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Patenting Marijuana Strains: Baking Up Patent Protection for Growers in the Legal Fog of this Budding Industry

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PATENTING MARIJUANA STRAINS: BAKING UP PATENT PROTECTION FOR GROWERS IN THE LEGAL FOG OF THIS BUDDING INDUSTRY

*Joseph Dylan Summer**

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I. INTRODUCTION

“It made my heart thump, for I was certain it was gold.”¹ James Marshall uttered these words when he discovered gold flakes at the Sutter’s Mill in Coloma, California.² As word spread, thousands of miners rushed to California in search of riches, in what was known as the Gold Rush of 1849.³ Now, America has a new rush—the “green” rush,⁴ and once again, it is centered in the American West.

Marijuana, formally known as cannabis,⁵ is on the brink of becoming a legitimate business. Despite a long history of medical use and recreational consumption dating back to ancient times, marijuana regulation is a recent development.⁶ Popularly known as “weed,” many believe cannabis culture is a counterculture aimed at destroying societal wellbeing in many ways.⁷

Recent state legalization allowing the recreational use and commercialization of cannabis in four jurisdictions⁸ has caught the eye of eager entrepreneurs, especially innovators of the product. However, legal impediments at the federal level⁹ hinder innovation in the cannabis industry from properly budding. As a result, scarce legal precedent exists for cannabis in the patent law arena. Given the federal prohibition on marijuana, patenting strains of the cannabis plant, and its derivative products, would seem to likely be prohibited. The word “likely” is used because, despite criminal legal impediments, marijuana has been patented,¹⁰ and more cannabis products are patent-pending.¹¹

¹ *The Discovery of Gold*, <http://memory.loc.gov/ammem/cbhtml/cbgold.html> (last visited Jan. 4, 2015).

² *Id.*

³ *Id.*

⁴ *Medical Marijuana: Will Colorado’s “Green Rush” Last?*, <http://www.cbsnews.com/videos/medical-marijuana-will-colorados-green-rush-last-3/> (last visited Nov. 15, 2015).

⁵ Cannabis is used throughout this Note because it is the scientific name for marijuana. The terms “cannabis” and “marijuana” will be used interchangeably.

⁶ *Dope Etc.*, FRONTLINE ON PBS, <http://www.pbs.org/wgbh/pages/frontline/shows/dope/etc/cron.html> (last visited Oct. 20, 2015). The Pure Food and Drug Act was the first law in United States history that required cannabis to be labeled in food and drug products. The Pure Food and Drug Act, 34 Stat. 768 (1906).

⁷ *Marijuana: Public Enemy Number One?*, Urban Greenhouse (July 6, 2015), <http://urbangreenhouse.com/marijuana-public-enemy-number-one/>.

⁸ See COLO. CONST. art. XVIII, § 16 (2013); WASH. ADMIN. CODE §§ 314-55-005 to 314-55-540 (2013). Recently, Oregon, Alaska, and the District of Columbia have legalized recreational marijuana.

⁹ The Controlled Substances Act, 21 U.S.C. § 801 (1970).

¹⁰ Cannabinoids as Antioxidants and Neuroprotectants, U.S. Patent No. 6630507 (filed Feb. 2, 2001) (issued Oct. 7, 2003).

¹¹ See *infra* Part II.

While a cannabis method-of-use patent has been granted to the federal government,¹² a unique cannabis strain has never been patented. This Note seeks to find concrete answers for a grower interested in patenting his or her unique cannabis strain. Because this is a novel patentable subject matter, this Note will explore patents in other industries that faced the same legal challenges afflicting cannabis variety patents. This Note asserts that equal challenges in other industries burden innovation in the cannabis industry.

This Note concentrates on the legal gray area around cannabis variety patents and how this uncertainty affects innovation. Part II outlines the legal environment surrounding marijuana patents and begins with a brief history of cannabis. Part II will explore the cannabis plant and discuss the federal ban on marijuana, state legalization for both medicinal and recreational use, and federal enforcement discretion on cannabis. Part II will survey utility and plant patents and potentially applicable case law analogous to the novel patentable subject matter discussed here. Lastly, Part II will conclude by discussing current patents granted for cannabis and patent-pending developments.

Part III will seek to demystify the legal fog surrounding cannabis variety patents by identifying the underlying issues and presenting clear answers. Part III will then conceptualize an analytical framework for cannabis cultivators navigating this new patentable subject matter. Next, Part III will assert that, despite federal opposition, cannabis variety patents are legal, given case law from the Supreme Court and Federal Circuit, as well as the policy considerations underlying patent law. Finally, Part III will identify legislative developments that would change the legal environment. Part IV will conclude that although cannabis cultivation is federally prohibited, policy considerations underlying plant patents and the case law from the Federal Circuit indicate cannabis varieties are likely patentable.

II. BACKGROUND

To outline the legal environment surrounding patent law, this Part will look to the history of cannabis, popular culture, and law that has shaped the current state of the cannabis industry. Then, this Part will explain the cannabis plant itself, its physical characteristics, and the patentable end products from the growth process. This Part will go on to discuss the federal ban on marijuana, recent state legislation, and the federal governments prosecutorial discretion. Next, this Part will survey the statutory and policy background of utility and

¹² Cannabinoids as Antioxidants and Neuroprotectants, U.S. Patent No. 663507 (filed Feb. 2, 2001) (issued Oct. 7, 2003).

plant patents, and potentially applicable case law from the Supreme Court and the Federal Circuit. Lastly, this Part will examine previous patents for cannabis and patent-pending developments.

A. A BRIEF HISTORY OF CANNABIS LAW AND CULTURE

Cannabis has a history dating back to ancient times. The cannabis plant likely originated from Southeast Asia.¹³ The father of Chinese medicine, Shen Nung, utilized cannabis for medicinal purposes.¹⁴ From Asia, the cannabis plant spread to other parts of the world, including Europe.¹⁵ Hemp is a fibrous by-product of cannabis that has many applications.¹⁶ Hemp fibers were used to make sails for ships, fabric, and other products in colonial America.¹⁷ In fact, George Washington and Thomas Jefferson grew hemp on their plantations.¹⁸

Cannabis and most drugs enjoyed no regulation until the twentieth century.¹⁹ After the Shanghai Opium Commission and Hague International Opium Convention, Congress passed the Harrison Narcotics Tax Act of 1914.²⁰ The Act did not explicitly prohibit marijuana, but placed a tax on opiates to induce a suppression of drug markets.²¹

In subsequent years, popular culture shaped legislative efforts concerning marijuana. In 1936, the film *Reefer Madness* sought to persuade the American public of the dangers of marijuana use.²² The film portrayed teenagers who became addicted to marijuana and committed acts of violence.²³ One year later, Congress passed the Marihuana Tax Act of 1937.²⁴ The Act did not criminalize

¹³ *The Origins of Cannabis*, <http://www.deamuseum.org/ccp/cannabis/history.html> (last visited Nov. 15, 2015).

¹⁴ *Yearbook of the United States Department of Agriculture 1913*, Internet Archive, 288, <https://archive.org/stream/yoa1913#page/n327/mode/2up> (last visited Nov. 15, 2015).

¹⁵ *Map of Cannabis Spread*, <http://www.nhm.ac.uk/resources/nature-online/life/plants-fungi/seeds-of-trade/images/maps/hemp.gif> (last visited Nov. 15, 2015).

¹⁶ Oscar H. Will, *The Forgotten History of Hemp Cultivation in America*, <http://www.farmcollector.com/farm-life/strategic-fibers.aspx#axzz3FzIQGeeM> (last visited Nov. 15, 2015).

¹⁷ *Id.*

¹⁸ Gene Johnson, *A History of Pot, from George Washington to Legalizing Ganja*, NBC NEWS (Dec. 6, 2012, 6:03 AM), http://usnews.nbcnews.com/_news/2012/12/06/15726635-a-history-of-pot-fr-om-george-washington-to-legalizing-ganja.

¹⁹ German Lopez, *Timeline: 100 Years of Drug Prohibition*, VOX (Sept. 9, 2014, 6:00 AM), <http://www.vox.com/2014/9/9/6104179/the-history-of-the-war-on-drugs>.

²⁰ *Id.*

²¹ Harrison Narcotics Act of 1914, 38 Stat. 785 (repealed 1970).

²² *Reefer Madness*, <http://www.imdb.com/title/tt0028346/> (last visited Nov. 15, 2015).

²³ *Id.*

²⁴ Marihuana Tax Act of 1937, 50 Stat. 551 (1937), *repealed by* *Leary v. United States*, 395 U.S. 6 (1969).

marijuana, but required people who dealt cannabis and its by-products to register with the federal government and pay a prohibitive occupational tax.²⁵ In 1969, the Supreme Court, under Chief Justice Earl Warren, struck down the Marihuana Tax Act. The Court found that the Act violated constitutional protections of self-incrimination by requiring persons dealing with marijuana to admit to trafficking by reporting to the Internal Revenue Service.²⁶ This concern, enunciated by the Warren Court, resonates for cultivators applying for cannabis variety patents today.²⁷

Marijuana, along with other drugs like LSD, was integral to the counterculture movement in the 1960's.²⁸ Along with the Vietnam War, cannabis usage was at the forefront of the American political conscious.²⁹ Most notably, Ken Kesey and the Pranksters set out across the country in a “magic” bus openly promoting the use of psychedelic drugs.³⁰

Cannabis was officially prohibited in the Controlled Substances Act (CSA) in 1970 during the presidency of Richard Nixon.³¹ The CSA was the first congressional act that actually criminalized marijuana.³² The congressional findings under the CSA state, “[t]he illegal importation, manufacture, distribution, and possession and improper use of controlled substances have a substantial and detrimental effect on the health and general welfare of the American people.”³³ Further, Congress enacted the CSA out of concern for the production and distribution of controlled substances into interstate channels.³⁴ Under the Act, drugs are classified into schedules.³⁵ Schedule I drugs are substances that have a high potential for abuse, no currently accepted medical treatment in the United States, and which are not safe for use under medical supervision.³⁶ Cannabis is classified as a Schedule I drug.³⁷

²⁵ *Id.*

²⁶ *Leary v. United States*, 395 U.S. 6 (1969).

²⁷ *See infra* Part III.

²⁸ *The 1960's Hippie Counter Movement*, Mortal Journey, <http://www.mortaljourney.com/2011/03/1960-trends/hippie-counter-culture-movement> (last visited Oct. 20, 2015).

²⁹ *A Brief History of How War Gets Us Hooked on Drugs*, Motherboard (Jan. 8, 2013, 4:00 PM), <http://motherboard.vice.com/blog/how-war-getsyou-hooked>.

³⁰ *MAGIC TRIP* (Magnolia Pictures 2011).

³¹ Controlled Substances Act, 21 U.S.C.S. § 801 (1970).

³² *See Lopez, supra* note 19.

³³ 21 U.S.C. § 801(2) (2012).

³⁴ *Id.*

³⁵ *Id.* § 812(a).

³⁶ *Id.* § 812(b)(1).

³⁷ Drug Enforcement Agency, *Drug Scheduling*, <http://www.justice.gov/dea/druginfo/ds.shtml> (last visited Nov. 15, 2015).

After the passage of the CSA, President Nixon encouraged Congress to enact legislation to enforce the CSA.³⁸ He declared that drugs were “public enemy number one.”³⁹ This federal prohibition on cannabis and other substances would popularly be known as the “War on Drugs.”⁴⁰ Later, Presidents Ronald Reagan and George H.W. Bush increased penalties for drug laws.⁴¹

Recently, however, public support for cannabis has changed. For example, a 1969 Gallup poll found public support for marijuana among twelve percent of the American populous.⁴² But, in 2013, the same Gallup poll found fifty-eight percent of Americans support legalization of marijuana.⁴³ Additionally, sixty-nine percent of millennials, people born between 1980 and the year 2000,⁴⁴ support marijuana legalization.⁴⁵

While smoked marijuana is classified as a Schedule I narcotic,⁴⁶ it has never been directly linked to any deaths.⁴⁷ In order to be fatal, a marijuana user needs to consume an estimated 1,000 times the amount required to achieve the therapeutic/psychotropic effect on a single occasion.⁴⁸ Many scientific authorities find substances like alcohol, tobacco, and prescription painkillers directly lead to more fatalities when they are abused.⁴⁹ However, cannabis has increased in potency over the past few decades.⁵⁰ Today’s cannabis user can achieve the same psychotropic effect with a smaller dosage than users in previous decades.⁵¹ Thus, cannabis users can consume less marijuana, and

³⁸ *Thirty Years of America’s Drug War* (PBS television broadcast 2000).

³⁹ *Id.*

⁴⁰ *Id.*

⁴¹ The Anti-Drug Abuse Act of 1986, 100 Stat. 3207 (1986); George Bush, President of the United States, Address to the Nation on the National Drug Control Strategy (Sept. 5, 1989).

⁴² *For First Time, Americans Favor Legalizing Marijuana*, <http://www.gallup.com/poll/165539/first-time-americans-favor-legalizing-marijuana.aspx> (last visited Nov. 15, 2015).

⁴³ *Id.*

⁴⁴ *Millennial Definition*, <http://www.merriam-webster.com/dictionary/millennial> (last visited Nov. 15, 2015).

⁴⁵ *Views of Same-Sex Marriage, Marijuana Legalization among Generations by Race* (Mar. 5, 2014), <http://www.pewsocialtrends.org/2014/03/07/millennials-in-adulthood/sdt-next-america-03-07-2014-2-11/>.

⁴⁶ Controlled Substances Act, 21 U.S.C.S. § 801 (1970).

⁴⁷ See Robert S. Gable, *The Toxicity of Recreational Drugs*, 94 AM. SCI., no. 3, 2006, at 206.

⁴⁸ *Id.*

⁴⁹ *Id.*

⁵⁰ *Marijuana: Know the Facts*, <http://www.whitehouse.gov/ondcp/ondcp-fact-sheets/marijuana-know-the-facts> (last visited Nov. 15, 2015).

⁵¹ *Id.*

ostensibly achieve the same psychotropic effect without any worry of a fatal overdose.

However, cannabis consumption likely has harmful health consequences for the user. Many drug policy authorities find that cannabis is most highly consumed by a small subset of users,⁵² who consume marijuana almost on a daily basis.⁵³ Health authorities believe that a high rate of cannabis consumption leads to overstimulation of the endo cannabinoid system, resulting in addiction.⁵⁴ Frequent users often experience withdrawal.⁵⁵ Also, cannabis usage has been shown to have detrimental effects on the developing teenage brain.⁵⁶ While cannabis usage among American ages twelve through seventeen has not increased over the past decade,⁵⁷ marijuana usage in these developmental years has been linked to cognitive disorders, like paranoid schizophrenia.⁵⁸

Despite studies showing detrimental health impacts on chronic users and minors, cannabis could be a lucrative industry. The cannabis plant “is America’s most valuable [cash crop], worth an estimated \$35 billion, more than hay, soybeans, and corn.”⁵⁹ Marijuana is estimated to potentially generate billions in both commercial and tax revenue.⁶⁰ Investment in cannabis has increased from \$500 million to a \$7 billion industry in the past two years.⁶¹ Additionally, by decriminalizing marijuana, both state and federal governments

⁵² *Market Size and Demand for Marijuana in Colorado*, The Marijuana Policy Group, 18 (2014), <https://www.colorado.gov/pacific/sites/default/files/Market%20Size%20and%20Demand%20Study,%20July%209,%202014%5B1%5D.pdf>.

⁵³ *Id.*

⁵⁴ *Is Marijuana Addictive?*, National Institute on Drug Abuse, <https://www.drugabuse.gov/publications/research-reports/marijuana/marijuana-addictive> (last visited Oct. 20, 2015).

⁵⁵ *Id.*

⁵⁶ Krista M. Lisdahl et al., *Dare to delay? The impacts of adolescent alcohol and marijuana use onset on cognition, brain structure, and function*, <http://journal.frontiersin.org/Journal/10.3389/fpsy.2013.00053/full> (last visited Nov. 15, 2015).

⁵⁷ *National survey shows lower rate of illicit drug use among adolescents ages 12 to 17*, <http://www.samhsa.gov/newsroom/press-announcements/201409160400> (last visited Nov. 15, 2015).

⁵⁸ David Bienenstock, *The Clinic: A Surprising Link between Marijuana and Schizophrenia*, <http://www.ihightimes.com/read/clinic-surprising-link-between-marijuana-and-schizophrenia> (last visited Nov. 15, 2015).

⁵⁹ Adrian A. Ohmer, *Investing in Cannabis: Inconsistent Government Regulation and Constraints on Capital*, 3 MICH. J. PRIVATE EQUITY & VENTURE CAPITAL L. 97 (2013) (quoting GREG CAMPBELL, POT, INC.: INSIDE MEDICAL MARIJUANA, AMERICA’S MOST OUTLAW INDUSTRY, at xxiii (2012)) (internal quotations omitted).

⁶⁰ Jeffery A. Miron, *Milton Friedman, 500+ Economists Call for a Marijuana Debate*, <http://www.prohibitioncosts.org> (last visited Sept. 28, 2014).

⁶¹ *Meet the Financier behind a Hot Pot Stock*, <http://www.bloomberg.com/news/2014-06-18/legal-pot-sets-off-penny-stock-frenzy.html> (last visited Nov. 15, 2015).

stand to save billions from law enforcement costs.⁶² Cannabis is the most common drug seized at the U.S. border, totaling almost 2 million pounds a year.⁶³ Further, the federal “drug interdiction budget request for F[iscal] Y[ear] 2011 was . . . \$15.55 billion, a 3.5 percent increase from F[iscal] Y[ear] 2010.”⁶⁴ Legalizing cannabis entirely would eliminate border seizure and enforcement costs for marijuana from the federal budget.

B. THE CANNABIS PLANT, PSYCHOTROPIC EFFECTS, AND THE GROWTH PROCESS

Cannabis has three species: *cannabis sativa*, *cannabis indica*, and *cannabis ruderalis*.⁶⁵ These species contain compounds called cannabinoids, including tetrahydrocannabinol (THC), which is the primary psychoactive ingredient that alters cognitive functioning.⁶⁶ Depending upon the manner of consumption, THC and other cannabinoids from the cannabis plant may cause a variety of effects on the user, including euphoria, increased giggling, lethargy, and paranoia, among others.⁶⁷

Reproduction of the cannabis plant occurs either asexually or sexually.⁶⁸ Asexual reproduction occurs through plant cloning.⁶⁹ For example, a grower can take a cutting from the cannabis plant and root it in a contained body of water known as hydroponics.⁷⁰ Asexually reproduced cannabis offspring are genetically identical to the parent plant.⁷¹ Conversely, sexual reproduction is the fusion of gametes between a male and a female plant that results in a seed.⁷² The offspring will have different physical and genetic characteristics due to the

⁶² Jeffery A. Miron, *The Budgetary Implications of Drug Prohibition*, Department of Economics, Harvard University (2010), http://scholar.harvard.edu/files/miron/files/budget_2010_final_0.pdf.

⁶³ Marijuana Seizures along the U.S. Mexico Border, <http://static.apps.cironline.org/border-seizures/> (last visited Nov. 15, 2015).

⁶⁴ Ohmer, *supra* note 59, at 97–98 (citations omitted).

⁶⁵ GEOFFREY GUY ET AL., *THE MEDICINAL USES OF CANNABIS AND CANNABINOIDS* 74 (Pharmaceutical Press, 2004).

⁶⁶ Amresh Shrivastava et al., *Cannabis Use and Cognitive Dysfunction*, *INDIAN J. PSYCHIATRY*, <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3221171> (last visited Nov. 15, 2015).

⁶⁷ *Id.*

⁶⁸ R.C. Clarke, *Cannabis Botany*, WEED FARMER, http://www.weedfarmer.com/cannabis/botany_guide.php (last visited Oct. 18, 2015).

⁶⁹ BUY DUTCH SEEDS, <http://www.buydutchseeds.com/growing-guide/cloning-cannabis> (last visited Nov. 15, 2015).

⁷⁰ *Id.*

⁷¹ *Id.*

⁷² Clarke, *supra* note 68.

recombination of chromosomes.⁷³ Sexual reproduction between a male and female cannabis plant leads to new cannabis varieties.⁷⁴

The marijuana product differs in its physical structure, aroma, and psychotropic effect and potency based on the growing conditions and harvesting method.⁷⁵ Cannabis is grown either in soil with natural nutrients, or through hydroponics, a method that uses inorganic content like rock wool or clay pellets.⁷⁶ During the maturation process, growers can manipulate the onset of the flowering period by limiting the amount of sunlight and darkness the plant receives.⁷⁷ Once the flowering period starts, the unfertilized female part of the cannabis plant, known as the pistil, is harvested, dried, and cured.⁷⁸ The timing of the harvest can change the psychotropic effect.⁷⁹ The finished product is a floral cluster, commonly known as the “bud.”⁸⁰ The “bud” is the ingestible end-product of the cannabis growing cycle. It can be packaged by retailers and enjoyed by consumers.

C. THE FEDERAL BAN ON CANNABIS

Under the Controlled Substances Act of 1970, possession, production, cultivation, and distribution of marijuana is prohibited.⁸¹ The executive branch of the United States charges the Drug Enforcement Administration (DEA) with the enforcement of the CSA. The DEA classifies drugs according to the “drug’s acceptable medical use and the drug’s abuse or dependency potential.”⁸² Again, cannabis is classified as a Schedule I drug, among other drugs including “heroin, lysergic acid diethylamide (LSD), . . . methylenedioxymethamphetamine (ecstasy),

⁷³ *Id.*

⁷⁴ *Id.*

⁷⁵ *Id.*

⁷⁶ THE DAILY SMOKER, <http://www.dailysmoker.com/cannabis-grow-guide/conditions/medium> (last visited Nov. 15, 2015).

⁷⁷ *Cannabis Life Cycle*, MONTANA LEGISLATURE: CHILDREN, FAMILIES, HEALTH, AND HUMAN SERVICES INTERIM COMMITTEE (June 2009–2010), http://leg.mt.gov/content/Committees/Interim/2009_2010/Children_Family/Emerging-Issue/mmga-presentation-cannabis-life-cycle.pdf.

⁷⁸ Clarke, *supra* note 68.

⁷⁹ *Id.* Depending on the point of harvest, the psychoactive effect can be a “light cerebral high,” or an “intense body effect.” This means a cannabis grower can vary the effect of their product to suit different consumers.

⁸⁰ *Id.*

⁸¹ 21 U.S.C. § 841.

⁸² *Drug Scheduling*, DRUG ENFORCEMENT AGENCY, <http://www.justice.gov/dea/druginfo/ds.shtml> (last visited Nov. 15, 2015).

methaqualone, and peyote.”⁸³ The federal government imposes severe punishments on those who possess, produce, or distribute cannabis.⁸⁴

Under the CSA, an interested party can change a drug’s schedule through an administrative mechanism.⁸⁵ Under this mechanism, an interested party can initiate a process to add, delete, or change the schedule of a controlled substance.⁸⁶ National Organization for the Reform of Marijuana Laws, otherwise known as NORML, and other organizations invoked this administrative mechanism in 1972 to change the classification of cannabis.⁸⁷ After sixteen years of court proceedings and negotiations, Administrative Law Judge Francis L. Young issued a decision.⁸⁸ His opinion discussed three issues: one principal issue and two subsidiary issues.⁸⁹ The principal issue concerned “whether the marijuana plant, considered as a whole, may lawfully be transferred from Schedule I to Schedule II.”⁹⁰ The two subsidiary issues regarded “whether [cannabis] . . . has an accepted medical use in treatment in the United States”⁹¹ and “whether there is a lack of accepted safety use of the marijuana plant under medical supervision.”⁹²

After thirty-eight findings of fact,⁹³ Judge Young found, by a preponderance of the evidence, that cannabis has “an accepted medical use in treatment in the United States in effecting relief for cancer patients.”⁹⁴ In assessing the safety of cannabis use, Judge Young found “no record in . . . extensive medical literature describing a proven, documented cannabis-induced fatality.”⁹⁵ While the DEA argued it needed more studies and tests to determine if cannabis can be consumed safely, Judge Young found “it is unrealistic and unreasonable to require unanimity of [medical professional] opinion[s]”⁹⁶ on the issue of safety.

⁸³ *Id.*

⁸⁴ See 21 U.S.C. § 841 (2012). The penalty for trafficking of 50 kilograms of marijuana or 10 kilograms of hashish is not more than five years imprisonment and a fine up to \$250,000.

⁸⁵ *Id.* § 814.

⁸⁶ Ohmer, *supra* note 59, at 100–01 (citing 21 U.S.C. § 814).

⁸⁷ *Id.* at 101.

⁸⁸ *Id.*

⁸⁹ Marijuana Rescheduling Petition, Dep’t of Justice, Drug Enforcement Admin., No. 86-22, at 7 (Sept. 6, 1988).

⁹⁰ *Id.*

⁹¹ *Id.*

⁹² *Id.*

⁹³ *Id.* at 10–26.

⁹⁴ *Id.* at 34.

⁹⁵ *Id.* at 56.

⁹⁶ *Id.* at 66.

Judge Young concluded “the provisions of the [CSA] permit and require the transfer of marijuana from Schedule I to Schedule II.”⁹⁷

Despite Judge Young’s ruling, the DEA denied a petition to change cannabis to a Schedule II drug following the administrative opinion.⁹⁸ The DEA issued the following statement:

The Administrator rejects the administrative law judge’s findings and conclusions. They were erroneous; they were not based upon credible evidence; nor were they based upon evidence in the record as a whole. Therefore, in this case, they carry no weight and do not represent the position of the agency or its Administrator.⁹⁹

The D.C. Circuit Court of Appeals affirmed the decision of the DEA and subsequently denied the petitioners’ petition for review.¹⁰⁰ As a result of this denial, cannabis remains a Schedule I controlled substance.

D. STATE LEGALIZATION OF CANNABIS FOR MEDICAL AND RECREATIONAL USE

Justice Brandeis once said,

It is one of the happy incidents of the federal system that a single courageous state may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country. This Court has the power to prevent an experiment.¹⁰¹

This famous statement likely provided the foundation for novel state legislation in the area of cannabis. The first experiment came in California in 1996, which legalized cannabis for medical purposes.¹⁰² A bevy of states then followed

⁹⁷ *Id.* at 67.

⁹⁸ Marijuana Scheduling Petition; Denial of Petition, 54 Fed. Reg. 53,767, 53,783 (Dep’t of Justice, Drug Enforcement Admin., Dec. 29, 1989).

⁹⁹ *Id.*

¹⁰⁰ Ohmer, *supra* note 59, at 102.

¹⁰¹ *New State Ice Co. v. Liebmann*, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting) (explaining that states have agency to enact laws in novel areas of law).

¹⁰² Ohmer, *supra* note 59, at 102.

California's lead.¹⁰³ These states have removed criminal consequences for possession, production, and use as long as a doctor has recommended use for medical issues.¹⁰⁴

Although state legislation has sanctioned cultivation and possession of cannabis within its borders, the federal government reserves the power to regulate interstate cannabis. In 2005, the Supreme Court upheld Congress's power to regulate marijuana under the interstate Commerce Clause in *Gonzales v. Raich*.¹⁰⁵ Here, California passed Proposition 215, which was codified as the Compassionate Use Act of 1996.¹⁰⁶ The Act allowed ill patients to have access to marijuana for medicinal purposes.¹⁰⁷ Also, the Act created an exemption to criminal prosecution for doctors and allowed patients and caregivers to grow marijuana with a prescription.¹⁰⁸

The Court of Appeals for the Ninth Circuit reversed the district court and held that homegrown medical marijuana was a "separate and distinct class of activities"¹⁰⁹ beyond the reach of federal power.¹¹⁰ In an application of the aggregation theory under *Wickard v. Filburn*,¹¹¹ the United States Supreme Court found the application of the Controlled Substances Act to intrastate growers is within the reach of Federal regulation because Congress has the power to regulate even intrastate cannabis activities that substantially affect interstate commerce.¹¹² In analogizing marijuana in this case to wheat production in *Wickard*, the Court found the purpose of the CSA was to regulate the supply of controlled substances into the drug market.¹¹³ Subsequently, the Court found

¹⁰³ *Id.* at 102–03. Other states that legalized cannabis for medical use include Oregon (1998); Alaska (1998); Washington (1998); Maine (1999); Hawaii (2000); Colorado (2000); Nevada (2000); Vermont (2004); Montana (2004); Rhode Island (2006); New Mexico (2007); Michigan (2008); Arizona (2010); New Jersey (2010); Delaware (2011); Connecticut (2012); Massachusetts (2012); Illinois (2013); New Hampshire (2013); Maryland (2014); Minnesota (2014); and New York (2014). States with limited access to Medical Marijuana include Alabama, Florida, Georgia, Iowa, Kentucky, Louisiana, Mississippi, Missouri, Oklahoma, South Carolina, Tennessee, Texas, Utah, Virginia, Wisconsin, and Wyoming. *State Medical Marijuana Laws*, National Conference of State Legislatures, <http://www.ncsl.org/research/health/state-medical-marijuana-laws.aspx> (last visited Oct. 20, 2015).

¹⁰⁴ Ohmer, *supra* note 59, at 103.

¹⁰⁵ 545 U.S. 1 (2005).

¹⁰⁶ *Id.* at 5.

¹⁰⁷ *Id.*

¹⁰⁸ *Id.*

¹⁰⁹ *Raich v. Ashcroft*, 352 F.3d 1222, 1228 (2003).

¹¹⁰ *Id.* at 1228.

¹¹¹ *See* 317 U.S. 111 (1942).

¹¹² *Gonzales*, 545 U.S. at 17.

¹¹³ *Id.* at 19.

there was a rational basis for Congress to believe that leaving homegrown marijuana outside the CSA would have an effect on drug markets when viewed in the aggregate.¹¹⁴ Further, the Court stated the CSA is a constitutionally valid statutory scheme and that Congress had the power to make all laws necessary and proper to enforce the CSA when it enacted the CSA.¹¹⁵

Even though the majority conceded that marijuana has a beneficial medicinal purpose, it found the federal government can criminalize marijuana under the CSA for any purpose.¹¹⁶ In his opinion, Justice Stevens suggested that if federal regulation on medical marijuana is “beyond the ‘outer limits’ of Congress’ Commerce Clause authority,”¹¹⁷ then “marijuana . . . for recreational purposes is also beyond those ‘outer limits,’ whether or not a State elects to authorize or even regulate such use.”¹¹⁸

Furthermore, in upholding the application of the CSA to intrastate activities, Justice Stevens invoked the Supremacy Clause by reiterating, “that if there is any conflict between federal and state law, federal law shall prevail.”¹¹⁹ Even though respondents in this case were comporting with the California regulatory scheme, respondents were not beyond federal jurisdiction under the CSA.¹²⁰

In dicta, Justice Stevens commented that medical discretion to prescribe marijuana was “open-ended.”¹²¹ Thus, doctors could prescribe cannabis for recreational uses and increase the supply of marijuana into drug markets.¹²²

Despite the *Gonzales* decision, California maintained its state law permitting medical marijuana. However, this decision created a legal quandary for dispensaries in California and other states sanctioning medical marijuana. While homegrown marijuana was permitted for sick patients under state law, cannabis cultivators could still be arrested and prosecuted by the federal government under the CSA.¹²³

¹¹⁴ *Id.*

¹¹⁵ *Id.* at 22. Congress has the power “[t]o make all Laws which shall be necessary and proper for carrying into Execution the foregoing Powers, and all other Powers vested by this Constitution in the Government of the United States, or in any Department or Officer thereof.” U.S. CONST. art. I, § 8, cl. 18.

¹¹⁶ *Gonzales*, 545 U.S. at 27.

¹¹⁷ *Id.* at 28.

¹¹⁸ *Id.*

¹¹⁹ *Id.* at 29.

¹²⁰ *Id.*

¹²¹ *Id.* at 30–31.

¹²² *Id.* at 31.

¹²³ *Id.*

Nevertheless, Colorado and Washington legalized marijuana for recreational use in 2013.¹²⁴ In Colorado, the state legalized marijuana through amendments to its constitution, “[i]n the interest of the efficient use of law enforcement resources, enhancing revenue for public purposes, and individual freedom.”¹²⁵ As long as a person is over the age of twenty-one, he or she will be legally allowed to consume marijuana, subject to certain restrictions.¹²⁶ Additionally, said person can possess six cannabis plants.¹²⁷

The state constitutional provision regulates marijuana in a manner consistent with alcohol.¹²⁸ Production and cultivation for commercial use requires a license from the state.¹²⁹ The provision defines a “marijuana establishment” for recreational use under four different types: “a marijuana cultivation facility, a marijuana testing facility, marijuana product manufacturing facility, or a retail marijuana store.”¹³⁰ These definitions essentially define the supply chain of marijuana distribution. Under the provision, a cultivation facility is the only “entity licensed to cultivate, prepare, package, and sell marijuana” to other facilities, but it cannot sell directly to the consumer. Only a retail store can sell to the consumer.¹³¹ The product manufacturing facility cannot cultivate marijuana; it can only package and prepare the product for retailers.¹³² The separation of entities allows Colorado to regulate the flow of marijuana from producer to consumer and prohibit wholesale distribution directly to the consumer.

In Washington, voters approved Initiative Measure No. 502, which “intend[s] to stop treating adult marijuana use as a crime.”¹³³ Initiative 502 is similar to the Colorado constitutional provision with immaterial changes in terminology. The procedures to obtain a marijuana license are explicitly

¹²⁴ See COLO. CONST. art. XVIII, § 16 (2013); WASH. ADMIN. CODE §§ 314-55-005 through 314-55-540 (2013). As of November 5th, 2014, Oregon, Alaska, and the District of Columbia have legalized recreational marijuana.

¹²⁵ COLO. CONST. art. XVIII, § 16(1)(a).

¹²⁶ *Id.* These certain restrictions include driving under the influence of marijuana, giving marijuana to a minor, requiring employers to permit use of marijuana in employment contracts, and other issues concerning the control of property. *Id.* § 16(6).

¹²⁷ *Id.* § 16(3)(b).

¹²⁸ *Id.* § 16(1)(b).

¹²⁹ *Id.* § 16(4)(c). This is subject to “article 4 of title 24 of the Colorado Administrative Procedure Act or any successor provision.” *Id.* § 16(5)(a)(1).

¹³⁰ *Id.* § 16(2)(i).

¹³¹ *Id.* § 16(2)(n).

¹³² *Id.* § 16(2)(j).

¹³³ Initiative Measure No. 502, http://sos.wa.gov/_assets/elections/initiatives/i502.pdf (last visited Nov. 15, 2015).

codified in Washington's Administrative Code.¹³⁴ Like Colorado, Washington regulates marijuana similarly to alcohol under its Liquor Control Board.¹³⁵ One material difference from Colorado is that Initiative 502 intends for tax revenue to fund "education, health care, research, and substance abuse prevention."¹³⁶ In Colorado, tax revenue from cannabis will go to school construction projects.¹³⁷

While Colorado and Washington have enacted liberal marijuana legislation in the face of the *Gonzales* decision, persons exercising rights afforded by Colorado and Washington are still subject to federal prohibitions.¹³⁸ Thus, the federal government may exercise prosecutorial discretion to enforce the CSA.¹³⁹ This means that growers may face federal criminal prosecution, even though recreational cannabis is legal in their state.

E. THE UNITED STATES DEPARTMENT OF JUSTICE'S PROSECUTORIAL DISCRETION TO ENFORCE THE CONTROLLED SUBSTANCES ACT

Despite state legalization, the federal government can circumvent state law and enforce the Controlled Substances Act. The power to enforce the CSA comes from the President of the United States, who has the power to execute federal laws.¹⁴⁰ The Department of Justice is the extension of this presidential power, headed by the Attorney General.¹⁴¹

Under former U.S. Attorney General Eric Holder,¹⁴² the Department of Justice issued press releases giving guidance for marijuana drug enforcement in states where marijuana has been legalized.¹⁴³ In a memorandum released on August 29, 2013, the Department of Justice stated:

Accordingly, in exercising prosecutorial discretion, prosecutors should not consider the size or commercial nature of a marijuana operation alone as a proxy for assessing whether marijuana

¹³⁴ See WASH. ADMIN. CODE §§ 314-55-005 through 314-55-540 (2013).

¹³⁵ See *supra* note 124 and accompanying text.

¹³⁶ See *supra* note 124 and accompanying text.

¹³⁷ COLO. CONST. art. XVIII, § 16(5)(d).

¹³⁸ *Gonzales*, 545 U.S. at 29.

¹³⁹ *Id.*

¹⁴⁰ U.S. CONST. art. II.

¹⁴¹ 28 U.S.C. § 503.

¹⁴² Holder announced his resignation on September 25, 2013. *Attorney General Eric Holder Announces Resignation*, <http://www.cnn.com/2014/09/25/politics/eric-holder-resignation/> (last visited Nov. 15, 2015). He was succeeded by Loretta E. Lynch.

¹⁴³ James M. Cole, Guidance Regarding Marijuana Enforcement, Department of Justice (2013), <http://www.justice.gov/iso/opa/resources/3052013829132756857467.pdf>.

trafficking implicates the Department's enforcement priorities . . . Rather, prosecutors should continue to review marijuana cases on a case-by-case basis and weigh all available information and evidence, including, but not limited to, whether the operation is demonstrably in compliance with a strong and effective state regulatory system.¹⁴⁴

While not totally eliminating its ability to enforce the CSA against state dispensaries, the Department of Justice has effectively relaxed its role in prosecuting state cannabis business entities comports with a state regulatory scheme.¹⁴⁵ Further, Department of Justice officials stated, "While the prosecution of drug traffickers remains an important priority, the president and the administration believe that targeting individual marijuana users, especially those with serious illnesses and their caregivers, is not the best allocation of federal law enforcement resources."¹⁴⁶

However, in the same memorandum, the Department of Justice made clear that it retains the right to enforcement in many scenarios.¹⁴⁷ While prosecutorial discretion has relaxed, the Department of Justice remains vague on which specific cases it will prosecute. In other words, some prosecutors may still raid dispensaries that comport with state regulatory schemes, despite the memorandum. The effect of this memo on those applying for cannabis variety patents is unclear and speculative at best.

¹⁴⁴ *Id.*

¹⁴⁵ *Justice Department Announces Update to Marijuana Enforcement Policy*, United States Department of Justice (2013), <http://www.justice.gov/opa/pr/justice-departmentannounces-update-marijuana-enforcement-policy> (arguing that federal government's limited prosecutorial resources should be utilized on enforcement priorities and leave state and local law enforcement agencies to handle intrastate and local marijuana activity).

¹⁴⁶ Nicole Flatow, *BREAKING: Justice Department Won't Challenge State Marijuana Laws, Announces Major Shift In Law Enforcement Policy*, THINK PROGRESS, <http://thinkprogress.org/justice/2013/08/29/2551851/breaking-justice-department-wont-challenge-state-marijuana-laws-announces-major-shift-law-enforcement-policy/> (last visited Nov. 15, 2015).

¹⁴⁷ Cole, *supra* note 143, at 1–2. The memorandum sets out situations where enforcement is a priority, including preventing the distribution of marijuana to minors, the sale of marijuana from going to criminal enterprises, gangs, and cartels, the diversion of marijuana to states where it is legal under state law in some form to other states, state-authorized marijuana activity from being used as a cover or pretext for the trafficking of other illegal drugs or other illegal activity, violence and firearms in the cultivation and distribution of marijuana, drugged driving and exacerbation of other adverse public health consequences associated with marijuana use, the growing or marijuana on public lands and the attendant public safety and environmental dangers posed by marijuana production on public lands, and marijuana possession or use on federal property.

In a farewell interview with the press, Eric Holder discussed rescheduling marijuana by questioning, “whether or not marijuana is as serious a drug as is heroin.”¹⁴⁸ He further stated, “The question of whether or not they should be in the same category is something that I think we need to ask ourselves, and use science as the basis for making that determination.”¹⁴⁹

While dialogue and discussions indicate changing politics and enforcement policy, cannabis cultivation is still a prosecutable offense under the CSA.¹⁵⁰ True change in this area of law can only be changed by congressional legislation or rescheduling cannabis from Schedule I.

F. THE LEGAL ENVIRONMENT BEHIND UTILITY AND PLANT PATENTS

The United States Constitution explicitly provides for patents.¹⁵¹ The pertinent section states, “[t]o promote the [p]rogress of [s]cience and useful [a]rts, by securing for . . . [i]nventors the exclusive [r]ight to their respective [w]ritings and [d]iscoveries.”¹⁵² The underlying rationale for this constitutional provision is an economic incentives theory.¹⁵³ By providing a limited monopoly to inventors, patents encourage invention and innovation of works of utilitarian value to the public interest.¹⁵⁴ Adam Smith argued for “the need for limited monopolies to promote innovation and commerce requiring substantial upfront investments and risk.”¹⁵⁵ Another famous economist, John Stuart Mill, found “a temporary ‘exclusive privilege’ was preferable to general governmental awards on the ground that it avoided ‘discretion’ and ensured that the reward to the inventor was proportional to the ‘usefulness’ to consumers of the invention.”¹⁵⁶ If patents extend to the cannabis industry, a grower will likely want to capitalize on his or her strain of cannabis by monopolizing it. This may give the necessary spark needed to see rapid innovations in cannabis varieties.

¹⁴⁸ Interview by Katie Couric with Eric Holder, U.S. Attorney General (Sept. 25, 2014), <http://news.yahoo.com/video/holder-disproportionately-longer-prison-sentences-053241539.html>.

¹⁴⁹ *Id.*

¹⁵⁰ 21 U.S.C. § 841 (2010).

¹⁵¹ U.S. CONST. art. I, § 8, cl. 8.

¹⁵² *Id.*

¹⁵³ Michael A. Sartori, *An Economic Incentives Analysis of the Jury's Role in Patent Litigation*, 79 J. PAT. & TRADEMARK OFF. SOC'Y 331, 336 (1997) (discussing the economic incentives theory in patent law).

¹⁵⁴ *Id.* at 339.

¹⁵⁵ Peter Menhall, *Intellectual Property: General Theories* 131 (1991), available at <http://levine.ssnnet.ucla.edu/archive/ittheory.pdf>.

¹⁵⁶ *Id.* at 132.

Patent issues, from application to infringement, are exclusively within federal jurisdiction.¹⁵⁷ Applications for patents are reviewed by a federal agency known as the United States Patent and Trademark Office (USPTO).¹⁵⁸ The Federal Circuit is a special court that receives appeals of patent cases.¹⁵⁹

A cannabis cultivator could protect his or her cannabis strain through a utility patent,¹⁶⁰ the Plant Patent Act¹⁶¹ (PPA), or the Plant Variety Protection Act¹⁶² (PVPA). Utility patents are governed by 35 U.S.C. § 101,¹⁶³ which states, “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.”¹⁶⁴ Abstract ideas, physical phenomena, and laws of nature, including compounds naturally occurring in nature, are not patentable.¹⁶⁵ Utility patents must satisfy four elements: novel, statutory, useful, and nonobvious.¹⁶⁶

To receive a patent, an invention or innovation must be novel.¹⁶⁷ Per 35 U.S.C. § 102, an invention cannot be patented if “the claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention”¹⁶⁸ or “the claimed invention was described in a patent . . . or in an application for patent published . . . in which the patent . . . names another inventor and was . . . filed before the . . . filing date.”¹⁶⁹ Likewise, under § 102(b), an invention is ineligible for patent protection where public use of the invention, prior to applying for a patent, has led people to believe that the invention is available to all.¹⁷⁰ This requirement protects the public’s expectations while also encouraging prompt disclosure of new and useful

¹⁵⁷ Mark J. Henry, *State Courts Hearing Patent Cases: A Cry for Help to the Federal Circuit*, 101 DICK. L. REV. 41, 44 (1996).

¹⁵⁸ Note, *The Disclosure Function of the Patent System (Or Lack Thereof)*, 118 HARV. L. REV. 2007, 2009 (2005).

¹⁵⁹ *Id.* at 2011–12.

¹⁶⁰ 35 U.S.C. § 101 (2012).

¹⁶¹ Townsend-Purnell Plant Patent Act, 35 U.S.C. §§ 161–164 (1954).

¹⁶² See 7 U.S.C.A. §§ 2321–2582 (2015).

¹⁶³ 35 U.S.C. § 101 (2012).

¹⁶⁴ *Id.*

¹⁶⁵ David Tyler, *Patent Requirement*, BITLAW, <http://bitlaw.com/patent/requirements.html> (last visited Nov. 15, 2015).

¹⁶⁶ *Id.*

¹⁶⁷ *Id.*

¹⁶⁸ 35 U.S.C. § 102(a)(1) (2012).

¹⁶⁹ *Id.* § 102(a)(2).

¹⁷⁰ See Tyler, *supra* note 165.

information.¹⁷¹ This requirement is similar to the novelty requirement, except it looks backward from the date of application rather than the date of invention.¹⁷²

The “useful” requirement is easily satisfied if the invention under the patent statute has any utilitarian purpose.¹⁷³ Many courts have found that the term “useful” in the patent statute is laden with ambiguity.¹⁷⁴ A patent discharges the obligation of usefulness if it sets forth a specific and substantial utility.¹⁷⁵ Specific utility is defined by specificity to the subject matter claimed¹⁷⁶ and can “provide a well-defined and particular benefit to the public.”¹⁷⁷ Substantial utility in “[a patent] application must show that an invention is useful to the public as disclosed in its current form, not that it may prove useful at some future date after further research.”¹⁷⁸ But, a court is more likely to find an invention or innovation is not useful if it is an inoperative invention, meaning it does not operate to produce the results claimed by the patent applicant.¹⁷⁹ As long as the invention or innovation operates as stated in the patent application and satisfies a specific and substantial utility, the standard for usefulness is usually met in patent applications.

Finally, under 35 U.S.C. § 103,

[a] patent for a[n] invention may not be obtained . . . if the differences between the claimed invention and the prior art are such that the claimed invention . . . would have been obvious before the effective filing date . . . to a person having ordinary skill in the art.¹⁸⁰

The nonobvious requirement is the most difficult barrier to a utility patent. In a nonobvious determination, patent examiners will review previous patents to

¹⁷¹ *Id.*

¹⁷² *Id.*

¹⁷³ *Id.* This will be explored in greater detail in Part II.G.

¹⁷⁴ *Brenner v. Manson*, 383 U.S. 519, 529 (1966) (simply everyday word like “useful” can be “pregnant with ambiguity when applied to the facts of life”).

¹⁷⁵ *2107.01 General Principles Governing Utility Rejections (R-11.2013)*, United States Patent and Trademark Office (Mar. 27, 2014, 10:10 AM), <http://www.uspto.gov/web/offices/pac/mpep/s2107.html>.

¹⁷⁶ *Id.*

¹⁷⁷ *In re Fisher*, 421 F.3d 1365, 1371 (Fed. Cir. 2005).

¹⁷⁸ *Id.* at 1371.

¹⁷⁹ *2107.01 General Principles Governing Utility Rejections (R-11.2013)*, *supra* note 175. *In re Harwood*, 390 F.2d 985, 989, 156 U.S.P.Q. 673, 676 (C.C.P.A. 1968) (“An inoperative invention, of course, does not satisfy the requirement of 35 U.S.C. § 101 that an invention be useful.”).

¹⁸⁰ 35 U.S.C. § 103 (2012).

find similarities to the claimed invention.¹⁸¹ If all the features from the claimed invention can be found in a single patent, then it will be rejected. Otherwise, the examiner will combine two or more patents and attempt to find all the claimed invention's features in the combined patents.¹⁸² If the examiner successfully finds all the features through a combination of patents, the patent examiner will reject the claimed invention because it is an obvious combination of features in the prior art.¹⁸³ If the claimed invention overcomes the patent examiner's process, then it will fulfill this element.

Besides a utility patent, a cannabis cultivator could get a plant patent under the PPA. The PPA became law in 1930.¹⁸⁴ It was the first legislation in the world to afford patent rights to plant breeders and ensure protection for innovators in agriculture.¹⁸⁵ The statute states "whoever invents or discovers and asexually reproduces any distinct and new variety of plant, including cultivated sports, mutants, hybrids, and newly found seedlings . . . may obtain a patent therefor."¹⁸⁶ Many courts interpret the phrase "invents or discovers"¹⁸⁷ to mean "uniqueness of the plant and subsequent asexual reproduction of the plant."¹⁸⁸ In order to comport with the phrase 'asexual reproduction' in the Act, courts deem acceptable methods of reproduction to be "grafting, budding, cutting, layering, division, and the like."¹⁸⁹ The Act recognizes the plant breeder's work "in aid of nature" should be granted patent protection.¹⁹⁰ In subsequent years, Congress further addressed plant patents in general patent law.¹⁹¹ It changed the protections for plant patents from the "exclusive right to the 'right to exclude,' based on court interpretations of the right conferred to utility patents."¹⁹² Later on, Congress disallowed patent protection for plants in an uncultivated state.¹⁹³ As a result, plants in a cultivated, fully-formed state

¹⁸¹ See Tyler, *supra* note 165.

¹⁸² *Id.*

¹⁸³ *Id.*

¹⁸⁴ Ann K. Wooster, Annotation, *Construction and Application of Plant Patent Act (35 U.S.C.A. §§ 161 et seq.)*, 135 A.L.R. FED. 273 (1996).

¹⁸⁵ *Id.*

¹⁸⁶ 35 U.S.C. § 161 (2012).

¹⁸⁷ *Id.*

¹⁸⁸ Wooster, *supra* note 184, § 2, at 282.

¹⁸⁹ *Id.*

¹⁹⁰ *Id.*

¹⁹¹ *Id.* (citing the Act of July 19, 1952 ch. 950, 66 Stat. 804).

¹⁹² *Id.*

¹⁹³ *Id.* Uncultivated plant varieties are "wild varieties discovered by [a] plant explorer or other person who has in no way engaged either in plant cultivation or care and who has in no other way facilitated nature in the creation of a new and desirable variety." S. REP. NO. 71-315, at 3 (1930).

and later asexually reproduced were given more expanded protections.¹⁹⁴ The PPA limits asexual reproduction to that of one mother plant.¹⁹⁵ In 1995, the Federal Circuit reaffirmed in *Imazio Nursery, Inc. v. Dania Greenhouse* that only asexual reproduction from *one* mother plant is protected under the PPA.¹⁹⁶

In 1970, Congress sought to expand plant protections by passing the PVPA.¹⁹⁷ Unlike the PPA, the PVPA affords “patent-like protections to novel varieties of sexually reproduced plants.”¹⁹⁸ Thus, seeds and other forms of uncultivated, sexually reproduced plants, specifically removed from the PPA, can receive patent-like protections.¹⁹⁹ The patent-like protections include “exclud[ing] others from selling the variety, . . . offering it for sale, . . . reproducing it, . . . importing it, . . . exporting it, or using it [to] produc[e] (as distinguished from developing) a hybrid or different variety therefrom” for a period of twenty years.²⁰⁰ The purpose of the PVPA is to provide developers of novel plant varieties with “adequate encouragement for research, and for marketing when appropriate, to yield for the public the benefits of new varieties.”²⁰¹ Subsequent amendments to the PVPA require that the plant variety be “new, distinct, uniform, and stable.”²⁰² Thus, the PVPA would protect a sexually reproduced plant from distinct male and female plants, but not a clone grown from a cutting of a single mother plant.

However, protection for plants patented under PVPA do not originate from the USPTO. Rather, this protection comes from the Department of Agriculture.²⁰³ Therefore, PVPA protections are patent-like, but are not true patents in themselves. Thus, PVP certificates are less protective of legal rights than utility and plant patents because they are not regulated and enforced with the USPTO’s expertise.

The Federal Circuit and the United States Supreme Court have not addressed whether marijuana strains are patentable. However, case law involving corn serves as guidance in this area by analogy. The Supreme Court upheld the patentability of sexually reproduced plants in *J.E.M. Ag Supply v. Pioneer Hi-Bred International, Inc.* in 2001 (*Pioneer*). Pioneer Hi-Bred International

¹⁹⁴ Wooster, *supra* note 184, at 282.

¹⁹⁵ *Id.* § 9.

¹⁹⁶ *Id.* § 5, at 287 (citing *Imazio Nursery, Inc. v. Dania Greenhouse*, 69 F.3d 1560 (Fed. Cir. 1995)).

¹⁹⁷ *Id.* at 343.

¹⁹⁸ *Id.* § 2, at 282.

¹⁹⁹ *Id.*

²⁰⁰ See 7 U.S.C.A. § 2483 (1970).

²⁰¹ See *id.* § 2581.

²⁰² Wooster, *supra* note 184.

²⁰³ 7 U.S.C.A. § 2321 (1970).

was a corporation selling seeds from its hybrid corn plant 3394.²⁰⁴ Pioneer sold the seeds under a license that did not allow “the use of such seed or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed.”²⁰⁵ The petitioner, J.E.M. Ag Supply (J.E.M.) doing business as Farm Advantage, purchased these seeds from Pioneer in bags with the license agreement.²⁰⁶ J.E.M. resold the bags, and was subsequently sued by Pioneer, which claimed patent infringement.²⁰⁷ J.E.M. entered a counterclaim of patent invalidity stating that sexually-reproduced plants are not patentable subject matter under 35 U.S.C. § 101.²⁰⁸ The Supreme Court affirmed the judgments of the district court and court of appeals, which granted summary judgment to Pioneer.²⁰⁹

In *Pioneer*, the Supreme Court cited *Diamond v. Chakerabarty*,²¹⁰ which found that § 101 of the patent statute should be broadly interpreted.²¹¹ The *Chakerabarty* Court found that Congress does not need to expressly authorize protection of a particular patentable subject matter.²¹² Prior to passage of the PPA in 1930, the *Chakerabarty* Court explained that two factors precluded plants from patentability.²¹³ First, plants were believed to be products of nature, and thus, not patentable subject-matter.²¹⁴ Second, plants could not fulfill the description requirement in patent law.²¹⁵ While Congress did not believe plants were patentable prior to 1930, the *Chakerabarty* Court found “the relevant distinction was not between living and inanimate things, but between products of nature . . . and human-made inventions.”²¹⁶ After the *Chakerabarty* decision, the USPTO found that plants are patentable subject matter under § 101 because they fall within the meaning of “manufacture” or “composition of matter” as used in the statute.²¹⁷ Thus, a plant patent may achieve the status of a utility patent.

²⁰⁴ J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred International, Inc., 534 U.S. 124 (2001). The patent for this seed is U.S. Patent No. 5,491,295, cols. 2–3, at 29–30.

²⁰⁵ *Pioneer*, 534 U.S. at 128 (quoting U.S. Patent No. 5,491,295 at 51).

²⁰⁶ *Id.*

²⁰⁷ *Id.*

²⁰⁸ *Id.* at 129.

²⁰⁹ *Id.* at 129–30.

²¹⁰ 447 U.S. 303 (1980).

²¹¹ *Pioneer*, 534 U.S. at 130.

²¹² *Id.*

²¹³ *Id.* at 134 (quoting *Chakerabarty*, 447 U.S. at 311–12 (1980)).

²¹⁴ *Id.*

²¹⁵ *Id.*

²¹⁶ *Chakerabarty*, 447 U.S. at 313.

²¹⁷ *Pioneer*, 534 U.S. at 131.

Even though the PPA was codified in a separate chapter, Chapter 15, of Title 35, the *Pioneer* Court found this did not change the substantive rights for a plant patent. The Court held “[p]lant patents under the PPA . . . have very limited coverage and less stringent requirements than § 101 utility patents.”²¹⁸ This meant that plant patents were easier to obtain, but less secure than a utility patent. Additionally, the Court found that Chapter 15 did not state that plant patents were the exclusive means for protection for plants.²¹⁹ Thus, plants could obtain utility patent protection in the alternative.

J.E.M., however, argued the PPA and PVPA provide the exclusive means for protecting plants and excluded utility patent protection under § 101.²²⁰ J.E.M. advanced that plants were not covered in § 101 prior to the passage of the PPA, but the Court rejected this contention and concluded the utility patent statute was dynamic enough to encompass new and unanticipated inventions.²²¹ Second, J.E.M. argued the PPA’s limitation on protection for sexually reproduced plants would be meaningless if Congress wanted the utility patent statute to encompass sexually reproduced plants. However, the Court examined the legislative context surrounding the PPA’s enactment and concluded that Congress had very different concerns in mind: Congress felt that patenting sexually reproduced seeds was economically infeasible because there was no established market for such seeds.²²² The Court found little evidence to indicate Congress intentionally precluded patent protection for sexually reproduced plants when it limited the PPA to asexually reproduced plants.²²³ Finally, although the Congress codified plant patents in § 161, the Court held plant patents still fell within the expansive language of § 101.²²⁴

In the alternative, J.E.M. argued that Congress intended to deny broader protections for utility patent protection because Congress specifically enacted the PVPA, which limited patent-like protection for certain sexually reproduced plants.²²⁵ The Court held that the PVPA does not explicitly provide that it is

²¹⁸ *Id.* at 133.

²¹⁹ *Id.*

²²⁰ *Id.*

²²¹ *Id.* at 135 (“Whatever Congress may have believed about the state of patent law and the science of plant breeding in 1930, plants have always had the *potential* to fall within the general subject matter of § 101, which is a dynamic provision designed to encompass new and unforeseen inventions.”).

²²² *Id.* at 136.

²²³ *Id.* at 137.

²²⁴ *Id.* at 137–38.

²²⁵ *Id.* at 138.

the exclusive means of protecting sexually reproduced plants.²²⁶ It also held utility patents provide a larger scope of protection than a Plant Variety Protection (PVP) Certificate.²²⁷ Utility patents for plants are more difficult to obtain than a PVP certificate because a utility patent must be “new, useful, and nonobvious,”²²⁸ and breeders must describe the plant in enough detail to enable future breeders to make and use the invention after the patent expires.²²⁹ A plant breeder need only show the plant variety is “new, distinct, uniform, and stable”²³⁰ for a PVP certificate.²³¹ While protections for the PVPA were increased,²³² the PVP certificate does not grant full protections enjoyed by utility patents.²³³ The court referenced an example to explain the difference in protection between PVP certificates and utility patents. PVP certificates differ “because a [random] breeder can use a plant that is protected by a PVP certificate to ‘develop’ a new inbred line while he cannot use a plant patented under § 101 for such a purpose.”²³⁴ Under a utility patent, there are no exemptions for research or saving seed.²³⁵ PVP certificates do have an exemption for research and saving seeds.²³⁶ Further, PVP have no patent claims.²³⁷ Patent claims, under 35 U.S.C. § 112(b), state “[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.”²³⁸ These patent claims set forth the metes and bounds of protection.²³⁹ In other words, patent claims define the scope of what the patent

²²⁶ *Id.* (“First, nowhere does the PVPA purport to provide the exclusive statutory means of protecting sexually reproduced plants.”).

²²⁷ *Id.* (“Because it is harder to qualify for a utility patent than for a Plant Variety Protection (PVP) certificate, it only makes sense that utility patents would confer a greater scope of protection.”).

²²⁸ *Id.* at 142 (citing 35 U.S.C. §§ 101–103).

²²⁹ *Id.* (citing 35 U.S.C. § 112).

²³⁰ *See* 7 U.S.C. § 2402(a).

²³¹ *Pioneer*, 534 U.S. at 142.

²³² The PVPA also protects “any variety that is essentially derived from a protected variety,” 7 U.S.C. § 2402(c)(1), and “any variety whose production requires the repeated use of a protected variety,” *id.* § 2402(c)(3). *See* Plant Variety Protection Act Amendments of 1994, § 9, 108 Stat. 3142.

²³³ *Pioneer*, 534 U.S. at 143.

²³⁴ *Id.*

²³⁵ *Id.*

²³⁶ *Plant v. Utility Patents*, PERENNIAL PATENTS, <http://perennialpatents.com/plantpatent-v-utility-patents/> (last visited Oct. 20, 2015).

²³⁷ *Id.*

²³⁸ 35 U.S.C. § 112(b) (2012).

²³⁹ *Plant v. Utility Patents*, *supra* note 236.

does and does not cover.²⁴⁰ Plant patents have one claim.²⁴¹ Utility patents are much broader in their protection because they can have multiple claims.²⁴² Additionally, utility patents can cover different types of claims, including seed deposit claims, trait claims, breeding methods, food product claims.²⁴³ Further, the Court also noted the USPTO has assigned utility plant patents for a significant time frame²⁴⁴ without inconsistent legislation from Congress, indicating congressional acquiescence to the PPA and PVPA.²⁴⁵ Thus, the court concluded “newly developed plant breeds fall within the terms of § 101, and that neither the PPA nor the PVPA limits the scope of § 101’s coverage.”²⁴⁶

The Supreme Court further explored seed patents in *Bowman v. Monsanto Co.*²⁴⁷ Monsanto owned a patent on a genetically modified soybean known as the “Roundup Ready” seed, which could survive exposure to certain herbicides.²⁴⁸ Under a special licensing agreement, the seed could be sold to a grain elevator or the resulting crop could be consumed for personal use or sold in commercial markets.²⁴⁹ The license did not permit breeding, even though it was possible.²⁵⁰ Since the seed’s resistance to certain herbicide came from a genetic trait, the trait could be passed down to seeds produced by the resultant crop.²⁵¹

A farmer named Vernon Bowman sought to circumvent the special licensing agreement and avoid paying premium prices for the Roundup Ready seed.²⁵² Instead of purchasing the seeds, Bowman purchased an assortment of commodity seeds from a grain elevator.²⁵³ The batch he purchased contained Roundup Ready seeds intermixed with other seeds.²⁵⁴ Bowman planted all the seeds and then applied a glyphosate herbicide.²⁵⁵ This method killed all the

²⁴⁰ *How Do I Read A Patent? The Claims*, BROWN AND MICHAELS, <http://www.bpmlegal.com/hotoppat5.html> (last visited Oct. 20, 2015).

²⁴¹ *Plant v. Utility*, *supra* note 236.

²⁴² *Id.*

²⁴³ *Id.*

²⁴⁴ At the time of the opinion, the Court noted utility plant patents had been granted for “at least 16 years.” *Id.* at 144.

²⁴⁵ *Id.* at 143–44.

²⁴⁶ *Id.* at 145.

²⁴⁷ 133 S. Ct. 1761 (2013).

²⁴⁸ *Id.* at 1764. The patent for this seed is U.S. Patent No. 5,352,605.

²⁴⁹ *Id.*

²⁵⁰ *Id.*

²⁵¹ *Id.* at 1765.

²⁵² *Id.*

²⁵³ *Id.*

²⁵⁴ *Id.*

²⁵⁵ *Id.*

non-Roundup Ready seeds and revealed the crops with the patented herbicide-resistant genetic trait.²⁵⁶ Bowman harvested these crops, saved the seeds, and replanted the patented Roundup Ready seed without paying Monsanto.²⁵⁷

Monsanto sued Bowman for patent infringement of its Roundup Ready seed.²⁵⁸ Bowman raised the patent exhaustion defense.²⁵⁹ The district court found Bowman infringed on Monsanto's patents and the Federal Circuit affirmed.²⁶⁰

The Supreme Court held the patent exhaustion doctrine does not permit a farmer to save seeds from resulting crops under Monsanto's special licensing agreement.²⁶¹ The Court explained that the patent exhaustion doctrine constrains the patent holder's right to control another's right to a particular article of the patented invention.²⁶² Once the patentee has received a reward for the *particular article* of the patented product, he or she retains no further control.²⁶³ However, the patentee maintains the ability to prevent the buyer to reproduce the particular article of the patented technology.²⁶⁴ Based on this rationale, the Supreme Court held Bowman was not entitled to the patent exhaustion defense while he had a right to use the original seeds he purchased, he needed Monsanto's permission to harvest reproduced seeds from their patented Roundup Ready seeds.²⁶⁵

In examining plant patents, the Court considered the *Pioneer* case and the PVPA.²⁶⁶ Here, the Court reaffirmed that a patent holder of a genetically modified seed, but not a holder of a PVP certificate, can preclude a buyer from saving seeds from the resulting crop.²⁶⁷ The court referred back to the *Pioneer* case, which concluded the "Patent Act, unlike the PVPA, contains 'no exception' for 'saving seed.'"²⁶⁸ Thus, buyers of a patented seed under § 101 could not save, and subsequently, breed the seed. The Court reasoned a patent would dramatically decrease in value after the first transaction if farmers could

²⁵⁶ *Id.*

²⁵⁷ *Id.*

²⁵⁸ *Id.*

²⁵⁹ *Id.*

²⁶⁰ *Id.*

²⁶¹ *Id.* at 1763.

²⁶² *Id.*

²⁶³ *Id.*

²⁶⁴ *Id.*

²⁶⁵ *Id.* at 1766.

²⁶⁶ *Id.* at 1767.

²⁶⁷ *Id.*

²⁶⁸ *Id.*

save seeds from the patented plant²⁶⁹ and create stockpiles of herbicide resistant seeds.

Bowman countered that the exhaustion defense applied in this case because farmers normally harvest seeds from crops for subsequent growing seasons.²⁷⁰ In dismissing this argument, the Court equated harvesting seeds from the resulting crop to making a new product.²⁷¹ In the alternative, Bowman argued that seeds naturally self-replicate, and thus, it was the planted seed that violated the patent, not Bowman.²⁷² The Court concluded Bowman's conduct made him more than a passive observer; rather, he maintained reproduction of the seeds for eight generations.²⁷³

In the concluding paragraph of the opinion, the Court limited its holding to Bowman's seed reproduction and not to other self-replicating technologies.²⁷⁴ The Court declined to address patent exhaustion scenarios where the self-replication happens outside the purchaser's control or self-replication is a step in using the particular article for another purpose.²⁷⁵

It is fairly clear that a plant can be patented through either a utility patent or a plant patent, or can receive patent-like protections under a PVPA certificate. However, cannabis presents another unique issue: can someone patent a plant that society considers harmful or immoral? This question invokes a concept in patent law known as the moral utility doctrine, which means, "not be frivolous, or injurious to the well-being, good policy, or good morals of society."²⁷⁶ Considering the moral utility in a patent is virtually irrelevant if a utilitarian purpose exists. In *Juicy Whip, Inc. v. Orange Bang, Inc.*, the Federal Circuit considered this moral utility doctrine²⁷⁷ and found that a patent is not invalid because it could be used for an immoral purpose.²⁷⁸ *Juicy Whip, Inc.* owned a patent²⁷⁹ for a drink dispenser with a simulated pre-mix tank on top of the dispenser.²⁸⁰ The tank gives the visual impression as if the tank is the principal

²⁶⁹ *Id.* at 1768.

²⁷⁰ *Id.*

²⁷¹ *Id.*

²⁷² *Id.* at 1768–69.

²⁷³ *Id.* at 1769.

²⁷⁴ *Id.*

²⁷⁵ *Id.*

²⁷⁶ *Lowell v. Lewis*, 1 Mason 82 (Cir. D. Mass. 1817), *abrogated by In re Fisher*, 421 F.3d 1365, 1371 (Fed. Cir. 2005).

²⁷⁷ *Juicy Whip, Inc. v. Orange Bang, Inc.*, 185 F.3d 1364 (Fed. Cir. 1999).

²⁷⁸ *Id.* at 1368.

²⁷⁹ POST-MIX BEVERAGE DISPENSER WITH AN ASSOCIATED SIMULATED VISUAL DISPLAY OF BEVERAGE, U.S. Patent No. 5,575,405 (filed Apr. 18, 1996) (issued Nov. 19, 1996).

²⁸⁰ 185 F.3d at 1365.

source of the bowl's contents; however, the true source of the beverage is mixed immediately before being dispensed underneath the cabinet.²⁸¹ Juicy Whip sued Orange Bang, Inc. for a patent infringement claim.²⁸² Subsequently, Orange Bang, Inc. successfully moved for summary judgment at the district court level, holding that Juicy Whip's patent was invalid because it lacked utility and could not be patented under § 101.²⁸³

On appeal, the Federal Circuit overturned the judgment of the district court because there was no basis to hold that the invention lacked utility simply because it could fool some members of the public.²⁸⁴ The Federal Circuit reasoned the threshold for finding an invention satisfied utility is only whether that invention is capable of providing some identifiable benefit.²⁸⁵ The Court held that the fact one product could be held to look like another invention is a specific benefit in itself.²⁸⁶

Even though the invention may deceive customers, the utility requirement was not a mandate for the USPTO to serve as arbiters of deceptive trade practices.²⁸⁷ Rather, the Court found this decision best left to other administrative agencies, like the Food and Drug Administration, to protect consumers from fraud and deception.²⁸⁸

While the Supreme Court has not specifically decided on the doctrine of moral utility, it has identified a categorical exclusion to patentable subject matter, notwithstanding a product's utilitarian value. In *Bilski v. Kappos*,²⁸⁹ the Supreme Court held the "machine-or-transformation test" is not the sole test for determining the patent eligibility of a process.²⁹⁰ In affirming the Federal Circuit opinion, the Court addressed three specific exceptions to patentable subject matter under § 101. In referencing the *Chakrabarty* opinion, the *Bilski* Court found only "laws of nature, physical phenomena, and abstract ideas"²⁹¹ are not patentable under § 101. Outside of these exceptions, the *Bilski* Court found Congress took a broad, permissive approach to patent eligibility under

²⁸¹ *Id.*

²⁸² *Id.* at 1366.

²⁸³ *Id.*

²⁸⁴ *Id.* at 1368.

²⁸⁵ *Id.* at 1366.

²⁸⁶ *Id.* at 1367.

²⁸⁷ *Id.* at 1368.

²⁸⁸ *Id.*

²⁸⁹ 561 U.S. 593 (2010).

²⁹⁰ *Id.* The facts underlying the opinion are not relevant to this analysis.

²⁹¹ *Id.* at 601.

§ 101.²⁹² In the aftermath of *Bilski*, it appears the Supreme Court interpreted § 101 broadly to include many areas for innovation as long as an invention does not fall into one of the aforementioned categorical exclusions.

While the aforementioned cases do not specifically address whether a strain of marijuana is patentable, they may provide guidance by analogy for this form of novel patentable subject matter.

G. CURRENT PATENTS GRANTED FOR CANNABIS AND PATENT PENDING DEVELOPMENTS

While the Federal Government explicitly prohibits cannabis possession, use, distribution, and cultivation under the CSA, ironically, the federal government itself owns a patent for cannabis. U.S. Patent No. 6630507, named “Cannabinoids as Antioxidants and Neuroprotectants” was issued on October 7th, 2003. The patent abstract states:

Cannabinoids have been found to have antioxidant properties, unrelated to NMDA receptor antagonism. This newfound property makes cannabinoids useful in the treatment and prophylaxis of wide variety of oxidation associated diseases, such as ischemic, age-related, inflammatory and autoimmune diseases. The cannabinoids are found to have particular application as neuroprotectants, for example in limiting neurological damage following ischemic insults, such as stroke and trauma, or in the treatment of neurodegenerative diseases, such as Alzheimer’s disease, Parkinson’s disease and HIV dementia. Nonpsychoactive cannabinoids, such as cannabidoil, are particularly advantageous to use because they avoid toxicity that is encountered with psychoactive cannabinoids at high doses useful in the method of the present invention.²⁹³

The patent does not give the federal government a patent on the cannabis plant because the plant is a product of nature. It rather patents a method of use of a

²⁹² *Id.* The Court took a broad permissive approach “to ensure that “ ‘ingenuity should receive a liberal encouragement.’ ” *Id.* (quoting *Diamond v. Chakrabarty*, 447 U.S. 303, 308–09 (1980)).

²⁹³ *Cannabinoids as Antioxidants and Neuroprotectants*, U.S. Patent No. 6630507 (filed Feb. 2, 2001) (issued Oct. 7, 2003).

non-psychoactive cannabinoid compound for treating some diseases.²⁹⁴ The patent does not claim a composition of matter or a compound, but rather a method for using specific cannabinoids for treating oxidative stress.²⁹⁵ Other marijuana patents have been granted for methods of use and marijuana associated products, but none have been granted for particular cannabis strains.²⁹⁶

Today, a medical marijuana product exists as a consumable product in the prescription drug industry. On May 31, 1985, the Federal Drug Administration (FDA) approved Marinol for marketing in the United States.²⁹⁷ Marinol incorporates Dronabinol in soft gelatin capsules.²⁹⁸ Dronabinol is a synthetic delta-9-tetrahydrocannabinol, commonly known as THC.²⁹⁹ The purpose of Marinol is to treat “anorexia with weight loss in patients with AIDS”³⁰⁰ and “nausea and vomiting associated with cancer chemotherapy in patients who have failed to respond adequately to conventional antiemetic treatments.”³⁰¹ Side effects for the drug could include abdominal pain, nausea, vomiting, amnesia, anxiety, confusion, depersonalization, dizziness, euphoria, hallucination, paranoia, somnolence, and “thinking abnormal.”³⁰² “[Marinol] ha[s] been through FDA’s rigorous approval process and [has] been determined to be safe and effective.”³⁰³ The FDA approval process necessitates “solid clinical data” along with “a scientifically based assessment of the risks and benefits” to assess the therapeutic value of drugs.³⁰⁴

²⁹⁴ Andrew Chadeayne, *Does U.S. Patent No. 6,630,507 Give the Government Ownership of Marijuana?*, INVESTING PATENTS-OWNING IDEAS, <http://inventingpatents.com/us-patent-66305070-methods-using-marijuana/> (last visited Nov. 15, 2015).

²⁹⁵ *Id.*

²⁹⁶ For more information, view the USPTO Patent Full-Text and Image Database and search for “cannabis.” USPTO Patent Full-Text and Image Database, <http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetacgi%2FPTO%2Fsearch-bool.html&r=0&f=S&l=50&TERM1=cannabis&FIELD1=&co1=AND&TERM2=&FIELD2=&d=P TXT> (last visited Nov. 15, 2015).

²⁹⁷ Testimony of Robert J. Meyer, M.D., <http://www.fda.gov/newsevents/testimony/ucm114741.htm>.

²⁹⁸ *Marinol*, <http://www.fda.gov/ohrms/dockets/dockets/05n0479/05N-0479-emc0004-04.pdf> (last visited Nov. 15, 2015).

²⁹⁹ *Id.*

³⁰⁰ *Id.*

³⁰¹ *Id.*

³⁰² *Id.* In clinical trials, the incidence rates of the side effects were 3% to 10%. *Id.*

³⁰³ Testimony of Robert J. Meyer, M.D., <http://www.fda.gov/newsevents/testimony/ucm114741.htm> (last visited Nov. 15, 2015).

³⁰⁴ *Id.* Any drug marketed in the United States must undergo rigorous scientific testing under the Pure Food and Drug Act of 1906. [Http://www.dea.gov/divisions/sea/in_focus/marinol-cessmet.pdf](http://www.dea.gov/divisions/sea/in_focus/marinol-cessmet.pdf) (last visited Nov. 15, 2015).

Marinol is a Schedule III drug³⁰⁵ regulated under the CSA, and is considered “abusable.”³⁰⁶ The DEA helped facilitate research of THC’s therapeutic effects on nausea and vomiting in the early 1980s.³⁰⁷ The research led to classification of Marinol as a Schedule III drug.³⁰⁸ In a 1999 report by the Institute of Medicine, the Institute did not recommend smoked marijuana for diseases treatable by cannabinoids, but it found that compounds in marijuana could be isolated in purified and synthetic forms in pharmaceuticals.³⁰⁹

While Marinol’s legality as a controlled substance indicates the federal government is open to legalizing THC-like substances, it has never allowed a patent of a cannabis strain. Scarce to no legal precedent exists for cannabis varieties. In fact, many cannabis varieties are patent-pending before the USPTO.³¹⁰ But, the USPTO has not granted a patent to a cannabis strain yet.³¹¹ According to the Jason Blevins, a writer for the Denver Post, “[t]he U.S. Patent and Trademark Office has rejected cannabis-related patents consistently, arguing that the invention is ‘immoral and scandalous’ because marijuana is illegal or that the invention has no useful purpose because its use violates federal drug law.”³¹² An eager grower can file a standard patent application with the USPTO, but he or she will likely run into federal inaction.³¹³ Further, the USPTO website states, “the average patent application pendency is 24.6 months.”³¹⁴ Given that it will take two years from the date of filing to reach a

³⁰⁵ According to the DEA, “Schedule III drugs, substances, or chemicals are defined as drugs with a moderate to low potential for physical and psychological dependence. Schedule III drugs abuse potential is less than Schedule I and Schedule II drugs but more than Schedule IV.” Drug Schedules, <http://www.dea.gov/druginfo/ds.shtml> (last visited Nov. 15, 2015).

³⁰⁶ Marinol, <http://www.fda.gov/ohrms/dockets/dockets/05n0479/05N-0479-emc0004-04.pdf> (last visited Nov. 15, 2015).

³⁰⁷ Pharmaceutical products already exist, called Marinol and Cesamet. [Http://www.dea.gov/divisions/sea/in_focus/marinol-cessmet.pdf](http://www.dea.gov/divisions/sea/in_focus/marinol-cessmet.pdf) (last visited Nov. 15, 2015).

³⁰⁸ *Id.*

³⁰⁹ *Id.*

³¹⁰ For an example of a patent-pending cannabis strain that is still in application phase, see, Patent Application 61923707, United States Patent and Trademark Office Patent Application Full Text and Image Database, <http://appft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HTTOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=24&f=G&l=50&co1=AND&=PG01&s1=cannabis.CLM.&OS=ACLM/cannabis&RS=ACLM/cannabis> (last visited Oct. 20, 2015).

³¹¹ Hilary Bricken, *The Possibility of Marijuana Plant Patents*, <http://abovethelaw.com/2015/07/the-possibility-of-marijuana-plant-patents/> (last visited Oct. 20, 2015).

³¹² Jason Blevins, *Pot Grower’s Quest: U.S. Patent Protection for Cannabis Seeds*, <http://www.thecannabist.co/2014/12/24/cannabis-seeds-pot-growers-us-patent-protection/25975/2/> (last visited Oct. 20, 2015).

³¹³ *Id.*

³¹⁴ *Patent FAQs*, UNITED STATES PATENT AND TRADEMARK OFFICE, <http://www.uspto.gov/help/patent-help> (last modified Dec. 13, 2014).

patent grant or denial, the only benefit from the patent application process a grower can hope for is a patent-pending designation³¹⁵ on his or her strain.

III. ANALYSIS

The legal muddle explained above provides little guidance for whether cannabis strains are patentable, and a cannabis strain has never been patented. While case law from the Federal Circuit provides some guidance for plant patents in the corn industry,³¹⁶ it is unclear whether a plant patent can be issued for a cannabis variety. Thus, growers are left in legal limbo.

Initially, since the cannabis plant is a product of nature, it cannot be patented.³¹⁷ Thus, while naturally occurring compounds are not patentable, synthetic compounds and purified components of marijuana are patentable as chemical inventions.³¹⁸ Additionally, new combinations of the molecules found in marijuana are patentable.³¹⁹

First, this Part will establish the underlying issues for cannabis variety patents. This Part will then analyze the major impediments to patentability and the underlying rationale for those obstacles. This Part will also evaluate some clear answers that have emerged from analogous patent law. Further, this Part will suggest a legal analytical framework for growers seeking to patent their respective cannabis strains. This framework considers salient questions of patent law: what avenues a cultivator could choose for his or her cannabis variety patent, the current federal prohibition, and its effect on cannabis variety patents. Next, this Part will answer the central question posed by this Note: whether a cannabis strain is patentable, and how a grower could go about receiving legal protection for their strain. Given the current state of federal law, this Part will assert that cannabis strains are patentable, using analogous case law and the underlying policy of patent law in general. Finally, this Part will address potential legislative developments that may change the analytical framework and the conclusion reached by this Note.

³¹⁵ “When a patent application is pending, the manufacturer is able to use the term ‘patent-pending’ on the product or in advertisements.” Bonnie Grant, *Deficiencies and Proposed Recommendation to the False Marking Statute: Controlling Use of the Term ‘Patent,’* 12 J. INTELL. PROP. L. 283 (2004).

³¹⁶ See *Monsanto Co.*, 133 S. Ct. at 1761; see also *Pioneer*, 534 U.S. at 124.

³¹⁷ Does U.S. Patent No. 6,630,507 Give the Government Ownership of Marijuana?, <http://inventingpatents.com/us-patent-66305070-methods-using-marijuana/> (last visited Nov. 15, 2015).

³¹⁸ *Patenting Marijuana Technology*, INVENTINGPATENTS.COM, <http://inventingpatents.com/patent-ing-marijuana-technology/> (last visited Nov. 15, 2015).

³¹⁹ *Id.*

A. PATENTABILITY OF CANNABIS VARIETIES: A CLEARER PICTURE OF THE UNDERLYING ISSUES

While the legal environment surrounding cannabis variety patents remains murky, there are some clearly definable issues and answers. The prospective patentee must understand what undercuts the potential patent.

The main impediment to patentability for cannabis varieties is the CSA.³²⁰ Under the CSA, the DEA has labeled cannabis as a Schedule I drug, meaning it has no medically accepted benefit and is highly susceptible to abuse. While many states legalized marijuana for medical and recreational use,³²¹ cannabis is federally prohibited. Pursuant to the CSA, the federal government can arrest state residents despite comporting with state marijuana laws, according to the *Gonzales* decision.³²² As a result, growers will need to find a way around the CSA.

This impediment has several practical impacts on the cannabis cultivation trade. First and foremost, it makes cannabis cultivation illegal. As a result, when cannabis cultivators apply to the patent process, they are essentially admitting to a federal crime.³²³ Cannabis cultivators thus risk criminal prosecution simply by applying for a patent. Further, one purpose of the CSA is to limit the supply of cannabis in the market.³²⁴ The cultivation of cannabis varieties increases the supply of cannabis in general. Therefore, the federal prohibition serves as a deterrent to cannabis cultivation, thereby limiting the supply in drug markets, and opportunities for innovation.

While the CSA has effectively prevented marijuana cultivation from developing legal precedent in the patent arena, some clear answers exist in current patent law. A patent for an extracted component of cannabis exists for the federal government.³²⁵ Therefore, it appears that cannabis is clearly patentable; however, this patent is materially limited. A further analysis of the patent shows this patent does not exist for the cannabis plant, but rather for a non-psychoactive cannabinoid compound derived from the plant.³²⁶ Thus, the question as to whether cannabis varieties are patentable has not been answered.

³²⁰ Controlled Substances Act, 21 U.S.C. § 801 (1970).

³²¹ See COLO. CONST. art. XVIII, § 16 (2013); see also WASH. ADMIN. CODE §§ 314-55-005 through 314-55-540 (2013). Recently, Oregon, Alaska, and the District of Columbia have legalized recreational marijuana.

³²² 545 U.S. at 29.

³²³ Interview with Joseph Miller, January 4th, 2015, by this Note's Author.

³²⁴ The Controlled Substances Act, 21 U.S.C. § 801 (1970).

³²⁵ Cannabinoids as Antioxidants and Neuroprotectants, U.S. Patent No. 6630507 (filed Feb. 2, 2001) (issued Oct. 7, 2003).

³²⁶ *Id.*

Additionally, a synthetic cannabis supplement, Marinol, is readily available for states that have legalized medical marijuana. While it appears the federal government has admitted cannabis compounds have medicinal uses by admitting Marinol as a Schedule III drug, this still leaves the cannabis variety patent question open. Therefore, while there are promising answers in this legal miasma, a genuine uncertainty remains for the patentability of unique cannabis varieties.

B. THE ANALYTICAL FRAMEWORK FOR GROWERS

Given the outstanding legal question as to whether cannabis varieties are patentable, many corollary questions surrounding cannabis varieties have developed.

The first question a cultivator must ask is whether the cannabis strain is patentable? Initially, a cultivator must determine whether the cannabis product occurs naturally, or is a unique cannabis variety either sexually or asexually reproduced. In order to answer this threshold inquiry, the cultivator must decide to pursue one of three routes: utility patents, PPA, or the PVPA.

Since utility patents afford the highest level of legal protection for intellectual property, they are the hardest to attain.³²⁷ While a cultivator can develop a new composition of matter theoretically attainable under § 101, evidenced by the utility patents granted in *Pioneer*, the cultivator actually needs to develop a new composition of matter. This may be above the pay grade of the average botanist and require sophisticated laboratory technology.

As a result, it is more prudent for a cultivator to apply for a plant patent under the PPA. Plant patents are more easily attainable than utility patents because fewer elements need to be proven in the patent application process. The precedent set forth in *Pioneer* indicates this is entirely possible. The only restriction on plant patents is that the variety must be asexually reproduced, thereby limiting the vast possibilities of genetic recombination through sexual reproduction. Additionally, since asexual reproduction can only be rendered from one mother plant,³²⁸ this may create more cost for the cultivator because a mother plant must be grown before an asexually reproduced plant can be patented.

Thirdly, cultivators can seek protection through a PVP certificate under the PVPA. PVP certificates grant patent-like protections for sexually reproduced

³²⁷ Utility patents require the showing of four elements: Novelty, statutory, nonobvious, and Usefulness. *See supra* Part II.

³²⁸ Wooster, *supra* note 184, § 2.

plants. All the grower must prove for a PVP certificate is that the cannabis variety is new, distinct, uniform, and stable. Thus, growers can receive legal protection for cannabis seeds and uncultivated plants. However, there are some drawbacks to this patent route. PVP certificates are granted by the Department of Agriculture, not the USPTO. The USPTO has more expertise in dealing with patents generally, whereas the Department of Agriculture dedicates only one office to Plant Variety Patents. Further, a PVP certificate has no claims on the scope of protection, whereas plant patents have one claim defining the bounds of protection. Thus, PVP certificates do not afford the full amount of protection afforded by a plant patent under the PPA.

A cannabis cultivator needs to thoroughly ascertain the details of the cultivation process needed to complete a valid patent application. Before submitting the patent application, the cannabis cultivator must determine if the federal government will deny the patent because cannabis is a Schedule I drug and illegal at the federal level. However, the *Juicy Whip* precedent suggests that the fact that cannabis is illegal under the CSA has no merit in the patent application process. As long as cannabis has an identifiable utilitarian benefit, it satisfies the usefulness requirement, and here, a cultivator can point the medical benefits of cannabis. While the court in *Juicy Whip* did not consider a patented product that was inherently illegal³²⁹ like cannabis, this Federal Circuit case clearly establishes that the USPTO does not look to moral utility in a patent application.³³⁰

Next, the cannabis cultivator will need to assess an important risk: criminal liability. The pertinent question is whether the patent application serves as an admission to a federal crime. Since the patent process is an incredibly detailed process, a cannabis cultivator will need to fully elucidate the details of the activities engaged in to develop a new cannabis variety in order to complete a valid patent application. Details about cultivation include growing methods, harvesting, and many other ways of cultivating the cannabis plant. Further, patent applicants will need to delve into further specificity of their innovation by proving the metes and bounds of their patent claims. While patent claims only apply to plant and utility patents, PVP certificates still must divulge information about the cannabis strain to the federal government to fulfill the necessary elements for the certificate. Since cultivation of marijuana is a federal crime under the CSA, the prospective patentee will be reporting facts that

³²⁹ The product in this case was a drink machine. *Id.* at 1365–68. By contrast, cannabis is inherently illegal under the CSA.

³³⁰ Even though the Federal Circuit has established no moral utility, it is still unclear what the Supreme Court will determine.

constitute an admission of criminal wrongdoing. Given that the acts undertaken to innovate are also acts that are punishable as crimes, a person could technically engage in them, but only at the cost of putting themselves in danger of being criminally prosecuted. Here, if the grower is willing to take the risk and fails, he or she may enjoy patent protection for their cannabis variety from the confines of a federal penitentiary.

C. ALTHOUGH CANNABIS IS A SCHEDULE I DRUG UNDER THE CSA, POLICY CONSIDERATIONS UNDERLYING PLANT PATENTS AND THE FEDERAL CIRCUIT CASE LAW INDICATE CANNABIS VARIETIES ARE LIKELY PATENTABLE

Although cannabis is a Schedule I drug under the CSA, cannabis strains are likely patentable because the USPTO does not look into the moral utility of a patent. From the face of the CSA, a grower may believe a cannabis variety patent is unattainable, given that cannabis cultivation is illegal at the federal level. However, there is no provision in the text of the CSA prohibiting patent protection, through utility patents, PPA, or the PVPA. It is safe to assert that the CSA did not contemplate patent law at all, but rather only criminal sanctions for cannabis possession and production. Assuming the cannabis variety cultivated is unique and not a product of nature or another categorical exclusion under the *Bilski* precedent,³³¹ a grower will theoretically receive a patent through proof of the creation of the variety and satisfactory completion of the patent application requirements.

As an initial matter, under *Juicy Whip*, the USPTO will not look to the moral utility of the invention. So long as the patent is written broadly enough to encompass a legitimate purpose, the fact that the invention's use is immoral does not affect its patentability. However, while there are good business reasons for making cannabis strains patentable, patent law usually ignores business considerations when determining patentability. Thus, cannabis strains likely do not violate the usefulness requirement.

Additionally, under *Bowman* and *Pioneer*, a cultivator can receive a patent for plants or a PVP certificate. Further, a grower can likely preclude purchasers of his or her plant patent from saving seeds and growing new batches. Thus, it appears that if cannabis varieties are plants and can be either sexually or asexually reproduced, they are patentable. Moreover, nothing in the *Bilski* precedent precludes the broad patentable subject matter of § 101, unless a product is a product of nature, physical phenomena, or an abstract idea. As

³³¹ The specific categorical exemptions are products of nature, physical phenomena, and abstract ideas. *Bilski*, 561 U.S. at 601.

long as the cultivator can show he engineered the variety in aid of nature, the cultivator will likely get around the products-of-nature exclusion.

Furthermore, the policy considerations underlying patent law support the patentability of cannabis strains. The fundamental purpose of patent law is encouraging innovation of utilitarian works.³³² Assuming cannabis varieties serve a utilitarian purpose—and medical evidence suggest they do³³³—providing patents for cannabis varieties promotes innovation in an industry ripe with opportunity. Cannabis cultivators will likely develop the best strains in the hopes of achieving legal legitimacy and protection from the federal government. The possibilities for invention and innovation are limitless. Preclusion of cannabis variety patents would likely result in a chilling effect on the cannabis industry as a whole. As a result, the possibility that new varieties are discovered will diminish dramatically, which likely will have a substantial adverse impact on the development of this emerging industry. Given that states like Colorado and Washington use revenues from marijuana sales to fund public goods, growth in the cannabis industry can funnel more money in educational projects and other public funds. This benefits society in addition to the billions of dollars saved on law enforcement and correctional facility costs. Furthermore, assuming cannabis does have a medical use, innovation in cannabis varieties may catalyze the development of unimagined pharmaceutical drugs and spur entirely new industries. But, much of these hypothetical benefits are likely not possible without an economic incentive, namely, the limited monopoly afforded by patent law.

Currently, economic barriers created by the CSA have limited the investment flowing into the cannabis industry. Many venture capitalists and angel investors are wary of the cannabis industry for two reasons: one, potential criminal liability, and two, the industry is not the type traditionally financed by venture capital funds.³³⁴ While venture capitalists and cannabis cultivators are understandably wary of the first reason, lack of quality in the industry may be alleviated by the provision of cannabis variety patents. If cannabis varieties are patentable, the cannabis industry gains much-needed credibility, which it currently lacks. By providing this credibility, legal protection would consequently provide a catalyst for capital investment. Therefore, the development of patent law in the corn industry, the virtual nonexistence of the moral utility doctrine, and the strong policy rationales underlying patent law support the idea that cannabis varieties should be patentable.

³³² Sartori, *supra* note 153, at 336 (discussing the economic incentives theory in patent law).

³³³ See *supra* note 93.

³³⁴ Ohmer, *supra* note 59, at 113–14.

D. LEGISLATIVE DEVELOPMENTS THAT CAN CHANGE THE LEGAL ENVIRONMENT

While cannabis varieties are likely a patentable subject matter, legislative enactments, executive action, and administrative capitulation by the USPTO can provide more assurance for a cannabis cultivator that his or her variety is patentable. The CSA was a product of congressional action. Accordingly, Congress is in the best position to effectuate change favoring cannabis variety patents. Congress could expressly allow cannabis patents through law.

More feasibly, Congress could allow the Attorney General to give states with regulatory schemes immunity from federal prosecution under the CSA. This could potentially resolve the conflict between state and federal laws on marijuana legalization. The federal government would then have leverage in ensuring state compliance with federal drug enforcement objectives, while also resolving the fear of federal prosecution on the part of those growers operating legally in states. Conversely, Congress could also specifically prohibit cannabis variety patents by statute. Here, the issue is not Congress's constitutional authority to act, but rather those political realities of congressional legislation.

Executive action by the President could also effectuate change in this legal environment. The President could reschedule marijuana from a Schedule I to a Schedule II drug and this seems like more of a reality in the wake of former Attorney General Eric Holder's comments in favor of this move. This would drastically change the legal environment. Such a move will likely be politically motivated, as it rests with the president's discretion. Furthermore, the federal government could choose not to prosecute the person making a cannabis variety claim. It appears from the Department of Justice memo that this may occur because such prosecution does not fulfill the priorities of federal enforcement.³³⁵ However, this still leaves open significant risk to the prospective cannabis variety patent applicant because there is always uncertainty about prosecutorial discretion.

Finally, if the patent-pending cannabis strain is granted by the USPTO, the precedent for marijuana strains is clear: it is allowed. Currently, the USPTO has not granted a cannabis strain patent citing marijuana's illegality under federal

³³⁵ *Justice Department Announces Update to Marijuana Enforcement Policy*, United States Department of Justice (2013), <http://www.justice.gov/opa/pr/justice-department-announces-update-marijuana-enforcement-policy> (explaining the federal enforcement priorities emphasize prevention of distribution to minors, distribution to criminal enterprises, distribution to states where marijuana is illegal, using marijuana as a cover for other drugs, use of firearms in distribution of marijuana, impaired driving and other adverse consequences, growing on public lands, and possession or use of marijuana on public lands).

law.³³⁶ Therefore, cannabis strains will not be issued without USPTO capitulation. Capitulation will likely not happen. However, in the event cannabis strains become patentable through congressional, executive, or administrative action, cannabis variety patents will likely emerge as a new patentable subject matter ripe for innovation.

IV. CONCLUSION

With its gradual legitimization, the cannabis industry is ripe for innovation. Embedded within this industry is the emergence of a new patentable subject matter: cannabis variety patents. While virtually unregulated before the turn of the twentieth century, cannabis endured more than a century of stigmatization and regulation, ultimately leading to its illegality nationwide through the Controlled Substances Act. Currently, marijuana is a Schedule I narcotic, meaning it has a high potential for abuse and no accepted medical uses.

However, the times are changing. Many studies today indicate more public support for marijuana decriminalization and legalization. In the face of the federal prohibition, many states like Colorado and Washington have not only legalized marijuana for medical use, but also for recreational use. Recently, the Department of Justice, the entity that prosecutes federal criminal offenses for possession and cultivation of marijuana, issued a memorandum indicating it would not employ its limited prosecutorial resources against individuals and businesses in states that have legalized cannabis recreationally, as long as the states have strict regulatory schemes in place. Furthermore, the federal government itself has patented a method-of-use for cannabis and has approved a drug utilizing synthetic THC to treat many medical ailments.

Yet, while a marijuana patent exists, no patents have been issued for cannabis variety strains. Despite this fact, case law from the Supreme Court and the Federal Circuit, along with persuasive policy considerations, suggest that a cannabis strain is patentable. If patentable, a grower could receive patent protection through one of three avenues: utility patents, plant patents, or the Plant Variety Protection Act certificates.

However, despite these favorable indications, the CSA is a virtually impervious barrier to patentability. Federal law reigns supreme over state legalization, as held in the *Gonzales* precedent. Patent law is exclusively within federal jurisdiction, and consequently, the legal domain follows federal law.

³³⁶ Jason Blevins, *Pot Grower's Quest: U.S. Patent Protection for Cannabis Seeds*, <http://www.thecannabist.co/2014/12/24/cannabis-seeds-pot-growers-us-patent-protection/25975/2/> (last visited Oct. 20, 2015).

Cultivators who apply for patent protection must be wary of the federal ban because details divulged during the patent application likely constitute admissions to a federal crime under the CSA. There are solutions to this problem. Congress could resolve the conflict between federal and state laws through a statute. The president could change the Schedule I status of cannabis to Schedule II or less. Or, the USPTO could capitulate and outright issue a patent for a cannabis strain. However, unless some legal change occurs, cannabis strains are not patentable.

Cannabis cultivators and venture capitalists are eager to see where federal law is going in light of state legalization and changing political realities. Legal developments surrounding cannabis at the federal level are likely to occur in the near future. For any real change to happen, the federal government must act. One thing is for certain, however: a small window of opportunity in this industry will propel it to new highs.

