Computation and Materiality in American Patent Law:
The Long History of Software Patenting in the United States

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UC Davis
Software Rights:
Patent Law and the American Computing Industry
Yale University Press, coming October 2019
Today’s Talk

The patent protection of computer programs originated in the 1950s at industrial research laboratories such as Bell labs.

Hinged on patent drafting technique later known as “embodying software.”

Disclosure of computer programs as collection of electromechanical components and their uses.
Today’s Talk

• Part 1: Bell Labs

• Part 2: Broader Patent Landscape
Richard Hamming

Model V Computer
US Patent Number 2,666,579
Filed in 1944, issued in 1954

Image Credit: Association of Computing Machinery
Mental Steps Doctrine

Steps that a human being can perform are ineligible for patent protection.

19th Century Precedent:

Cochrane v. Deener (1876)

O’Reilly v. Morse (1854)
Inventions that perform steps described with any of the following terms are ineligible for patent protection:

Determining, registering, counting, computing, comparing, etc.

The mere presence of these words is enough to signal patent-ineligibility.
Bernard Holbrook

Richard Hamming & Bernard Holbrook
At work on the Mark V
Image Credit: Computerworld
ERROR-DETECTING AND CORRECTING SYSTEMS

PATENT NO. 3,526,299
DATING: OCT 26, 1970

INVENTOR:
RICHARD W. HAMMING AND BERNARD S. HOLBROOK

DOMESTIC INVENTION

LOCATION:
AMHERST, MA

STATE:
MASSACHUSETTS

APPLICATION FILED COMPLETE JAN 11, 1950

P. O. BOX 1050
AMHERST, MA 01002

AMHERST, MA 01002

TITLE OR SUBJECT MATTER:
ERROR-DETECTING AND CORRECTING SYSTEMS

ATTORNEY:

PATENT application for
Hamming and Holbrook
Considerations such as those of cost and
it upon the extent to which the error
is to be carried in any particular case.

An analysis of the description which

complexity both in theory and practice

provides for the correction and/or

errors in a code wherein the information

of a definite number. However, under
Programming the ENIAC by rewiring it

Image Credit: University of Pennsylvania
“apparatus for and a method of detecting and correcting errors which impair the accuracy of the output”
Today’s Talk

- Part 1: Bell Labs

- Part 2: Broader Patent Landscape
1. In re Abrams (1951)

Application of Armand Abrams (1944), National Records and Archive Administration, Kansas City
1. In re Abrams (1951)

Application rejected based on mental steps doctrine.

Presence of words such as “calculating,” “comparing,” “converting,” and “determining” used as evidence.
1. In re Abrams (1951)

Three kinds of method claims:

1) Steps in method are all “purely mental in character” [Not P.E.]  

2) Method involves mental and physical steps, and novelty resides only in the mental ones. [Not P.E.]  

3) Method involves mental and physical steps, and novelty resides only in physical ones. [P.E.]
2. In re Yuan (1951)

Invention included steps such as

• “computing pressure distribution”

• “determining the airfoil altitude”

• “determining values”
2. In re Yuan (1951)

Relied on the classification from Abrams’ case.

Yuan’s invention comprised only mental steps that humans can perform with paper and pencil.

Unacceptable under the Cochrane doctrine.
British Tabulating Machine Company
Apparatus for translating a number from a first to a second radix of notation having

[1] means for storing a limited number of equivalent values of one of the radices expressed in the other of the radices,

[2] means for reading out the stored values sequentially,

[3] *analyzing means for* determining which of the equivalent values is contained in said number and

[4] *means controlled by the analyzing means* for selecting and summing those read out values which are contained in said number.
RCA, Data Translating System

IBM, Decimal to Binary Translator
Prater and Wei
Creation of a spectrogram and measurement of peak heights
System of equations in Prater and Wei’s invention
\[ Y_1 = a_{11}x_1 + a_{12}x_2 + \ldots + a_{1m}x_m \]
\[ Y_2 = a_{21}x_1 + a_{22}x_2 + \ldots + a_{2m}x_m \]
\[ \vdots \]
\[ Y_i = a_{i1}x_1 + a_{i2}x_2 + \ldots + a_{im}x_m \]
\[ \vdots \]
\[ Y_n = a_{n1}x_1 + a_{n2}x_2 + \ldots + a_{nm}x_m \]
Purely Mental Steps

Purely Physical Steps
Purely Mental Steps

Purely Physical Steps
“You build a special-purpose computer by placing it under the control of the computer program... A user having a single general-purpose computer and a thousand programs in his library has 1,000 special-purpose computers.”

Morton Jacobs
New York Times
1969
Further reading

