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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Ex parte TOMOKAZU ABE

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Appeal 2018-004394
Application 14/684,796[1]
Technology Center 2600

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Before HUNG H. BUI, ADAM J. PYONIN, and MICHAEL J. ENGLE, *Administrative Patent Judges.*

BUI, *Administrative Patent Judge.*

DECISION ON APPEAL

Appellant seeks our review under 35 U.S.C. § 134(a) from the Examiner's Non-Final Rejection of claims 21–43, which are all the claims pending in the application. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.[2]

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STATEMENT OF THE CASE

Appellant's invention describes data compression and decompression techniques that are used to compress and decompress audio, image, and other digital data processed by a computer. Conventional data compression techniques divide music data on the basis of frequency ranges and convert divided signals into frequency domain data for encoding purposes. Spec. ¶ 2. However, such techniques divide music data on the basis of fixed frequency ranges determined in advance. Spec. ¶ 3. As such, Appellant's invention seeks to improve the efficiency of data compression on a block basis where music data is divided into a plurality of pieces of frequency domain data and a plurality of blocks is generated on the basis of the characteristics or properties of pieces of frequency domain data such that separation positions of the blocks are variable, or alternatively, such that the number of pieces of frequency domain data included in each block is variable. Spec. ¶¶ 6–9; Abstract. According to Appellant, "[t]his [technique] makes it possible to categorize pieces of data into some types [(i.e., different categories)], and generate blocks on the basis of the types" and therefore is "more suitable for data compression." Spec. ¶¶ 17, 19. In other embodiments, the plurality of blocks may also be generated on the basis of (1) a continuity between pieces of frequency domain data when arranged (Spec. ¶ 22), (2) the number of bits for representing each of the pieces of frequency domain data (Spec. ¶ 24), or (3) taking into account the size of decompression information used to decompress compressed data (Spec. ¶ 39).

Claims 21, 38, 39, 40, 41, 42, and 43 are independent. Claim 21 is illustrative of the claimed subject matter, as reproduced below:

21.   A data compression apparatus for compressing a plurality of pieces of input data to generate compressed data, the data compression apparatus comprising:

a processing system that includes at least one processor coupled to a memory, the processing system configured to:
acquire input data that is separated into a plurality of pieces;
determine that values of two adjacent ones of the plurality of pieces of input data are representable by the same required number of bits;
based on the number of bits required to represent values of the plurality of pieces of input data, generate a plurality of blocks such that each of the plurality of pieces of input data is included in any one of the plurality of blocks, where the pieces of input data for each one of the plurality of blocks is stored using a number of bits for the corresponding block, wherein the two adjacent ones of the plurality of pieces of input data are included in the same one of the plurality of blocks that are generated based on the determination, where pieces of input data for at least two of the blocks of the plurality of blocks are stored using a different number of bits;
compress, on a block basis, the pieces of input data included in the generated blocks, thereby generating the compressed data; and
output the compressed data to a memory storage medium.

App. Br. 24 (Claims App'x).

EXAMINER'S REJECTION

Claims 21–43 stand rejected under 35 U.S.C. § 101 for being directed to non-statutory subject matter. Non-Final Act. 2–6.

ANALYSIS

Patent eligibility is a question of law that is reviewable *de novo*. *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1333 (Fed. Cir. 2012). Patent-eligible subject matter is defined by 35 U.S.C. § 101 as follows:

> [w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

In interpreting § 101, the Supreme Court has emphasized that patent protection should not preempt "the basic tools of scientific and technological work." *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972); *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 71 (2012); *Alice Corp. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2354 (2014). The rationale is that patents directed to basic building blocks of technology would not "promote the progress of science" under the U.S. Constitution, Article I, Section 8, Clause 8, but, rather, would impede it. Accordingly, laws of nature, natural phenomena, and abstract ideas are not patent-eligible subject matter. *Thales Visionix Inc. v. U.S.*, 850 F.3d 1343, 1346 (Fed. Cir. 2017) (citing *Alice*, 134 S. Ct. at 2354).

In *Alice*, the Supreme Court has reiterated the analytical two-step framework previously set forth in *Mayo* "for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts." *Alice*, 134 S. Ct. at 2355. The first step in the analysis is to "determine whether the claims at issue are directed to one of those patent-ineligible concepts," such as an abstract idea. *Id.* If the claims are directed to eligible subject matter, the

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inquiry ends. *Thales*, 850 F.3d at 1349; *Enfish, LLC v. Microsoft Corp.*, 822
F.3d 1327, 1339 (Fed. Cir. 2016).

If the claims are directed to a patent-ineligible concept, the second
step in the analysis is to consider the elements of the claims "individually
and 'as an ordered combination'" to determine whether there are additional
elements that "'transform the nature of the claim' into a patent-eligible
application." *Alice*, 134 S. Ct. at 2355 (quoting *Mayo*, 566 U.S. at 79, 78).
In other words, the second step is to "search for an 'inventive concept'—*i.e.*,
an element or combination of elements that is 'sufficient to ensure that the
patent in practice amounts to significantly more than a patent upon the
[ineligible concept] itself.'" *Id.* (quoting *Mayo*, 566 U.S. at 72–73).
"'[W]ell-understood, routine, [and] conventional activit[ies]' previously
known to the industry" are insufficient to transform an abstract idea into
patent-eligible subject matter. *Alice*, 134 S. Ct. at 2359 (quoting *Mayo*, 566
U.S. at 73).

In rejecting claims 21–43 under 35 U.S.C. § 101, the Examiner
determines the claims are directed to an abstract idea of "data compression"
and contain limitations such as "acquiring input data . . . determining values,
generating blocks, compressing data and outputting the compressed data"
that are akin or analogous to "a process of organizing information through
mathematical correlations" discussed in *Digitech*. Ans. 2–3 (citing *Digitech
Image Techs., LLC v. Elecs. for Imaging, Inc.*, 758 F.3d 1344, 1350 (Fed.
Cir. 2014). The Examiner also determines these claims are directed to an
abstract idea because the process recited in these claims can be implemented
mentally or performed manually by a human with pen and paper. Non-Final
Act. 4; *see also CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366,

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1372 (Fed. Cir. 2011). The Examiner further determines additional elements in the claims, whether taken separately or in an ordered combination, do not amount to significantly more than an abstract idea, because (i) "the additional computer elements [(e.g., processor, memory)], which are recited at a high level of generality, provide conventional computer functions that do not add meaningful limits to practicing the abstract idea"; and (ii) "data compression is algorithmic in nature and the data compression does not improve the apparatus." Ans. 2–3.

Alice/Mayo—Step 1 (Abstract Idea)

Turning to the first step of the *Alice* inquiry, Appellant argues "independent claims 21, [and] 38–43 are not directed to an abstract idea" (emphasis and capitalization omitted) because:

(1)   "data compression is NOT an abstract idea" and the steps recited "cannot, by definition, be performed in the 'human mind'" (App. Br. 13);

(2)   "[n]o court has found subject matter directed to data compression techniques to be abstract" (*id.* at 14);

(3)   *Digitech* is inapposite because (i) "the court in *Digitech* held that the device process was merely [] 'a collection of intangible color and spatial information'" and "never held that processes for data compression were abstract ideas" and (ii) "*Digitech* does not stand for the broad proposition that organization and manipulation of data through mathematical correlation is patent ineligible - because that is 'the essence of software' and software (i.e., the new use of a machine - a computer) is patent eligible subject matter" (*id.* at 14–15);

(4)   *RecogniCorp, LLC v. Nintendo Co.*, 855 F.3d 1322, 1327 (Fed. Cir. 2017) is also inapposite because *RecogniCorp's* claims relate to "'<u>standard</u> encoding and decoding, *an abstract concept long utilized to transmit information*,'" whereas Appellant's

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claims relate to an improved compression technology that the Examiner "has acknowledged that the claims are both novel and non-obvious (i.e., an advancement) over the prior art techniques for compression and decompression" (*id.* at 15); and

(5) "[t]he steps [recited in Appellant's claims] cannot be performed mentally" because the human mind does not (i) "operate in the context of 'bits' (e.g., a binary medium)," (ii) "generate blocks for input data based on the number of bits required to represent the input data," and (iii) "'compress' on a block-by-block basis" (*id.* at 16–17) (emphasis and capitalization omitted).

According to Appellant, the claims are directed to "an improved technological process in computer technology (i.e., improved compression and decompression techniques)" and, like the claims of *Enfish* and *Visual Memory LLC v. Nvidia Corp.*, 867 F.3d 1253 (Fed. Cir. 2017), Appellant's "claims are directed to an improvement to computer functionality versus being directed to an abstract idea." App. Br. 17. In particular, Appellant argues "the claims are 'directed to' improved data compression techniques in which the blocks that are compressed are arranged by determining when two (or more) pieces of input data can be represented with the same number of bits and, if they can, then those two pieces of input data are included in the same block and the blocks are then compressed on a block-by-block basis" which "improves the amount of storage (or bandwidth) needed for the original input data." *Id.* at 19–20.

In response, the Examiner takes the position that (1) like *RecogniCorp* "the claims recite a very generic data compression and [Appellant] does not allege a particularized application of data compression"; (2) "the claimed invention preempts all uses of the recited abstract idea not only in specific technologies, but through mathematical correlations"; and (3) in contrast to

Visual Memory, "[t]he current claims does [sic] not meet the technical field requirement because it merely recites ways [to perform] generic data compression, wherein generic relates to terms that are not directed to a specific data type." Ans. 5–6.

We disagree with the Examiner's positions. At the outset, we note the Federal Circuit has interpreted *Alice* step 1 as asking "whether the claims are directed to an improvement to computer functionality versus being directed to an abstract idea," as recognized by Appellant. App. Br. 17 (quoting *Enfish*, 822 F.3d at 1335). The Federal Circuit has also "emphasized that the key question is 'whether the focus of the claims is on the specific asserted improvement in computer capabilities (i.e., the self-referential table for a computer database [in *Enfish*])." *Visual Memory*, 867 F.3d at 1258 (citing *Enfish*, 822 F.3d at 1335–36).

Contrary to the Examiner's characterization, Appellant's claims do not recite any "generic data compression." Instead, Appellant's claims seek to improve the efficiency of data compression on a block basis where data is divided into a plurality of pieces of frequency domain data and a plurality of blocks is generated on the basis of the characteristics or properties of pieces of frequency domain data such that separation positions of the blocks are variable, or alternatively, such that the number of pieces of frequency domain data included in each block is variable. Spec. ¶¶ 6–9; Abstract. According to Appellant's Specification, "[t]his [technique] makes it possible to categorize pieces of data into some types [(i.e., different categories)], and generate blocks on the basis of the types" and "more suitable for data compression." Spec. ¶¶ 17, 19.

For example, Appellant's claim 21 recites a data compression apparatus for compressing a plurality of pieces of input data to generate compressed data, comprising a processing system configured to:

> acquire input data that is separated into a plurality of pieces;
> determine that values of two adjacent ones of the plurality of pieces of input data are representable by the same required number of bits;
> based on the number of bits required to represent values of the plurality of pieces of input data, generate a plurality of blocks such that each of the plurality of pieces of input data is included in any one of the plurality of blocks, where the pieces of input data for each one of the plurality of blocks is stored using a number of bits for the corresponding block, wherein the two adjacent ones of the plurality of pieces of input data are included in the same one of the plurality of blocks that are generated based on the determination, where pieces of input data for at least two of the blocks of the plurality of blocks are stored using a different number of bits;
> compress, on a block basis, the pieces of input data included in the generated blocks, thereby generating the compressed data; and
> output the compressed data to a memory storage medium.

App. Br. 24 (Claims App'x).

According to Appellant's Specification,

> in terms of improvement of the compression ratio, a data sequence is divided into a plurality of variable blocks, and each block is compressed. Specifically, if the size of the data compressed when a block is divided is smaller than the size of the data compressed when the block is not divided, the block is divided. Alternatively, in another embodiment, in terms not only of improvement of the compression ratio, but also of, for example, improvement of the processing speed, a data sequence may be divided into a plurality of variable blocks, and the blocks may be compressed by a predetermined compression method. That is, the above technique may be used in order to reduce the

processing load for compressing or decompressing the data sequence.

Spec. ¶ 100.

> As recognized by Appellant, the claimed
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> techniques herein thus improve "processing speed" (e.g., the speed at which a data sequence is processed), reduce the "processing load for compressing or decompressing" (e.g., decrease the amount of work a processor must undertake to achieve a result), and decrease the physical storage space required to store a data sequence because of the "improvement of the compression ratio." All of these aspects are improvements in computing technology . . . rooted in computing technology, and thus improve the functioning of a computer.

Reply Br. 3; *see Enfish*, 822 F.3d at 1339 (holding the claimed "specific type of data structure designed to improve the way a computer stores and retrieves data in memory" is patent-eligible).

Further, Appellant's claims are not akin or analogous to the claims of *RecogniCorp*. In *RecogniCorp*, the Federal Circuit held that a software-based method for encoding/decoding image data is an "abstract idea" in part because the technological processes for encoding an image and then decoding image data involved conventional data encoding/decoding techniques. *RecogniCorp*, 855 F.3d at 1327. In contrast to *RecogniCorp*, Appellant's claims provide a particular technique to improve the efficiency of data compression "on a block basis."

Lastly, we are not persuaded that Appellant's particular advancement in data compression/decompression technology on a "block-by-block" basis can be performed solely in a person's mind. Under the "mental steps" doctrine, a patent claim that can be performed solely in a person's mind is considered an "abstract idea" and, as such, is patent-ineligible under § 101.

For example, in *Benson*, the Supreme Court held a number-conversion method using a mathematical algorithm is patent-ineligible under § 101 because the conversion "can be done mentally" and "without a computer." *See Benson*, 409 U.S. at 67. These "mental processes—or processes of human thinking—standing alone are not patentable even if they have practical application." *In re Comiskey*, 554 F.3d 967, 979 (Fed. Cir. 2009). Similarly, in *CyberSource*, the Federal Circuit held *CyberSource's* method claim for detecting fraud in credit card transactions conducted over the Internet between consumer and merchant is drawn to an unpatentable "mental process" because "[a]ll of [its] method steps can be performed in the human mind, or by a human using a pen and paper" and do not require a computer. *CyberSource*, 654 F.3d at 1372. However, the Federal Circuit also held that method claims "for calculating an absolute position of a GPS receiver and an absolute time of reception of satellite signals" are patent-eligible under § 101 because "the methods [] could not be performed without the use of a GPS receiver." *SiRF Tech., Inc. v. Int'l Trade Comm'n*, 601 F.3d 1319, 1331–1332 (Fed. Cir. 2010).

Contrary to the Examiner's characterization, we do not discern how specific steps of Appellant's advancement in data compression and decompression technology recited in Appellant's independent claims 21 and 38–43 can be performed solely in a person's mind. As recognized by Appellant, the human mind does not "generate [variable] blocks for input data based on the number of bits required to represent the input data" and "'compress' on a block-by-block basis." App. Br. 16–17. Moreover, like the claims in *SiRF Technology*, the steps recited in Appellant's

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independent claims 21 and 38–43 require the use of a computer to process input data in the claimed manner.

For these reasons, we agree with Appellant that claims 21–43 are not directed to an abstract idea of "compressing data." Because *Alice* step 1 is dispositive, we need not reach *Alice* step 2 (inventive concept). As such, we do not sustain the Examiner's rejection of claims 21–43 under 35 U.S.C. § 101.

CONCLUSION

On the record before us, we conclude Appellant has demonstrated the Examiner erred in rejecting claims 21–43 under 35 U.S.C. § 101.

DECISION

As such, we reverse the Examiner's rejection of claims 21–43 under 35 U.S.C. § 101.

REVERSED