In the

Supreme Court of the United States

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ROBERT GOTTSCHALK, ACTING COMMISSIONER OF PATENTS,

Petitioner,

v.

GARY R. BENSON and ARTHUR C. TABBOT

No. 71-485

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SUPREME COURT, U. S.

Washington, D. C.
October 16, 1972

Pages 1 thru 44

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Washington, D. C.
546-6666

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Washington, D.C..
Monday, October 16, 1972

The above-entitled matter came on for argument at 10:03 o'clock, a.m.

BEFORE:

WARREN E. BURGER: Chief Justice of the United States
WILLIAM O. DOUGLAS, Associate Justice
WILLIAM J. BRENNAN, JR., Associate Justice
BYRON R. WHITE, Associate Justice
THURGOOD MARSHALL, Associate Justice
WILLIAM H. REHNQUIST, Associate Justice

APPEARANCES:

RICHARD B. STONE, ESQ., Office of the Solicitor General, Department of Justice, Washington, D.C.

HUGH B. COX, ESQ., 888 16th Street., N.W., Washington, D.C.

C O N T E N T S

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P R O C E E D I N G S

MR. CHIEF JUSTICE BURGER: We will hear arguments first this morning in Number 71-485, Gottschalk, Commissioner of Patents against Benson and Tabbot.

Mr. Stone, you may proceed whenever you are ready.

ORAL ARGUMENT OF

RICHARD B. STONE, ESQ.

ON BEHALF OF THE PETITIONER

MR. STONE: Thank you, Mr. Chief Justice and may it please the Court:

This case, which is here on a somewhat unusual writ of certiorari to the United States Court of Customs and Patent Appeals raises the question whether Respondents are entitled to a patent on the method which they have devised for converting numerical information expressed in one form of mathemati al language into another mathematical language, both of which languages are used extensively in general purpose digital computers.

Q Well, must they not have the digital computer as part of this combination in order to make the whole thing meaningful or is this part of this combination in order to make the whole thing meaningful? If the formula -- the process stands alone, it is not very meaningful, is it?

MR. STONE: No, that is precisely our contention, Mr. Chief Justice, is that what the Respondents have claimed

here is simply a set of steps to be carried out in a machine. They have tried to link the claim that they have made to the machinery in a number of ways, but our contention, which I will shortly develop, is --

Q They are interdependent, aren't they?

MR. STONE: Our contention is that the mathematical procedure which Respondents are claiming, the procedure for converting from one form of mathematical language into another is indeed entirely independent of the machinery.

Q Interdependent, I said.

MR. STONE: No, independent is precisely our claim and I will develop that shortly. That is the basic thrust of our argument, Mr. Chief Justice.

The underlying mathematical technology involved in Respondents' claim is expressed at great length in our brief and in Respondents' brief and, though there is some difference in emphasis, I think there is little, if any, significant difference between the Government and Respondents with respect to the technological nature of the claim discovery.

Furthermore, though, the technical background set forth in our brief, I believe, would help to place Respondents' claim in its proper context. The technology necessary to an understanding of the legal issue in this case is, I think, simpler than it may appear and I will brief describe here exactly what it is that Respondents wish

to patent.

A computer is a device which solves problems involving either numerical information or other kinds of data which can be broken down by logic into numerical form. By far the most common type of computer in operation today is the digital computer which, as its name implies, operates on information and data expressed in numerical digits.

The basic function of the computer is quite simple. After a problem has been broken down into the mathematical steps necessary to solve that problem, the computer computes the solution by actually doing the arithmetic; though it is an enormounsly elaborate and complicated and sophisticated device, the modern computer itself is really an extension in principle of the old adding machine or calculator. Its utility lies in its ability to perform in minutes or even in seconds, calculations which would require years to perform by hand.

Although the computer represents digits and numbers in physical form such as, for example, by a series of electrical pulses, the mathematical processes which the computer performs are the same which a human would perform except that they are expressed by means of the physical symbols built into the computer which uses electrical signals for example in a manner similar to the way in which we use pencil and paper.

Thus, the machine is built with the capacity to carry out a wide variety of arithmetical calculations but though the machine is built to do the arithmetic it is told to do, the machine can't think. It cannot solve the problem unless the operator breaks that problem down into a series of mathematical or logical steps for the computer to carry out. This series of mathematical steps is the computer's instruction or, as it is popularly known in the trade, a "program."

Though some computers are built to carry out a particular program, obviously the greatest utility is in general purpose computers which are built to perform a wide variety of programs, requiring only that the problems be broken down into logical mathematical steps and translated into a language that is compatible with the internal physical characteristics of the computer.

This brings us to the precise subject of Respondents' claim. In the great majority of general purpose digital computers, the simplest and most convenient means of physically representing numbers is in switchlike alternatives, such as the presence or absence of an electrical signal or pulse, for example -- analagous in perhaps more understandable terms to the on and off of a light bulb.

For this reason, data used within a digital computer is ordinarily recorded, not by means of our decimal number system, but instead by means of the binary number system,

which expresses numbers in terms of only two characters, 0 and 1, which can be easily correlated to the presence or absence of an electrical pulse, the on and off of a light bulb, and which is based on powers of the number 2 rather than powers of the number 10, like our decimal number system.

These two characters, as I say, are easily represented in the computer, for example, by the on and off of an electrical impulse.

Now, the numbers that we deal with in our daily lives are ordinarily in decimal form. Therefore, much of the data which we feed into computers has to be converted from the decimal number system to the binary number system. An intermediate step of this conversion process is the binary coded decimal number system which is a combination of binary and decimal numbers in that it expresses the ordinary decimal digits in binary numerals and arranges them in the order of the decimal number system.

Thus the number 53, for example, would consist of the binary representation of 5 in the left-hand place and the binary representation of 3 in the left-hand place, and it is frequently desirable to convert binary-coded decimal numbers to pure binary form.

Respondents have discovered a mathematical relationship between binary-coded decimal numbers and pure binary numbers. They have translated this mathematical relationship

or theorum into a mathematical procedure for performing the conversion of binary-coded decimal numbers to binary numbers. What they are claiming -- and their claims are set forth in pages three and four of our brief and in numerous other places in the record, is an algorithm, which the dictionary defines as any procedure for solving a given type of mathematical problem.

The basic step in Respondents algorithm, as we show in the Appendix to our reply brief and in the Appendix to our petition, is the repeated multiplication in binary, according to the rules of binary, by the decimal number 10. Their claim would, if granted, give them a monopoly over any computer program based on this mathematical relationship which they have discovered. Though what they claim is not exactly a computer program itself, it is a generalized formulation for programs which solve the mathematical problem of converting from one form of numerical representation, binary-coded decimal, to another form of numerical representation, that is, pure binary.

Now, let us deal with precisely what it is that the Patent Office and its Board of Appeals found wrong with the Respondents claim. The patent law defines patentability essentially in two aspects. First, the statute sets forth, at 35USC101 what constitutes patentable subject matter. That is, what types of of invention are patentable.

Then there are other provisions, notably 35USC102 and 103, which set forth conditions for the patentability of otherwise qualified subject matter which are essentially that the invention be new, that it be useful, and that it be nonobvious.

The Patent Office did not deal here with the issue of whether the algorithm claimed by the Respondents is new, useful and nonobvious because it found that Respondents, in any event, were claiming a patent on nonpatentable subject matter.

Under 35USC101, a patentable invention must be a "process,machine, manufacture or composition of matter." It is a fundamental axiom of the patent law, originating in the writings of Thomas Jefferson and repeated in perhaps the most consistent theme throughout the patent decisions of this Court that ideas including scientific principles or mathematical formulas, mental processes and other abstract intellectual concepts, are not patentable, only machines, manufactures, compositions of matter or processes.

Now, how exactly does Respondents claim for an algorithm for converting binary-coded decimal numbers into binary numbers fit into this fundamental distinction between a non-patentable abstract mental procedure and a patentable process machine,manufacture or composition of matter?

Clearly, their mathematical proceudre is not a

machine, manufacture or composition, as those three are all tangible products or substances. The only question, then, is whether their claimed invention is a "process" within the meaning of 35USC101 and, therefore, the starting point of this inquiry is, what is the distinction between an abstract principle or mental procedure and a patentable process?

The statute merely defines the process at 35USC100 to include "process, art or method," which brings in the old terminology historically used as synonymous with the word "process."

Obviously, there is no sharp line between these two concepts. Indeed, every process, and I suppose every tangible product such as a machine or a manufactured article, embodies and can be explained at some level in terms of abstract principles. But in the case of machines or other tangible products, the patent is not granted on the idea but on the tangible object itself, so that the ideas themselves are not monopolized except in the limited tangible form in which they are embodied in the machine or manufactured product.

In what circumstances, then, may patents be granted on processes? In other words, where have the decided cases drawn the line between ideas and patentable processes?

There are essentially two lines of cases which I believe cover virtually all process patents that have been granted. First, the Patent Office has granted, and this Court

has validated, patents on processes which involve the chemical or physical transformation of tangible substances, such as, for example, the processes for the vulcanization of rubber, the conversion of fat into soap or the grinding of flour as it is used in the seminal case of Cochrane and Daener. These cases -- and many of these are cited at pages six to seven of our reply brief -- consistently emphasize the Court's conception of a patentable process as a series of acts to be performed on a tangible substance to change its physical properties in some way. And that concept is expressly articulated in the leading decision of Cochrane and Daener at 94US.

The rationale of these decisions is that when a process deals with the transformation of specific substances, by specific physical acts, a patent on that process has a finiteness, a foreseeability of scope, and a tangible qualtiy that distinguishes it from a patent on a pure idea.

The other line of cases which must be considered here in the context of process patents are those 19th century landmark cases in which process patents were granted to Mr. Morse in connection with his invention of the telegraph and to Mr. Bell in connection with his invention of the telephone.

The inventions claimed in these cases were series of steps performed on electric currents to produce physical

reactions, in one case to print letters at a distance and in one case to produce sound at a distance.

In our view, these cases are really analogous to cases such as Cochrane and Deener, which involved the physical transformation of substances because the inventive element in these cases was in the physical manipulation of electric signals.

In our case, by contrast, electricity is really an arbitrary means or symbol by which numbers in mathematical operations are physically represented. The inventive element in Respondents claim is not in the physical manipulation of electricity, but rather in the mathematical steps which the computer carries out under Respondents' instructions with the physical symbols that are already built into the computer.

But even assuming that the Morse and Telephone cases were analagous to our case and avoiding a metaphysical argument with a tangible or intangible nature of electric pulses, these cases granted claims only on those processes which were limited by reference to a specific apparatus and end-use and this is discussed at great length in our brief.

For this reason, Mr. Morse was denied a patent on his claim eight. His claim eight was not limited to operation through the machinery which he had described and Mr. Morse was granted a patent on his first claim, which was so limited and the court granted Mr. Bell's claims on processes carried

out by means of the two specific aparatuses which he described. For in these cases, as in the cases such as Cochrane and Daener which patented processes for transforming physical and chemical substances, any monopoly that might have been granted on the underlying scientific principles was limited by reference to tangible apparatus.

And now, finally, what is it that Respondents claim here as a patentable process?

Respondents have discovered a relationship between binary-coded decimal numbers and pure binary numbers that enables them to convert from one numerical language to another by repeated multiplication according to the rules of binary multiplication by the decimal number 10 which is expressed in binary form as 1010.

The algorithm which they set forth in their claim merely translates into the language of computer programs a set of multiplications and additions by the binary equivalent of 10. Though there is no time here to explain in detail why Respondents' discovery is no more than a procedure involving multiplication by binary 1010, the Court need not accept this conclusion on faith, for it is fully developed in the Appendix to our reply brief where we analyze Respondents' claims step by step.

Though Respondents have illustrated their claim at great length with complicated explanations and diagrams and

charts, they have not contradicted our analysis of the mat ematical procedure that they claim, nor have they denied that the algorithm described in their claim merely translates their mathematical discovery into the language of computer programming.

When the operator tells the computer to add, he uses words like "shifting," "masking," and "storing." These words do not change the mathematical theorum that Respondents have discovered into a patentable process any more than one changes two plus three into a patentable process by calling it deux et trois or translating it into some other foreign language.

Q Mr. Stone, don't they at least, though, limit the scope of the path to the computer field?

MR. STONE: Mr. Justice Rehnquist, it is not entirely clear whether their claim is limited to operation in the computer field because the only words in that -- in one of their claims they refer to shifting and a shift register, and that is a word which is probably related to at least general purpose digital computers. Their claim 13 has no such limiting reference. I suppose their -- in practicality, their claim is likely to be carried out primarily on digital computers because the computations are very elaborate, but even if that is the case, we believe that a general purpose digital computer is a trivial limitation on the claim because it is

really no more than an extension of an adding machine or calculator. It is no more than the most advanced device we have for calculating extensive mathematical calculations that take up too much time to be done with pencil and paper but as a matter of fact, the Patent Office felt that Respondents' claim could be carried out by means of pencil and paper.

Q Wouldn't you agree with the earlier question of the Chief Justice that outside of the computer field there is simply no utility to the thing?

MR. STONE: I would agree that outside of the computer field, that there is no general utility known right now for this process other than carrying out calculations on a computer, but that is such an -- data processing itself is such an abstract science and it is really a -- it is the science of finding answers to mathematical problems and it is inherently -- the information that is fed into a data processer is inherently nonpatentable in the most extreme sense in which we don't allow patents on scientific and mathematical ideas.

Q Is the computer itself patentable?

MR. STONE: Yes, the computer itself is certainly patentable and had Respondent claimed a computer for carrying out this process which was new and useful and nonobvious, they certainly could have been given a patent. But what they can't get is a patent for --

Q Well, assume there hadn't been any computers until they invented one to make this conversion?

MR. STONE: Well, I suppose they could have -- if they had invented a computer they could certainly have claimed a computer.

Q You just think they haven't claimed a computer?

MR. STONE: They haven't claimed a computer because they haven't invented a computer. All they --

Q Assume if there hadn't been any computers and they invented a computer to carry out this process and that was applicable, why isn't this --

MR. STONE: No --

Q -- against the background of existing computers, why isn't this a new use of an old machine?

MR. STONE: That is very simple, Mr. Justice White. It is not a new use of an old machine because a computer is built to carry out all the calculations which this program calls for being carried out.

Q Well, it is doing something it never did before.

MR. STONE: No more than an adding machine is doing something it never did before when it adds a series of numbers that it has never added before.

Q Well, until this process was discovered, computers had never done this particular operation, had they?

MR. STONE: (No response.)

Q Until this came along, the computer had never done this.

MR. STONE: Well, Mr. Justice White, the analogy which we use in our brief -- and I think that this is the appropriate analogy -- is an old player piano which carries out -- which plays songs when piano rolls are inserted into it. We do not believe that the computer acquires a new function every time it carries out new calculations that it is inherently built to perform, any more than a player piano carries out a new function or acquires a new use every time a new piano roll is inserted into it.

That is precisely the heart of our case. The computer and the machine are one thing. Many of the aspects of the computer and the machinery are patentable but the computer is built to carry out, through physical symbols and into electricity and other devices, all the calculations which this Respondent has told it to carry out. It doesn't --

Q When the computer is programmed to give this answer, it is not the same machine as it is when it isn't programmed.

MR. STONE: It is precisely the same machine, Mr. Justice White. It is precisely the same machine.

Q Why put in the instructions, then?

MR. STONE: I -- I don't understand what the connection between those two propositions is. It is the

same machine because it is inherently able to carry out all of these calculations. That is exactly what it is built and designed to do. It is the same machine even though it is playing different music or carrying out different calculations exactly the same way that an adding machine is the same machine when it says 3 plus 3 as when it says 3 plus 2.

Q Well, you certainly do reduce programs to a nothing.

MR. STONE: I don't reduce them --

Q They don't add a thing to the computer.

MR. STONE: I don't reduce them to nothing. The underlying mathematical discoveries that are involved with them may be extremely ingenious and extremely important and extremely useful, but they don't add anything to a computer. They are mathematical calculations which the computer is already there to carry out.

Indeed, if Respondent had invented the Pythagoran Theorum and the Pythagoran Theorum were complicated enough so that it could only be carried out on a computer, I don't think think you would say that Respondent was entitled to a patent on the Pythagoran Theorum merely because it was likely to be carried out on a computer or that the computer acquired a new function in carrying out the Pythagoran Theorum that it does not have when it, say, is computing the area of a circle.

Q Mr. Stone, when scientists and physicians and researchers have put toghether known substances which perform a totally new function -- that is, it will open up or close up a particular valve in the heart, for example -- it may be a crude example, but it is that type of thing, is that patentable?

MR. STONE: That may be patentable if it meets all the necessary qualifications, Mr. Chief Justice. That is, of course --

Q What are they giving the patent on? The substances or the intellectual concept?

MR. STONE: They are giving a patent -- assuming that they asked -- that the device itself that they asked for a patent on -- they are given a patent on the device.

Q Well, the device is the sum total of the end substance that is the medicine which produces this result.

MR. STONE: Well, the --

Q These are all known substances, aren't they?

MR. STONE: Yes, and there are cases -- if all they have discovered is that certain substances, in combination, produce a certain result, it may be that they don't get a patent because a number of cases such as the Funk Brothers case, 333US and the Armour case at 396Fed 2nd, Armour vs. Richardson Merrell have made the point quite forcefully that the mere discovery that a combination is useful is not

patentable of itself unless there is some element of invention in putting that combination together or some synergistic relationship between the substances that make for an invention other than the pure invention of the mathematical or scientific principle.

But our point in this case is the only element of invention in Respondents' claim, the only element of invention in this algorithm is the mathematical invention and the mathematical theorum itself. There is no element of invention whatsoever that takes places subsequent to the discovery of this mathematical process and therefore it is not in the useful arts and not patentable subject matter.

We have touched upon these subjects already in the questioning, but Respondents basically describe their mathematical procedure as a machine process and take a number of other steps to describe their claims in ways that make it look like more than pure mathematics.

One, which we have already touched upon in questioning by Mr. Justice White, is that they imply that it is a machine process rather than a mathematical process because it is, in effect, it creates a new use for the machine.

As I have said, these instructions which Respondent has devised really contribute nothing to the operation of this machine because the computer was always able to carry out

these steps before the program that the Respondents invented was ever devised. The Respondents have never denied this and, indeed, they admitted it in the court below when they stated in their brief that all of the recited signal manipulations are conventional operations which are performed by conventional electronic apparatus.

They also allege that the steps which they set forth are not strictly mathematical but are machine steps because they are carried out by means of electricity in the machine. As we have said, the inventive element in Respondents claim is entirely mathematical and has nothing to do with electricity. Respondents have not invented the technique for carrying out their calculations on a machine. That was done by the inventor of the digital computer.

Indeed, virtually everything that Respondents claim as inventable other than mathematics and as patentable other than mathematics in this law suit was invented by the inventor of the digital computer and not by Respondents.

Electricity, as I said, is merely the writing medium which the computer uses to perform the mathematical steps that Respondents have devised and it no more imports patentability to Respondents' theorum to translate it into a computer algorithm or program any more than it would import patentability to the equation A equals pi R squared, translated into a computer algorithm for determining the area of

a circle.

Respondents also attempt to make a patentable process out of their theorum by referring repeatedly in their brief to the special private exchange telephone system, called the "PBX" which includes a digital computer apparatus that Respondents allege their algorithm is especially designed to accommodate. They seem to imply that they are claiming a patent on this mathematical procedure only as it is used in this PBX device, if, indeed, they are not implying that their claim is in some way analagous to a claim on the PBX itself.

The fact is that their claim makes no reference whatsoever to the PBX device or, indeed, to any other device. In its broadest sense it can be read, perhaps, to refer to operation on a digital computer but we do not believe that that limitation would give Respondents' invention tangibility any more than no limitation at all, because if they have a monopoly on this procedure as carried out on the digital computer, they have, in effect, a monopoly on the theorum itself.

The thrust of our argument is that there is no invention in this process other than a mathematical invention. Their invention adds nothing to the digital computer except in the sense that it gives the digital computer another operation to carry out which the digital computer is built to carry out inherently and which really amounts to no more than

the normal inherent operation of that digital computer. For this reason we believe the decision below should be reversed.

I will save my remaining time for rebuttal.

MR. CHIEF JUSTICE BURGER: Thank you, Mr. Stone.

Mr. Cox.

ORAL ARGUMENT OF

HUGH B. COX, ESQ., ON BEHALF OF

THE RESPONDENTS

MR. COX: Mr. Chief Justice and may it please the Court:

In our view, the question presented here is whether a method for converting electrical signals in an electrical data processing machine that signals that represent binary-coded decimal numbers into pure binary numbers is a patentable invention under Section 101 of the Statute.

The only issues seems to be an issue of subject matter. The claims were not rejected in the Patent Office on any grounds of utility, novelty, or obviousness and those points weren't raised or decided in the court below. As I understood the argument for Counsel for the Commissioner this morning, he is not raising those points in this court.

So that I submit that the question of subject matter has to be considered on the assumption that these claims are useful, novel and nonobvious.

Now, I should like to begin by saying a word about

the background and nature of this invention. The Respondents here made the invention because they were working on what was essentially a machine problem and they solved the problem by inventing a machine method. They were working on a PBX.

Now, a PBX, as I assume every member of the -- everyone knows, is a switching device that connects a group of telephones one with the other and also connects those telephones with outside telephones. It is used in a hotel, for example, to connect all phones in the hotel and those phones with outside phones and is used the same way in an office.

Now, one of the elements of this switching device was a control unit which was a kind of digital computer. It received electrical impulses from the telephone making the call. By electrical impulses it identified the telephone that was being called and then it connected the two telephones.

Now, to carry out this function, it was necessary in that control unit to convert binary-coded decimal numbers, B, C, D numbers, into pure binary numbers.

When the Respondents were working on this problem, there were quite a number of known ways of converting these B,C,D numbers into binary numbers but all these ways were unsatisfactory simply because of the physical limitations of the computer with which the Respondents were working. Some of the methods required storage of -- in the computer -- of

elaborate tables of conversion of values and then circuits to do what is called "multi-digit adding." Some of them required other special circuits to perform special functions.

Now, the computer that the Respondents were working with did not have storage capacity. It didn't have multi-digit adding circuits. It didn't have these other special circuits. So their problem was to find a mtehod of converting B,C,D numbers into binary numbers that was to be consistent and feasible and efficient within the terms of the physical limitations of this computer they were working with.

They discovered such a method. Now, we have described the method in our brief and in the Appendix to our brief. Briefly, I simply will say this: It consists of processing a B,C,D number in a series of repetitive cycles and you do this to the electrical impulses in the machine. In each cycle an electrical impulse is detected, discovered, by another electrical impulse. It is cancelled and then two electrical impulses are inserted in predesignated places in the original sequence of impulses that you are converting and when you have done that for each signal in the B,C,D series of signals under this process, you then obtain a series of signals which are the representational value that is equivalent in binary to the representational value in B,C,D with which you started.

Now, in discovering and in inventing this method,

the Respondents detected that there was a mathematical relationship that would be useful. And I emphasize that because the important thing here is a recognition that this relationship, this mathematical relationship could be useful in devising a machine method that would solve their problem and by -- as a result of that recognition they devised this simple method of carrying out this operation and it had great advantages, of course, for them. It made it possible for this computer they were working with to do something that it couldn't do before. And it has advantages for any digital computer, even though it has more elaborate equipment than the equipment in the computer with which they were working.

It reduces the number of signals and the amount of circuitry you have to use and that reduces the possibility of error through circuit malfunction which sometimes happens. It means that you don't have to use a lot of storage space in a computer, even if you have it, which is often a convenience necessary.

Now, as I said, in the storage, it has advantages, substantial synergistic advantages in any kind of a digital computer.

Now, as I said, they were able to do -- to make -- to devise this method because they -- they recognized that this mathematical relationship could be used to advantage in a machine in converting these B,C,D signals -- these impulses --

into the impulses representing pure binary numbers. But the patent claim is on the machine method and not on the mathematics. I want to emphasize that point because it is a confusion that seems to me to run through the argument of the Petitioner here.

There are two claims in this case. They were both rejected by the Patent Office on the ground, and the sole ground, that they represented or were an attempt to claim mental processes and mathematical steps. The court below reversed holding that they were claimed on a machine method and we submit the court below is right.

We have discussed the language of those two claims at great length in our brief. I don't propose to retread that discussion here. I will simply say this: That I think there really isn't any room for argument about claim eight. It is stated in terms of a machine method. No one would describe anything else from the terms that were used in thatclaim and the Government Petitioner doesn't really argue that there is any doubt that that claim is confined to a method to be practised on an electrical data processing machine, a computer.

They make some arguments about claim 13. We think those arguments are wrong. We think when the claim is read as a whole and it context, it, too, like claim eight, simply claims a method that is to be practiced on an electrical

data processing machine. But whether there is merit in those arguments or not, they don't apply to claim eight because they depend upon language claim 13. Claim eight stands upon an independent basis.

Now, I should like now to examine the reasons that the Petitioner here gives in saying that this machine method is not covered, not patentable subject matter under Section 101 of the Statute.

I don't really think the Petitioner is relying in any degree on the conventional patent law about mental steps. He said this morning that a computer doesn't think and I suppose there is no doubt about that. When this method is practiced, it is a practice for manipulating electrical signals and when the steps described in the claims are taken, the signals are detected, blanked out, transferred, inserted in other places. It is a mechanical operation.

The rule against patenting mental steps is simply a rule that you can't patent something that goes on in the mind and the Respondents here have not attempted to do that. These claims are confined to the steps that take place in a machine. I think what --

Q Mr. Cox, if the claims weren't tied to a machine, would these claims be in trouble?

MR. COX: I think they might, yes. I think they might be in trouble.

Q Why?

MR. COX: Well, I think that they -- I say, I'm taking your words "in trouble" because I think that it would raise some serious questions. I think there is a rule and probably a sensible rule that you cannot get a patent on something that goes on simply in the mind.

Q Well, if these applicants had simply stated in their claims this method, this relationship, this way of converting, you would agree it would not be patentable?

MR. COX: I think there would be a serious question there because I doubt whether they would have made a specific application of it in the useful arts.

You see, there is a very old doctrine that I am going to say something about in a moment.

Q However, these would still be very useful. I mean, there would be advantages.

MR. COX: Yes, but the trouble with it, Mr. Justice White, I think would -- I am in the position of arguing rather than on the other side of this, but the trouble would be that unless you make a specific application of the thing of the useful arts, then the claim may be so broad as to preclude any use of the formula at all even for purposes of speculation or thought or something of that kind and I think that is one of the bases of the old rule that you can't patent a natural law as such, or a principle as such. Respondents here have not

tried to do that. But I think they would be -- if they had -- if these patent claims simply read, "We patent this method of converting numbers," I think that it would be a very arguable question whether they would be patentable. But it isn't here. That question isn't here.

Q Well, I would suppose it is. In fact, if there weren't such a principle, the Government wouldn't have any case at all.

MR. COX: They wouldn't have any case at all.

Q So the question is here.

MR. COX: Well, the question is not here because the Respondents here haven't made that kind of a claim, Mr. Justice White. They have only claimed the use of --

Q Yes, but the Government is claiming you are.

MR. COX: Well, they are claiming we are, but the fact is that the claims -- the claims --

Q That's what this case is all about.

MR. COX: The claims simply do not extend that far and, furthermore, the Government -- the Government doesn't really want to win on the ground that the claims go too far. What they want is a rule that would exclude all of these programs and if there is any trouble about these claims, claims could easily be drawn that would put it beyond the doubt of even 17th century conveyancer that these claims didn't extend to anything except the use of this method in

the machine.

Q You claim this is a process, I take it?

MR. COX: It is a process and a machine process.

Q Under what part of the definition of process in the statute do you think this falls?

MR. COX: Well,there isn't any definition beyond the word but it's -- it is -- you could say it is a process for a new use of an old machine possibly although I really think that this point is developed, both in our brief and the brief of others, that when a thing like this is used in a computer, you so change the function of the computer that it really becomes a new machine but I would say that this is a process because it achieves by a result, a useful result by a series of machine steps that have not heretofore been achieved in this manner.

Q As you put it, you could get a patent on the machine. Once you put the program in, you can get a patent on the machine, when it is set up that way.

MR. COX: Well, I'm not -- I'm not sure of that. I think you could, because the -- the machine can change the circuit -- you change the circuitry in a sense, temporarily, of course, if you had a permanently wired circuit that did this, I think you could get a patent on it. And, in fact, a patent has been issued on --

Q If the machine has not been changed, then all

you are doing is using the machine to carry out a mental process. If it is a new machine, why would you need a process patent?

MR. COX: Well, you need a process patent because the very purpose of programs and the utility of programs, in a sense the inventiveness of programs, lies in the fact that it makes it possible to use a machine without changing the circuitry. You can change the machine without changing the circuitry by changing the way the functions are performed. And the point is that when you have a method, a process, that does that, it seems to me to fall squarely within the definitions of process as they have been laid down by the decisions of this court.

Section 101 simply speaks -- uses the word "process" without trying to define it, but there is a definition, I think, in 100 which says that -- tries to give it a little content but I think this might be an appropriate place for me to say something about the piano roll analogy which was brought into the argument a little while ago, because the -- I think its precisely on this point that the piano roll analogy breaks down.

When the program does make a difference in the technological functioning of the machine it rearranges the way the signals operate, the way the circuits operate so that there is a difference of that kind. Now, a piano roll

produces a different song, but that is the only difference between one piano roll and another and of course, that kind of value is not protected by the patent law. It is an aesthetic value so that I think the piano roll is more comparable to the numbers, the data, that is fed into a computer because a piano roll doesn't essentially change the function of what the player piano does. It produces a different tune, which is not subject to patent protection at all.

But I want to emphasize this point because I think of the confusion that is involved, that these patent claims do not attempt to claim the mathematics as such. Anybody who wants to practice this method -- the mathematics -- not the method, because the method is a series of machine steps, but anyone who wants to use the mathematics to convert numbers by pen or pencil or by some other kind of a machine, calculating machine or machine that isn't an electrical data processing machine, can do so without infringing these claims. The claims don't cover that.

All these claims cover is this specific series of steps carried on within an electrical data processing machine.

Q Why didn't claim 13 say so?

MR. COX: Well, we think it did say so.

Q Well, it didn't use those words. It would have been awfully easy to do so.

MR. COX: Well, it -- Mr. Justice White, the

Respondents here have consistently taken the position with the Patent Office all the way through that that is what claim 13 meant and in the Patent Office they offered and tried to amend claim 13 to put in the words "electrical signals" to make it absolutely clear and the Patent Office examiner wouldn't allow them to do it because, as far as I understand what he said, he said it wouldn't make any difference.

You see, the real point in this case is the point that I think that was made this morning, a point that has no sanction, I submit, in the decisions. It is a notion that you can't get a patent here on these machine steps because the machine, by mechanical means, is doing something that the human mind could also do by using the same mathematics.

That is what the argument comes to.

And I submit that there is no justification for it and it is really inconsistent with the whole 150 years of development under the patent laws because the essence of most inventions is substituting -- or many inventions -- is substituting mechanical effort for human effort. Of course, by mental process you could do this conversion, but what the Respondents here have done is to invent a -- to devise a method, a method for doing the machine which enhances the operations of the machine and enables the machine to do something more efficiently than could be done simply by other methods.

Now, to speak of this merely because the conversion has certain has certain representational value, represents symbols, it means something for given conventional values in a man's -- men's minds, does not, it seems to me, suggest that there is any reason why it can't be patented.

After all, communication depends upon the same kind of conventions and when you talk over the telephone, the communication is sensible only because the words, by convention have certain meanings to the person who listens to you and that is true in this case as to these numbers. They are assigned, conventionally, certain symbolic significance but it doesn't, it seems to me, have anything to do with the question of whether the machine method for making these computations is patentable. It is not a mental process. The claims don't cover the mathematics as such. They don't monopolize the mathematics. It is simply a claim on a machine method.

Now, the argument, I think, that this is an attempt to patent a principle or a law of nature simply misconceives the origins and the nature of that rule because when you read the cases -- and it is an old rule -- you see that those cases really stand for this. They are cases that hold, in the first place, a man cannot get a patent on a principle in the general and the abstract, simply he must make a specific application of the principle to the useful arts and,

furthermore, he cannot get a patent on some application that he hasn't invented.

Now, I submit that this -- these claims here satisfy both tests. The Respondents discovered this mathematical relationship and, what is more important, determined it to be useful in devising a machine method and the only thing they are claiming is a particular machine method that they invented. They are not claiming the principle except as it is applied by these steps in a machine so they do not run afoul of either aspect of the rule against patenting a general principle.

There is, I submit, a kind of strained and artificial quality about all of these arguments that are made against the patentability of these claims. They use the conventional terms "the patent law" and the conventional concepts, but when you look at the arguments they do not -- those applications don't -- simply don't apply. Take the reliance upon the Telephone case. Now, if there is one thing that is perfectly clear about the Telephone case, it is that that case did not hold that a method patent had to be confined to a use in a particular kind of apparatus. What that case held was that if you had a valid method claim, it extended to the use of the method on any apparatus that was used to practice the claim and, in fact, in that case, the court upheld that claim, held that it was infringed by the

use of an apparatus that practiced the method, although it was an apparatus that Mr. Bell had not described in his patent and, as far as you can tell from the record, had never even dreamed of.

There is the limitations that the Petitioner says must be put on a method claim of this kind are simply not required by the cases and, indeed, in certain respects their argument is pussling because in their brief, at least, they seem to be more cautious in their oral argument. They suggested that maybe this patent would be all right if it had been confined to use in a PBX.

Well, now, that is really a strange suggestion because the subject matter is the same, whether it is used in a PBX or whether it is used in all computers. It is no more or no less a mathematical axiom or a principle in the one case than it is in the other.

The point is that this is useful. It is useful in all digital computers and it was properly claimed in those terms, not claimed in any terms of any other machine, but claimed in terms of electrical data processing machines.

Now, all fo these arguments really seem to me to be -- as I say, I think they are strained arguments because they are directed to an end. They are examples of the realizing, trying to do the work of analysis. What the Petitioner wants and what the Amici want, who are supporting

him, is a broad rule of law that will exclude from the Patent Act, from the protection of the Patent Act, all computer processes and programs.

And, indeed, they presented that case in those terms and the Petition for Certiorari and I suppose that is why the case is here, because this court will not ordinarily take cases on certiorari, simply in the normal run of affairs, simply to look at the circumstances affecting a particular patent.

Therefore, I think I am obliged to say something about the policy arguments that they advanced to support this broad result.

Now, the first thing I am going to say, I'm just -- I'm going to pass over it because we have developed it in our brief. We think it is inconsistent with both the spirit of the patent law, the letter of the patent law and the 150 years of decision to exclude a whole field of technology in this way because the patent law has constantly been interpreted and applied as extending to new fields of technology as they come along if the inventions meet the standards of the act.

Beyond that, I submit that these reasons, these policy reasons which they advanced for the broad rule of law that they acquire will not withstand examination if they are viewed in relation to the Patent Act itself. The Petitioner or the Commissioner of Patents says that it will be

burdensome and inconvenient for him if he has to search, classify, examine patents in this field and I submit that is hardly a good reason for denying patentability to a whole area of patents. Of course, it will involve some additional work; any new technology does but the standards of the Patent Act should not be bent or departed from for that reason and I think the difficulties, in any event, are exaggerated for the reasons set forth in our brief.

But that brings me to the other thing that I find myself obliged to say something about which is the economic reality that underlies this contest over whether these processes should be patentable.

If you examine the briefs in this case, the brief Amici, you will see that the patentability of these programs is opposed by the group of hardware manufacturers. They are large companies whose business primarily is the manufacture of the computers, although they also manufacture programs called "software." The patentability of the programs is supported by the companies which are engaged in the business of software or of making, devising, inventing computer programs and processes. These companies are for the most -- as compared with -- the hardware industry is a concentrated industry. There are three or four companies in it and one of them, IBM, has by far the largest share of the market. The software industry, on the other hand, is a diffused and

diversified industry with a lot of companies in it, most of them small. They are precisely the kind of enterprises that need the protection of patents in order to stimulate research and invention, to raise capital to protect the time they spend on developing these things which -- and they are the source from which you might reasonably expect invention would come because the hardware manufacturers are far more interested in their machinery and, sometimes, these programs cut down the use of the machinery or they make simpler machinery feasible. They are far more interested in their machinery than they are in the program so the patentability of these computer processes and programs, I submit, will be consistent with the policy of the patent law because it will provide protection and stimulation for invention from the very source which needs the protection and from which invention may reasonably be expected to come.

So I submit, in conclusion, that whether you look at this case in terms of the conventional standards of the Patent Act as they have been developed in 150 years of decision, or whether you go beyond that and look at it in terms of the policy arguments that have been presented here, in either view of the matter the decision of the court below should be affirmed.

MR. CHIEF JUSTICE BURGER: Thank you, Mr. Cox.

Mr. Stone.

REBUTTAL ARGUMENT OF

RICHARD B. STONE, ESQ., ON BEHALF OF

THE PETITIONER

MR. STONE: Thank you, Mr. Chief Justice.

I think the essence of the conflict in this case is reflected here in this oral argument as intensibly as it can be and that is, that Respondents have attempted repeatedly throughout their briefs and in their oral argument, to skirt the fact that the invention which they have come up with and which they claim in this case is an invention purely mathematical in nature.

They have used repeatedly essentially two methods to try to relate this invention to machinery on which doubtless there are many possible and permissable and appropriate patents.

First, they have -- as they did in their brief -- referred extensively to this PBX telephone-switching system which they allege that this patent was very specifically designed to accommodate because of certain problems and limitations of the PBX machinery itself.

Our response to this is quite clearly and simply that their claim makes no mention whatsoever of the PBX device. It has nothing to do with -- as far as we can determine from the PBX device. Granted, it would cover the use of this mathematical procedure in any type of digital

computer and would certainly not be limited to the PBX. Even if it were limited to the PBX, the Patent Office would perhaps hear arguments as to why there was some special synergistic relationship between this program and the PBX device and if Respondents could prove some synergistic relationship that would import an element of invention that was beyond the invention of their mathematical theorum, the Patent Office might be presented with a different case.

We are highly doubtful, however, that Respondent's could prove such a synergistic connection between this algorithm and the PBX device and in any event they have not claimed any limitation whatsoever to the PBX device and we are therefore unconcerned with the underlying motive for their invention -- for their discovery of this particular theorum.

Q Well, Mr. Stone,did you say that an application of the Government's theory here would not then require outright rejection of the validity of the patent claim if it had been limited to the PBX? It would be at least be heard as factual?

MR. STONE: Yes, Mr. Justice Rehnquist, the Patent Office would certainly have heard the issue whether there was some invented element beyond the pure mathematical invention or some synergistic relationship between the claimed machine and the algorithm which would import patentability. But that simply is not present in this case.

In addition, Respondents have repeatedly used the

word "machine process" which, I reiterate, brings up the implication that what they -- the mathematical steps which they have asked this machine to carry out and instructed this machine to carry out import a new function of some sort to this machine and are related in some way to an invention on the machinery itself.

There are -- in one of the Amicus briefs -- there is given a list of and description of a number of important theoretical discoveries involving mathematical steps used, for example, to predict weather which are so complicated and so long to carry out that they can only practically be done on what is today known as a digital computer, our most complex calculating device.

If Respondents are entitled to a machinery, to a patent on -- if Respondents are entitled to a patent on this mathematical procedure, merely because it is most likely to be carried out on a digital computer, then all of those important mathematical discoveries as well as other important mathematical discoveries which are likely because of their -- of the inherent length of their mathematical calculations to be carried out on a digital computer, would be monopolized and taken out of the realm of common usage even though they have nothing inherently to do with machinery except that they are likely to be performed on machinery that has already been invented and designed to carry out those mathematical steps.

Finally, Respondent -- excuse me --

MR. CHIEF JUSTICE BURGER: Mr. Stone, your time is up, but did I understand you to say that if this had been limited to the PBX or a single-purpose machine of some kind, that the Government's position would be different?

MR. STONE: No, Mr. Chief Justice, I have not said that. All I have said is that if it had been limited to the PBX, then it would have been appropriate, perhaps, to make an inquiry as to whether there was some special relationship between Respondents' discovery in the PBX which would import an inventive element other than the mere mathematical discovery to the claim and perhaps warrant a patentability.

All we say is that this might have been a different case but that is not the case before us.

Finally, the competitive -- the problems of the competitive status of the software industry which Respondents alluded to are indeed important problems which of course, I think it is a matter of public record, the Government is quite concerned with. Our view is simply that the solution to these competitive problems is not to grant undeserved monopolies on mathematical principles. Thank you.

MR. CHIEF JUSTICE BURGER: Thank you, Mr. Stone. Thank you, Mr. Cox. The case is submitted.

(Whereupon, at 10:58 a.m. o'clock, the case was submitted.)