

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT NO.: 5,164,316
ISSUED: Nov. 17, 1992
TO: McPherson et al.
FOR: DNA CONSTRUCT FOR ENHANCING THE
EFFICIENCY OF TRANSCRIPTION

ATTACHMENT TO FORM PTO-1465,
REQUEST FOR *EX PARTE* REEXAMINATION

SIR:

The Public Patent Foundation (“PUBPAT”), a not-for-profit public service organization that works to protect the public from the harms caused by undeserved patents and unsound patent policy, respectfully requests *ex parte* reexamination under 35 U.S.C. §§ 302 – 307 and 37 C.F.R. § 1.510 of every claim of United States Patent No. 5,164,316 issued November 17, 1992, to McPherson et al. and assigned to Monsanto Company (“the '316 patent”) because they are all invalid under 35 U.S.C. §§ 103 and their existence is causing significant public harm.¹

¹ A copy of the '316 patent is attached hereto as Appendix A.

THE '316 PATENT IS CAUSING SIGNIFICANT PUBLIC HARM

The '316 patent relates to genetic modification of plants. More specifically, the '316 patent claims plant cells containing DNA constructs for enhancing the efficiency of transcription. Monsanto is using the '316 patent – and three other patents for which requests for reexamination are being filed concurrently herewith – to harass and, in many instances, literally bankrupt countless numbers of American farmers. *See, e.g., Monsanto v. U.S. Farmers, Center for Food Safety (2005)*. Monsanto's campaign of harassment has included the filing of dozens of infringement lawsuits against farmers, many of whom are financially unable to retain sufficient counsel to defend themselves in court.² Monsanto's aggressive assertion of its patents is not only obnoxious and offensive to the core fabric of American life and culture, it is also causing substantial public harm. As the Center for Food Safety found in its study of the matter:

Monsanto has used heavy-handed investigations and ruthless prosecutions that have fundamentally changed the way many American farmers farm. The result has been nothing less than an assault on the foundations of farming practices and traditions that have endured for centuries in this country and millennia around the world, including one of the oldest, the right to save and replant crop seed.

Id. Although these issues are not grounds to grant this request for reexamination, PUBPAT respectfully requests that they be considered when determining whether the validity of the '316 patent merits review by your office.

THE SUBSTANTIAL NEW QUESTION OF PATENTABILITY

The substantial new question of patentability raised by this request is whether claims 1 through 4 of the '316 patent were rendered obvious by U.S. Patent No. 4,407,956 issued

² Appendix C contains a listing of litigation involving the '316 patent.

to Howell on October 4, 1983 (“Howell”), in light of Guilley, et al., “Transcription of Cauliflower Mosaic Virus DNA: Detection of Promoter Sequences, and Characterization of Transcripts,” *Cell*, 30(3):763-773 (1982) (“Guilley”).³ A detailed explanation of the pertinency and manner of applying Howell and Guilley to each of claims 1 through 4 of the '316 patent is set forth below.

HOWELL AND GUILLEY RENDERED THE ‘316 PATENT OBVIOUS

The '316 patent claims priority through a string of applications, the first of which was filed on January 13, 1987. Although PUBPAT does not concede that the '316 patent can justifiably claim priority to January 13, 1987, we do not address that issue at this time because it is not material to the arguments made in this request. Since Howell issued on October 4, 1983, more than a year before January 13, 1987, Howell is prior art to the '316 patent under 35 U.S.C. § 102(b). Likewise, since Guilley was published in October 1982, more than a year before January 13, 1987, Guilley is also prior art to the '316 patent under 35 U.S.C. § 102(b).

One of ordinary skill in the art would have been motivated to combine the teachings of Howell and Guilley because they were both directed to the same exact subject matter, namely the use of cauliflower mosaic virus (“CaMV”) to introduce foreign genes into plants. Further, Guilley expressly cited two articles written by the sole named inventor of Howell and Howell expressly cited the journal *Cell* in which Guilley was published. Thus, there was more than sufficient suggestion and motivation in the art to combine the teachings of Howell and Guilley.

The chart below sets forth an element-by-element comparison of all 4 claims of

³ Appendix B contains a copy of Howell and Guilley.

the '316 patent to the combined teachings of Howell and Guilley. In essence, every element of each claim of the '316 patent was obvious in light of Howell and Guilley. As such, each claim of the '316 patent is invalid and should be canceled.

<i>'316 Patent</i>	<i>Howell and Guilley</i>
1. A plant cell comprising: a DNA construct having as components,	Howell taught that “[t]he DNA of certain viruses such as cauliflower mosaic virus which infect plants may serve as 'vehicles' for the introduction of 'exogenous' or 'foreign' DNA into plant cells.” 1:54-57. The terms exogenous and foreign DNA are synonymous with DNA construct. Similarly, Guilley taught that “cauliflower mosaic virus [] is a potential vector for the introduction of foreign DNA into plants.” 763.
(a) a duplicated CaMV 35S enhancer sequence comprising	<p>Howell taught that (i) “[r]egulatory elements would be inserted [into the viral DNA vehicles, including specifically CaMV] to insure the appropriate or <i>enhanced</i> 'expression' of the foreign structural gene in the infected plant,” (ii) that “[r]egulatory elements may be derived from a variety of donors, eucaryotic promoter sites from plants, etc. or the elements may be <i>duplicate copies</i> of elements already resident within the viral DNA,” and (iii) “the term, regulatory element, is also taken to include coding signals – signals for transcription initiation and termination, capping sites, ribosome binding, translation initiation start and stop signals, etc..” 5:14-36 (emphasis added). Thus, Howell taught duplicate copies of regulatory elements, including signals for transcription initiation, within the viral DNA construct. One of ordinary skill in the art would have understood Howell's broad definition of regulatory elements to also include enhancer sequences generally and, since CaMV was Howell's primary example, CaMV enhancer sequences specifically.</p> <p>Guilley specifically taught that the CaMV 35S region was much more active than other CaMV regions. 770. Thus, one of ordinary skill in the art would have been motivated to make DNA constructs according to Howell's teaching using the 35S region of CaMV as taught by Guilley, because Howell recognized that “it may be desirable to increase the copy number of a gene endogenous to the plant to enhance production of the gene product in the plant.” 3:40-44.</p>

'316 Patent	<i>Howell and Guilley</i>
an AluI-EcoRV fragment of a CaMV 35S upstream region;	Howell taught that, “[o]ne linker insertion at an Alu I site near a Bgl I site between region I and region VI described as an intergenic region was found to retain infectivity, being in the Eco RI b restriction fragment adjacent to the Eco RI c restriction fragment.” 7:26-31. Thus, Howell taught a CaMV DNA vector having a fragment containing an Alu I restriction site linker. Guilley also taught various Eco RI fragments of the CaMV 35S promoter region, which is inherently upstream. 764-65.
and (ii) a promoter comprising an RNA polymerase binding site and an mRNA initiation site;	Howell taught regulatory elements including ribosome binding sites and transcription initiation sites. 5:33-36. Promoters inherently have a RNA polymerase binding site and an initiation site. Thus, Howell taught a promoter with RNA polymerase binding and mRNA initiation sites. Further, Guilley expressly disclosed promoters with RNA polymerase transcription sites and RNA initiation sites. 770-71.
(b) a nucleotide sequence of interest for transcription to mRNA;	Howell taught that generally “[a] wide variety of genes are of interest for insertion into the virus, particularly, genes which modify the existing properties of the plant or endow the plant with the ability to produce new substances.” More specifically, Howell taught that “modified CaMV DNA has been prepared with insertion of an oligonucleotide into an active region, with retention of infectivity and movement of the product.” 5:37-40; 7:46-49.
and (c) a termination region wherein said components are operably joined.	Howell taught the insertion of regulatory elements, including specifically termination signals and stop signals, into viral DNA vehicles. 5:33-36. Howell further taught that “[t]he various genes may be introduced simultaneously with or sequentially with regulatory signals,” which one of ordinary skill in the art would have understood to mean that the genes were functionally linked between the affecting sequences. 5:48-50. Thus, Howell taught operably linked components.

'316 Patent	<i>Howell and Guilley</i>
<p>2. The plant cell according to claim 1, wherein said promoter is a T-DNA gene 7 or gene 5 promoter or a CaMV 35S promoter.</p>	<p>Howell taught that “in the case of the tumor inducing (Ti) plasmid in the bacterium <i>Agrobacterium</i>[, a] portion of the Ti plasmid is transferred from bacterium to plant when <i>Agrobacterium</i> infects plants.” 1:44-47 (the “portion of the Ti plasmid [that] is transferred” is commonly referred to as the T-DNA). Howell continued to teach that “[t]hat type of DNA transfer has been [] utilized in certain genetic modification experiments involving plants.” 1:47-50. In order to achieve this genetic modification, the T-DNA must inherently contain a promoter, such as gene 7 or gene 5, because a promoter is required to achieve expression in the plant cell.</p> <p>Further, Howell taught the use of CaMV, including inherently CaMV promoter, and Guilley expressly taught the CaMV 35S promoter.</p>
<p>3. The plant cell according to claim 1, further comprising as component the right T-DNA border.</p>	<p>Howell taught that “in the case of the tumor inducing (Ti) plasmid in the bacterium <i>Agrobacterium</i>[, a] portion of the Ti plasmid is transferred from bacterium to plant when <i>Agrobacterium</i> infects plants.” 1:44-47 (the “portion of the Ti plasmid [that] is transferred” is commonly referred to as the T-DNA). Howell continued to teach that “[t]hat type of DNA transfer has been [] utilized in certain genetic modification experiments involving plants.” 1:47-50. In order to achieve this genetic modification, the T-DNA must inherently contain its right border because the T-DNA border sequences are essential for the transfer to take place.</p>
<p>4. The plant cell according to claim 1, wherein said sequence of interest is an open reading frame with an initiation codon for expressing a protein of interest.</p>	<p>Howell taught inserting into DNA constructs sequences of interest that code for a structural gene, which inherently contain an open reading frame that codes for a protein. 5:37-40; 7:46-52. Further, in order to initiate protein expression, as taught by Howell, the RNA transcript must inherently have an initiation codon. 6:64-68.</p>

[continued on next page]

CONCLUSION

For the reasons set forth above, each of the claims of the '316 patent are invalid for being obvious in light of Howell and Guilley. As such, PUBPAT respectfully requests that they be reexamined *ex parte* and ultimately canceled.

September 29, 2006

/s/

Date

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CERTIFICATE OF SERVICE

The undersigned certifies that a copy of this Request for *Ex Parte* Reexamination in its entirety, including all accompanying documents, is being deposited with the U.S. Postal Service as Priority Mail with Delivery Confirmation on the date of the signature below in an envelope addressed to the attorney of record for the assignee of U.S. Patent No. 5,164,316 as provided for in 37 C.F.R. § 1.33(c):

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APPENDIX A

U.S. PATENT NO. 5,164,316

APPENDIX B

HOWELL AND GUILLEY

APPENDIX C

COPENDING LITIGATION

U.S. Patent No. 5,164,316 is or has been the subject of the following litigation:

1. Monsanto Company v. Agmax, LLC, Filed December 23, 2005, D.C. S.D. Illinois, Doc. No. 4:05cv4223
2. Monsanto Company v. Anderson & Jones Inc, et al, Filed November 19, 1999, D.C. E.D. Missouri, Doc. No. 4:99cv1805
3. Monsanto Company v. Dewayne Hendrix, et al, Filed Apr. 6, 2001, D.C. E.D. Missouri, Doc. No. 4:01cv523ERW
4. Monsanto Company v. Norman Kelly, et al, Filed Sep. 14, 2001, D.C. E.D. Missouri, Doc. No. 4:01cv1484CEJ
5. Monsanto Company, et al v. Olvey, et al, Filed November 23, 2004, D.C. Arizona, Doc. No. 2:04cv2667
6. Monsanto Company v. Kem Ralph individually, et al, Filed Jan. 28, 2000, D.C. E.D. Missouri, Doc. No. 4:00cv135
7. Monsanto Company v. Mitchell Scruggs, et al, Filed Sep. 7, 2000, D.C. N.D. Mississippi, Doc. No. 3:00CV161-B-A
8. Monsanto Company v. Hal Swann (d/b/a Howell Everett Swann), et al, Filed Sep. 14, 2000, D.C. E.D. Missouri, Doc. No. 4:00CV01481CEJ