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Trial of a Patent Case

*105 THE DOCTRINE OF EQUIVALENTS

Robert Greene Sterne
Donald R. McPhail [FN1]
Sterne, Kessler, Goldstein & Fox P.L.L.C.
Washinton, D.C.

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*107 The doctrine of equivalents is the appropriate legal principle for determining infringement of a patent where the accused product or process does not contain exactly all of the limitations of the allegedly infringed claim(s). The focus of the court or jury in determining infringement under the doctrine is whether the difference(s) between the claim and the accused product or process is (are) insubstantial. In 1997, the Supreme Court addressed the issue of how to determine infringement under the doctrine of equivalents for the first time in nearly fifty years. While the Court re-affirmed the vitality of the doctrine, the Court left it to the Federal Circuit to determine the particular "formulation of the test for equivalence" to be applied in a given case. Since 1997, the Federal Circuit has generally employed at least one of the following four different linguistic frameworks or "tests" in the over thirty published decisions in that time frame: (i) function-way-result tripartite test; (ii) the all elements rule; (iii) the hypothetical claim analysis; and (iv) prosecution history estoppel. The application of these tests to different areas of technology and certain potential inconsistencies apparent in their application are discussed in this paper.

I. Introduction

The manufacture, sale and/or use of any composition, method or device that is described by a patent claim is an act of patent infringement. [FN2] If that composition, method or device is identically described by the patent claim, then the claim is infringed literally. [FN3] Any deviation from the exact language of the claim, however, precludes a finding of literal infringement. [FN4] That is, if any single element or limitation of the claim is not exactly and identically found in the accused composition, method or

device, then there is no literal infringement of the claim. Put in other words, any *108 composition, method or device that would have anticipated the claim if found in the prior art will literally infringe that patent claim. [FN5]

As set forth by the controlling precedent, a proper analysis of literal infringement requires the resolution of two specific inquiries: first, the claims must be construed to resolve their proper scope and meaning; and, second, it must be determined whether the accused composition, method or device falls exactly within the scope of the properly construed claims. [FN6] The first inquiry, claim construction, is a legal question to be answered by the court, while the second inquiry, reading the claim on the accused infringement, is a factual question for the jury's consideration and determination. [FN7]

Although determining literal infringement appears a relatively straightforward analysis, the exact copying of a patented invention is rare in the present marketplace. Except for those situations where statutory, industry or technical requirements proscribe variation -- such as with the active chemical entity of an approved drug product, or the use of electronic interface standard for interoperability -- rationale companies acting in their best interests should tend to avoid the precise duplication of a patented invention. The disincentives and penalties associated with exact copying include the possibility of up to three-fold enhancement of damages provided by the statute in cases in which willful infringement is found. [FN8] Indeed, a finding of willful infringement can provide the requisite basis for classifying a case as exceptional, with a concomitant award of attorneys' fees. [FN9]

Because literal copying is relatively uncommon, the doctrine of equivalents arose from and evolved through the efforts of the courts to avoid the otherwise harsh result that might result for the patentee from a strict construction limiting the laws to literal infringement. In particular, the doctrine of equivalents was created and, indeed, continues to be applied because:

> the courts have ... recognized that to permit imitation of a patented invention which does not copy every literal detail would be to convert *109 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.
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> 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. [FN10]

Certain problems, however, are inherent in the doctrine of equivalents. Although designed to protect the patentee from what was deemed a potentially harsh result, the doctrine of equivalents nonetheless represents a deviation from the requirement that the public be clearly and precisely notified of the scope and limitations of the patent grant. [FN11] With regard to this public notice objective, because a patent represents a right to exclude others from certain intellectual property, it is important that the patent clearly define

and circumscribe the boundaries of that intellectual property to the public. The doctrine of equivalents, by expanding the scope of protection beyond the literal words of the claims, injects an uncertainty into what should be a relatively simple and straightforward analysis of what the claims ultimately cover and protect.

Regardless of such issues, the doctrine of equivalents is "alive and well" because it addresses a needed public policy objective of preventing claims from being unduly narrowed in a patent suit. Accordingly, it is important to understand the framework by which the federal courts, particularly the Court of Appeals for the Federal Circuit, resolve issues of infringement under the doctrine of equivalents. It is especially important to consider the various tests available for proving or rebutting an allegation of infringement under the doctrine of equivalents.

The Supreme Court in Warner-Jenkinson Co. v. Hilton-Davis Chem. Co., [FN12] its most recent consideration of infringement under the doctrine of equivalents (and, in fact, its only meaningful *110 discussion of the subject since Graver Tank some fifty years ago), the Court noted that "[t]here can be no denying that, when applied broadly, the doctrine of equivalents conflicts with the definitional and public-notice functions of the statutory claiming requirement." Nevertheless, the Court held that the doctrine of equivalents remained viable under the 1952 revision of the Patent Act, because it was to be applied to particular elements of a claim and not the claim as a whole. More specifically, the Court stated that "[e]ach element contained in a patent claim is deemed material to defining the scope of the patented invention, and thus the doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole. It is important to ensure that the application of the doctrine, even as to an individual element, is not allowed such broad play as to effectively eliminate that element in its entirety. So long as the doctrine of equivalents does not encroach beyond the limits just described ... we are confidant that the doctrine will not vitiate the central functions of the patent claims themselves."

In setting forth a specific test for determining in a particular case whether there was infringement under the doctrine of equivalents, the Court stated that "[in the case below, b]oth the parties and the Federal Circuit spend considerable time arguing whether the so-called 'triple identity test--focusing on the function served by a particular claim element, the way that element serves that function, and the result thus obtained by that element -- is a suitable method for determining equivalence, or whether an 'insubstantial differences' approach is better.... In our view, the particular linguistic framework used is less important than whether the test is probative of the essential inquiry: Does the accused product or process contain elements identical or equivalent to each claimed element of the patented invention?"

The Supreme Court did not provide, however, much specific guidance as to how the "essential inquiry" was to be answered, noting instead that "[d]ifferent linguistic frameworks may be more suitable to different cases, depending on their particular facts. A focus on individual elements and a special vigilance against allowing the concept of equivalence to eliminate completely any such elements should reduce considerably the imprecision of whatever language is used.... We expect that the Federal Circuit will refine the formulation of the test for equivalence in the orderly course of case-by-case determinations. and we leave such refinement to that court's sound judgment in this area of its special expertise." The Federal Circuit, of course, had held below in banc that "the application of the doctrine of equivalents rests on the substantiality of the differences between the

claimed and accused products or processes, assessed according to an objective standard."

Since the Supreme Court decision in Warner-Jenkinson three years ago, the Federal Circuit has, as the Court anticipated, repeatedly refined its "formulation" for evaluating the substantiality of the differences between the claim and the allegedly infringing product or process. Despite multiple refinements in the linguistic frameworks in the subsequent cases, certain themes have persisted. The "formulations" used by the Federal Circuit for evaluating equivalence can be broadly grouped into the following four basic "tests": (i) the function-way-result tripartite test; (ii) the all elements or all limitations rule; (iii) the hypothetical claim analysis; and (iv) prosecution history estoppel.

The importance of which test is applied in determining equivalence is illustrated throughout the cases on infringement decided by the Federal Circuit since Warner-Jenkinson in 1997. For purposes of this paper, we have reviewed all of the published decisions of the Federal Circuit since *111 June 1, 1998 and discuss certain representative cases in some detail below as to which test was applied by the court in evaluating equivalence and whether infringement was found. As our discussion shows, it is critical that the patentee and the accused infringer each consider very early in a litigation how each of the four basic tests applies to the facts and focus their case preparation and presentation appropriately.

Indeed, the published cases show that the patentee must be sure that none of the four tests will result in a conclusion of substantial differences, because a successful showing by the accused infringer under any one test appears to be sufficient to establish a lack of equivalence and, consequently, no infringement. Similarly, the accused infringer must evaluate all four tests to see if there is at least one test that could result in a conclusion of substantial differences and, accordingly, no infringement. In other words, the patentee must prevail under all four tests while the accused infringer need only prevail under one to win.

This paper examines each of the four basic tests, and includes a summary discussion of certain published decisions since June, 1998 in which one or more of these tests was applied. This paper further discusses important implications surrounding the application of these different tests, and provides some considerations for the patentee and the accused infringer when faced with the issue of infringement under the doctrine of equivalents.

II. Equivalence Under the Doctrine

With the endorsement of the Supreme Court, the Federal Circuit has now firmly established the principle issue for determining infringement under the doctrine of equivalents as the substantiality of the differences between the claimed and accused products or processes. In practice, four basic tests have been used by the court to evaluate the substantiality of the differences between the claim(s) in suit and the allegedly infringing composition, method or device. Each of these tests is discussed below, followed by a discussion of some of the considerations for the patentee and the accused infringer.

A. The Tests of Equivalence

1. The Function-Way-Result Tripartite Test

The "function-way-result" tripartite test is probably the oldest enunciated test for determining equivalence under the doctrine of equivalents. This test dates back to at least the 1950 decision in Graver Tank, in which the Supreme Court set forth the following test for determining infringement: "a patentee

may invoke this doctrine to proceed against the producer of a device 'if it performs substantially the same function in substantially the same way to obtain the same result.' 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."' [FN13] From the language of this decision, the applicable test subsequently became widely *112 known as the "function-way-result" tripartite test and was frequently employed in resolving questions of infringement under the doctrine of equivalents. Indeed, the "function-way-result" tripartite test was the most commonly employed by the Federal Circuit over the past two years.

As employed, the "function-way-result" tripartite test requires a showing by the patentee that the element at issue in the allegedly infringing product or process performed substantially the same function as an element in the claimed product or process, in substantially the same way to give substantially the same result. Thus, an "equivalent" of a claim limitation cannot substantially alter the manner in which the function of the claimed invention is performed. [FN14] "Where an accused device performs substantially the same function to achieve substantially the same result but in a substantially different manner, there is no infringement under the doctrine of equivalents." [FN15]

An alternative manifestation of the "function-way-result" tripartite test looks to the knowledge possessed by one of skill in the art of the interchangeability between claimed and accused elements. [FN16] More specifically, "[a]n important factor [to be considered in determining equivalence] 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." [FN17] Thus, the substitution of one or more different ingredients which are known to provide the same result as the corresponding ingredients recited in the claim represents a classic situation in which infringement under the doctrine of equivalents is found. [FN18] Indeed, the known interchangeability of two given elements would seem to be almost irrefutable proof that they performed substantially the same function in substantially the same way to achieve substantially the same result (or else why would one skilled in the art consider them interchangeable?).

It should also be noted that although evidence that the accused infringer developed its product or process through independent development is not directly relevant to the question of infringement under the doctrine of equivalents, "[t]he need for independent experimentation ... could reflect knowledge--or lack thereof--of interchangeability possessed by one presumably skilled in the art. The known interchangeability of substitutes for an element of a patent is one of the express objective factors ... bearing upon whether the accused device is substantially the same as the patented invention. Independent experimentation by the alleged infringer would not always reflect upon the objective question whether a person skilled in the art would have known of the interchangeability *113 between two elements, but in many cases it would likely be probative of such knowledge." [FN19] Finally, "the proper time for evaluating equivalency--and thus knowledge of interchangeability between elements--is at the time of infringement, not at the time the patent was issued." [FN20]

A number of Federal Circuit cases since June 1, 1998, have included the use of the "function-way-result" tripartite test for determining infringement under the doctrine of equivalents. Indeed, this test remains the predominant one, being employed in over half of the published decisions since that date. We now discuss some of the cases in which this test was applied by the court.

In Hill-Rom Co., Inc. v. Kinetic Concepts, Inc., [FN21] for example, the patent-in-suit related to hospital beds which had two layers of inflatable

cushions, one on top of the other, rather than a mattress. The only two claims at issue read as follows:

1. A patient support surface, comprising:

a support assembly;

a first longitudinal cushion set coupled to said support assembly, said first longitudinal cushion set including a plurality of generally parallel cells, and extending a portion of the longitudinal length of said support assembly;

a second longitudinal cushion set coupled to said support assembly, said second longitudinal cushion set including a plurality of generally parallel cells and also extending a second, longitudinally offset portion of the longitudinal length of said support assembly; and

an inflatable support layer disposed generally above said first and second longitudinal cushion sets.

10. A support surface for supporting a patient comprising:

a support assembly;

a first set of inflatable longitudinal cushions coupled to said support assembly and arranged to extend partially along the longitudinal length of said patient;

*114 a second set of inflatable longitudinal cushions coupled to said support assembly and arranged to extend partially along another, longitudinally offset portion of the length of said patient;

a patient contacting assembly retained between said patient and said first and second sets of inflatable longitudinal cushions; and

a supply of air in selective communication with said patient contacting member and with said first and second sets of inflatable longitudinal cushions.

The upper layer of cushions was divided into zones which could be independently inflated to provide optimum comfort to the patient, which the lower layer could be differentially inflated to distribute the amount of support pressure under different parts of the patient. Moreover, the differential inflation of the lower layer could be used to turn the patient from side to side.

In contrast to the claimed bed, the allegedly infringing beds consisted of an upper layer of cushions and a lower layer of "inflatable longitudinal bladders." These bladders were inflated only for the purpose of rotating the patient, i.e. by lifting and tilting the upper layer of cushions to one side or the other, and were otherwise left deflated.

At trial, the district court construed the term "cushion" as used in the claims "to mean 'an inflatable enclosure or bag, which, when inflated, should provide basic support and comfort, but which does not necessarily have to be inflated at all times."' Moreover, the trial court found that "the sole function of the bladders in the [accused] beds is to rotate the patient ...." Based on this finding and its claim construction, the district court "concluded that the lower body bladders of the [accused] bed perform a different function, operate in a different way, and produce a different result from the invention claimed in the patent." The district court therefore held that the accused bed did not infringe the claim at issue (claim 10) under the doctrine of equivalents.

On appeal, the patentee argued that the only function of the cushions explicitly required by the claim was that the cushions "retain air at specified pressures and [are] capable of maintaining a defined orientation." The patentee further argued that it was this function that should have been considered for purposes of evaluating equivalency (this function being performed by the bladders in the accused bed).

The Federal Circuit, however, disagreed with the patentee's argument. More specifically, the Federal Circuit concluded that "[t]he trial court correctly

defined 'cushion' .... Thus, in determining whether a structural element of the accused device is equivalent to the [claimed] 'set of inflatable longitudinal cushions' ... the court properly considered whether that element performs substantially the same function of providing support and comfort as the cushions ...." As support for this conclusion, the Federal Circuit noted that "the term 'cushion' ... carries with it certain functional features as a matter of the definition of the term, [and so] equivalence cannot be measured by reference only to the functions expressly set forth in claim 10, while ignoring the functional elements inherent in the term 'cushion."' The Federal Circuit therefore upheld the district court's finding that *115 the lower body bladders in the accused bed do not perform substantially the same function as the claimed cushions.

In Kemco Sales, Inc. v. Control Papers Co., Inc., [FN22] the patent- in-suit related to plastic security envelopes that are tamper-resistant, i.e. indicate when someone has opened the envelope and removed the contents thereof. The only claim at issue read as follows:

27. A tamper-evident sealing system for an envelope made at least partially of plastic material comprising:

envelope pocket having an opening therein through which contents can be placed into the pocket before the opening is closed;

plastic envelope closing means secured to the plastic envelope material to close the opening and to form a closed pocket, the closing means having at least one transverse edge;

first, adhesive, sealing means between the closing means and plastic envelope material for sealing the closing means to the plastic envelope material; and

second, tamper-evident, sealing means secured to both the closing means and the envelope extending substantially along the length of and over the transverse edge which becomes visibly distorted, broken apart, or of disrupted continuity if attempts are made to reopen the second, tamper-evident, sealing means whereby tamper-evidency is provided even if the first, adhesive, sealing means can be reopened and reclosed without visual detection thereof.

The accused envelope was structurally similar to the claimed envelope, including the use of two adhesive layers (one to seal the envelope and the other to indicate evidence of tampering). The accused envelope, however, was closed by a dual-lip structure that seals via an internal adhesive.

At the district court, [FN23] the accused infringer moved for summary judgement of non-infringement and the patentee cross-moved for summary judgement of literal infringement. The district court first construed the claim and held that the "plastic envelope closing means" limitation was written in means-plus-function language. Reviewing the specification, the district court determined that the disclosed structure associated with this means was "a flap that folds over the opening and is secured to one or more of the outside panels of the envelope."

Based on this claim construction and the difference between the accused dual- lip structure and the claimed fold-over flap, the district court held that no reasonable jury could have found that the accused product literally infringed the claim. Moreover, the district court further held that no reasonable jury could have found that the accused structure was an equivalent of the claimed *116 structure because it was not disclosed in the specification, even though "such a structure existed prior to the issuance of the [] patent." The district court therefore granted the accused infringer's motion for summary judgement of non-infringement.

On appeal, the Federal Circuit "agree[d] with the district court that no reasonable jury could have found that the [accused envelope] infringes, either literally or under the doctrine of equivalents." The Federal Circuit

dealt first with infringement under section 112, paragraph 6 and, using a function- way-result test, determined that, although "both the accused and disclosed structures perform the identical function, which is to close the envelope.... the dual-lip structure closes the accused envelope in a different way .... The accused structure's different way of closing also yields a substantially different result."

Turning to the issue of infringement under the doctrine of equivalents, the Federal Circuit found the above analysis dispositive of the issue. In particular, the Federal Circuit held that "[w]hen a court determines that the 'way' and/or 'result' is/are substantially different under a section 112, paragraph 6 equivalents analysis, a patentee cannot prevail under the doctrine of equivalents for the reason(s)." Thus, the court concluded that "[i]n this case, the dual-lip structure is not a section 112, paragraph 6 equivalent of a fold-over flap because the 'way' and 'result' are substantially different; accordingly, the dual-lip structure cannot be an equivalent under the doctrine of equivalents." The Federal Circuit therefore affirmed the district court's granting of the motion for summary judgement of non-infringement.

Finally, in Augustine Medical, Inc. v. Gaymar Indus., Inc., [FN24] the patents-in-suit related to convective thermal blankets, which inflate to direct warm or cool air onto a person. All of the patents-in-suit stemmed from related applications and claim features in particular convective thermal blanket design. One of the patents-in-suit included the following independent claim:

1. A cover for delivering a diffuse medium flow to a human body, comprising:

an inflatable cover housing including a plurality of inflatable hollow tubes, each tube having a rounded upper portion and a flattened lower portion, joined in a substantially parallel array to form a substantially smooth lower cover surface including said lower tube portions for facing a body to be covered and a quilted upper cover surface including said upper tube portions for facing away from said body;

an entry port in said upper surface for admitting an inflating medium into said housing;

*117 transverse openings connecting the interior of each tube with the interior of at least one other adjacent tube in said array for conducting an inflating medium into all of said tubes to inflate said housing; and

exit ports formed in the flattened portion of each of said tubes for, when said housing is inflated, permitting said medium to flow out of said housing through said smooth lower surface.

The limitation of interest here recited, in pertinent part, "an inflatable cover housing including a plurality of inflatable hollow tubes, each tube having a rounded upper portion and a flattened lower portion, joined in a substantially parallel array to form a substantially smooth lower cover surface ...."

At the district court, the accused infringer successfully moved for summary judgement of non-infringement, both literal and under the doctrine of equivalents. With respect to the issue of infringement under the doctrine of equivalents, the district court relied on the "all elements" rule (discussed infra) and concluded that application of the doctrine of equivalents to the accused devices would render meaningless some of the claim elements, including "flattened" and "substantially smooth". Accordingly, the district court concluded that the accused devices did not infringe the relevant patent under the doctrine of equivalents.

On appeal, the Federal Circuit set forth the standard for determining infringement in this case as follows: "[t]o infringe under the doctrine of equivalents, the accused blankets must contain features which are

insubstantially different than the claim elements. Insubstantial differences may be found where a structure performs substantially the same function in substantially the same way to achieve substantially the same result as the claim element."

Turning to the facts of the case at bar, the Federal Circuit noted that "[a]s explained in the specification, the 'flattened lower portion' claim element functions together with the 'rounded upper portion' to create a structure that avoids contact with the patient." The Federal Circuit further noted that "the accused blankets have nearly identical, quilted upper and lower surfaces and ... the blankets rest on and maintain significant contact with the patient when inflated." The Federal Circuit therefore concluded that "we are unable to identify any features of the accused blankets which could function to create a 'self-supporting structure' that avoids contact with the patient." Accordingly, the Federal Circuit affirmed the district court's grant of summary judgement of non-infringement.

Thus, as illustrated by these three decisions, the traditional "function-way- result" tripartite test compares the element of the claim not literally found in the accused product or process with a particular component of the accused product or process. The issue for resolution by the finder-of-fact is then whether that particular component of the accused product or process performs *118 substantially the same function as the claim element not literally found, in substantially the same way to achieve substantially the same result.

2. The All Elements Rule

As may be seen from a review of the cases in which it was applied, the traditional "function-way-result" tripartite test is premised on the underlying assumption that each of the elements recited in the claim is found somewhere in the accused product or process (although not always in what might be regarded as the corresponding element [FN25]). Not every case of infringement under the doctrine of equivalents, however, can support such an underlying assumption. The question then is what happens if one of the elements recited in the claim is asserted by the accused infringer to be missing from the accused product or process?

Since the en banc decision of the Federal Circuit in Pennwalt Corp. v. Durand-Wayland, Inc., [FN26] proof of infringement under the doctrine of equivalents has required an element-by-element comparison between the claimed invention and the accused product or process. Such an element-by-element comparison is necessary because:

> [e]ach element contained in a patent claim is deemed material to defining the scope of the patented invention, and thus the doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole. [FN27]

This element-by-element comparison for determining infringement, which is also widely known as the "all elements" or "all limitations" rule, looks to whether each claim element is the same as, or an equivalent to, a corresponding structure or step in the accused product or process. [FN28] Satisfaction of the "all elements" or "all limitations" rule is achieved by focusing on the equivalent *119 element or limitation in the context of the entire claim. [FN29] Thus, a particular "element" in a claim may be satisfied not just by the corresponding element in the accused product or process, but also by a different element or combination of elements in the accused product or process. [FN30]

Based on the "all elements" rule, the absence of even a single element (or limitation), both literally and equivalently, should preclude a finding of infringement and so represents a strong potential defense available to an

accused infringer. Under this defense when an alleged infringer proves by a preponderance of the evidence that even a single claim element is missing in the accused product or process, then the "all elements" rule dictates that the accused product or process cannot infringe the claim at issue. Accordingly, from an accused infringer's perspective, proper use of the "all elements" rule may provide a ready way to defend successfully a charge of infringement under the doctrine of equivalents.

In the past two years, the "all elements" rule has been successfully used to defend a charge of infringement under the doctrine of equivalents. For example, in Ethicon Endo-Surgery, Inc. v. United States Surgical Corp., [FN31] the patent-in-suit related to a "lockout mechanism" for use in linear cutter staplers (which allow a surgeon to make an incision in tissue while simultaneously stapling closed each side of the incision to reduce bleeding).

Claim 6 of the patent, which was at issue in the suit, reads as follows:

> 6. In a staple cartridge insertable within a surgical stapler and containing staples and comprising an elongated body including one or more longitudinal slots for slidably receiving one or more longitudinal pusher bars comprising a firing mechanism of said surgical stapler and a plurality of drivers engageable by said pusher bars for ejecting the staples from the cartridge, said staple cartridge releasably fastened to a [sic] said surgical stapler,
>
> the improvement comprising a lockout mechanism connected to said longitudinal slots for preventing said pusher bar from passing more than one time through said longitudinal slots.

*120 The accused infringing devices had been previously found not to literally infringe this claim of the patent. [FN32]

The district court with respect to doctrine of equivalents determined on motion for summary judgement that the accused infringing staplers did not infringe claim 6. In particular, the district court concluded that the lockout mechanism found in the accused staplers "differs substantially from the 'connected to said longitudinal slots' limitation .... [because] the accused lockout 'is located at the distal end of the [stapler]' nowhere near the longitudinal slots which are located in the staple cartridge at the front end ... [and] claim 6 does not describe the structure of the lockout mechanism but merely describes its location and function."

On appeal to the Federal Circuit, the patentee argued that it had raised issues of material facts as to: (i) whether the lockout mechanism in the accused staplers "plays substantially the same role" as the claimed lockout mechanism, irrespective of its location; and (ii) whether one skilled in the art would have recognized the accused lockout mechanism as "interchangeable" with the claimed mechanism. The accused infringer countered that the "all elements" rule would be violated if the "[i]n a staple cartridge" and "connected to said slots" limitations were ignored, and thus the district court properly granted summary judgement.

The Federal Circuit agreed with the accused infringer that the grant of summary judgement was appropriate. More specifically, the court noted that "[b] ecause the rear of the stapler is opposite the longitudinal slots, no reasonable jury could have found that the [accused] lockout was substantially 'connected to said longitudinal slots.' Similarly, no reasonable jury could have found that the 'in a staple cartridge' limitation was met by an equivalent." Accordingly, the Federal Circuit concluded that the grant of summary judgement of non-infringement was proper under the "all elements" rule because "no reasonable jury could have found that the difference between the location of the [accused] lockout and the location of the lockout as claimed was insubstantial."

Similarly, in Zodiac Pool Care, Inc. v. Hoffinger Indus., Inc., [FN33] the patent-in-suit involved a vacuum system for cleaning swimming pools. As recited in claim 1, this system involved four distinct elements:

1. A swimming pool cleaner comprising:

(a) a forwardly inclined body having a flow passage therethrough;

(b) an inlet foot having a water inlet, the inlet foot being attached to the body and connected to the flow passage and when in use, is proximate to a surface to be cleaned;

*121 (c) a flexible disc surrounding the water inlet and rotably connected to the inlet foot, and having a peripheral edge; and

(d) a stop for preventing upward flexing of the peripheral edge beyond a predetermined amount located forward of the body and above and substantially inward of the peripheral edge.

At the district court, [FN34] the only issue for the jury was the question of infringement under the doctrine of equivalents because the court had found no literal infringement on motion for summary judgement.

During trial, the accused infringer had conceded that the accused device included the first three elements recited in claim 1, but denied that its device included the fourth element ("a stop for preventing upward flexing of the peripheral edge ... located ... above and substantially inward of the peripheral edge"). The accused infringer presented evidence that a particular element in its device (the weight arm) "could not function as the stop ... because its arm extended at least to the peripheral edge of the disk, and thus was not located 'substantially inward' thereof." The jury, however, found for the patentee that the accused device infringed the claims of the patent under the doctrine of equivalents. The accused infringer then moved for JMOL on the issue of infringement, and the district court granted this motion and entered judgment on behalf of the accused infringer.

The Federal Circuit subsequently agreed with the district court's determination that the verdict of infringement under the doctrine of equivalents was "untenable in light of the claims when properly construed" and so affirmed the entry of judgment by the district court. On appeal, the patentee had relied on the traditional "function-way-result" tripartite test, arguing that the weight arm in the accused device "accomplish[ed] substantially the same function, in substantially the same way, to achieve substantially the same result" as the claimed stop element.

The Federal Circuit, however, did not employ the "function-way-result" tripartite test. Rather, analogizing to its decision in Sage Prods., Inc. v. Devon Indus., Inc. [FN35] the Federal Circuit noted that the patent-in-suit "contains 'clear structural limitations,' including a limitation that the stop be located 'substantially inward' of the peripheral edge of the disc. Given the proper construction of this limitation, a verdict of infringement under the [doctrine of equivalents] would reduce the claims to nothing more than 'functional abstracts, devoid of any meaningful structural limitations on which the public could rely."' Moreover, the Federal Circuit reiterated that "'[i]t is important to ensure that the application of the doctrine [of equivalents], even as to an individual element, is allowed such broad play as to effectively eliminate that element in its entirety."' Accordingly, the Federal Circuit concluded that the accused infringer was entitled to JMOL and affirmed the district court's grant thereof.

*122 A similar result was also reached in Loral Fair child Corp. v. Sony Corp., [FN36] where the patent-in-suit related to charge coupled devices, which are useful in devices where there is a need to store a continuously changing image (e.g. camcorders, cameras, facsimile machines, etc.). The relevant claim in the patent at issue read as follows:

1. A structure comprising

a. a light sensing element comprising a first region of semiconductor material overlaid by a first electrode separated from said semiconductor material by insulation, said light sensing element being capable of containing a charge packet;

b. an adjacent region of said semiconductor material disposed for receiving said charge packet from said light sensing element;

c. means for controlling the transfer of said charge packet from said light sensing element to said adjacent regions; and

d. charge sink means having a contact for applying a bias thereto buried within said semiconductor material and disposed for receiving excess charge accumulated in said light sensing element, said charge sink means extending laterally from said contact toward said light sensing element while beneath the surface of said semiconductor material.

The issue of literal infringement of this claim had been resolved in favor of the accused infringer on motion for summary judgement. Following trial, [FN37] the jury found that the accused device infringed claim 1 under the doctrine of equivalents. The accused infringer moved for JMOL and the district court held that no reasonable jury could have found infringement because the accused device contained no equivalent to the "charge sink means ... buried within" the semiconductor material, as recited in the claim.

On appeal, the Federal Circuit noted that there was no structure in the accused device that was "buried within" the semiconductor material as required by the claim (instead, in the accused device, the entire structure functions as a charge sink). Relying on the "all elements" rule and the fact that the "charge sink means ... buried within" element was utterly missing from the accused device, the Federal Circuit concluded that the district court correctly held that the accused infringer could not possibly infringe the claim under the doctrine of equivalents.

Accordingly, as illustrated by these three cases, an accused infringer who can show that a particular claim element or limitation is missing from the accused product or process should be able to obtain a judgment of no infringement under the doctrine of equivalents based on the "all elements" *123 or "all limitations" rule. Interestingly, compliance with the "all elements" rule is for the court to resolve as a matter of law. [FN38]

3. The Hypothetical Claim Analysis

Although the "all elements" rule would appear to provide an almost unassailable defense for an accused infringer, an opportunity nevertheless remains for a patentee to assert infringement of the claim under the doctrine of equivalents even when all of the elements of that claim are not present in the accused product or process. First articulated by the Federal Circuit in 1990 in Wilson Sporting Goods v. David Geoffrey & Assoc., [FN39] the "hypothetical claim" analysis actually allows a patentee to assert a scope for his claims that reaches to the very limits of the prior art. [FN40]

When employing the "hypothetical claim" analysis, the patentee proposes a hypothetical claim (i.e. a claim not found in the patent per se but which has disclosure support therein) that is broad enough to encompass literally the accused infringing composition or device. [FN41] If that hypothetical claim could have been allowed by the PTO in view of the prior art as of the effective filing date of the patent (not the date of the alleged infringement), then the prior art does not preclude the patentee from asserting that the accused product or process infringes the patent under the doctrine of equivalents. [FN42] Conversely, if any of the prior art references, alone or in combination, indicate that the proposed hypothetical claim was not novel or would have been obvious to one of ordinary skill in the art, then the prior art is a bar to the asserted range of equivalents.

[FN43] Whether the scope of equivalents accorded to a particular hypothetical claim would encompass the prior art is a question of law for the court to resolve, with the ultimate burden of persuasion on the patentee. [FN44]

*124 Thus, the ultimate burden is on the patentee to prove that the proposed hypothetical claim is, in fact, novel and non-obvious over the prior art. [FN45] More particularly, when a patentee has made a prima facie case of infringement under the doctrine of equivalents by proposing a hypothetical claim that encompasses the accused composition or device, the accused infringer then has the burden of coming forward with evidence showing that the claim is unpatentable over the prior art. [FN46] But, once the accused infringer has satisfied its burden of coming forward with evidence of unpatentability, the patentee must prove that its claim does not encompass the prior art.

The "hypothetical claim" analysis does not provide a patentee with an opportunity to redraft a patent claim in toto, both narrowing and broadening an asserted claim at the same time. Rather, only broadening of a claim is permitted, and no limitations may be added to the claim to provide patentability. [FN47]

Significantly the "hypothetical claim" analysis does permit a patentee to expressly cancel at least some of the limitations in the asserted claim. For the hypothetical claim to encompass the accused product or process, the canceled limitations will be the ones that are not found in the accused product or process. The "hypothetical claim" analysis therefore appears to provide an exception to the "all elements' or "all limitations" rule (provided, of course, that the patentee can show the patentability of the asserted claim lacking the element or limitation missing in the accused product or process).

In addition, the "hypothetical claim" analysis also provides an exception to the general principle that when one does not infringe a particular claim, one cannot infringe any claim dependent thereon. [FN48] Because the dependent claims of a patent contain additional limitations that may impart patentability, it may be possible to broaden these claims by canceling certain other limitations without encompassing the prior art as would happen if the relevant independent claim were broadened in a similar fashion. [FN49]

*125 Although first used by the Federal Circuit in Wilson Sporting Goods in 1990, the "hypothetical claim" analysis has never been widely employed by the courts or litigants and cases resolved by its use represent a significant minority of published decisions. Nevertheless, the "hypothetical claim" analysis remains a valid test for determining infringement under the doctrine of equivalents, as shown by a recent resurgence in the use of this test over the past two years.

For example, in Streamfeeder, LLC v. Sure-Feed Sys., Inc., [FN50] the patent-in-suit involved devices which collate paper for processing, such as in mass mailing, printing and binding. Of the claims at issue, the only independent claim read as follows:

> 1. An apparatus for serially feeding sheets in a forward direction from the bottom of a generally vertical stack of such sheets comprising:
>
> means for supporting the generally vertical stack of sheets and so that the stack defines a forward side composed of aligned forward edges of the sheets, and a bottom, said supporting means including endless belt means and means rotatably mounting said endless belt means so as to have an upper run positioned to extend across the bottom of said stack;
>
> drive means for rotating said endless belt so that said upper run moves in the forward direction; and
>
> means including a stationary gate forming member positioned above said upper run of said belt means and adjacent the forward side of said stack and so as to define a nip which forms a gap between said gate forming member and

said upper run, for permitting the lowermost sheet of the stack to pass forwardly from the stack through said nip, said gate forming member including first surface means facing toward forward side of said stack so as to engage the forward edges of the sheets in the stack, and second surface means at said nip and having a coefficient of friction which is higher than that of said first surface means, and such that the lowermost sheet is free to pass through said nip without significant frictional resistance while the sheet immediately above the lowermost sheet is retarded in moving through said gap by its frictional engagement with said second surface means.

Both the claimed device and the accused infringing device operated by taking a stack of paper and feeding the bottom sheet thereof forward through the machine. A "gate forming member" prevented any additional sheets from being fed with the bottom sheet, thereby permitting the sheets to be processed singly. It was this "gate forming member" that was the element of the claim at issue in the suit, i.e. whether the gate found in the Sure-Feed device was an equivalent of the claimed "gate forming member".

At the district court, Streamfeeder alleged infringement under the doctrine of equivalents using the traditional "function-way-result" tripartite test, and argued that the gate in the Sure-Feed *126 device functioned in the same way, and with the same result, as the claimed "gate forming member". Sure-Feed countered using a "hypothetical claim" analysis, and argued that expanding claim 1 to encompass the Sure-Feed device would also ensnare the prior art.

In response to Sure-Feed's argument, Streamfeeder proposed a hypothetical claim based on claim 1 above, but with the following amendments to the language describing the "gate forming member" (underlined language is added; bracketed language is deleted):

> ... said gate forming member comprising a cylindrical member having a plurality of annular grooves formed inwardly from a periphery thereof at regularly spaced intervals and with elastomeric bands disposed in said annular grooves and including first surface means facing toward forward side of said stack so as to engage the forward edges of the sheets in the stack, and second surface means at said nip [and having a coefficient of friction which is higher than that of said first surface means], said plurality of elastomeric bands and said cylindrical member being arranged to present higher frictional resistance to the forward edges of the sheets at said second surface means than at said first surface means and such that the lowermost sheet is free to pass through said nip without significant frictional resistance while the sheet immediately above the lowermost sheet is retarded in moving through said gap by its frictional engagement with said second surface means.

Thus, Streamfeeder alleged a hypothetical claim in which one limitation, that relating to the "gate forming member" element, was narrowed by reciting specific additional structural elements and another limitation, that relating to the relative friction values of the two surfaces of the gate, was broadened.

The case was eventually tried before a jury, which found that the Sure-Feed device infringed, inter alia, claim 1 under the doctrine of equivalents. On appeal to the Federal Circuit, Sure-Feed asserted that Streamfeeder's hypothetical claim was impermissible because it both narrowed and broadened the claim at issue.

In an opinion by Judge Lourie, the Federal Circuit agreed with Sure-Feed, concluding that "the district court erred ... in adopting Streamfeeder's hypothetical claim, because such a claim impermissibly narrowed the gate member limitation." As grounds for this conclusion, the court noted that "use of a hypothetical claim may permit a minor extension of a claim to cover subject matter that is substantially equivalent to that literally claimed,

one cannot, in the course of litigation and outside the PTO, cut and trim, expanding here, and narrowing there, to arrive at a claim that encompasses and accused device, but avoids the prior art. Slight broadening is permitted at that point, but not narrowing.... Hypothetical claim analysis ... cannot be used to redraft granted claims in litigation by narrowing and broadening a claim at the same time." [FN51]

*127 The Federal Circuit continued by noting that "[w]hen one considers a permissible hypothetical claim in this case, i.e. Streamfeeder's hypothetical claim without the narrowed limitation, it is clear that the hypothetical claim reads on the prior art; Streamfeeder failed to satisfy its ultimate burden of persuasion to the contrary. Sure-Feed satisfied its burden of coming forward with evidence that the hypothetical claim reads on the prior art." Accordingly, the Federal Circuit reversed the decision of the district court, holding that the district court erred in adopting the jury's verdict of infringement under the doctrine of equivalents because the hypothetical claim encompassing Sure- Feed's device was not patentable over the prior art.

A similar result was reached by a slightly different panel of the Federal Circuit (but including Judge Lourie) in Ultra-Tex Surfaces, Inc. v. Hill Bros. Chem. Co. [FN52] In that case, the patent-in-suit related to processes for creating low-cost, ornamental concrete surfaces. The only claim at issue was a dependent claim, which, along with claim 5 from which it depends, read as follows:

5. A process for coating a substrate with a decorative surface comprising mixing a first batch of liquid mortar consisting of a mixture of cement, sand and an aqueous solution of adhesive resin and applying a first layer of said liquid mortar to said surface;

allowing said first layer to cure;

providing a flexible template panel having a pattern of desired grout lines, an adhesive layer and a backing layer;

removing said backing layer to expose said adhesive layer;

securing said template to said first layer;

mixing a second batch of cement, sand and an aqueous solution of adhesive resin including also a color pigment contrasting with the color of said first batch;

applying a second layer of said second batch of liquid mortar over said first layer and said template and allowing said second layer to fully dry;

removing said template with any part of said second layer immediately above said template, and allowing said second layer to finish curing; and

applying a coat of concrete sealer material over said first and second mortar layers.

6. A process as claimed in claim 5 wherein said flexible template is of heavy wax impregnated paper with adhesive backing.

*128 In other words, the claimed process involved mixing a first batch of liquid mortar and applying it to a substrate to form a first mortar layer. After that layer has cured, an adhesive-backed, wax-impregnated template is secured to the first mortar layer by the adhesive. A second batch of mortar is then mixed and applied over the template and first mortar layer to form a second mortar layer, which is allowed to dry before the template is removed. Sealant is finally applied to the final product.

The accused process followed essentially the same steps as recited in claim 6 with one notable exception. While the claimed process required the use of heavy wax impregnated paper as the template material, the accused process employed a polycoat paper.

Following a bench trial, the district court analyzed, inter alia, claim 6 to determine if the accused process infringed under the doctrine of equivalents. Applying the "function-way-result" tripartite test, the district court found that the polycoat paper template used in the accused process was

an equivalent of the claimed heavy wax impregnated paper template. The district court then, however, employed a hypothetical claim analysis to determine that such a range of equivalents would have encompassed the prior art (having found that a polycoat template was simply a paper template coated with polyethylene, the use of which was disclosed in similar prior art processes). The district court therefore held that there was no infringement of claim 6 under the doctrine of equivalents.

In an opinion by Judge Lourie, the Federal Circuit agreed with the district court that the accused process did not infringe claim 6 under the doctrine of equivalents. More specifically, the Federal Circuit agreed that "the [district] court properly held ... that a hypothetical claim covering [the accused] processes would impermissibly ensnare the prior art."

Describing the "hypothetical claim" analysis, the Federal Circuit again noted that "[u]nder a hypothetical claim analysis, a patentee proposes a hypothetical claim that is sufficiently broad in scope to literally encompass the accused product or process. If that claim would have been allowed by the PTO over the prior art, then the prior art does not bar the application of the doctrine of equivalents. Conversely, if that claim would not have been allowed, the prior art bars application of the doctrine and infringement by equivalents may not be found." [FN53] The Federal Circuit further noted, however, that "hypothetical claim analysis is not a vehicle for a patentee to 'freely redraft granted claims' by expanding some limitations in order to read on an accused process or device while narrowing other limitations to avoid prior art."

In the case at bar, Ultra-Tex had proposed the following hypothetical claim based on claims 5 and 6 (underlined language is added; bracketed language is deleted):

> 5. A process for coating a substrate with a decorative surface having clean distinct grout lines comprising mixing a first batch of liquid mortar consisting of a *129 mixture of cement, sand and an aqueous solution of adhesive resin and applying a first layer of said liquid mortar to said surface;
>
> allowing said first layer to cure;
>
> providing a flexible template panel which is substantially impervious to water having a pattern of desired grout lines, an adhesive layer and a backing layer;
>
> removing said backing layer to expose said adhesive layer;
>
> securing said template to said first layer;
>
> mixing a second batch of cement, sand and an aqueous solution of adhesive resin including also a color pigment contrasting with the color of said first batch;
>
> [applying] troweling a second layer of said second batch of liquid mortar over said first layer and said template [and] without first spraying said second batch, within said template said template adheres to said first cemented layer tightly enough to avoid infiltration of the second layer material between the first layer-template bond;
>
> allowing said second layer to fully dry;
>
> removing said template with any part of said second layer immediately above said template[, and] wherein said template withstands mechanical pressure so as to remain intact during removal of the template;
>
> allowing said second layer to finish curing; and
>
> applying a coat of concrete sealer material over said first and second mortar layers.
>
> [6. A process as claimed in claim 5 wherein said flexible template is of heavy wax impregnated paper with adhesive backing.]

Thus, Ultra-Tex proposed a hypothetical claim in which one limitation, that relating to the composition of the flexible template (viz. the "heavy wax-

impregnated paper" element) was deleted and four limitations, three of which related to properties of the flexible template (viz. imperviousness to water, prevention of bleeding, and resistance to tearing), were added.

Considering this hypothetical claim, the Federal Circuit first noted that "Ultra-Tex [has] used hypothetical analysis to 'freely redraft' its claim by impermissibly broadening and narrowing it at the same time, a practice our case law clearly forbids .... Thus, the hypothetical claim is only a device for limited, not substantial, inclusion of unclaimed subject matter and not for the exclusion of unduly limiting subject matter." Based on this analysis, the Federal Circuit concluded that "[t]he claim created by Ultra-Tex does not pass muster."

Moreover, upon review of the district court's decision, the Federal Circuit further concluded that even the (improper) hypothetical claim proposed by Ultra-Tex would not have been patentable over evidence presented by the accused infringer of prior art public uses of processes employing *130 polycoat paper templates. Because Ultra-Tex failed to rebut this evidence, the Federal Circuit concluded that the district court correctly found that the accused process did not infringe Ultra-Tex's patent under the doctrine of equivalents.

Finally, a similar result was also reached by yet another panel of the Federal Circuit in Marquip, Inc. v. Fosber America, Inc., [FN54] wheres the court applied its own hypothetical claim analysis. In that case, the patent-in- suit related to methods and devices for shingling and stacking corrugated paperboard sheets with interrupting the flow thereof. The only device claim at issue read as follows:

> 13. In a device for conveying sheets in succession from a first location along a plurality of separate in-line conveyors to a stacker wherein a vertical stack of a predetermined number of sheets is to be formed, and wherein said plurality of conveyors are traveling at the same speed, the combination comprising:
>
> (a) means for shingling said sheets as they pass said location to form a group of shingled sheets for stacking,
>
> (b) means for increasing the speed of said group of shingled sheets,
>
> (c) and means for slowing each said separate in-line conveyor individually and successively in a downstream direction in response to passage of the trailing end of said group past the end of each respective separate conveyor to thereby slow sheets traveling upstream of said group of sheets.

The difference between the accused device and the patented device was in element (c) of the claim. More specifically, the accused device included an interrupt mechanism between the first and second conveyors of the device (elements (a) and (b) of claim 13), which grasps and holds some sheets to create a gap in the flow thereof (creating a first and second group of sheets). At this time, the first conveyor slows down and the second conveyor speeds up to carry the first group of sheets toward a stacker. When the first group of sheets leaves the second conveyor, its slows down to the speed of the first conveyor and the second group of sheets is released by the interrupt mechanism.

The issue at trial before the district court [FN55] was whether element (c) of the claim covered the interrupt mechanism of the accused device under the doctrine of equivalents (literal infringement having been resolved in an earlier proceeding [FN56]). Although the district court concluded the interrupt mechanism of the accused device performed the result function (slowing the conveyors) and obtained the requisite result (decreasing the speed of the second group of sheets), the district court found that it did so in a "fundamentally different way" than the claimed device. The district court also apparently *131 found that application of the doctrine of

equivalents to encompass the accused device would also ensnare the prior art. Accordingly, the district court granted the accused infringer's motion for summary judgement of non-infringement.

In an opinion by Judge Rader, the Federal Circuit affirmed the district court's grant of summary judgement, but based it on ensnaring the prior art not on the "function-way-result" tripartite test. More specifically, the Federal Circuit noted that "[b]ecause prior art limits the exclusive right available to an inventor [at the PTO], it also limits the range of permissible equivalents of a claim." The Federal Circuit then proceeded to undertake a hypothetical claim analysis, in which element (c) of the claim was construed to cover an interrupt mechanism such as that found in the accused device. The court found, however, that such a device was disclosed in the prior art and so "it would be improper to interpret element (c) of the claims to cover the [accused] device by equivalence because to do so would render the asserted claims unpatentable over the prior art."

The Federal Circuit therefore concluded that "the district court properly held ... that the [accused] device ... does not infringe under the doctrine of equivalents because it uses technology ... already in the prior art." Accordingly, the Federal Circuit affirmed the district court's grant of summary judgement of non-infringement.

As illustrated by these three cases, the "hypothetical claim" analysis theoretically permits a patentee to simply cancel from its asserted claim(s) any element(s) not found in the accused product or process, either literally or under the traditional "function-way-result" tripartite test. If the remaining claim is patentable over the prior art, then infringement may be shown under the doctrine of equivalents. The "hypothetical claim" analysis therefore appears to provide the patentee with a counter to the "all elements" rule, provided, of course, that the missing elements were not required for patentability.

4. Prosecution History Estoppel

Even if a patentee is able to make a prima facie showing of equivalence under the traditional "function-way-result" tripartite test or the "hypothetical claim" analysis, the fourth basic "test" employed by the Federal Circuit may be used by the accused infringer to show that the difference(s) between the claim and the accused product or process are such that there can be no infringement under the doctrine of equivalents based on the prosecution history of the patent-in-suit.

More specifically, the doctrine of prosecution history estoppel precludes a patent owner from obtaining a claim construction that would resurrect subject matter surrendered during prosecution *132 of its patent application. [FN57] If, during prosecution of the application for patent, the patentee indicated that a claim was distinguishable over the prior art by virtue of a particular interpretation to be given to language of the claim, or by the addition of new limitations to the claim, then the claim will thereafter be so limited and cannot be interpreted to include that which had clearly been surrendered to get the claim allowed. [FN58] Indeed, "the prosecution history (or file wrapper) limits the interpretation of claims so as to exclude any interpretation that may have been disclaimed or disavowed during prosecution in order to obtain claim allowance." [FN59]

The doctrine of prosecution history estoppel applies both to claim amendments made to overcome rejections based on prior art and to arguments submitted to obtain the patent. [FN60] In other words, whenever a patentee tries to utilize the doctrine of equivalents in an infringement suit to extend the scope of its claims, it cannot recapture claim scope which it has surrendered by amendment or by argument which limited the interpretation of

language used therein. [FN61] The patentee's arguments to enlarge the scope of its claims by application of the doctrine of equivalents are, in effect, open to rebuttal based on both the patentee's claim amendments and its express statements made during prosecution. [FN62]

Not all claim amendments, however, necessarily result in an estoppel under this doctrine, such as where an amendment was "not required in response to an examiner's rejection or critical to the allowance of the claims, no estoppel has been found." [FN63] Where amendments are made, however, for *133 both substantive and formal reasons, then those amendments give rise to estoppel based on their substantive nature. [FN64]

Moreover, there is no "mechanical rule for determining prosecution history estoppel's effect on the range of equivalents." [FN65] After reviewing the prior art and the language and purpose of the amendment in order to determine the range of equivalents (if any): "'a close examination must [then] be made as to, not only what was surrendered, but also the reason for such a surrender;' the fact that claims were narrowed 'does not always mean that the doctrine of file history estoppel completely prohibits a patentee from recapturing some of what was originally claimed."' [FN66]

The scope of prosecution history estoppel is evaluated from the perspective of a reasonable competitor, i.e., "[t]he legal standard for determining what subject matter was relinquished is an objective one, measured from the vantage point of what a competitor was reasonably entitled to conclude, from the prosecution history, that the applicant gave up to procure issuance of the patent." [FN67] If the prosecution history contains evidence that a particular amendment was "related to patentability," then prosecution history estoppel applies to that element of the claim. [FN68] In such cases, application of prosecution history estoppel does not preclude application of the doctrine of equivalents, but rather limits the range of equivalents that may be allowed. [FN69]

Conversely, if the prosecution history contains evidence that a particular amendment was not "related to patentability," the prosecution history estoppel does not apply to that element absent a *134 "clear and unmistakable surrender" of the subject matter. [FN70] If, however, the prosecution history does not contain any apparent reason as to why a particular amendment was made, it is presumed that the amendment was related to patentability. [FN71]

There are a number of cases in the past two years in which the issue of infringement under the doctrine of equivalents was resolved by application of prosecution history estoppel. Indeed, prosecution history estoppel is now alleged as a defense to a charge of infringement under the doctrine of equivalents almost as a matter of course, because, if successful, it appears to be an absolute bar to liability, even if infringement has been shown by one of the other tests discussed above.

For example, in Merck & Co. v. Mylan Pharmaceuticals, Inc., [FN72] the patents-in-suit related to a controlled release formulation of a combination of drugs used to treat Parkinson's disease. The particular combination of drugs and their therapeutic use had been known in the prior art, as had been the desirability of the controlled release of these drugs and certain polymeric vehicles which could be used for controlled release. The relevant claims of the two patents-in-suit read as follows:

> 1. A controlled release oral dosage formulation comprising a uniform dispersion of 25-100 mg of carbidopa, 100 to 400 mg of levodopa, 1-10 mg of a tablet lubricant and in mixture thereof with a pharmaceutically acceptable dye, in a polymer vehicle comprising 5-25 mg of water-soluble hydroxypropyl cellulose polymer, and 2-50 mg of a less water-soluble polyvinyl acetate-crotonic acid copolymer, whereby following administration the carbidopa and levodopa are released slowly and simultaneously from the formulation.

1. A controlled release oral dosage formulation comprising a uniform dispersion of 25-100 mg of carbidopa and 100 to 400 mg of levodopa in a polymer vehicle comprising 5-25 mg of a water-soluble hydroxypropyl cellulose polymer, and 2-50 mg of a less water-soluble polyvinyl acetate-crotonic acid copolymer whereby, following administration, the carbidopa and levodopa are released slowly and simultaneously from the formulation.

The allegedly infringing product contained 50 mg of carbidopa and 200 mg of levodopa (the active ingredients) in a vehicle containing 29.3 mg of hydroxypropyl cellulose (HPC) and 12.8 mg of hydroxypropyl methylcellulose (HPMC).

*135 Because the allegedly infringing product did not contain each of the ingredients recited in either of the claims at issue, literal infringement was not alleged by the patentee from the outset. Rather, the patentee alleged infringement under the doctrine of equivalents on the grounds that the difference between the claimed formulation and the accused product was insubstantial and that HPMC and PVACA (the polymer in the claimed formulation) were interchangeable.

At the district court, [FN73] the accused infringer did not expend much effort to dispute the allegations of insubstantial differences and interchangeability, but rather moved for summary judgment of non-infringement based on prosecution history estoppel. The district court agreed and granted summary judgment of non-infringement on both patents. In particular, the district court ruled that the patentee had surrendered coverage of an HPC/HPMC formulation during prosecution of the applications that gave rise to the patents-in-suit, by amending and narrowing claims in response to rejections over prior art.

On appeal, the Federal Circuit noted that the claims originally filed in the applications that gave rise to the patents-in-suit were broad enough to literally encompass the accused formulation. The Federal Circuit further noted that the specific polymers (HPC/HPMC) used in the accused formulation were originally presented in a Markush group with the claimed polymers (HPC/PVACA) during prosecution, and subsequently canceled. Although the patentee argued that the claim amendments were made for reasons other than patentability, the Federal Circuit nevertheless "conclude[d] that the most reasonable reading of the prosecution history is that [the patentee's] actions in limiting all of the claims of both patents to a single species of combined polymer vehicle, without further pursuit of broader polymer claims, were primarily" for purposes of distinguishing over the prior art.

The Federal Circuit therefore concluded that prosecution history estoppel would apply. The issue to be resolved then was the scope of that prosecution history estoppel, as "estoppel is not automatic as to everything beyond the literal scope of the claim; its extent must be determined from what was relinquished, in light of the prior art." Because in this case the patentee's original claims had included the particular polymers used in the accused formulation and these specific polymers were canceled by amendment in response to a prior art rejection, the Federal Circuit "affirm[ed] the district court's ruling that [the patentee] is estopped to assert infringement by the HPC/HPMC combination, under the doctrine of equivalents ...."

Similarly, in Bayer AG v. Elan Pharmaceutical Res. Corp., [FN74] the patent-in-suit related to a solid pharmaceutical formulations, such as tablets, of nifedipine, a drug used to treat hypertension. The patent-in-suit more particularly related to pharmaceutical formulations in which the nifedipine *136 crystals had a defined "specific surface area" (SSA). The relevant claims of the patent-in-suit all included a specific SSA range; claim 1, which is representative, read as follows:

1. A solid pharmaceutical composition comprising as the active ingredient an effective amount of nifedipine crystals with a specific surface area of 1.0 to 4m2/g, in admixture with a solid diluent, to result in a sustained release of nifedipine.

This specific SSA range allegedly solved the problem of the poor solubility of nifediine without compromising the long-term bioavailability thereof

The accused infringer had submitted an Abbreviated New Drug Application ("ANDA") to the U.S. Food & Drug Administration ("FDA") seeking approval to market a generic version of the patentee's commercial product. With this ANDA, the accused infringer submitted a Certificate of Quality and Analysis for the active nifedipine in the generic version, which showed that the nifedipine crystals in the generic version had a SSA of 6.15m2/g. The accused infringer further stated to the FDA that it would not use nifedipine crystals having a SSA of less than 5m2/g in its generic version.

At the district court, [FN75] the accused infringer moved for summary judgement of non-infringement, both literally and under the doctrine of equivalents. With respect to literal infringement, the district court noted that the ANDA specified the nifedipine crystals had a SSA of not less than 5m 2/g and the patentee had offered no contrary evidence. With respect to infringement under the doctrine of equivalents, the district court concluded that "during prosecution, [the patentee] had surrendered claim coverage to nifedipine crystals beyond the range of 1.0 to 4m2/g." In support of this conclusion, the district court noted that the patentee had both (i) amended the claims to narrow the SSA range from 1.0 to 6m2/g down to 1.0 to 4m2/g, and (ii) made arguments in support of patentability "that constituted 'clear and unmistakable surrender' of subject matter outside of the claimed range of 1.0 to 4m2/g." Accordingly, the district court granted the motion for summary judgment of non-infringement.

On appeal, the Federal Circuit affirmed the district court's grant of summary judgment of non-infringement, both literally and under the doctrine of equivalents. With respect to the doctrine of equivalents, the Federal Circuit noted that "[Even i]f an asserted claim does not literally read on an accused product, infringement may still occur under the doctrine of equivalents if there is not a substantial difference between the limitations of the claim and the accused product." The Federal Circuit further noted, however, that "[p] rosecution history estoppel is one limitation on the scope of equivalents that a patentee can claim under the doctrine of equivalents."

Turning to the specific facts in the case at bar, the Federal Circuit concluded "that a competitor looking at the prosecution history as a whole would reasonably believe that [the patentee] *137 surrendered SSAs above 4m 2/g." In support of this conclusion, the Federal Circuit noted that "before the PTO, [the patentee] made affirmative statements about the superiority of the 1.0 to 4m2/g SSA range. After amending its claims to cover a SSA range of 1.0 to 4m2/g, [the patentee] asserted that it claimed 'a special form of nifedipine, namely, having a specific surface area of 1.0 to 4m2/g,' and it stated that 1.0 to 4m2/g was a superior, inventive range." [FN76] These statements "in total, amount to a 'clear and unmistakable surrender,' so that a competitor would reasonably believe that [the patentee] had surrendered SSAs outside the claimed range." The Federal Circuit therefore affirmed the district court's grant of judgment in favor of the accused infringer.

Finally, in Sextant Avionique, S.A. v. Analog Devices, Inc., [FN77] the patents-in-suit related to small devices capable of detecting acceleration and which are useful in avionic and automotive applications. Two patents were being asserted, one of which was disclosed in its specification to constitute an improvement over the other. A representative claim of the improvement patent read as follows:

1. An accelerometer sensor comprising

a flat pendular structure made from one and the same crystalline wafer, said structure having in a same plane[] a flat fixed part, at least two parallel blades flexible in the same plane and delimiting there between a space, each of said blades having a first end portion fixedly connected to said fixed part, and a second end portion, said structure further comprising a flat test body connected to the second end portions of said blades so as to be suspended from the flat fixed part and to be able to move in translation in the same plane along a sensitive axis under the effect of an acceleration with a position which varies in relation with said acceleration, said flat test body extending at least partially into said space,

wherein said flat test body comprises at least a first edge which carries a first metallization having first and second opposite faces and said flat fixed part comprises at least a second and third edge carrying respectively a second and third metallizations, said second and third metallizations respectively facing said first and second opposite faces, so as to form capacitors whose capacities vary depending on the position of said test body, said first metallization being brought to a first voltage V sub0 , whereas the second and the third metallizations are respectively brought to a second and third voltages V sub1 and V sub2 which are capable of generating an electrostatic return force on the flat test body.

*138 The accused infringing devices used a doped polysilicon layer for those structures corresponding to the test body and blades of the claims.

At the district court, the accused infringer moved for summary judgement of non-infringement and for a construction of certain claim limitations. Of interest here, the district court "construed the term 'metallization' to mean a deposited metallic material" and thereafter granted the motion for summary judgment of no literal infringement because the accused devices used doped polysilicon instead of a deposited metallic layer.

The accused infringer later moved for JMOL on the grounds that prosecution history estoppel precluded the patentee from asserting infringement of either patent-in-suit under the doctrine of equivalents. This motion was granted by the district court.

As grounds for granting the motion for JMOL, the district court noted, with respect to the basic patent, that the patentee "added the 'metallization' limitations to his patent to distinguish [over cited prior art] and by so doing, it surrendered an accelerometer in which the test body and attachment means are conductive without the addition of an additional deposited metal layer. The Court furthermore found that [the] accused devices are conductive without the addition of a deposited metal layer and therefore fell within the scope of the "metallization' estoppel." The district court therefore concluded that the patentee "[wa]s estopped from claiming infringement under the doctrine of equivalents as to the 'metallization' element of the ... patent claims."

With respect to the improvement patent, the district court "concluded that the estoppels present in the [basic patent] file history were applicable to limit the scope of equivalence of the same claim terms in the [improvement] patent." This conclusion was based on the grounds that "[i]t appears that [the patentee's] intent in adding these terms was to secure quick allowance of the [improvement] application and to avoid the objections raised during [the] prosecution of [the basic] patent. Under these circumstances, the Court finds that [the patentee] should be estopped from asserting infringement under the doctrine of equivalents against [the accused infringer] as to these claim elements."

On appeal, the Federal Circuit affirmed the district court's grant of judgment of non-infringement, both literally and under the doctrine of equivalents.

With respect to the issue of infringement of the basic patent under the doctrine of equivalents, the Federal Circuit noted that "it is clear that [the patentee] is estopped from asserting that [the accused] devices employing doped silicon are equivalent to the 'metallization' of the claims. As noted above, [the patentee's] 'metallization' limitation was added in response to the examiner's citation of [prior art], which disclosed the use of doped silicon. In addition to the amendment, [the patentee] argued that its claim was distinguishable over [the cited art] because [the cited art]'s capacitor plate 'comprise[d] monocrystalline silicon heavily doped with boron ... without metallizations."'

The Federal Circuit therefore concluded that "[t]he effect of [the patentee's] amendment and argument was clearly to surrender silicon materials made conductive by doping. [The accused] doped-polysilicon devices thus fall within the scope of the estoppel and therefore do not infringe the *139 [basic] patent under the doctrine of equivalents." Accordingly, the Federal Circuit held that the district court had not erred in granting judgement to the accused infringer as a matter of law that there was no infringement under the doctrine of equivalents.

With respect to the issue of infringement of the improvement patent under the doctrine of equivalents, the Federal Circuit noted that "this case involves the situation in which the prosecution history of [the improvement patent] does not disclose the reason for the addition of the 'metallization' limitation.... [A] ddition of this limitation was not necessary to overcome the prior art rejection ... that was pending at the time of the amendment[, which] disclosed this exact arrangement ...." The Federal Circuit therefore concluded that "we must, under Warner-Jenkinson, rebuttably presume that this limitation was added for a reason 'related to patentability' and that prosecution history estoppel applies to limit the range of equivalents that might otherwise be affordable to the 'metallization' limitation."

As to the scope of the estoppel arising from this amendment and the presumption that it was related to patentability, the Federal Circuit noted that:

> in the circumstance in which a presumption is operative, because the record is unclear concerning the reason for an amendment, it is unlikely that the prior art or the patentee's arguments, if any, will be of assistance in an estoppel analysis. The lack of relevant information concerning the scope of surrendered subject matter is further exacerbated if the patentee does not provide clarification during rebuttal. Indeed, this case is an example of the futility of a scope analysis in the circumstance in which the presumption is operative. Unguided by the prosecution history, the prior art, applicant's argument during prosecution, and sufficient evidence in rebuttal to the presumption, we have no way to set reasonable limits on how far beyond the literal scope of the term 'metallization' the estoppel will allow the doctrine of equivalents to reach. We can expect reasonable competitors assessing the file history of [the improvement patent] to be equally puzzled as to the scope of any potential estoppel. Thus, it is logical and fair that prosecution history estoppel arising from the operation of the Warner-Jenkinson presumption allows the doctrine of equivalents no room to operate. Finding the Supreme Court's language clear, we hold that in circumstances in which the Warner-Jenkinson presumption is applicable, i.e., where the reason for an amendment is unclear from an analysis of the prosecution history record, and unrebutted by the patentee, the prosecution history estoppel arising therefrom is total and completely 'bars' the application of the doctrine of equivalents as to the amended limitation.

Accordingly, the Federal Circuit held that the district court had not erred in granting judgement to the accused infringer as a matter of law because the patentee "could not show equivalency to the 'metallization' limitation."

Thus, as these cases illustrate, prosecution history estoppel can be a powerful tool for an accused infringer, as it represents a bar to a finding of infringement under the doctrine of equivalents, even if the patentee has presented proof of insubstantial differences using one of the other tests.

*140 B. Some Considerations for Litigation

As may be seen from a review of the cases over the past few years, including those discussed above, the choice of test for proving (or disproving) infringement under the doctrine of equivalents can be a significant factor in determining one's success in the courts.

A simple but convenient way to reconcile the above four tests with one another is to look on each as providing evidence of either a substantial or an insubstantial difference between the claimed invention and the accused product or process. For example, a showing that an element in an accused product performs a substantially different function than the asserted element in the claimed invention, or performs the same function but in a substantially different way or to obtain a substantially different result, is clearly evidence of a more than insubstantial difference between the accused product and the claimed invention. Similarly, a showing that a particular element of the claim is completely missing is also evidence of a more than insubstantial difference between the accused product and the claimed invention.

With respect to prosecution history estoppel, a showing that a particular element of the claim was necessary for patentability, whether added by amendment, argued during prosecution or arising from the Warner-Jenkinson presumption, may be viewed as evidence that an accused product lacking that specific element is more than insubstantially different from the claimed invention. In other words, the actions of the patentee during prosecution can give special status to certain elements that makes any deviation therefore a substantial difference.

Likewise, with respect to a hypothetical claim analysis, a showing that a hypothetical claim that encompasses the accused product but does not ensnare the prior art may also be view as evidence that the difference between the claimed invention and the hypothetical claim (and hence the accused product) is an insubstantial difference, i.e. because the element omitted in the hypothetical claim was not necessary for patentability.

In terms of enforcement, the patentee's choice of tests for proving infringement under the insubstantial differences standard is essentially limited either to the traditional function-way-result tripartite test or to a hypothetical claim analysis. [FN78] That is, the patentee may show infringement by proving that each element of the claim finds an element in the accused product that performs substantially the same function in substantially the same way to achieve substantially the same result. Alternatively, the patentee may show infringement by proving that a hypothetical claim derived from *141 one of the patent claims encompasses the accused product but does not ensnare the prior art. Given the current state of the hypothetical claim analysis, it is advantageous to look to dependent claims with a significant number of limitations such that cancellation of certain limitations to encompass the accused device does not render the resulting hypothetical claim unpatentable.

The accused infringer, however, can avoid a conclusion of infringement under the doctrine of equivalents using any one of the above tests. An accused infringer may therefore choose to confront the allegation of infringement directly and challenge the showing made by the patentee under either the traditional tripartite test or a hypothetical claim analysis.

Alternatively, an accused infringer may choose to show non-equivalence under one or more of the other tests.

Thus, for example, an accused infringer facing an allegation of infringement based on a showing of insubstantial differences under the function-way-result tripartite test may choose to challenge that showing directly and attack the patentee's proofs of substantial similar function-way-result concerning whatever element(s) is (are) not literally found in the claim. Indeed, when using the traditional function-way-result tripartite test, a showing of a substantial difference in any one of the three prongs -- a substantially different function or a substantially different way or a substantially different result -- is sufficient to show non-equivalence and, consequently, non-infringement.

Alternatively, the same accused infringer may choose to use one of the other tests, viz. a hypothetical claim analysis, the all elements rule or prosecution history estoppel, to rebut the prima facie showing of equivalence by the patentee. The accused infringer, for example, may show that a hypothetical claim based on the claim asserted as infringed and encompassing the accused product is not patentable over the prior art. That same accused infringer may also show that the patentee is estopped from asserting the equivalence of the element not literally met based on an amendment and/or an argument made during prosecution of the patent-in-suit at the PTO.

Indeed, the prudent accused infringer will assert as many of the alternative tests that support its position, as well as attacking the patentee's if possible, so as to maximize the accused infringer's chances of success at trial. Of significant importance, it would appear that a successful showing of non-equivalence under any of the above four tests is sufficient to avoid infringement, irrespective of whether there is a showing of equivalence under any, or indeed all, of the other tests. That is, a showing of a single "substantial difference" using any of the above tests appears to be sufficient to rebut an up to three-fold showing of "insubstantial differences" by the other tests!

For example, as shown by the decision in Streamfeeder, a prima facie showing of equivalence using the traditional function-way-result tripartite test can be successfully rebutted using a hypothetical claim analysis showing non- equivalence, i.e. that every hypothetical claim that encompasses the accused product or process also ensnares the prior art. Moreover, there is no reason to believe that the converse is not also true, i.e. that a prima facie showing of equivalence using a hypothetical claim analysis can be successfully rebutted using the traditional function-way-result tripartite test, or, indeed, prosecution history estoppel or the all elements rule. Nor, as also shown by Streamfeeder, do the courts appear obligated to employ the test of equivalence asserted by the patentee.

*142 A similar result was also achieved by the accused infringer in Ethicon. In that case, while the patentee asserted infringement under the "function-way-result" tripartite test (and its alter ego - interchangeability), the accused infringer countered with the all elements rule. Finding that equivalence would require the vitiation of a particular claim limitation, the Federal Circuit concluded that there was no infringement under the doctrine of equivalents. The Federal Circuit appears to have reached this conclusion without regard to whether or not equivalence could have been shown under the function-way-result tripartite test. Again, this tacitly suggests that a showing of non-equivalence under one test is sufficient for the accused infringer to prevail.

It is therefore of paramount importance for an accused infringer to look at all four tests that may be employed for determining infringement under the doctrine of equivalents and not to rely solely on the theory being asserted by the patentee. Based on a review of the decisions over the past two years,

it appears that the courts are not bound by the assertions of the patentee and can look to any of the tests promulgated by the Federal Circuit in resolving the issue of equivalency. Moreover, because it appears that a successful showing of substantial differences under any one of the four potential tests is sufficient to show non-infringement, the accused infringer should not neglect a defense based on only one of the tests, even if each of the other three tests leads to a conclusion of insubstantial differences.

III. Conclusion

Since the decision by the Supreme Court in Warner-Jenkinson, the standard for proving infringement under the doctrine or equivalences has been whether the difference(s) between the claimed invention and the accused product or process was (were) insubstantial. Four tests have subsequently evolved for showing that a difference is or is not substantial: (i) the function-way-result tripartite test; (ii) the all elements rule; (iii) the hypothetical claim analysis; and, (iv) prosecution history estoppel.

In a case involving an allegation of infringement under the doctrine of equivalents, the initial challenge is faced by the patentee. First, it is the patentee who must prove that the differences between the elements of the claimed invention and those of the accused product or process are insubstantial by making out at least a prima facie showing of equivalence using the function- way-result tripartite test or a hypothetical claim analysis. In addition, that same patentee must be prepared to face a challenge based on one or more of the other tests; as well as, or in the alternative to, the test asserted by the patentee. Accordingly, it is incumbent upon the patentee to prepare before suit, examining each of the above tests as it may apply to the specifics of the patent to be asserted and the product or process alleged to infringe the claims.

For the accused infringer, however, it is also equally important to consider all of the tests and their application to the specific facts involved. Although a showing of non-equivalence under any one of the above tests appears to be sufficient to rebut a prima facie showing of equivalence, it is incumbent upon the accused infringer to assert as many of the above tests as may be applicable in order to maximize the chance for success.

*143 Thus, the key to success in any infringement case involving the doctrine of equivalents is to focus the court's attention on the test (or tests) that provides the desired result, i.e. equivalence or non-equivalence. Each party needs to do this analysis as early in the case as possible so that discovery and proofs are directed at the desire goal.

[FN1]. The authors are patent attorneys with the Washington, D.C. intellectual property specialty firm of Sterne, Kessler, Goldstein & Fox, P.L.L.C. The opinions expressed herein are solely those of the authors based on the published decisions of the United States Court of Appeals for the Federal Circuit from June 1998 to June 2000, and do not necessarily reflect the views of their law firm or their clients. The authors can be reached by telephone at (202) 371-2600 or by e-mail at rsterne@skgf.com and dmcphail@skgf.com, respectively. (c) 2000, Sterne, Kessler, Goldstein & Fox, P.L.L.C., all rights reserved worldwide.

[FN2]. See 35 U.S.C. ¤ 271(a).

[FN3]. See Corning Glass Works v. Sumitomo Elec., 868 F.2d 1251, 1254, 9 USPQ2d 1962, 1967 (Fed. Cir. 1989).

[FN4]. See, e.g., Cole v. Kimberly-Clark Corp., 102 F.3d 524, 532, 41 USPQ2d 1001, 1007 (Fed. Cir. 1996), cert. denied, 522 U.S. 812 (1997).

[FN5]. See, e.g., Lewmar Marine, Inc. v. Barient, Inc., 827 F.2d 744, 3 USPQ2d 1766 (Fed. Cir. 1987) ("That which would literally infringe if later in time anticipates if earlier than the date of invention.").

[FN6]. See Markman v. Westview Instruments, Inc., 52 F.3d 967, 976-80, 34 USPQ2d 1321, 1326-30 (Fed. Cir. 1995) (en banc), aff'd, 517 U.S. 370, 38 USPQ2d 1461 (1996); see also Novo Nordisk of N. Am., Inc. v. Genentech, Inc., 77 F.3d 1364, 1367-68, 37 USPQ2d 1773, 1776 (Fed. Cir. 1997).

[FN7]. See Markman, 52 F.3d at 976, 34 USPQ2d at 1326.

[FN8]. See 35 U.S.C. ¤ 282.

[FN9]. See, e.g., Modine Mfg. Co. v. Allen Group, Inc., 917 F.2d 538, 16 USPQ2d 1622 (Fed. Cir. 1990), cert. denied, 500 U.S. 918 (1991 ("An express finding of willful infringement is a sufficient bases for classifying a case as 'exceptional,' and indeed, when a trial court denies attorney fees in spite of a finding of willful infringement, the court must explain whey the case is not 'exceptional' within the meaning of 35 U.S.C. Section 285.").

[FN10]. Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 607-08, 85 USPQ 328, 330 (1950).

[FN11]. See 35 U.S.C. ¤ 112, ¦ 2.

[FN12]. 520 U.S. 17, 41 USPQ2d 1865 (1997).

[FN13]. Graver Tank, 339 U.S. at 608, 85 USPQ at 330.

[FN14]. See Dolly, Inc. v. Spalding & Evenflo Cos., Inc., 16 F.3d 394, 400, 29 USPQ2d 1767, 1771 (Fed. Cir. 1994).

[FN15]. Dolly, 16 F.3d at 400, 29 USPQ2d at 1771. Thus, the structure is as important as the function and the result.

[FN16]. See Hilton Davis, 62 F.3d at 1519, 35 USPQ2d at 1646.

[FN17]. Graver Tank, 339 U.S. at 609, 85 USPQ at 16.

[FN18]. See Corning Glass Works v. Sumitomo Elec. U.S.A., Inc., 868 F.2d 1251, 1261, 9 USPQ2d 1962, 1967 (Fed. Cir. 1989).

[FN19]. Warner-Jenkinson, 520 U.S. at 36, 41 USPQ2d at 1874.

[FN20]. Warner-Jenkinson, 520 U.S. at 37, 41 USPQ at 1874. But what if the patentee knew of the interchangeability at the time of filing of the patent application but failed to include it in the description of the invention -- does that cut back on the scope of equivalents?

[FN21]. 209 F.3d 1337, 54 USPQ2d 1437 (Fed. Cir. 2000).

[FN22]. 208 F.3d 1352, 54USPQ2d 1308 (Fed. Cir. 2000).

[FN23]. 93 F. Supp. 2d 563 (D.N.J. 1998).

[FN24]. 181 F.3d 1291, 50USPQ2d 1900 (Fed. Cir. 1999).

[FN25]. See Sun Studs, Inc. v. ATA Equip. Leasing Inc., 872 F.2d 978, 10 USPQ2d 1338 (Fed. Cir. 1989) ("One-to-one correspondence of components is not required, and elements or steps may combined without ipso facto loss of equivalency."). One-to-one correspondence often is not the case in certain technologies, such as electronics, where hardware and software implementations produce the same functions and results using different components.

[FN26]. 833 F.2d 931, 4 USPQ2d 1737 (Fed. Cir. 1987) (en banc), cert. denied, 485 U.S. 961, 485 U.S. 1009 (1988).

[FN27]. Warner-Jenkinson, 520 U.S. at 29, 41 USPQ2d at 1871 (emphasis added).

[FN28]. See Athletic Alternatives, 73 F.3d at 1582, 37 USPQ2d at 1373.

[FN29]. Corning Glass Works v. Sumitomo Elec., 868 F.2d 1251, 1260, 9 USPQ2d 1962, 1969 (Fed. Cir. 1989) (emphasis added).

[FN30]. See Corning Glass, 868 F.2d at 1260-61, 9 USPQ2d at 1969 (finding a claim to coated fibers with a positive dopant in core was infringed under doctrine of equivalents by coated fibers having negative dopant in coating).

[FN31]. 149 F.3d 1309, 47 USPQ2d 1272 (Fed. Cir. 1998).

[FN32]. See Ethicon Endo-Surgery, Inc. v. United States Surgical Corp., 93 F.3d 1572, 40 USPQ2d 1019 (Fed. Cir. 1996).

[FN33]. 206 F.3d 1408, 54 USPQ2d 1141 (Fed. Cir. 2000).

[FN34]. Barracuda International Corp. v. Hoffinger Indus., Inc., 4 F. Supp. 2d 1188 (N.D.Ga. 1998).

[FN35]. 126 F.3d 1420, 44 USPQ2d 1103 (Fed. Cir. 1997).

[FN36]. 181 F.3d 1313, 50 USPQ2d 1865 (Fed. Cir. 1999).

[FN37]. Loral Fairchild Corp. v. Victor Co. of Japan, Ltd., 931 F. Supp. 1014 (E.D.N.Y. 1996).

[FN38]. See Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 172 F.3d 1361, 50 USPQ2d 1385 (Fed. Cir. 1999) ("[C]ompliance with the all-elements rule [i]s a question for the court, first identifying the claim elements as a matter of construction of the claim, and then determining the correspondence of these elements, or limitations, with the components or steps of the accused device or process.") (citations omitted).

[FN39]. 904 F.2d 677, 684, 14 USPQ2d 1942, 1948 (Fed. Cir.), cert. denied, 498 U.S. 992 (1990).

[FN40]. See Key Mfg. Group, Inc. v. Microdot, Inc., 925 F.2d 1444, 1449, 17 USPQ2d 1806, 1810 (Fed. Cir. 1991).

[FN41]. See Wilson, 904 F.3d at 684, 14 USPQ2d at 1948.

[FN42]. See Wilson, 904 F.2d at 684, 14 USPQ2d at 1948.

[FN43]. See Key Mfg., 925 F.2d at 1449, 17 USPQ2d at 1810.

[FN44]. See Wilson, 904 F.2d at 683, 14 USPQ2d at 1948.

[FN45]. See Wilson, 904 F.2d at 685, 14 USPQ2d at 1948-49.

[FN46]. See National Presto Indus., Inc. v. West Bend Co., 76 F.3d 1185, 1192, 37 USPQ2d 1685, 1689 (Fed. Cir. 1996).

[FN47]. See Jurgens v. McKasy, 927 F.2d 1552, 1561, 18 USPQ2d 1031, 1038 (Fed. Cir.) ("[I]t may be helpful to 'conceptualize' the prior art limitation on the doctrine of equivalents by envisioning a hypothetical patent claim - similar to the asserted claim but broad enough to literally cover the accused products - and testing whether that claim would have been patentable in view of the prior art."), cert. denied, 502 U.S. 902 (1991).

[FN48]. See, e.g., Wahpeton Canvas Co. v. Frontier, Inc., 870 F.2d 1546, 1552 n.9, 10 USPQ2d 1201, 1207 n.9 (Fed. Cir. 1989) ("One who does not infringe an independent claim cannot infringe a claim dependent on (and thus containing all the limitations of) that claim.").

[FN49]. See Wilson, 904 F.2d at 686, 14 USPQ2d at 1949.

[FN50]. 175 F.3d 974, 50 USPQ2d 1515 (Fed. Cir. 1999)

[FN51]. See Jurgens v. McKasy, 927 F.2d 1552, 1561, 18 USPQ2d 1031, 1038 (Fed. Cir. 1991) ("[I]t may be helpful to 'conceptualize' the prior art limitation on the doctrine of equivalents by envisioning a hypothetical patent claim -- similar to the asserted claim but broad enough to literally cover the accused products -- and testing whether that claim would have been patentable in view of the prior art.").

[FN52]. 204 F.3d 1360, 53 USPQ2d 1892 (Fed. Cir. 2000)

[FN53]. With respect to the burden of proving the patentability of the proposed hypothetical claim, the Federal Circuit held that "while the accused infringer must come forward with evidence that the hypothetical claim reads on the prior art, once the patentee has made out a prima facie case of infringement by equivalence, the ultimate burden of persuasion rests on the patentee to show that the hypothetical claim does not read on the prior art [asserted by the accused infringer]."

[FN54]. 198 F.3d 1363, 53 USPQ2d 1015 (Fed. Cir. 1999).

[FN55]. 30 F. Supp. 2d 1142 (W.D.Wis. 1998).

[FN56]. See Marquip, Inc. v. Fosber America, Inc., No. 97-1441, 1998 U.S. App. LEXIS 27136 (Fed. Cir. 1998).

[FN57]. See Sextant Avionique, 172 F.3d at 826, 49 USPQ2d at 1870; see also Thomas & Betts Corp. v. Litton Sys., Inc., 720 F.2d 1572, 1579, 220 USPQ 1, 6 (Fed. Cir. 1983).

[FN58]. See Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1460, 46 USPQ2d 1169, 1178 (Fed. Cir. 1998) (en banc).

[FN59]. See Standard Oil Co. v. American Cyanamid Co., 774 F.2d 448, 452, 227 USPQ 293, 296 (Fed. Cir. 1985).

[FN60]. See Texas Instruments, Inc. v. United States Int'l Trade Comm'n, 988 F.2d 1165, 1174, 26 USPQ2d 1018, 1025 (Fed. Cir. 1993); see also Hoganas AB v. Dresser Indus., Inc., 9 F.3d 948, 28 USPQ2d 1936 (Fed. Cir. 1993).

[FN61]. See Hughes Aircraft Co. v. United States, 140 F.3d 1470, 1476, 46 USPQ2d 1285, 1290 (Fed. Cir. 1998), cert. denied, 119 S. Ct. 1112 (1999).

[FN62]. See Caterpillar Tractor Co. v. Berco, S.p.A., 714 F.2d 1110, 219 USPQ 185 (Fed. Cir. 1983); see also Coleco Indus., Inc. v. United States Int'l Trade Comm'n, 573 F.2d 1247, 197 USPQ 472 (CCPA 1978).

[FN63]. Mannesmann Demag Corp. v. Engineered Metal Prods. Co., 793 F.2d 1279, 1285, 230 USPQ 45, 48 (Fed. Cir. 1986).

[FN64]. See Environmental Instruments, Inc. v. Sutron Corp., 877 F.2d 1561, 11 USPQ2d 1132 (Fed. Cir. 1989).

[FN65]. LaBounty Mfg., Inc. v. United States Int'l Trade Comm'n, 867 F.2d 1572, 1576, 9 USPQ2d 1995, 1999 (Fed. Cir. 1989).

[FN66]. LaBounty Mfg., 867 F.2d at 1576, 9 USPQ2d at 1999 (quoting Loctite Corp. v. Ultraseal Ltd., 781 F.2d 861, 871, 228 USPQ 90, 96 (Fed. Cir. 1985)); see also Bayer Aktiengesellschaft v. Duphar Int'l Research B.V., 738 F.2d 1237, 1243, 222 USPQ 649, 653 (Fed. Cir. 1984); Hilton Davis, 62 F.3d at 1525, 35 USPQ2d at 1651.

[FN67]. Haynes Int'l, Inc. v. Jessop Steel Co., 8 F.3d 1573, 1578, 28 USPQ2d 1652, 1656 (Fed. Cir. 1993), modified on reh'g, 15 F.3d 1076, 29 USPQ2d 1158 (Fed. Cir. 1994); see also Sextant Avionique, 172 F.3d at 826- 27, 49 USPQ2d at 1875.

[FN68]. See Warner-Jenkinson, 520 U.S. at 30, 117 S.Ct. at 1049-50, 41 USPQ2d at 1871-72; Bai v. L & L Wings, Inc., 160 F.3d 1350, 1355, 48 USPQ2d 1674, 1677 (Fed. Cir. 1998); see also Litton Sys., Inc. v. Honeywell, Inc., 140 F.3d 1449, 1458, 46 USPQ2d 1321, 1327 (Fed. Cir. 1998).

[FN69]. See Litton, 140 F.3d at 1461-62, 46 USPQ2d at 1326; Hughes Aircraft, 717 F.2d at 1363, 219 USPQ at 481.

[FN70]. See Warner-Jenkinson, 520 U.S. at 31-32, 41 USPQ2d at 1872; Litton, 140 F.3d at 1458, 46 USPQ2d at 1327.

[FN71]. See Warner-Jenkinson, 520 U.S. at 33, 41 USPQ2d at 1873.

[FN72]. 190 F.3d 1335, 51 USPQ2d 1954 (Fed. Cir. 1999).

[FN73]. 19 F. Supp. 2d 334 (E.D. Pa. 1998).

[FN74]. 212 F.3d 1241, 54 USPQ2d 1710 (Fed. Cir. 2000).

[FN75]. 64 F. Supp. 2d 1295 (N.D.Ga. 1999).

[FN76]. The Federal Circuit specifically rejected the patentee's argument that these claim amendments were made in response to a rejection under 35 U.S.C. ¤ 112, and so should not give rise to any estoppel.

[FN77]. 172 F.3d 817, 49 USPQ2d 1865 (Fed. Cir. 1999).

[FN78]. Two other tests have also been mentioned by one or more judges on the Federal Circuit: interchangeability and obviousness. Neither of these tests, however, has achieved appreciable acceptance, and no decision in the last two years has been significantly based on either of them..

Prosecution history estoppel, or a lack thereof, is not a test by which a patentee can show infringement, unless it is combined with a showing under the function-way-result tripartite test or a hypothetical claim analysis. Similar, the all elements rule is satisfied by the patentee upon a showing that each element in the claim or hypothetical claim is found in the accused product or process, generally by the function-way-result tripartite test, but could also apparently be shown by known interchangeability or recognized obviousness.

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