[22] I turn to consider the prior art. In US Patent 3735858 A (Walter J. Hartwig), 29 May 1973, the following figure illustrates one of a number of metal elements which constitute the belt that forms part of that invention. As can be seen, it contains perforations alternating with non-perforated parts of a metal element.

[10] [2011] ZASCA 123; [2011] All SA 221 (SCA) at para 41. (Italics my own.)

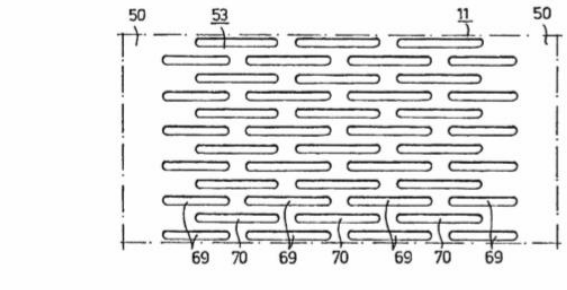


The following illustration depicts a number of linked elements.



The assertion now not relied on, that the advantage of the elements of the invention in question is that they can be removed and replaced individually rather than the entire belt being replaced was, rightly, not persisted in.

[23] In US Patent 4316718 A (Roland Drugge), 23 February 1982, the following illustration depicts perforated areas in a different pattern. It does, however, also show perforated zones alternating with non-perforated zones.



[24] Drugge shows a conveyor system including a plurality of mutually adjacent endless, imperforate belt parts separated by perforated regions. Furthermore, ‘the perforations in the conveyor are formed by slots which preferably extend in the transverse direction of the conveyor, whereby differences in longitudinal expansion of the perforated regions and of the imperforate belt parts in the longitudinal direction of the conveyor can

be compensated by spontaneous change of the width of the slots, so that buckling or other forms of deformation of the imperforate belt parts is at least substantially avoided, while expansion of the upper conveyor part in its cross-direction can be permitted to lead to a certain amount of sagging of the perforated regions between the supported imperforate regions.' This demonstrates that the width and area can be adjusted at will and across a range so as, in the words of counsel, to locate a 'sweet spot'.

[25] The stated 20-60% range of perforations is the only ostensible distinction in relation to the prior art. Having regard to the prior art the stated broad range would have been obvious to a person skilled in the art. The court below ought to have concluded that Sandvik discharged the onus and that the challenge to the patent on the basis of a lack of an inventive step was well founded.

[26] The following order is made:

(a) The appeal is upheld with costs.

(b) The judgment in the court below is set aside and substituted as follows:

'1 South African Patent No. 2002/58267 is revoked.

2 The applicant is granted the costs of revocation, including the costs relating to the respondent's application for the joinder of the second respondent in the application for revocation.'

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M S Navsa

Judge of Appeal

APPEARANCES:

For Appellant:	A J Bester SC Instructed by: Bouwers Inc., Hyde Park Phatsoane Henney Attorneys, Bloemfontein
For Respondent:	G D Marriott Instructed by: Spoor & Fisher, Centurion Matsepes Inc., Bloemfontein