

DIAMOND, COMMISSIONER OF PATENTS AND
TRADEMARKS v. DIEHR ET AL.

CERTIORARI TO THE UNITED STATES COURT OF CUSTOMS AND
PATENT APPEALS

No. 79-1112. Argued October 14, 1980—Decided March 3, 1981

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Opinion of the Court

JUSTICE REHNQUIST delivered the opinion of the Court.

We granted certiorari to determine whether a process for curing synthetic rubber which includes in several of its steps the use of a mathematical formula and a programmed digital computer is patentable subject matter under 35 U. S. C. § 101.

I

The patent application at issue was filed by the respondents on August 6, 1975. The claimed invention is a process for molding raw, uncured synthetic rubber into cured precision products. The process uses a mold for precisely shaping the uncured material under heat and pressure and then curing the synthetic rubber in the mold so that the product will retain its shape and be functionally operative after the molding is completed.¹

Respondents claim that their process ensures the production of molded articles which are properly cured. Achieving the perfect cure depends upon several factors including the thickness of the article to be molded, the temperature of the molding process, and the amount of time that the article is allowed to remain in the press. It is possible using well-known time, temperature, and cure relationships to calculate by means of the Arrhenius equation² when to open the press

Law Association, Inc.; by *Morton C. Jacobs* for Applied Data Research, Inc.; by *William L. Mathis* and *Harold D. Messner* for Chevron Research Co.; and by *Reed C. Lawlor* and *James W. Geriak* for the Los Angeles Patent Law Association.

¹ A "cure" is obtained by mixing curing agents into the uncured polymer in advance of molding, and then applying heat over a period of time. If the synthetic rubber is cured for the right length of time at the right temperature, it becomes a usable product.

² The equation is named after its discoverer Svante Arrhenius and has long been used to calculate the cure time in rubber-molding presses. The equation can be expressed as follows:

$$\ln v = CZ + x$$

wherein $\ln v$ is the natural logarithm of v , the total required cure time;

and remove the cured product. Nonetheless, according to the respondents, the industry has not been able to obtain uniformly accurate cures because the temperature of the molding press could not be precisely measured, thus making it difficult to do the necessary computations to determine cure time.³ Because the temperature *inside* the press has heretofore been viewed as an uncontrollable variable, the conventional industry practice has been to calculate the cure time as the shortest time in which all parts of the product will definitely be cured, assuming a reasonable amount of mold-opening time during loading and unloading. But the shortcoming of this practice is that operating with an uncontrollable variable inevitably led in some instances to overestimating the mold-opening time and overcuring the rubber, and in other instances to underestimating that time and undercuring the product.⁴

Respondents characterize their contribution to the art to reside in the process of constantly measuring the actual temperature inside the mold. These temperature measurements are then automatically fed into a computer which repeatedly recalculates the cure time by use of the Arrhenius equation.

C is the activation constant, a unique figure for each batch of each compound being molded, determined in accordance with rheometer measurements of each batch; Z is the temperature in the mold; and x is a constant dependent on the geometry of the particular mold in the press. A rheometer is an instrument to measure flow of viscous substances.

³ During the time a press is open for loading, it will cool. The longer it is open, the cooler it becomes and the longer it takes to reheat the press to the desired temperature range. Thus, the time necessary to raise the mold temperature to curing temperature is an unpredictable variable. The respondents claim to have overcome this problem by continuously measuring the actual temperature in the closed press through the use of a thermocouple.

⁴ We note that the petitioner does not seriously contest the respondents' assertions regarding the inability of the industry to obtain accurate cures on a uniform basis. See Brief for Petitioner 3.

When the recalculated time equals the actual time that has elapsed since the press was closed, the computer signals a device to open the press. According to the respondents, the continuous measuring of the temperature inside the mold cavity, the feeding of this information to a digital computer which constantly recalculates the cure time, and the signaling by the computer to open the press, are all new in the art.

The patent examiner rejected the respondents' claims on the sole ground that they were drawn to nonstatutory subject matter under 35 U. S. C. § 101.⁵ He determined that those

⁵ Respondents' application contained 11 different claims. Three examples are claims 1, 2, and 11 which provide:

"1. A method of operating a rubber-molding press for precision molded compounds with the aid of a digital computer, comprising:

"providing said computer with a data base for said press including at least,

"natural logarithm conversion data (ln),

"the activation energy constant (C) unique to each batch of said compound being molded, and

"a constant (x) dependent upon the geometry of the particular mold of the press,

"initiating an interval timer in said computer upon the closure of the press for monitoring the elapsed time of said closure,

"constantly determining the temperature (Z) of the mold at a location closely adjacent to the mold cavity in the press during molding,

"constantly providing the computer with the temperature (Z),

"repetitively calculating in the computer, at frequent intervals during each cure, the Arrhenius equation for reaction time during the cure, which is

"ln v=CZ+x

"where v is the total required cure time,

"repetitively comparing in the computer at said frequent intervals during the cure each said calculation of the total required cure time calculated with the Arrhenius equation and said elapsed time, and

"opening the press automatically when a said comparison indicates equivalence.

"2. The method of claim 1 including measuring the activation energy constant for the compound being molded in the press with a rheometer and automatically updating said data base within the computer in the

steps in respondents' claims that are carried out by a computer under control of a stored program constituted nonstatutory subject matter under this Court's decision in *Gottschalk v. Benson*, 409 U. S. 63 (1972). The remaining steps—installing rubber in the press and the subsequent closing of the

event of changes in the compound being molded in said press as measured by said rheometer.

"11. A method of manufacturing precision molded articles from selected synthetic rubber compounds in an openable rubber molding press having at least one heated precision mold, comprising:

"(a) heating said mold to a temperature range approximating a predetermined rubber curing temperature,

"(b) installing prepared unmolded synthetic rubber of a known compound in a molding cavity of predetermined geometry as defined by said mold,

"(c) closing said press to mold said rubber to occupy said cavity in conformance with the contour of said mold and to cure said rubber by transfer of heat thereto from said mold,

"(d) initiating an interval timer upon the closure of said press for monitoring the elapsed time of said closure,

"(e) heating said mold during said closure to maintain the temperature thereof within said range approximating said rubber curing temperature,

"(f) constantly determining the temperature of said mold at a location closely adjacent said cavity thereof throughout closure of said press,

"(g) repetitively calculating at frequent periodic intervals throughout closure of said press the Arrhenius equation for reaction time of said rubber to determine total required cure time *v* as follows:

$$\ln v = cz + x$$

"wherein *c* is an activation energy constant determined for said rubber being molded and cured in said press, *z* is the temperature of said mold at the time of each calculation of said Arrhenius equation, and *x* is a constant which is a function of said predetermined geometry of said mold,

"(h) for each repetition of calculation of said Arrhenius equation herein, comparing the resultant calculated total required cure time with the monitored elapsed time measured by said interval timer,

"(i) opening said press when a said comparison of calculated total required cure time and monitored elapsed time indicates equivalence, and

"(j) removing from said mold the resultant precision molded and cured rubber article."

press—were "conventional and necessary to the process and cannot be the basis of patentability." The examiner concluded that respondents' claims defined and sought protection of a computer program for operating a rubber-molding press.

The Patent and Trademark Office Board of Appeals agreed with the examiner, but the Court of Customs and Patent Appeals reversed. *In re Diehr*, 602 F. 2d 892 (1979). The court noted that a claim drawn to subject matter otherwise statutory does not become nonstatutory because a computer is involved. The respondents' claims were not directed to a mathematical algorithm or an improved method of calculation but rather recited an improved process for molding rubber articles by solving a practical problem which had arisen in the molding of rubber products.

The Commissioner of Patents and Trademarks sought certiorari arguing that the decision of the Court of Customs and Patent Appeals was inconsistent with prior decisions of this Court. Because of the importance of the question presented, we granted the writ. 445 U. S. 926 (1980).

II

Last Term in *Diamond v. Chakrabarty*, 447 U. S. 303 (1980), this Court discussed the historical purposes of the patent laws and in particular 35 U. S. C. § 101. As in *Chakrabarty*, we must here construe 35 U. S. C. § 101 which provides:

"Whoever 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."⁶

⁶ The word "process" is defined in 35 U. S. C. § 100 (b):

"The term 'process' means process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material."

In cases of statutory construction, we begin with the language of the statute. Unless otherwise defined, "words will be interpreted as taking their ordinary, contemporary, common meaning," *Perrin v. United States*, 444 U. S. 37, 42 (1979), and, in dealing with the patent laws, we have more than once cautioned that "courts 'should not read into the patent laws limitations and conditions which the legislature has not expressed.'" *Diamond v. Chakrabarty*, *supra*, at 308, quoting *United States v. Dubilier Condenser Corp.*, 289 U. S. 178, 199 (1933).

The Patent Act of 1793 defined statutory subject matter as "any new and useful art, machine, manufacture or composition of matter, or any new or useful improvement [thereof]." Act of Feb. 21, 1793, ch. 11, § 1, 1 Stat. 318. Not until the patent laws were recodified in 1952 did Congress replace the word "art" with the word "process." It is that latter word which we confront today, and in order to determine its meaning we may not be unmindful of the Committee Reports accompanying the 1952 Act which inform us that Congress intended statutory subject matter to "include anything under the sun that is made by man." S. Rep. No. 1979, 82d Cong., 2d Sess., 5 (1952); H. R. Rep. No. 1923, 82d Cong., 2d Sess., 6 (1952).

Although the term "process" was not added to 35 U. S. C. § 101 until 1952, a process has historically enjoyed patent protection because it was considered a form of "art" as that term was used in the 1793 Act.⁷ In defining the nature of a patentable process, the Court stated:

"That a process may be patentable, irrespective of the

⁷ In *Corning v. Burden*, 15 How. 252, 267-268 (1854), this Court explained:

"A process, *eo nomine*, is not made the subject of a patent in our act of congress. It is included under the general term 'useful art.' An art may require one or more processes or machines in order to produce a certain result or manufacture. The term machine includes every mechanical device or combination of mechanical powers and devices to perform some

particular form of the instrumentalities used, cannot be disputed. . . . A process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing. If new and useful, it is just as patentable as is a piece of machinery. In the language of the patent law, it is an art. The machinery pointed out as suitable to perform the process may or may not be new or patentable; whilst the process itself may be altogether new, and produce an entirely new result. The process requires

function and produce a certain effect or result. But where the result or effect is produced by chemical action, by the operation or application of some element or power of nature, or of one substance to another, such modes, methods, or operations, are called processes. A new process is usually the result of discovery; a machine, of invention. The arts of tanning, dyeing, making water-proof cloth, vulcanizing India rubber, smelting ores, and numerous others, are usually carried on by processes as distinguished from machines. One may discover a new and useful improvement in the process of tanning, dyeing, &c., irrespective of any particular form of machinery or mechanical device. And another may invent a labor-saving machine by which this operation or process may be performed, and each may be entitled to his patent. As, for instance, A has discovered that by exposing India rubber to a certain degree of heat, in mixture or connection with certain metallic salts, he can produce a valuable product, or manufacture; he is entitled to a patent for his discovery, as a process or improvement in the art, irrespective of any machine or mechanical device. B, on the contrary, may invent a new furnace or stove, or steam apparatus, by which this process may be carried on with much saving of labor, and expense of fuel; and he will be entitled to a patent for his machine, as an improvement in the art. Yet A could not have a patent for a machine, or B for a process; but each would have a patent for the means or method of producing a certain result, or effect, and not for the result or effect produced. It is for the discovery or invention of some practical method or means of producing a beneficial result or effect, that a patent is granted, and not for the result or effect itself. It is when the term process is used to represent the means or method of producing a result that it is patentable, and it will include all methods or means which are not effected by mechanism or mechanical combinations."

that certain things should be done with certain substances, and in a certain order; but the tools to be used in doing this may be of secondary consequence." *Cochrane v. Deener*, 94 U. S. 780, 787-788 (1877).

Analysis of the eligibility of a claim of patent protection for a "process" did not change with the addition of that term to § 101. Recently, in *Gottschalk v. Benson*, 409 U. S. 63 (1972), we repeated the above definition recited in *Cochrane v. Deener*, adding: "Transformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include particular machines." 409 U. S., at 70.

Analyzing respondents' claims according to the above statements from our cases, we think that a physical and chemical process for molding precision synthetic rubber products falls within the § 101 categories of possibly patentable subject matter. That respondents' claims involve the transformation of an article, in this case raw, uncured synthetic rubber, into a different state or thing cannot be disputed. The respondents' claims describe in detail a step-by-step method for accomplishing such, beginning with the loading of a mold with raw, uncured rubber and ending with the eventual opening of the press at the conclusion of the cure. Industrial processes such as this are the types which have historically been eligible to receive the protection of our patent laws.⁸

⁸ We note that as early as 1854 this Court approvingly referred to patent eligibility of processes for curing rubber. See *id.*, at 267; n. 7, *supra*. In *Tilghman v. Proctor*, 102 U. S. 707 (1881), we referred to the original patent Charles Goodyear received on his process for "vulcanizing" or curing rubber. We stated:

"That a patent can be granted for a process, there can be no doubt. The patent law is not confined to new machines and new compositions of matter, but extends to any new and useful art or manufacture. A manufacturing process is clearly an art, within the meaning of the law. Goodyear's patent was for a process, namely, the process of vulcanizing india-rubber by subjecting it to a high degree of heat when mixed with sulphur

III

Our conclusion regarding respondents' claims is not altered by the fact that in several steps of the process a mathematical equation and a programmed digital computer are used. This Court has undoubtedly recognized limits to § 101 and every discovery is not embraced within the statutory terms. Excluded from such patent protection are laws of nature, natural phenomena, and abstract ideas. See *Parker v. Flook*, 437 U. S. 584 (1978); *Gottschalk v. Benson*, *supra*, at 67; *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U. S. 127, 130 (1948). "An idea of itself is not patentable," *Rubber-Tip Pencil Co. v. Howard*, 20 Wall. 498, 507 (1874). "A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right." *Le Roy v. Tatham*, 14 How. 156, 175 (1853). Only last Term, we explained:

"[A] new mineral discovered in the earth or a new plant found in the wild is not patentable subject matter. Likewise, Einstein could not patent his celebrated law that $E=mc^2$; nor could Newton have patented the law of gravity. Such discoveries are 'manifestations of . . . nature, free to all men and reserved exclusively to none.'" *Diamond v. Chakrabarty*, 447 U. S., at 309, quoting *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, *supra*, at 130.

Our recent holdings in *Gottschalk v. Benson*, *supra*, and *Parker v. Flook*, *supra*, both of which are computer-related, stand for no more than these long-established principles. In *Benson*, we held unpatentable claims for an algorithm used to convert binary code decimal numbers to equivalent pure binary numbers. The sole practical application of the algorithm was in connection with the programming of a

and a mineral salt. The apparatus for performing the process was not patented, and was not material. The patent pointed out how the process could be effected, and that was deemed sufficient." *Id.*, at 722.

general purpose digital computer. We defined "algorithm" as a "procedure for solving a given type of mathematical problem," and we concluded that such an algorithm, or mathematical formula, is like a law of nature, which cannot be the subject of a patent.⁹

Parker v. Flook, *supra*, presented a similar situation. The claims were drawn to a method for computing an "alarm limit." An "alarm limit" is simply a number and the Court concluded that the application sought to protect a formula for computing this number. Using this formula, the updated alarm limit could be calculated if several other variables were known. The application, however, did not purport to explain how these other variables were to be determined,¹⁰ nor

⁹The term "algorithm" is subject to a variety of definitions. The petitioner defines the term to mean:

"1. A fixed step-by-step procedure for accomplishing a given result; usually a simplified procedure for solving a complex problem, also a full statement of a finite number of steps. 2. A defined process or set of rules that leads [sic] and assures development of a desired output from a given input. A sequence of formulas and/or algebraic/logical steps to calculate or determine a given task; processing rules." Brief for Petitioner in *Diamond v. Bradley*, O. T. 1980, No. 79-855, p. 6, n. 12, quoting C. Sippl & R. Sippl, *Computer Dictionary and Handbook* 23 (2d ed. 1972).

This definition is significantly broader than the definition this Court employed in *Benson* and *Flook*. Our previous decisions regarding the patentability of "algorithms" are necessarily limited to the more narrow definition employed by the Court, and we do not pass judgment on whether processes falling outside the definition previously used by this Court, but within the definition offered by the petitioner, would be patentable subject matter.

¹⁰As we explained in *Flook*, in order for an operator using the formula to calculate an updated alarm limit the operator would need to know the original alarm base, the appropriate margin of safety, the time interval that should elapse between each updating, the current temperature (or other process variable), and the appropriate weighing factor to be used to average the alarm base and the current temperature. 437 U. S., at 586. The patent application did not "explain how to select the approximate margin of safety, the weighing factor, or any of the other variables." *Ibid.*

did it purport "to contain any disclosure relating to the chemical processes at work, the monitoring of process variables, or the means of setting off an alarm or adjusting an alarm system. All that it provides is a formula for computing an updated alarm limit." 437 U. S., at 586.

In contrast, the respondents here do not seek to patent a mathematical formula. Instead, they seek patent protection for a process of curing synthetic rubber. Their process admittedly employs a well-known mathematical equation, but they do not seek to pre-empt the use of that equation. Rather, they seek only to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process. These include installing rubber in a press, closing the mold, constantly determining the temperature of the mold, constantly recalculating the appropriate cure time through the use of the formula and a digital computer, and automatically opening the press at the proper time. Obviously, one does not need a "computer" to cure natural or synthetic rubber, but if the computer use incorporated in the process patent significantly lessens the possibility of "overcuring" or "undercuring," the process as a whole does not thereby become unpatentable subject matter.

Our earlier opinions lend support to our present conclusion that a claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program, or digital computer. In *Gottschalk v. Benson* we noted: "It is said that the decision precludes a patent for any program servicing a computer. We do not so hold." 409 U. S., at 71. Similarly, in *Parker v. Flook* we stated that "a process is not unpatentable simply because it contains a law of nature or a mathematical algorithm." 437 U. S., at 590. It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection. See, e. g., *Funk Bros. Seed*

Co. v. Kalo Inoculant Co., 333 U. S. 127 (1948); *Eibel Process Co. v. Minnesota & Ontario Paper Co.*, 261 U. S. 45 (1923); *Cochrane v. Deener*, 94 U. S. 780 (1877); *O'Reilly v. Morse*, 15 How. 62 (1854); and *Le Roy v. Tatham*, 14 How. 156 (1853). As Justice Stone explained four decades ago:

"While a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be." *Mackay Radio & Telegraph Co. v. Radio Corp. of America*, 306 U. S. 86, 94 (1939).¹¹

We think this statement in *Mackay* takes us a long way toward the correct answer in this case. Arrhenius' equation is not patentable in isolation, but when a process for curing rubber is devised which incorporates in it a more efficient solution of the equation, that process is at the very least not barred at the threshold by § 101.

In determining the eligibility of respondents' claimed process for patent protection under § 101, their claims must be considered as a whole. It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis. This is particularly true in a process claim because a new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made. The "novelty" of any element or steps in a process, or even of the

¹¹ We noted in *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U. S. 127, 130 (1948):

"He who discovers a hitherto unknown phenomenon of nature has no claim to a monopoly of it which the law recognizes. If there is to be invention from such a discovery, it must come from the application of the law of nature to a new and useful end."

Although we were dealing with a "product" claim in *Funk Bros.*, the same principle applies to a process claim. *Gottschalk v. Benson*, 409 U. S. 63, 68 (1972).

process itself, is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter.¹²

It has been urged that novelty is an appropriate consideration under § 101. Presumably, this argument results from the language in § 101 referring to any "new and useful" process, machine, etc. Section 101, however, is a general statement of the type of subject matter that is eligible for patent protection "subject to the conditions and requirements of this title." Specific conditions for patentability follow and § 102 covers in detail the conditions relating to novelty.¹³

¹² It is argued that the procedure of dissecting a claim into old and new elements is mandated by our decision in *Flook* which noted that a mathematical algorithm must be assumed to be within the "prior art." It is from this language that the petitioner premises his argument that if everything other than the algorithm is determined to be old in the art, then the claim cannot recite statutory subject matter. The fallacy in this argument is that we did not hold in *Flook* that the mathematical algorithm could not be considered at all when making the § 101 determination. To accept the analysis proffered by the petitioner would, if carried to its extreme, make all inventions unpatentable because all inventions can be reduced to underlying principles of nature which, once known, make their implementation obvious. The analysis suggested by the petitioner would also undermine our earlier decisions regarding the criteria to consider in determining the eligibility of a process for patent protection. See, e. g., *Gottschalk v. Benson*, *supra*; and *Cochrane v. Deener*, 94 U. S. 780 (1877).

¹³ Section 102 is titled "Conditions for patentability; novelty and loss of right to patent," and provides:

"A person shall be entitled to a patent unless—

"(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or

"(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, or

"(c) he has abandoned the invention, or

"(d) the invention was first patented or caused to be patented, or was

The question therefore of whether a particular invention is novel is "wholly apart from whether the invention falls into a category of statutory subject matter." *In re Bergy*, 596 F. 2d 952, 961 (CCPA 1979) (emphasis deleted). See also *Nickola v. Peterson*, 580 F. 2d 898 (CA6 1978). The legislative history of the 1952 Patent Act is in accord with this reasoning. The Senate Report stated:

"Section 101 sets forth the subject matter that can be patented, 'subject to the conditions and requirements of this title.' The conditions under which a patent may be obtained follow, and *Section 102 covers the conditions relating to novelty.*" S. Rep. No. 1979, 82d Cong., 2d Sess., 5 (1952) (emphasis supplied).

It is later stated in the same Report:

"Section 102, in general, may be said to describe the statutory novelty required for patentability, and in-

the subject of an inventor's certificate, by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application for patent or inventor's certificate filed more than twelve months before the filing of the application in the United States, or

"(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371 (c) of this title before the invention thereof by the applicant for patent, or

"(f) he did not himself invent the subject matter sought to be patented, or

"(g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other."

cludes, in effect, an amplification and definition of 'new' in section 101." *Id.*, at 6.

Finally, it is stated in the "Revision Notes":

"The corresponding section of [the] existing statute is split into two sections, section 101 relating to the subject matter for which patents may be obtained, and section 102 defining statutory novelty and stating other conditions for patentability." *Id.*, at 17.

See also H. R. Rep. No. 1923, 82d Cong., 2d Sess., 6, 7, and 17 (1952).

In this case, it may later be determined that the respondents' process is not deserving of patent protection because it fails to satisfy the statutory conditions of novelty under § 102 or nonobviousness under § 103. A rejection on either of these grounds does not affect the determination that respondents' claims recited subject matter which was eligible for patent protection under § 101.

IV

We have before us today only the question of whether respondents' claims fall within the § 101 categories of possibly patentable subject matter. We view respondents' claims as nothing more than a process for molding rubber products and not as an attempt to patent a mathematical formula. We recognize, of course, that when a claim recites a mathematical formula (or scientific principle or phenomenon of nature), an inquiry must be made into whether the claim is seeking patent protection for that formula in the abstract. A mathematical formula as such is not accorded the protection of our patent laws, *Gottschalk v. Benson*, 409 U. S. 63 (1972), and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment. *Parker v. Flook*, 437 U. S. 584 (1978). Similarly, insignificant postsolution activity will not trans-

form an unpatentable principle into a patentable process. *Ibid.*¹⁴ To hold otherwise would allow a competent draftsman to evade the recognized limitations on the type of subject matter eligible for patent protection. On the other hand, when a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect (*e. g.*, transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of § 101. Because we do not view respondents' claims as an attempt to patent a mathematical formula, but rather to be drawn to an industrial proc-

¹⁴ Arguably, the claims in *Flook* did more than present a mathematical formula. The claims also solved the calculation in order to produce a new number or "alarm limit" and then replaced the old number with the number newly produced. The claims covered all uses of the formula in processes "comprising the catalytic chemical conversion of hydrocarbons." There are numerous such processes in the petrochemical and oil refinery industries and the claims therefore covered a broad range of potential uses. 437 U. S., at 586. The claims, however, did not cover every conceivable application of the formula. We rejected in *Flook* the argument that because all possible uses of the mathematical formula were not pre-empted, the claim should be eligible for patent protection. Our reasoning in *Flook* is in no way inconsistent with our reasoning here. A mathematical formula does not suddenly become patentable subject matter simply by having the applicant acquiesce to limiting the reach of the patent for the formula to a particular technological use. A mathematical formula in the abstract is nonstatutory subject matter regardless of whether the patent is intended to cover all uses of the formula or only limited uses. Similarly, a mathematical formula does not become patentable subject matter merely by including in the claim for the formula token postsolution activity such as the type claimed in *Flook*. We were careful to note in *Flook* that the patent application did not purport to explain how the variables used in the formula were to be selected, nor did the application contain any disclosure relating to chemical processes at work or the means of setting off an alarm or adjusting the alarm limit. *Ibid.* All the application provided was a "formula for computing an updated alarm limit." *Ibid.*

ess for the molding of rubber products, we affirm the judgment of the Court of Customs and Patent Appeals.¹⁵

It is so ordered.

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