

SOUTH AFRICA / JUDGMENT

Stauffer Chemical Company and Another v Safsan Marketing and Distribution (85/86) [1986] ZASCA 78 (18 August 1986) [1986] ZASCA 78

COURT

Supreme Court of Appeal

BEFORE

Corbett, Viljoen, Hefer, Galgut, Nicholas

CASE / FILE NUMBER

85/86

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IN THE SUPREME COURT OF SOUTH AFRICA (APPELLATE DIVISION)

In the matter of:

STAUFFER CHEMICAL COMPANY 1st appellant,
STAUFFER CHEMICAL (SOUTH AFRICA)
(PROPRIETARY) LIMITED 2nd appellant,
versus
SAFSAN MARKETING AND
DISTRIBUTION
COMPANY (PROPRIETARY) LIMITED 1st respondent,
CHEMTRADE (PROPRIETARY) LIMITED 2nd respondent
KEMPTON PRODUCE SUPPLY
(PROPRIETARY) LIMITED 3rd respondent
CORAM: Corbett, Viljoen, Hefer, JJA, Galgut et Nicholas, AJJA DATE
OF HEARING: 17 and 18 March 1986 DATE OF JUDGMENT 18 August 1986.

JUDGMENT

CORBETT JA:

Before this Court are an appeal and a cross-

/ appeal

2appeal against a decision of NESTADT J, sitting as Commissioner in the Court of the Commissioner of Patents, leave to appeal and cross-appeal having been granted ("in so far as it may be necessary") by NESTADT J and the parties having lodged with the Commissioner notice in writing in terms of sec. 76(4) of the Patents Act 57 of 1978 consenting to the appeal being heard by this Court without any intermediate appeal.

The proceedings in the Court a quo took the form of an action instituted by first and second appellants as plaintiffs (originally there was a third plaintiff but at some stage it withdrew from the action) against the respondents as defendants, in which appellants, alleging that respondents were infringing first plaintiff's South African patent no 72/2519, claimed an interdict and ancillary relief. In defence to the claim the respondents denied the alleged infringement and alleged upon

/ various

3various grounds that the patent was invalid. The alleged invalidity also formed the basis of a counter-claim by respondents for the revocation of the patent.

The Commissioner held that infringement had not been established by appellants and that respondents had failed to prove invalidity on any of the grounds relied upon by them. He accordingly dismissed both the claim and the counter-claim and made certain orders as to costs, to which I shall refer in more detail later. The appeal is directed against the dismissal of the claim and the cross-appeal against the dismissal of the counter-claim and against certain aspects of the costs order.

The facts of the matter and the basic chemistry involved in the case are fully and accurately set forth in the careful judgment of NESTADT J which has been reported in Burrell's Patent Law Reports (see 1983 BP 209). Accordingly, I shall confine my reference to the facts

/ and 4and the chemistry to those matters which are strictly pertinent to the reasoning of this judgment.

THE FACTSFirst appellant, Stauffer Chemical Company, is a company incorporated in the United States of America, where it carries on business on a very large scale as a manufacturer and distributor of, inter alia, agricultural chemicals. It is the registered proprietor of patent no. 72/2519, a convention patent entitled "Herbicide Compositions", registered in South Africa on 4 May 1973, with 16 April 1971 as its priority date.

The invention described and defined in the

specification of patent no 72/2519 consists of "herbicidal compositions" comprising "an active herbicidal compound" and an "antidote" therefor. Before explaining these terms and elaborating upon the invention, as described in the

/ specification 5specification, it is necessary to take a brief look at the prior art.

The invention is, in popular parlance, a chemical weed-killer. It was evolved for use in respect of agricultural crop plants, more especially maize, or "corn" as it is known in the United States of America. Weeds have always been the enemy of agricultural crops because they compete for the water and nutrients in the soil. One of the tasks of the agricultural farmer is, therefore, to eliminate weeds as far as possible from the land where his crops are growing. Earlier this was done in the United States by tillage between the crop rows. The introduction in about 1945 of synthetic fertilizers, containing nitrogen, greatly increased the fertility of the soil. This improved the potential for crop growth, but at the same time it increased the weed menace. This problem stimulated the discovery and development of chemical herbicides designed to eradicate weeds -

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There were three methods evolved for the application of herbicides: (i) post-emergent, ie where the application is to the growing plants; (ii) pre-emergent, ie application to the soil surface after the planting of the seeds, but before the plants have emerged; and (iii) pre-plant incorporation, ie the herbicide is incorporated into the soil prior to planting.

One of the first chemical herbicides to be introduced commercially (in about

1945) was a compound popularly known as "2,4-D". It was applied by the post-emergent method and was effective against broad-leaved weeds, but not against the grass species. The latter characteristic was both an advantage and a disadvantage. It was an advantage because it meant that 2,4-D did not harm grass-like crops, such as corn; it was a disadvantage in that the grass-like weeds, not being affected thereby and having less competition from weeds

/ of

of the broad-leaved variety, multiplied rapidly. Another group of herbicides, similar in effect to 2,4-D, were the S-triazines.

In about 1955 first appellant invented the thiolcarbamate herbicides, which were very effective against grass-like weeds and controlled some broad-leaved varieties as well. The thiolcarbamates were only suitable for application by the pre-plant incorporation method. First appellant took out a South African patent, no 57/2419 (since expired), in respect of such herbicides. One of the embodiments of this invention was a compound generally known by the acronym "EPTC". This was very effective against grass-like weeds and was a commercially successful product. But it had the disadvantage that it also tended to damage grass-like crops, such as corn, by causing malformation or stunted growth.

This problem led to the invention of the

/ antidotes

8antidotes (or "safeners"). The first of these, a compound which was commercially exploited under the name "Protecto", was applied as a coating to the seed of the crop before planting; but there were a number of problems (which need not be detailed) associated with this form of treatment. This led to the invention which is the subject-matter of the patent in suit. I turn now to the specification of that patent.

In the section headed "Background of the Invention" it is stated that among the many herbicidal compounds commercially available the thiolcarbainates, either alone or

admixed with other herbicides such as the triazines, have

reached a "relatively high degree of commercial success".

Here reference is made, by way of example, to compounds described in certain named United States patents. The section also adverts to the toxicity of these herbicides to weed pests and to the concomitant problem of injury to

/ the 9the crop plant. The specification then proceeds to describe the invention in the following terms:

"It has been discovered that plants can be protected against injury by the thiol-carbamates alone or mixed with other compounds and/or the tolerance of the plants can be substantially increased to the active compounds of the above-noted U.S. Patents by adding to the soil an antidote compound corresponding to the following formula:

wherein R can be selected from the group consisting of (and then follow the names

of fifty or more radicals or groups of radicals) ; R1 and R2 can be the same or

different and can be selected from the group

consisting of (and then follow

sixty or more radicals or groups of radicals)

provided that when R1 is hydrogen R2

is other than hydrogen and halophenyl".

/ The.....

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The specification then describes how the compounds represented by this formula can be synthesized and gives 42 examples of the antidote, with detailed instructions as to how each of these is to be prepared. Then follows a table of compounds (Table I) "representative of those embodied by the present invention". Table I lists 513 compounds (numbered from 1 to 513), all of which conform to the basic antidote formula quoted above. These compounds are referred to elsewhere in the specification by

the numbers assigned to them respectively in Table I.

Thereafter the specification describes how

"compositions of this invention", ie herbicide and antidote, were tested. The first test was a soil incorporation test. Trays ("flats") of soil were treated with varying solutions of herbicide and antidote and seeds were planted in the soil. The trays were then kept under greenhouse conditions and the plants watered appropriately. The crop

/ tolerance

11tolerance (indicated by the degree of malformation or stunting) at three weeks, four weeks and six weeks after planting was then rated. The results of this test are contained in Table II of the specification. Certain control tests were also done, ie the application of the herbicide without antidote and the results thereof are included in Table II. The second test consisted of a corn seed treatment. The soil in trays was treated with herbicide. Seeds treated with antidotal protectant and untreated seeds were then planted in alternate rows. The

trays were then kept under greenhouse conditions, with appropriate watering, and the resultant injury (if any) to the plants at two weeks after planting and four weeks after planting was assessed. The results of this test,

or series of tests, are contained in Table III of the specification.

The specification then continues to describe

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the invention and how it is to be performed and its pre-ferred embodiments. Thereafter follow 44 claims. At this stage only claim 1 need be referred to. It conforms largely to the description of the invention quoted above. I quote the relevant portion:

"1. A herbicidal composition comprising an active herbicidal compound and an antidote therefor corresponding tothe formula: "

(and then follow the formula quoted

above and the same lists of radicals

from which R, R1 and R2 "can be selected".)

As appears from the specification and the ex-

pert evidence, the novelty of the invention described in

this specification resides in the composition of the

antidote. This is defined by the organic chemical formu-

la quoted above. The formula consists of a nucleus or core, which falls under the amide functional group, repre-

/sented thus —

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sented thus —

SEE ORIGINAL JUGDMNT FIGURE

and three radicals represented by the symbols R, R1 and R2. This core comprises a carbon atom linked by a double bond

to an oxygen atom and by a single bond to a nitrogen atom.

The carbon atom has one free valency by which it may be lin-

I ked to the R radical; and the nitrogen atom has two free valencies available for linkage with the R1 and R2 radicals.

A radical may be defined as a group of atoms bonded to-

one another, which group has an available or free bond or

valency through which it bonds or links to other groups,

such as functional groups. A functional organic chemical

group was defined in evidence to be a group of atoms

including the carbon atom which are bonded to one another

and I have the common characteristics of that group.

A functional group is always bonded to other organic

chemical groups or radicals.

/Embodiments

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Embodiments of the antidote described in the specification must naturally all contain the amide core (this is an invariable component) and the R, R1 and R2 radicals. Because of the large number of alternative radicals and groups of radicals listed in claim 1 and the various permutations and combinations which the formula permits, potentially the invention covers an enormous number of compounds. In evidence a figure of 300,000 was mentioned, but if account be taken of the various alternatives under the groups of radicals mentioned the possibilities may well run into millions.

One of the antidotes falling within the scope of the invention which figures prominently in the tests described in the specification (the results of which are recorded in Tables II and III) is the compound listed no. 6 in Table I. Compound 6 was shown by the tests to be an effective antidote and probably the most succes-

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of all the embodiments tested by the inventors. A composition consisting of EPTC as the herbicidal component and compound 6 as the antidote was marketed by first appellant under the commercial name "EPTAM SUPER" with considerable success, both in the United States of America and in South Africa.

At all material times second appellant, a subsidiary of a Dutch subsidiary company of first appellant, has been first appellant's licensed manufacturer and distributor in South Africa of herbicidal compositions covered by patent no 72/2519.

The alleged infringement relates to the marketing

and distribution in South Africa of a herbicidal product

under the commercial name "GENEP PLUS". It is not dis-

puted that the three respondents, in various capacities,

have been responsible since about August 1982 for the marketing of GENEP PLUS in South Africa. It appears

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too that the antidote component of GENEP PLUS is supplied to first respondent by an American company, PPG Industries Incorporated, of Pittsburgh, Pennsylvania ("PPG"). PPG carries on business on a large scale in competition with first appellant. A research chemist employed by PPG, Dr J K Rinehart, first synthesized the antidote of GENEP PLUS in August 1979. In 1981 PPG was granted a United States patent covering this antidotal compound and in the following year a similar patent was granted in South Africa. There are proceedings pending for the revocation of the South African patent (initiated by first appellant) and for the revocation of patent no 72/2519 (initiated by PPG). These applications are awaiting the outcome of the present litigation. As the Commissioner rightly remarked (see reported judgment at p 214D) —

"In reality it is these two companies (ie first appellant and PPG) who are protagonists in this litigation".

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I turn now to the various issues in the appeal.

THE ALLEGED INFRINGEMENT

The sole issue in regard to infringement is whether PLUS falls within the scope of what is claimed by patent no. 72/2519. In considering this issue I shall concentrate on claim 1 for appellant's counsel conceded that if he failed to establish infringement of claim 1 he could not succeed in respect of any of the other claims alleged to have been infringed. Infringement falls to be considered in terms of the provisions of the Patents Act 57 of 1978.

The integers of claim 1 may be stated as follows:

- (1) A herbicidal composition comprising (2) an active herbicidal compound and
- (3) an antidote therefor corresponding to the formula consisting of —
- (a) a central amide core or nucleus, (b) an R selected from the list of radicals

/ prescribed

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prescribed therefor in the claim,

- (c) an R₂ selected from the list of radicals prescribed therefor in the claim, and (d) an R₂ selected from the list of radicals prescribed therefor in the claim.

(Because they are not relevant here, I have omitted the directions in the claim that R₁ and R₂ can be the same or different; and that when R₁ is hydrogen R₂ must be other than hydrogen and halophenyl.)

I shall deal in more detail with the meanings to be attributed in claim 1 to the terms "herbicidal composition" and "active herbicidal compound" when I come to consider certain grounds of alleged invalidity. Suffice it to say at this stage (when validity is assumed) that it is not disputed that in terms of claim 1 GENEP PLUS is a herbicidal composition and that it contains an active herbicidal compound, viz EPTC. Integers (1) and (2) are therefore present. It is also common cause that

/ GENEP

19 GENEP PLUS contains an antidote the chemical formula whereof does comprise (a) a central amide core, (b) an R which falls under one of the listed radicals, viz haloalkyl, and (c) an R₁ which falls under one of the listed radicals, viz alkenyl. Integers 3 (a), (b) and (c) are thus also present. The infringement issue consequently turns on the R₂ radical of the antidote, ie on integer 3(d).

In their further particulars for trial the

respondents stated that the chemical name for the R₂

radical of the antidote of GENEP PLUS was "1,3-dioxolan-

2-yl-methyl". It was conceded by Prof Baldwin, an ex-

pert witness called on behalf of the appellants, that this was a "perfectly legitimate name" and that basically the radical consisted of a dioxolan cyclic structure bonded to a methyl unit. No such radical for the R2 position is named in claim 1.

/ Essentially

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Essentially; the appellants' main case, to

begin with, was that there were different ways of naming chemical structures and that the R2 radical of the antidote of GENEP PLUS could also be classified under the names "alkoxyalkyl" or, alternatively, "dialkoxyalkyl". "Alkoxyalkyl" is specifically listed in claim 1 amongst the radicals from which the R2 radical may be selected; and, so it was contended, the name "alkoxyalkyl" must be read to include "dialkoxyalkyl".

A considerable portion of the expert evidence led by the appellants was directed towards the substantiation of these propositions. And in this connection stress was laid on the difficulties of nomenclature in this field and the possibility of an organic compound or radical being named in several different ways, depending, inter alia, upon which part or feature thereof was being accentuated. (See, too, in this regard the judgment a quo at pp 226C - 228B.)

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In the end, however, the appellants did not pursue this line of argument. Certain of their key witnesses do not appear to have fared too well under cross-examination when attempting to establish these propositions: and the cross-examination of Prof Rees, respondents' main witness on the classification and naming of compounds, especially the R2 radical of the GENEP PLUS antidote (or "PPG R2, as it was sometimes called in the Court a quo) , seems to indicate that appellants had by that stage given up the idea of pressing the contention that this R2 radical was classifiable as either an alkoxyalkyl or a dialkoxyalkyl. It seems, too, that by the argument stage in the Court a quo appellants' counsel had accepted —

" that, on a literal interpretation,

whatever system of nomenclature was applied, the PPG R2 was neither an alkoxyalkyl nor a dialkoxyalkyl".

(See the reported judgment, at p 233B.) The attitude of appellants' counsel on appeal before us was the same.

/ Moreover,

Moreover, at no stage was it suggested that claim 1 contained any other named radical for the R2 which would comprehend the R2 radical of the GENEP PLUS antidote.

This compelled appellants to fall back on an alternative line of argument. In broad outline it ran as follows:

- (1) A person infringes a patent when he takes the "substance" or "pith and marrow" of the invention .
- (2) In the case of a chemical patent this may occur where the infringer substitutes a chemical equivalent or trivial variant for some constituent of the invention.
- (3) In the present case the R 2 of the GENEP PLUS antidote was such a chemical equivalent or trivial variant with the result that the compo-

/ sition 22

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sition, taken as a whole, infringed claim 1 of patent no. 72/2519.

In elaboration of point (3) above appellants made particular reference to a composition called the "Stauffer Test Composition" ("the STC"). The STC consists of EPTC and an antidote. The antidote component of the STC was first synthesized by Dr Rinehart on 20 March

1979. Earlier that year PPG had decided to enter the thiolcarbarnate herbicide market. In order to do so it needed an effective safener and Rinehart was instructed to conduct a "crash" research programme to find such a safener. An initial series of tests produced a "lead compound", which formed the basis of a testing programme commencing in the middle of March

1979. The antidote of the STC was one of the first compounds synthesized in the course of this programme and the antidote of GENEP PLUS one of the last. In the period end of 1981/ beginning of 1982 Mr L L Green, a research biologist in the

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employ of first appellant, conducted a series of evaluation tests designed to compare the overall performance of, inter alia, the STC and GENEP PLUS. He concluded that the overall performance of these two compounds in this evaluation was "very similar". They both proved to have excellent antidotal qualities.

The chemical compositions of the STC and GENEP PLUS are similar. Each consists of a mixture of EPTC and an antidote. The antidote in each case consists of the amide nucleus and they have identical R and R1 radicals. The R2 radicals differ, but have certain features in common . I reproduce the R2 portions of their respective formulae thus :

STC R2 GENEP PLUS R2

SEE ORIGINAL JUDGMENT FIGURE

/ The.....

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The STC R2 was described in evidence as a dialkoxyalkyl with an acyclic acetal function; and the R2 of GENEP PLUS as a dioxolan with a cyclic acetal function. The cyclic and acyclic structures of the respective R2 radicals of GENEP PLUS and the STC appear from the above extracts from their chemical formulae- (See in this regard the judgment a quo at pp 232 A - C, 245 A - F.)

In argument appellants used the comparison between the STC and GENEP PLUS in this way:

(a) The antidote of the STC comprises an amide nucleus and R and R1 radicals falling within claim 1.

(b) The R2 radical of the antidote of the STC is to be classified as a dialkoxyalkyl and also as an acyclic acetal.

(c) Claim 1 includes amongst the radicals from which the R2 may be selected "alkoxyalkyl".

/ (d) In

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(d) In the context of claim 1 "alkoxyalkyl" must be interpreted to include mono-alkoxyalkyls and dialkoxyalkyls. (e) Consequently the STC antidote represents an embodiment of the invention claimed in claim 1.

(f). Apart from the R 2 radicals, the antidotes of the STC and GENEP PLUS are identical.

(g) The R2 radical of the antidote of GENEP PLUS may be classified as a cyclic acetal.

(h) The difference between the R2 radical of the STC antidote, an acyclic acetal, and that of the GENEP PLUS antidote, a cyclic acetal, is trivial.

(i) Consequently GENEP PLUS constitutes an infringement of claim 1.

Propositions (a), (b), (c), (f) and (g) of this argument are not in dispute. The others are very much

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27in issue. In regard to (d) the arguments and counterarguments and the relevant evidence are fully discussed in the judgment of NESTADT J (see reported judgment pp 238 E - 244 G). The learned Commissioner held that there was merit in the argument of respondents' (in the Court below defendants') counsel. but found it unnecessary to decide the issue and proceeded on the assumption, in appellants' favour, that claim 1 included dialkoxyalkyls. He also assumed that claim 1 included dialkoxyalkyls having an acyclic acetal function (see reported judgment p 244 E). The whole issue was fully re-argued on appeal. I am inclined to share the Commissioner's evident preference for respondents' argument on this issue, but, like him, I do not find it necessary to decide the point. I shall proceed to consider appellants' argument on the same assumptions as those made by the Commissioner.

At the outset I would point out that the comparison

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between the STC and GENEP PLUS, which is central to appellants' argument, is a misconceived approach. Apart from the fact that the STC was not even a described embodiment of the invention (in truth, as I have indicated, it is a matter of dispute as to whether it is an embodiment at all), the correct comparison in law is between claim 1, properly construed, and GENEP PLUS. For the determination of the question as to whether or not the plaintiff has proved an infringement of his patent turns upon a comparison between the article or process, or both, involved in the alleged infringement and the words of the claims in the patent (see *Letraset Ltd v Helios Ltd* 1972 (3) SA 245 (A), at pp 274 H and 277 D; *Moroney v West Rand Engineering Works* 1977 BP 452, at p 460; *Rodi & Wienenberger A G v Henry Showell Ltd* [1969] RPC 367 (HL), at p 391). I proceed, however, to consider appellant's general submission, viz. that claim 1 includes amongst the radicals from which the R2 may be selected dialkoxyalkyls having an acyclic acetal function

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(which proposition I have assumed to be correct), that the R2 radical of the antidote of GENEP PLUS constitutes a chemical equivalent or trivial variant of an R2 radical consisting of such a dialkoxyalkyl. and that, therefore, GENEP PLUS infringes claim 1. This brings me to the general topic of chemical equivalence.

There have been a number of judgments of this

Court dealing with the situation where an alleged infringer has taken, say, all but one of the features of the invention as claimed by the patentee and, as regards that one feature, has either omitted it or substituted an equivalent ; and the question has arisen as to whether he should be adjudged to have infringed the patent in that he has appropriated the substance or pith and marrow of the invention (see eg. Frank and Hirsch (Pty) Ltd v Rodi & Wienenberger Aktiengesellschaft 1960 (3) SA 747 (A); Letraset Ltd v Helios Ltd 1972 (3) SA 245 (A):

/ Multotec

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Multotec Manufacturing (Pty) Ltd v Screenex Wire Weaving Manufacturers (Pty) Ltd 1983 (1) SA 709 (A); cf. Selas Corporation of America v Electric Furnace Co 1983 (1) SA 1043 (A)). The answer to this question depends basically on whether the features of the claimed invention taken by the alleged infringer represent all the essential integers of the claim and the feature omitted or substituted by an equivalent is an unessential integer. If so, then the alleged infringer may have infringed, depending on the nature of the so-called equivalent. If, on the other hand, the feature omitted or substituted is an essential integer, then no infringement has been committed.

In the Multotec case (supra) reference

was made (at p 722 A-D) in this regard to a decision of the House of Lords, Catnic Components Limited and Another v Hill & Smith Limited

[1982] RPC 183. This decision was also much relied upon by counsel

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in argument before us in the present case. The Catnic case concerned the alleged infringement of a patent for galvanised steel lintels used in building construction. The invention consisted of a box-girder structure, in which one of the components was a rigid support member described in the relevant claim as "extending vertically". The lintel could be made in two different modules. The defendant manufactured and marketed galvanised steel lintels (also in two modules) which were identical to the lintel described in the claim in all respects save that the corresponding rigid support member in each module was not precisely vertical,

but inclined slightly — 6 from the vertical in the case of

one module and 8 from the vertical in the case of the other module: The question to be decided was whether this deviation from exact geometric verticality saved defendant's product from infringing the patent. The House of Lords, reversing a majority decision of the Court of Appeal and re-

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storing the judgment of the trial Judge, held that it did not. The speech of Lord DIPLOCK, which was concurred in by the other members of the Court, contains the following passage (at p 242, line 44, to p 243, line 24) :

"My Lords, a patent specification is a unilateral statement by the patentee, in words of his own choosing, addressed to those likely to have a practical interest in the subject matter of his invention (i.e. 'skilled in the art') , by which he informs them what he claims to be the essential features of the new product or process for which the letters patent grant him a

monopoly. It is those novel features on-

ly that he claims to be essential that constitute the so-called 'pith and marrow' of the claim. A patent specification should be given a purposive, construction rather than a purely literal one derived from applying to it the kind of meticulous verbal analysis in which lawyers are too often tempted by their training to indulge. The question in each case is: whether persons with practical knowledge and experience of the kind of work in which the invention was intended to be used, would understand that strict compliance with a particular descriptive word or phrase appearing in a claim was intended by the patentee to be an essential requirement of the invention so that any variant

/ would

33 would fall outside the monopoly claimed, even though it could have no material effect upon the way the invention worked.

The question, of course, does not arise where the variant would in fact have a material effect upon the way the invention worked Nor does it arise unless at the date of publication of the specification it would be obvious to the informed reader that this was so. Where it is not obvious, in the light of then-existing knowledge, the reader is entitled to assume that the patentee thought at the time of the specification that he had good reason for limiting his monopoly so strictly and had intended to do so, even though subsequent work by him or others in the field of the invention might show the limitation to have been unnecessary. It is to be answered in the negative only when it would be apparent to any reader skilled in the art that a particular descriptive word or phrase used in a claim cannot have been intended by a patentee, who was also skilled in the art, to exclude minor variants which, to the knowledge of both him and the readers to whom the patent was addressed, could have no material effect upon the way in which the invention worked."

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The approach of giving a specification a "purposive construction" was followed in the Multotec case (supra, at p 722 A-D; and see also the Selas Corporation case, supra, at p 1052 H - 1053 G). There has been some comment on Lord DIPLOCK's use of the epithet "purposive" in this context (see eg B C Reid in 1985 CIPA 254.7); and in Codex Cor-

poration v Racal-Milgo Limited [1983] RPC 369, at p 382,

it was equated to "realistic". In this latter case MAY LJ,

delivering the judgment of the Court of Appeal and, having

quoted the general exposition given in the Catnic case which I have set out above, proceeded to state (at p 381, line 41, to page 382, line 6) —

"First, therefore, we must construe the specification and claims in the present case purposively, through the eyes and minds of those skilled in the art at the material time, and not by applying to them an over-meticulous verbal analysis. Having done

/ this

35 this, we must then decide whether there has been an infringement of them, approaching and answering this question with the guidance given by Lord Diplock in those parts of his speech in the Catnic case which I have quoted. We do not think that the decision in this recent case has had the far-reaching effect that Mr. Blanco White feared, or that for which Mr. Aldous, in the alternative, contended. For instance, there is no suggestion in Lord Diplock's speech that one should look only to the essence or principle of a patent in suit and hold there to have been an infringement merely because that essence or principle has been made use of by the alleged infringer. There may have been, or there may not. The question to be asked is one of construction, but of purposive or realistic construction through the eyes and with the learning of a person skilled in the art, rather than with the meticulous verbal analysis of the lawyer alone. Approaching the claims of the patent in suit in this way we think that the essential and novel features in the claims, particular ly claim 1, as they would appear to the rea der skilled in the art, are those of "

In Burrell, South African Patent Law and Practice ,

2nd ed. (1986), at p 251 it is stated:

"It has, however, been pointed out, with

respect correctly, that the South African/ approach

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approach to purposive construction is based on a misunderstanding. The 'doctrine' of pith and marrow has always been expressed in terms of the essentiality of a feature of an invention. As against that and fundamental to the rule of purposive construction, is the dispensing with of the need to distinguish between essential and unessential integers of a claim as a step preparatory to the application, or non-application of the 'doctrine' of pith and marrow".

With respect, it seems to me that this incorrectly reflects the effect of the Catnic case. I do not read Lord DIP-LOCK'S judgment as laying down that the need to distinguish between essential and unessential integers is dispensed with.

Two further English judgments may be referred to

with profit. In *Marconi v British Radio Telegraph and Telephone Company Ltd* [1911] 28 RPC 181 PARKER J said (at p 217):

"It is a well-known rule of Patent Law that no one who borrows the substance of a patented invention can escape the consequences of infringement by making immaterial variations. From this point

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of view, the question is whether the infringing apparatus is substantially the same as the apparatus said to

have been infringed

(W)here the Patent is for a combination of parts or a process, and the combination or process, besides being itself new, produces new and useful results; everyone who produces the same results by using the essential parts of the combination or process is an infringer, even though he has, in fact altered the combination or process by omitting some unessential part or step and substituting another part or

step, which is, in fact, equivalent to the part or step he has omitted. "

(Quoted with approval in *RCA Photophone Ltd v Gaumont-*

British Picture Corporation Ltd and British Acoustic Films Ltd [1936] 53 RPC 167, at p 197, and *Birmingham Sound Reproducers Ltd v Collaro Ltd* [1956] RPC 232, at p 243.) And in *C. Van der Lely NV v Bamfords Ltd* [1963] RPC 61

Lord REID said (at p 76):

/"you,.....

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".... you cannot avoid infringement by substituting an obvious equivalent for an unessential integer".

(See also Halsbury, 4 ed; vol. 35, para. 579.)

The patent law of the United States of America also recognizes that a patent may be infringed even though the infringing article does not fall literally within the claim. In the leading case of *Graver Tank & Manufacturing Co. Inc. et al v Linde Air Products Co* [1950] USSC 54; , 339 US 605, Mr Justice JACKSON, delivering the majority opinion of the US Supreme Court, stated at pp 607-9:

/"In determining

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"In determining whether an accused device or composition infringes a valid patent, resort must be had in the first instance to the words of the claim. If accused matter falls clearly within the claim, infringement is made out and that is the end of it.

But courts have also recognized that to permit imitation of a patented invention which does not copy every literal detail would be to convert the protection of the patent grant into a hollow and useless thing. Such a limitation would leave room for - indeed encourage - the unscrupulous copyist to make unimportant and insubstantial changes and substitutions in the patent which, though adding nothing, would be enough to take the copied matter outside the claim, and hence outside the reach of law. One who seeks to pirate an invention, like one who seeks to pirate a copyrighted book or play, may be expected to introduce minor variations to conceal and shelter the piracy. Outright and forthright duplication is a dull and very rare type of infringement. To prohibit no other would place the inventor at the mercy of verbalism and would be subordinating substance to form. It would deprive him of the benefit of his invention and would foster concealment rather than disclosure of inventions, which is one of the primary purposes of the patent system.

The doctrine of equivalents evolved in response to this experience. The essence of the doctrine is that one may not practice a

fraud on a patent.

/ The

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The theory on which it is founded is that 'if two devices do the same work in substantially the same way, and accomplish substantially the same result, they are the same, even though they differ in name, form, or shape'. In its early development, the doctrine was usually applied in cases involving devices where there is equivalence in mechanical components. Subsequently, however, the same principles were also applied to compositions, where there was equivalence between chemical ingredients. Today the doctrine is applied to mechanical or chemical equivalents in compositions or devices.

What constitutes equivalency must be determined against the context of the patent, the prior art, and the particular circumstances

of the case. Consideration must

be given to the purpose for which an ingredient is used in a patent, the qualities it has when combined with the other ingredients, and the function which it is intended to perform. An important factor is whether persons reasonably skilled in the art would have known of the interchangeability of an ingredient not contained in the patent with one that was.

A finding of equivalence is a determination of fact. Proof can be made in any form: through testimony of experts or others versed in the technology; by documents, including texts and treatises; and, of course, by the disclosures of the prior art."

(See also in this regard Deller's Walker on Patents, 2nd ed,

/vol 7,

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vol 7, §§ 536, 537, 546; 548, 571, 572; Ziegler

Phillips Petroleum Company [1973] USCA5 1919; 483 F. 2d 858 (1973) at pp

868-9; Sarkisian v Winn-Proof Corp. [1981] USCA9 1832; 686 F. 2d 671

(1981), at pp 684-5). According to Ziegler's case

(at p 686), in order to establish equivalency for the

purpose of showing infringement of a patent claim, the

patentee has the burden of proving a real identity of

means, operation and result. (Cf. the test posed in

the English cases of RCA Photophone Ld v Gaumont British

Picture Corporation Ld and British Acoustic Films Ld,

supra, at p 189, lines 31-5; Birmingham Sound Reproducers

Ld v Collaro Ld, supra, at p 245, lines 29-31; and see

also Blanco White, Patents for Inventions, 5th ed . , p 43.)

There may be certain differences in the approach

of the English and American courts in this realm of patent

law. For instance, in Hughes Aircraft Co v United States

[1983] USCA6 1335; 717 F. 2d 1351 (1983) at p 1361, it was stated that the

doctrine of equivalents was "judicially devised to do

/ equity".....

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equity" (see also Ziegler's case, supra, at p 869), whereas in England the emphasis is rather on the proper interpretation of the patent claim. Furthermore, in Atlas Powder Company v E.I. Du Point De Nemours & Company 750 F 2d 1569 (1984) it was stated that:

"It is not a requirement of equivalence, however, that those skilled in the art know of the equivalence when the patent application is filed or the patent issues. That question is determined as of the time infringement takes place" (p 1581).

This may be contrasted with what was said by Lord DIPLOCK in the above-quoted extracts from the Catnic case and with the following extract from the judgment of PEARSON J in the 'early English case of *Badische Anilin und Soda Fabrik v Levinstein* (1883) 24 Ch D 156, at pp 170-1:

" in these chemical cases where a

patentee has made some discovery in chemistry, any person may afterwards use for the same purpose chemical equivalents which were not known to be chemical equivalents at the time the patent was taken out. That is so expressed in the judgment of Mr Justice Williams in the case of *Unwin v Heath*, in which he says, 'There is ample evidence

/ that

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that to melt together oxide of manganese and carbonaceous matter, with steel and iron, will serve as an equivalent for the melting together of carburet of manganese with steel or iron in producing the desired result. But there is no evidence that at the time of the patent and specification this was known to persons of ordinary skill in chemistry. And I fully agree with the doctrine which has been repeatedly laid down in the course of the discussion of this cause, that though the use of a chemical or mechanical substitute which is a known equivalent to the thing pointed out by the specification and claimed as the invention, amounts to an infringement of the patent: yet if the equivalent were not known to be so at the time of the patent and specification, the use of it is no infringement.'

And Mr Baron Parke says this, 'The specification must be read as persons acquainted with the subject would read it at the time it was made, and if it could be construed as containing any chemical equivalents it must be such as are known to such persons at that time; but those which are not known at the time as equivalents, and afterwards are found to answer the same purpose, are not included in the specification. They are new inventions. "

(The judgment of PEARSON J on the issue of infringement was concurred in by the Court of Appeal, see (1885) 29

/ Ch D 366

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Ch D 366 at pp 399, 416, and the House of Lords, see (1887) 12 Appeal Cases 710, at p 726; see also Blanco White, op. cit., p 45, n 26.) American law, too, embraces concepts such as "pioneer patents" and "file-wrapper estoppel", which are foreign to English law and our law. Nevertheless, the fundamental idea that a person should not be entitled to pirate an invention by substituting an equivalent for an unessential feature of the claimed invention underlies all three systems. And here I would

again stress that it is only in respect of the unessential features or integers of a claim that the doctrine

of infringement by the substitution of equivalents can

apply. If the feature or integer for which an equivalent has been substituted is an essential part of the

claimed invention, then there is no room for the doc-

trine of equivalents (see *Marconi v British Radio Telegraph and Telephone Company Ltd* [1911] 28 RPC 181, at p 217, line 46 - p 218, line 2; the *RCA Photophone* case, supra,

/ at

45 at p 197; the *Birmingham Sound* case, supra, at p 243; the *Rodi & Wienenberger* case, supra, at p 384, lines 18-21; the *Catnic* case, supra, per BUCKLEY LJ in CA at p 225, lines 31-8).

To ascertain what are and what are not the essential features or integers of a claimed invention the specification must be read and interpreted purposively or realistically, with the understanding of persons with practical knowledge and experience of the kind of work in which the invention was intended to be used and in the light of what was generally known by such persons at the date of the patent (see the *Prank and Hirsch* case, supra, at pp 762-3; the *Marconi* case, supra, at pp 217-8; the *Catnic* case, supra, at p 243), which date by our law is the priority date of the claim (see *Burrell*, op. cit., para. 5.23, p 246). Obviously, the fact that a claim incorporates a particular feature does not alone suffice

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to make that feature an essential one. Otherwise the problem would not arise. In general, if the feature is in fact essential to the working of the claimed invention, then it must be regarded as an essential feature. On the other hand, a patentee may indicate in his specification, either expressly or by implication, that he

regards a particular integer as essential; and in that event it must be treated as essential and it matters not

that it may not be essential to the working of the inven-

tion. Where, however, a feature is not essential to the working of the invention and the patentee has not indicated that, he regards it as an essential integer, then in general it may be treated as unessential and an alleged infringer may be held to have infringed the claim notwithstanding that his product or process does not incorporate that feature or substitutes an equivalent for it (see Van der Lely case, *supra*, at p 76, lines 29-30;

/ Catnic

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Catnic case, *supra*, at pp 226-7, 228, per BUCKLEY LJ in CA, and p 243, per Lord DIPLOCK in HL).

Most of the cases in England and South Africa in this field have dealt with instances of mechanical equivalence rather than chemical equivalence. In principle there is no difference between the two (see *Beecham Group Ltd v Bristol Laboratories Ltd and Another* [1978] RPC 153; at p 200), but the difficulty in explaining the behaviour of chemical compositions — why and how they react in order to achieve a particular result — and difficulty in predicting how different chemical substances in combination will behave under varying circumstances are often obstacles in the path of a patentee seeking to establish a case of infringement based on chemical equivalence. As it is put in Fox, *The Canadian Law and Practice relating to Letters Patent for Inventions*. 4th ed, at p 380:-

/ "Even

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"Even to chemists many of the reactions of various chemical components will be obscure when taken in conjunction with the other agents set forward in combination. As was observed by Maclean J. in *Chipman Chemicals Ltd. v Pairview Chemical Co Ltd*:

"There is no prevision in chemistry"

is an observation attributed to Sir James Dewar. One cannot always predicate the results that may be obtained from chemical substances in combination, as in a combination of mechanical devices."

It will, therefore, be seen that a consideration of the doctrine of equivalents as applied to chemical patents presents

considerable difficulty."

See also Nobel 's Explosives Company Ld v Anderson (1895)

12 RPC 164, at p 167, lines 4 2-58; In the matter of

Andrew's Patent (1907) 24 RPC 349, at p 366, lines 18-37;

Beecham's case, supra, at p 200, lines 14-17; Nation-

wide Chemical Corporation v Wright 458 F Supp 828 (1976),

at p 839.)

In general the onus is on the plaintiff to

establish a case of infringement, and in a case of

/ alleged

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alleged mechanical or chemical equivalence the plaintiff would carry the burden of showing that, despite the variant, the infringing product or process falls within the scope of the patent claim.

I come now to apply these principles to the facts of the present case. I shall deal first with the question of essentiality. There can be no question that

an R2 radical is essential to the invention claimed by

the patent in suit. The antidote compound needs an R2radical just as much as it needs the amide nucleus and the R1 and R2 radicals. Without all these elements the anti-dote cannot exist. That is common cause. Appellants' case, however, is that it was not essential that the R2radical be one of the list of radicals contained inclaim 1 (from which the R1 and R2 radicals "can be selected"); that the R2 could be a variant which achievedthe same result in the same way; and that anyone who madeor used a product which contained the amide nucleus, R and/ R1 radicals

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R1 radicals selected from those listed in claim 1 and

such a variant for the R2 radical would infringe the claim,

In my view this argument is unsound. If the R2 as defined in claim 1, may be substituted by another radical not listed therein, which is said to be a variant, then I see no reason why the same process of

reasoning should not be applied to the R and R1 radicals; and taken to its logical conclusion I suppose, following a flight of chemical fancy, one might have variants of all three radicals. It would be absurd to suggest that a compound so composed would infringe claim 1. The answer, of course, is that claim 1, properly interpreted, makes it essential that the radicals be selected from the sub-

stances or groups listed therein. It is clear to me that

the patentee, realising that the antidotal effect of its invention could be achieved by compounds consisting of different chemical variants of the basic composition,

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cast his net as widely as he could (consistent with

validity) in order to cover all known or predictable

variations. For each radical there were claimed a large number of substances and, as has been pointed out, the possible permutations under the claim 1 formula may run into millions. The expert witnesses were unable to point to any variants not claimed for the R2 radical, which were known at the time of the patent; and, if they had been known, it seems unlikely that the patentee would not have included them in claim 1. In my opinion, persons skilled in this field would, in the light of what

was generally known at the date of the patent, have under-

stood claim 1 to define exhaustively the many different

alternatives for the R2 radical; and, of course, for

the, R and R1 radicals. And this was what the patentee intended. It would follow that the choice of one of these listed R2 radicals is an essential integer of claim 1. If that be the case, then there is no room for any

/ argument

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argument based upon chemical equivalence.

However, if I am wrong in this conclusion and

strict adherence to the listed R2 radicals be not an essential integer, I am nevertheless of the opinion that appellants failed to establish that the R2 radical of the GENEP PLUS antidote was at the time of the patent, a known and obvious variant or substitute which performed

the same function as, say, a dialkoxyalkyl radical of a

composition falling under claim 1. In the first place

it was conceded by appellants' main expert witness, Prof. Baldwin, that at the time when the patent was issued the organic chemist in the field of herbicides (who would be the skilled addressee) knew relatively little about antidotes and no one knew how they functioned; and that even at the time of the trial their "detailed chemical mechanism" was not known. No other expert witness suggested anything to the contrary. In the circumstances it was difficult for appellants to show that the antidote of GENEP

/ PLUS

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PLUS performed the same function in substantially the same way; and, in my opinion, they failed to do so. (See in this regard the Commissioner's finding, reported judgment at pp 260F - 261A.)

In the second place I am of the opinion that

appellants failed to show that the R2 radical of the GENEP

i.

PLUS antidote was in 1971 a known or obvious variant. There

Was, some disagreement between the experts as to the predict-

ability of the biochemical properties of a chemical com-

pound. In relation to the particular field of the in-

vention in issue appellants' expert, Prof. Baldwin, was of the view that given all the examples in the patent having

the common property of antidotal effectiveness, he, if presented with another chemical structure, would be able

to predict with confidence whether it would behave in the/ same ,

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same way or not. He stated:

"If the biological data is available for dozens or hundreds of examples and I am given a new example that is new in some structural detail but essentially the same then I can predict with a fair degree of confidence that the compound will behave biochemically in a manner analogous to the behaviour exhibited in tests with other very similar chemical structures. That is. the general proposition is that like structures behave in like manner."

Prof Slife, also called by appellants, gave evidence broadly

to the same effect. Respondents' witnesses, Prof Rees, Dr Rinehart and Dr Richter, were less confident. Prof Rees went so far as to say that biochemical reactivity, unlike physical properties or chemical properties, was such a com-

plicated matter that one could never make predictions.

An expert in a particular area, who "researched it hard

enough", would have "a very good hunch" that a particular compound might be active, but he would have to do the necessary testing before he would know - and he might be proved

/ to.....

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to be totally wrong. Dr Rinehart stated that he did not agree with Prof Baldwin on this issue. He said:

"Biological testing is just too unpredictable . You have to make and test compounds to find the results (R)elatively minor changes in a molecule can have a rather profound effect on its biological activity."

Under cross-examination, however, he conceded that in certain instances the biological effects of a particular compound could be predicted "with reasonable probability". Dr Richter stated that it was not possible to predict in advance the effect of going from the STC to the antidote of; GENEP PLUS. He said:

"No, you cannot predict, you hope, you make the compound and you test it. "

On the question of the credibility of the expert

witnesses the Commissioner found that they all expressed

their honest opinions and on purely factual issues tes-

tified truthfully.

/ Whatever

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Whatever the true position in regard to predictability may be, both in general and in regard to the specific field of the patent invention, the true enquiry is

whether the antidote of GENEP PLUS was a known or obvious

variant of one or other of the many antidotes claimed by the

patent. In relation to this enquiry I do not find the theorising of the experts, speaking with hindsight, particularly helpful. To my mind, the actual facts are more

eloquent and cogent. Firstly, there is the fact that the patentee, with the knowledge and skill at its disposal at the time, demarcated its monopoly in very wide terms (which included many thousands, possibly millions, of compounds) and yet did not see fit to include the antidote of GENEP PLUS. Secondly, there is the fact that both prior to the patenting of the invention and thereafter first appellant's researchers tested many thousands of antidotal compounds - and indeed in some instances the tests resulted in new patents being filed - / and.....

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and yet at no stage until PPG had done so did they think of synthesizing the STC or GENEP PLUS antidotes, both of which have proved very effective. It is true that Rinehart, having established his lead compound, synthesized both the STC and GENEP PLUS antidotes within a matter of four to five months. But the fact of the matter is that he did it and no-one else did. Whatever

it was that led him along this path of research - be it luck; inspired guess-work or hunch - is probably the stuff that, chemical inventions are made of.

For these reasons I hold that the Commissioner correctly found that appellants had failed to establishIt infringement on the basis of chemical equivalence . follows that the appeal fails.

I turn now to the cross-appeal and the various grounds of' invalidity claimed by the respondents. Invalidity must be adjudged with reference to the Patents Act No

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