

IN THE SUPREME COURT OF SOUTH AFRICA
(APPELLATE DIVISION)

~~In the matter between~~

ROMAN ROLLER CC.....

1st Appellant

GYULA LASZLO ROMAN..... 2nd Appellant

and

SPEEDMARK HOLDINGS (PROPRIETARY)
LIMITED.....

Respondent

CORAM: CORBETT CJ, E M GROSSKOPP, NESTADT, VAN DEN
HEEVER et SCHUTZ JJA

DATE OF HEARING: 5 May 1995

DATE OF JUDGMENT: 22 August 1995

JUDGMENT

/ CORBETT CJ:.....

CORBETT CJ:

This is a patent case with a difference. In 1985 and on the application of a company known as F A Pressings (Pty) Ltd ("FA Pressings") patent no 84/3606, entitled "Conveyor Roller and Method of Assembly Thereof" ("the patent"), was registered. The inventor was stated in the application to have been Gyula Laszlo Roman. He is now the second appellant and in these proceedings the admitted infringer of the patent. In the original application for a provisional specification made by second appellant (at the time a shareholder in and director of F A Pressings) on 13 May 1983 he subscribed the usual declaration that to his best knowledge and belief, if a patent were to be granted on the application, there would be no lawful ground for its revocation. As I shall show, he now contends that the patent is invalid and seeks its revocation. It is common cause that the priority date of the patent is 13 May 1983.

In 1986 the patentee's rights under the patent were

assigned to Process Plant (Pty) Ltd, which in turn assigned them to Brelko Manufacturing CC in 1988.

In 1989 and effectively from 8 December 1988 the latter assigned its patent rights to Speedmark Holdings (Pty) Ltd (respondent on appeal).

In 1989 the respondent became aware of the fact that a close corporation, Roman Roller CC (of which the second appellant was the sole member and which is the first appellant in this appeal) was manufacturing and disposing of conveyor rollers which fell within the scope of certain of the claims of the patent and thereby infringed the patent. Consequently the respondent instituted action in the Court of the Commissioner of Patents, citing first and second appellants as defendants and claiming interdicts and certain ancillary relief. The action was defended by the appellants, who admitted infringement of certain of the claims in the patent, but (somewhat remarkably) denied the validity of the patent and counterclaimed for its revocation on the grounds that the "invention" was not new, that it was obvious, and

consequently did not involve an inventive step, and that its claims were not clear.

The case was tried by MacArthur J, sitting as a Commissioner of Patents. At the inception of the trial the appellants formally abandoned the defence and ground of revocation based on lack of novelty. MacArthur J found against the appellants on the remaining issues of obviousness and clarity, granted the relief prayed by the respondent and dismissed the counterclaim with costs. He further granted leave to appeal to this Court. (The judgment of MacArthur J has been reported: see Speedmark Holdings (Pty) Ltd v Roman Roller CC and Another 1993 BP 397.)

On appeal counsel appearing on behalf of the appellants advanced the same two grounds of invalidity and revocation. Before dealing with them, I shall describe the patent in more detail.

The Patent Under the heading "Background to the Invention", the body of the specification opens with the words -

"THIS INVENTION relates to conveyor tellers or rollers of the type adapted to support conveyor belts used in mining, industrial and like applications."

As this quotation indicates - and as was confirmed in evidence - "idlers" and "rollers" are alternative terms for the same thing. The specification then proceeds (I have for convenience of reference numbered the quoted passages from the specification):

"1. Conveyor rollers generally comprise a rigid sleeve or drum which is rotatably mounted by means of suitable bearings on a shaft, the shaft being supported in a cradle or frame which in turn is mounted to a foundation. Generally the sleeve is formed from a steel tube. Problems with steel or metal sleeves occur when the idler jams due to . bearing seizure or for other reasons. When this

occurs, the belt runs over a stationary idler causing the steel sleeve to heat up and wear away, resulting

in the belt being damaged.

2 . Other problems arise when the conveyor is carrying uneven loads which form a protuberance on the underside of the belt which impinges on the conveyor idler as the protuberance passes over the idler. This can cause denting of the sleeve as well as jolting and possible damage to the bearing assembly.

3 . Further problems with conventional rollers occur because the outer surface of the sleeve is not absolutely concentric with the axis of rotation. Rotation of an eccentric roller causes rapid deterioration of the bearing assembly as well as the setting up of harmonic vibrations in the belt. Also, because the steel sleeve is smooth, the belt will tend to 'wander' relative to the idler which is considered undesirable."

The specification then describes attempts to alleviate "at least some" of these problems.

These attempts have consisted in the

development of conveyor idlers formed of or having an outer cover of rubber or soft plastics, which absorbs some of the shocks to which the idlers are subjected. In this connection certain British patents are referred to, more particularly British patent no 1076499 which describes a roller having a cylindrical drum covered with a "rubber sleeve". But with rubber or "like synthetic plastics materials such as polyethelene" there are, according to the specification, other problems in that-

"4. . . . once the roller jams, the relative movement between belt and stationary roller causes rapid breakdown of the cover, eventually leading to damage to the belt. Also, such materials tend not to be dimensionally stable, and as soon as an eccentricity occurs in the roller, further rotation causes rapid deterioration of the eccentric condition."

The specification states that the object of the invention is to provide a conveyor roller which runs smoothly and which has

superior wear or operational characteristics "in at least some applications". The invention is

described thus:

"5. According to the invention there is provided a conveyor roller comprising a drum rotatably supported on a shaft by a bearing assembly, the drum comprising a right circular cylindrical tubular inner sleeve formed of metal, and a coaxial right circular cylindrical outer sleeve formed of a hard, wear resistant, plastics material.

Preferably the hard plastics sleeve will be self supporting and the metal sleeve will be formed of thin steel tube.

4 . Further there is provided for the plastics material to have self lubricating characteristics. Specifically it is envisaged that the plastics material will have physical characteristics similar to that of rigid polyvinyl chloride (rigid PVC), polypropylene, or high density polyethylene.

5 . Further there is provided for the outer surface of the drum to be machine turned such that the axis of the outer surface is concentric with the axis of rotation of the roller. During turning a

fine helical groove or a plurality of concentric circular grooves may be cut into the outer surface of the plastics sleeve, along substantially the entire length of the sleeve. The fine groove will not materially affect frictional resistances to movement tangentially to the sleeve but will increase frictional resistance to movement parallel to the axis of rotation of the idler.

6 . The bearing assembly by means of which the drum is supported on the shaft may comprise a pair of roller bearings preferably mounted in end caps formed of a hard plastics material. The plastics material of the end caps may be a nylon 66 derivative and will preferably be moulded to the required shape. The shape may include a ribbed formation.

7 . It is envisaged that the plastics material of the sleeve will have characteristics substantially as follows:

Mass density:	1350 - 1460 kg/m ³
heat reversion:	less than 3.0%
specific heat capacity:	0,85-2.10 kJ/kg ⁰ C
vicat softening point:	82 - 85

tensile strength @ 20° C: 56 MPa (at yield) modulus of elasticity: 3,2
GPa compressive strength: 80 MPa"

(It was common cause that the word "comprehensive" was an error and should read
"compressive".)

"10. Further there is provided for the polymeric sleeve to comprise a length
of rigid PVC piping which during assembly of the idler is heat shrunk onto
the metal sleeve. This material is suitable as it has a low coefficient of friction with a
conveyor belt.

8 . It will also be possible for the plastics sleeve to have electrically
conductive particles interspersed therethrough which will assist in reducing electrostatic buildup on the
roller in use.

9 . The end caps may be press fitted into the drum or alternatively
may be screwed into thread formations formed on the inner surface of the drum."

The specification then proceeds to describe a method of

assembling such a conveyor roller. This consists essentially of what is referred to as heat-shrinking (see passage 10 above). The plastic outer sleeve is heated to a condition of "slight plasticity"; the inner (steel) sleeve and the outer sleeve are placed end-to-end in a coaxial relationship; the outer sleeve is urged over the inner sleeve so that they form a single composite drum; and the composite drum is then allowed to cool. Other methods described relate to the shaving of the outer surface of the outer sleeve to achieve concentricity; the cutting of circular or helical grooves into the outer surface of the outer sleeve; and an hydraulic ram for urging the outer sleeve over the inner sleeve.

The specification includes certain drawings, which are fully described in the body of the specification and descriptions of preferred embodiments of the invention. I shall return to some of these descriptions later.

The specification concludes with 20 claims, of which seventeen are product claims and three are method claims. The

claims in issue in this case are nos 1,7,8 and 15. The attack upon the validity of the patent is concentrated on claim 1. Claims 7, 8 and 15 are dependent on claim 1 and consequently they stand or fall by the validity of claim 1.

Claim 1 (as amended in September 1989) reads as follows:

"A conveyor roller comprising a drum rotatably supported on a shaft by bearing assemblies near respective ends of the shaft, the drum comprising a right circular cylindrical tubular inner sleeve formed of metal, and coaxial right circular cylindrical outer sleeve formed of a hard, wear resistant, plastics material, each bearing assembly being mounted in an end cap which is fitted into the drum, each end cap comprising a cylindrical body within which a bearing assembly is received and having a radially extending lip which overlies the end of the inner sleeve."

As I have indicated, the attack upon the validity of the

patent is two-pronged: (1) obviousness and (2) lack of clarity. I shall deal with these in turn. At this stage it is appropriate to point out that the onus of establishing invalidity on either of the grounds alleged rests on the appellants (Gentiruco A.G. v Firestone S.A. (Pty) Ltd 1972 (1) SA 589 (A), at 629 E - F).

Obviousness Sec 25(1) of the Patents Act 57 of 1978

("the Act")

provides that, subject to certain limitations and exclusions (none of

which is here relevant), a patent may 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."

According to sec 61(l)(c) of the Act a person may apply for the revocation of a patent on the

ground, inter alia -

... that the invention concerned is not patentable

under section 25".

And, in terms of sec 65(4) of the Act, in any proceedings for infringement the defendant may counterclaim for the revocation of the patent and, by way of defence, rely upon any ground on which a patent may be revoked.

One of the requirements of patentability prescribed by sec 25(1) is that the new invention must involve "an inventive step". The meaning of this term is defined by sec 25(10), the relevant portion of which reads:

"... 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 any claim to the invention, part of the state of the art by virtue only of subsection (6)..."

Subsection (6) provides:

"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."

As sec 25(1) indicates, an invention is deemed to involve an inventive step if it is not obvious to a person skilled in the art, having regard to the state of the art at the relevant time. Conversely, if the invention is obvious to such a person, then the invention is deemed not to involve an inventive step and to be invalid on the ground of obviousness.

In order to apply these provisions to a particular case it; is necessary first to determine (i) what the art is to which the invention relates, (ii) what the state of this art was at the relevant time and (iii) who is to be regarded as a "person skilled in the art". These were matters in dispute, both before the Commissioner and before us.

The Relevant Art

At this point it is pertinent to make some reference to the evidence adduced in the Court a quo. Three witnesses testified. They were, in order of appearance, Mr Frittella, an expert called by appellants, Mr Roman (the second appellant), the original inventor, and Mr H W Read, respondent's expert. Although an expert summary in respect of second appellant was filed, his evidence was mainly factual and consisted of description of how he came to hit upon the invention which he patented in 1983 and of an explanation (given, it would seem, with a measure of embarrassment) of his later viewpoint (i e after receiving a summons for patent infringement) that the patent was invalid. His description of how the invention came about merits repetition. At the time he was engaged in the manufacture of steel rollers and was seeking business with "the mines". A visit to a mine revealed to him quantities of steel rollers, some of them still "brand new", which had been scrapped. Someone at the mine told him that

if he could "do something which is better" he would be "in business". He went back to his workshop and began experimenting with different types of materials. In his own words, he first of all -

"took an ordinary steel roller and ask a person to cover it with fibreglass. We have it tested and it did not work. Then I see a water pipe lying just around in my workshop and I thought about that you know, if I could get these in different sizes, I could use it as a coat for the steel roller. So I looked around and I find a suitable water pipe which we called at the time, made out of plastic that I shrink onto the steel pipe. Then it put it to tests and it did work for a short time. Then I went to John and Kemick and I wanted to get some advice if this idea of mine can be patentable or protected or something to protect it with. There they advised me to patent the thing first or take a provisional out and then we will deal with the rest"

As to the scope of the art in question, Messrs Read and Fritella disagreed with one another. Mr Read drew a distinction

between what he termed "belt conveyor rollers", i.e. rollers which supported and propelled a conveyor belt (upon which the goods to be moved were placed), and "cargo rollers", i.e. rollers upon which cargo is conveyed without the intervention of a belt; and he expressed the view that the relevant art was confined to belt conveyor rollers. In this connection he pointed to various design considerations which differentiated between these two types of rollers; and also to the fact that the opening words of the specification make it clear that the invention relates to rollers of the type adapted to support conveyor belts (see quotation above). Mr Frittella, on the other hand, expressed the view that this distinction was not a valid one. According to him the functions performed by belt conveyor rollers and cargo rollers might differ, but the basic engineering concepts required in both their design and their manufacture were similar. He defined a roller as a cylindrical element which by its rotating motion allows the actual movement of a load. In his expert summary (which he confirmed in

evidence) Mr Frittella defined the art in question thus:

"The art involves rollers with or without belts and includes for example, rollers for conveying material in the mining industry and rollers, with or without belts, for the conveyance of materials in other industries, e.g. cargo conveying."

He conceded, under cross-examination, that the patent related only to belt conveyor rollers, but contended that this did not contradict his evidence about the scope of the art.

In the Court below the Commissioner dubbed the distinction an "artificial" one and investigated the state of the art on the basis that it included both belt conveyor rollers and cargo rollers (see reported judgment pp 404 G - 405 B, 406 G-407F).

On appeal respondent's counsel sought to persuade us that the Commissioner's findings in this regard were incorrect and that the art was confined to belt conveyor rollers. I am not so persuaded. It seems to me that respondent's contention fails to distinguish the art to

which an invention relates and a particular application within the scope of that art. At all events, as I shall show, this dispute is not of crucial importance in this case.

The State of the Art In order to establish the state of the relevant art immediately before the priority date, viz 13 May 1983, the appellants pleaded and produced some fourteen published documents. It is not in dispute that these documents were available to the public before the priority date. Only ten of these documents were referred to in evidence and I do not think that the remaining four take the appellants' case any further. Apart from one (a pamphlet referred to as Hewitt-Robins), the ten documents are all patent specifications emanating from various countries - Germany, the United Kingdom, the Republic of South Africa and the United States of America. One of these specifications (referred to as Agfa) relates to rollers used in

photographic development tanks. These are not conveyor rollers and it seems to me that the Agfa document falls outside the scope of the art. (Cf the reported judgment of the Commissioner, p 409 F-G.) , The same would seem to apply to the document referred to as Wittler, a German patent for the broad-drawing of flexible continuous sheet materials, particularly textiles. This leaves the following documents which do relate to either belt conveyor rollers or cargo rollers: the McCullagh, Halbron, Thompson, Fyson, Vom Stein and Gruber specifications. In addition, in argument before us the appellants relied on another transport roller specification, referred to as Fototechnik (though this was not referred to in the evidence adduced by appellant). The Hewitt-Robins pamphlet was also relied upon by the appellants, but from the limited information contained in this document it is not possible to say what the purpose of the roller depicted therein is and I leave it out of account.

The Skilled Addressee

Appellants contend that the notional person skilled in the art to whom the specification should be taken to be addressed is a fitter and turner or artisan. The respondent, on the other hand, though initially contending that the skilled addressee is an engineer, indicated in the course of argument (through its counsel) that it was prepared to abide by the conclusion of the Court a quo which was as follows (see reported judgment, at 406 D-G):

"As far as the present matter is concerned, the alleged invention does not appear to be particularly sophisticated. Having heard the evidence of Fritella and Read, I would assess it as being fairly low down in the technology scale and certainly not requiring skills of a graduate engineer to comprehend and understand it. However, the characteristics of the plastics material from which the outer sleeve of the roller is made may make it difficult for a skilled journeyman to understand fully. The physical properties of the plastics material set out in the specification and claims are

elaborate and consequently, my inclination is to say that the skilled addressee in this case is slightly more qualified than the ordinary artisan. I would categorise him as a designer-draughtsman who is acquainted with workshop techniques but such a person does not necessarily have to be a professional engineer"

I am broadly in agreement with this. As I shall show, a central feature of the invention in this case is the hard plastic outer sleeve which encases the roller and it seems to me that the skilled addressee should be someone whose expertise includes a knowledge of plastics technology.

A Step Forward?

I turn now to the question whether, in the light of the state of the art as it was immediately prior to 13 May 1983, the invention claimed in the patent constituted a step forward. In order to answer this question it is necessary to analyse the invention and to

compare it with the state of the art as revealed by the documents to

which I have referred. Essentially the enquiry relates to claim 1, which, it was agreed, comprises the

following integers:

10 . A conveyor roller

11 . comprising a drum

12 . rotatably supported on a shaft

13 . by bearing assemblies

14 . near respective ends of the shaft

15 . the drum comprising a right circular tubular inner sleeve

16 . formed of metal

(h) and a coaxial right circular cylindrical outer sleeve

(i) formed of a hard, wear resistant, plastics material

(j) each bearing assembly being mounted in an end cap

(k) which (end cap) is fitted into the drum

(l) each end cap comprising a cylindrical body

(m) within which a bearing assembly is received

(n) and having a radially extending lip

(o) which overlies the end of the inner sleeve.

It is, I think, common cause that none of the state of the

art documents relied on by the appellants describes a conveyor roller

with all the above-listed integers. It is also common cause that, apart

from integers (f), (g), (h) and (i), all the above integers are to be

found individually in one or more of these documents. According to

respondent, what is new about the invention in suit is the combination

of (i) a right circular tubular metal inner sleeve (integers (f) and (g))

and (ii) a coaxial right circular cylindrical outer sleeve formed of a

hard, wear resistant plastics material (integers (h) and (i)) to form the

drum component of the roller. In the context of these integers "right"

means that the end of the tube or cylinder is at right angles to the axis

thereof; and "co-axial" I take to mean having a common axis of

rotation. There was much debate concerning the meaning of the word

"sleeve", appearing in integers (f) and (h). I shall come to this later.

Of the state of the art documents, those referred to as McCullagh, Halbron, Fyson and Vom Stein do not disclose a drum consisting of an inner and outer sleeve. Thompson describes an inner metal tube and an outer "tire" of elastomeric or plastic material, which has been injection-moulded onto the inner tube. Gruber, which is referred to in the body of the patent in suit, describes an outer sleeve of rubber which is pulled onto the roller. And Fototechnik, which was strongly relied upon by appellants in oral argument before us, reveals a transport roller comprising a metal pipe having a synthetic material "sleeve". The body of this specification indicates that this "sleeve" should be composed of -

"a thermoplastic synthetic material, eg of rigid PVC, compact grained polyamide, polypropylene, polyethylene, or a mixture of the said materials; it ,may be extruded, cast or injection-moulded on to said roller".

Appellant's reliance on Thompson and Fototechnik raises the question

of the meaning of the word "sleeve" in the patent in suit and whether it can consist of a layer which is superimposed by, for example, extrusion, casting, coating or injection-moulding. Reference was made by the expert witnesses to the Chambers Dictionary of Science and Technology. This work defines "sleeve" (in the engineering context) as -

"a tubular piece, usually one machined externally and internally".

This accords with other dictionary definitions:

"A tube, or hollow shaft, fitting over or enclosing a rod, spindle, etc., and designed to protect or strengthen it, or to connect one part with another (Oxford English Dictionary, sv "sleeve", meaning 7.b.)

"A tubular part designed to fit over another part". (Webster's Third New International Dictionary, sv "sleeve", meaning 2a.)

If reference be made to the body of the specification, it, in my opinion, provides a clear indication as to what is meant in claim 1 by the word "sleeve". This is to be found particularly in the passage 10 (quoted above) which describes the polymeric sleeve as comprising "a length of rigid PVC piping" which during the assembly of the roller is "heat shrunk" onto the metal sleeve; and in the directions given in regard to the assembly of the roller, involving heating, the placing of the inner steel sleeve and the outer plastic sleeve end-to-end and the urging of the latter over the former to form a single composite drum. Indeed, once one has separate tubes to be assembled coaxially, a method of the kind described is necessarily implicit in claim 1 of the patent.

In evidence (given mainly with reference to Thompson) Mr Fritella tried valiantly to substantiate the proposition that in relation to a conveyor roller a "sleeve" just meant "a covering of sorts", including a coating or lagging or a sheath. Under cross-

examination, however, he was forced to concede that this definition of his did not accord with either the definition in Chambers or the definition to be deduced from the patent specification itself. MacArthur J rejected Mr Fritella's evidence on this point (see reported judgment, at 408 D-G); and, in my opinion, he was correct in doing so.

It is true that Fototechnik speaks of a synthetic material "sleeve", which is extruded, cast or injection-moulded onto a metal pipe to form the drum of the roller. But this document was not properly considered in evidence. The appellants did not refer to it at all (until it came to oral argument on appeal); and in his evidence Mr Read referred to it only in connection with integers (n) and (o). The original document is in German and uses the word "Ummantelung", which has been rendered "sleeve" in the English translation before us. Because the matter was not canvassed it is not possible to say how accurate this translation is. In any event, the point at issue is the

meaning of "sleeve" in the patent in suit and I fail to see how this can be materially influenced by the wording of another patent.

Mr Read adopted the dictionary meanings of "sleeve" and, in so far as his evidence is admissible in this regard, it would seem to be acceptable. Accordingly it is clear that neither Thompson nor Fototechnick establishes that integers (f), (g), (h) and (i) - and more particularly (n) and (i) - were part of the state of the art in 1983. And indeed Mr Fritella conceded that, giving "sleeve" this meaning, a hard plastic outer sleeve over a steel inner sleeve was "not to be found in the documents".

In all the circumstances, I am, therefore, of the opinion that the patent does disclose a step forward.

An Inventive Step? The next and final question in regard to the issue of obviousness is whether the patent involves an inventive step. This

must be judged by asking oneself whether, in the light of the state of the art at the time, the step forward taken by the invention would have been obvious to the skilled addressee. Simplicity is no obstacle. Experience has shown that a number of simple inventions have, constituted patentable subject matter. Moreover, one must guard against the snare of hindsight, while at the same time not over-compensating for this factor.

In this regard relevant evidence was given by Mr Read, an engineer with some twenty years experience in the mining industry. He had been intimately involved, in the course of his employment by several different mining corporations, with the operation, maintenance, design, procurement and construction of conveyor systems, including the conveyor belts and the rollers comprising them. In 1986 he left his then employer, Gencor Limited, and formed his own company, but continued to be involved with conveyor systems.

Mr Read stated in evidence that prior to 13 May 1983

there were a number of problems relating to belt conveyor rollers. Rollers with all-metal drums were heavy and had high inertia; they were subject to wear and corrosion; in the event of the failure of an individual roller, there was the danger of damage to the belt, an expensive component of the conveyor system; and the machining of metal drums to achieve concentricity was expensive and rarely done. (Cf passages 1, 3 and 4 of the specification in suit quoted above.) An attempt was made to overcome these problems by providing a rubber outer sleeve, but this did not work. (Cf passage 4 above.) There were numerous products on the market with coatings, but they became delaminated and did not last. Eventually in about 1985 he encountered the rollers made under the patent by, presumably, F A Pressings. Asked about his reaction to this product Mr Read stated:

"When we looked at it we thought it had possibilities. We then tried it and we were really over the moon with the results. It worked very

well."

Mr Read elaborated by explaining how reliable the plastic sleeve was, how well it lasted and how it did not come loose. On the longer belts the lower inertia was important and reduced belt tensions. The outer sleeve protected the roller from corrosion; there was superior concentricity and grooves machined in the plastic surface of the drum helped to prevent wander. (Cf passages 5 and 7 above.) Mr Fritella did not really dispute this evidence. He in fact had never worked on the mines.

It would seem, too, from the evidence that the use of PVC or other forms of wear resistant plastic piping, which is manufactured for other purposes as well, would be cheaper than a process involving injection moulding.

Under cross-examination it was suggested to Mr Read that the invention was obvious. He replied:

"If it was so obvious, why did we have to wait so long before somebody did it? We battled and we had major problems."

On the issue of inventiveness the Commissioner expressed his conclusion thus (see reported judgment, at 411 E-G):

"The invention, albeit simple in concept, is a commercial success and the hard sleeve does overcome many of the problems encountered in these rollers and, at the priority date, namely 13 May 1983, no-one had ever produced a roller with this combination of integers including an outer sleeve of hard, wear resistant plastics material. The submission that all this is obvious is, I believe, a case of being wise after the event. I am satisfied that the step forward was inventive and this ground of opposition must fail not only in respect of claim 1 but also for the other claims."

I agree. Appellants' attack upon the validity of the patent on the ground of obviousness accordingly fails.

Lack of Clarity It is a ground for the revocation of a patent, and also a defence in an action for infringement -

"... that the claims of the complete specification concerned are not . . .
clear . . ."

(See 61(l)(f)(i), read with sec 65(4), of the Act.) This ground of invalidity/revocation is sometimes referred to as "ambiguity". It is the duty of a patentee to state clearly and distinctly the nature and limits of his claim: to define his monopoly. Only if this is done will others know exactly what they may do and what they may not do. The degree of clarity required is that which leads to "reasonable certainty".

In determining whether a patent claim stakes its monopoly with a sufficient degree of clarity, the Court must view the patent through the eyes of the skilled addressee in the relevant art; and the

Court must take into account that such addressee is expected to use reasonable skill and intelligence in interpreting the language of the patent. He is not required to struggle unduly with it, but he must make the best of it and not adopt an attitude of studied obtuseness. If words or expressions in a claim are affected or defined by what is said in the body of the specification, the language of the claims must be construed accordingly. Moreover, uncertainty or ambiguity in a claim may be resolved by what appears in the body of the, specification, which may be thus resorted to not only when the language in question has been expressly defined in the body of the specification, but also, in the absence of such definition, where there is material in the body from which the intention of the draftsman can be gathered. Where the words permit it, an interpretation should be adopted which is consistent with the description of the problem to be overcome and the method of doing so described in the body of the specification. Another source of elucidation of apparently unclear

language may be the prior art itself. (See generally Helios Limited v Letraset Limited (1970) BP 495 (T), at 498 G - 499 B, 500 B - G, 503 B -C; Letraset Ltd v Helios Ltd 1972(3) SA 245 (A), at 249 H - 251 B.)

Sometimes a patentee uses general or flexible language where he could have set forth mathematical limitations to define his claim, or one or more of the integers thereof. Here I agree with Colman J (delivering the judgment of the Full Bench of the Transvaal Provincial Division in Helios Limited v Letraset Limited, supra) when he said (at p 499 C-F) that a claim whose integers are defined in terms of mathematical limits may be circumvented by a person who varies his dimensions so as to take his article outside the inventor's prescribed limits, but who makes substantially what is claimed in the patent; and that consequently the use of flexible language may be justified even where it is possible to impose mathematical limits. As Colman J put it (at 499 D):

"It is... often possible for an inventor to limit the scope of one or more of the integers in his claim by setting forth mathematical limitations; but in some cases the adoption of that expedient will leave doors open which the inventor is entitled to close."

(See also remarks of Lord Shaw of Dunfermline in British Thomson-Houston Company Ltd v Corona Lamp Works Ltd (1922) 39 RPC 49 (H.L.), at 90, lines 8 - 26.) Moreover, the mere fact that simple, non-inventive test trials or experiments may be necessary in order to ascertain whether a particular item falls within the ambit of a patent or not, will not invalidate the patent (Helios Limited v Letraset Limited, supra, at 502 A; cf British Thomson-Houston case, supra, at 81, lines 8-16).

With these principles in mind, I turn to the patent in suit.

Appellants' attack upon its validity focused on the use of the word

"hard" in integer (i); and it was argued that this introduced a fatal

measure of ambiguity in claim 1, and consequentially in claims 7, 8 and 15 as well.

The ordinary dictionary meaning of "hard" is -

"That does not yield to blows or pressure; not easily penetrated or separated into particles; firm and resisting to the touch; solid, compact in substance and texture"

(Shorter Oxford English Dictionary, sv "hard", meaning 1.1.)

Thus, in a general sense there is no difficulty about the meaning of "hard". More specifically, however, there is because "hard" is a relative term: there are different degrees of hardness. Does this pose a real problem in the present case? I do not think that it does.

There are, in my opinion, two sources from which the skilled addressee (who, it will be recalled, is endowed with a knowledge of plastics technology) would be able to ascertain with' reasonable certainty what integer (i) means when it speaks of -

"... a hard, wear resistant, plastics material. . ."

The first of these sources is the body of the specification itself. Here a clear indication is given of the type of plastics material which is regarded as "hard" and "wear resistant". I refer in this connection to passage 6 (quoted above) which states that it is envisaged that the plastics material will have physical characteristics similar to rigid polyvinyl chloride (PVC), polypropylene or high density polyethelene. In passage 10 there is again a reference to rigid PVC piping. In the portion of the specification devoted to a detailed description of the drawings it is again stated that it is envisaged that the outer sleeve -

"... will be formed of a rigid polyvinyl chloride (uPVC), high density polyethelene, or polypropelene. Other materials which may be used are a suitable Zytel (a Dupont product). Preferably the outer sleeve will be formed of a plastics material which is sufficiently wear resistant

to withstand the rigours of use as a conveyor roller, and will not be brittle."

The physical qualities referred to in passage 9 do not apparently measure or reflect hardness; or at any rate it was not shown that they did.

The second source which the skilled addressee would be able to utilise in interpreting integer (i) would be hardness tables, referred to as the Rockwell hardness test and the Shore hardness test. These were referred to in Mr Read's expert summary; and also dealt with in evidence by both Mr Fritella and Mr Read. Mr Fritella testified that a fitter and turner would not know these tests, but in view of the finding that the skilled addressee would not be a mere fitter and turner this evidence is beside the point. Under cross-examination he agreed, with reference to the Rockwell and Shore scales, that there were accepted engineering principles with regard to the testing of plastics for hardness. Read dealt extensively in his evidence with the

Rockwell and Shore scales and the recognised tests for measuring hardness of plastic materials.

In his oral argument in reply appellants counsel submitted that respondent was not entitled to rely upon these hardness scales because, so he said, it had been agreed between the parties that there were no words or phrases used in the specification which bore "a special technical meaning". Appellants' counsel made a statement to this effect in his opening address and it was not at that stage contested by counsel for the respondent. There is no substance in this point. Appellant's counsel fully canvassed the hardness scales in the Court a quo. I am not persuaded that respondent's counsel agreed to anything which would preclude reference to the hardness scales. And, in any event, I do not think that it is a question of giving a word a special technical meaning. The hardness scales simply represent part of the , technical equipment and know-how which the skilled addressee would have when called upon to interpret and apply claim 1 of the patent.

I do not propose to go into detail with reference to the application of the hardness scales. Suffice it to say that the plastic materials referred to in the body of the specification figure on these scales and that I am satisfied that, armed with these scales and, if necessary, with the benefit of some simple testing or experimentation, the skilled addressee would have little difficulty in deciding the meaning of "hard" (in the context of claim 1) in relation to other plastic materials. This is a typical case where the adoption of mathematical limitations could have left the doors wide open to the patentee's competitors and the failure to define "hard" in mathematical terms is, in my opinion, not fatal to the validity of the patent.

For these reasons, I hold that the appellants have failed to establish that claim 1 is lacking in clarity.

The appeal is dismissed with costs.

E M GROSSKOPF JA)
NESTADT JA) VAN DEN HEEVER
JA) CONCUR SCHUTZ JA)

M M CORBETT