Federal Court of the 1st Region
PJe - Electronic Judicial Process

01/13/2021

Number: **1043634-48.2020.4.01.3400**

Class: **COMMON CIVIL PROCEDURE**
Judging Body: **4th Federal Civil Court of the SJDF**
Last Distribution: **08/06/2020**
Amount in Controversy: **R$ 100,000.00**
Matters: **Registration of Trademarks, Patents, or Inventions**
Confidentiality? **NO**
Legal Aid? **NO**
Request for Injunction or Preliminary Relief? **NO**

Parties	Attorney/Linked Third Party
Nokia Technologies OY (PLAINTIFF)	**LILIANE DO ESPIRITO SANTO RORIZ DE ALMEIDA (ATTORNEY)** **RODOLFO PINTO BARRETO (ATTORNEY)** **FELIPE VALENTE MESQUITA (ATTORNEY)** **CARLOS EDUARDO CORRÊA DA COSTA DE ABOIM (ATTORNEY)** **OTTO BANHO LICKS (ATTORNEY)** **THIAGO MARINS VIVACQUA RUSCHI (ATTORNEY)**
LENOVO TECHNOLOGY (BRAZIL) LIMITED (DEFENDANT)	**GUSTAVO PRIETO MOISES (ATTORNEY)**
NATIONAL INSTITUTE OF INDUSTRIAL PROPERTY - INPI (JOINT PARTY)	

Documents

Id.	Date of Signature	Document	Type
414234415	01/13/2021 11:48	Intervening Petition	Intervening Petition

MINISTRY OF ECONOMY
NATIONAL INSTITUTE OF INDUSTRIAL PROPERTY
General Coordination of Appeals and Administrative Nullity Processes
Rua Mayrink Veiga, 9 - Downtown, Rio de Janeiro/RJ, ZIP 20090-910
Phone: (21) 3037-3000

ORDER

Ref.

INPI Process No. 52402.008590/2020-41

To

Technical Coordination of Appeals and Administrative Nullity Processes of Patents

Dear Technical Coordinator,

I request that the necessary measures be taken to fulfill the request made by the PFE/INPI.

Gerson Corrêa
General Coordinator

Document electronically signed by **GERSON DA COSTA CORREA, General Coordinator**, on 12/17/2020, at 22:43, according to Brasília official time, pursuant to art. 6, § 1, of Decree No. 8,539, of October 8, 2015.

The authenticity of this document can be verified on the site http://sei.inpi.gov.br/sei/controlador_externo.php?acao=documento_conferir&id_orgao_acesso_externo=0, by entering the verification code **0359026** and CRC code **D81CE86F**.

Reference: If replying to this Official Letter, please expressly indicate Process No. 52402.008590/2020-41 SEI No. **0359026**

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ORDER

Ref.
INPI Process No. 52402.008590/2020-41
To

To Renato Castro Dutra,

With the aim of providing the technical support for INPI's defense, we request the examination of the case files and the necessary actions to enable the assigned Federal Prosecutor to proceed with the preparation of the legal document.

For receipt control, we request confirmation of reading via the SEI icon.

Sincerely,

Heleno José Costa Bezerra Netto
Acting Technical Coordinator
INPI-CGREC-COREP

Document electronically signed by **HELENO JOSE COSTA BEZERRA NETTO, Acting Coordinator**, on 12/17/2020, at 19:20, according to Brasília official time, based on art. 6, § 1, of Decree No. 8,539, of October 8, 2015.

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FEDERAL PUBLIC SERVICE
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TECHNICAL SUBSIDY OPINION – JUDICIAL ACTION

Patent No.:	PI0211263-9	
CNJ Process:	1043634-48.2020.4.01.3400	1054710-69.2020.4.01.3400 (dependency)
INPI Process:	52402.008590/2020-41	52402.012468/2020-70 (dependency)
Filing Date:	09/11/02	
Union Priority:	US 09/954,608 (09/17/2001)	
Holder:	Nokia Technologies Oy (FI)	
Inventor:	Marta Karczewicz, Antti Hallapuro	
Title:	"METHOD OF INTERPOLATION IN VIDEO CODING, VIDEO ENCODER FOR CODING AN IMAGE AND COMMUNICATION TERMINAL"	
Demand:	Response to Declaratory Action	
Applicant:	Lenovo Tecnologia Brasil Ltda	

TECHNICAL SUBSIDY

1. Motivation

In compliance with the request of the Federal Attorney General's Office stated in SEI order No. 0356483, dated 12/16/2020, and attached to electronic process INPI No. 52402.008590/2020-41, follows the Technical Subsidy containing INPI's statements regarding the defense against the judicial action pending in the 4th Federal Civil Court of the Federal District – TRF1 – under No. 1043634-48.2020.4.01.3400, in which Lenovo Tecnologia Brasil Ltda (hereinafter Defendant) asserts that documents US5594813, TML6, US5521642, and EP05762990 constitute grounds for modifying the scope of protection and the rights conferred by the invention patent PI0211263-9, filed on 09/11/02, whose holder is Nokia Technologies Oy (FI) (hereinafter Plaintiff).

2. Introduction

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The invention patent PI0211263-9 had its international filing, via PCT, on 09/11/2002, entering the national phase on 01/19/2004, through petition No. 004092 of 01/19/2004, claiming union priority through document US09/954608 of 09/17/2001, containing a Descriptive Report with seventy-five (75) pages, Claim Table with sixteen (16) pages and forty-six (46) claims, Drawings with twenty-six (26) pages, and Summary with one (1) page, with the Claim Table consisting of 13 (1, 17, 18, 22, 25, 26, 29, 32, 33, 39, 40, 43, and 46) Independent Claims that sought protection for methods, video encoders, codecs (encoders and decoders), terminals, and interpolation systems in video encoding, where an image comprises, in summary, pixels arranged in rows and columns where the interpolation generates sub-pixels. On 02/14/2005, through petition No. 020050006977, the Examination of the Application was requested. The technical examination of invention patent PI0211263-9 at the first instance, at INPI, after two (2) notifications to the Applicant, and two (2) responses from the Applicant, resulted in rejection, published in RPI No. 2445 of 11/14/2017, due to articles 25 and 32 of the IP Law. It should be noted that invention patent PI0211263-9 possessed inventive activity in light of Articles 8 and 13 of the IP Law; however, it presented wording in the Claims that impaired clarity and precision (Art. 25 of the IP Law), as well as lack of subject matter originally claimed (Art. 32 of the IP Law).

Subsequently, the Applicant filed an Administrative Appeal against the rejection of patent application PI0211263-9 through petition No. 870180003155 of 01/12/2018, attaching a modified Claim Table of seventeen (17) pages containing 47 Claims, consisting of seven (7) Independent Claims for methods, encoders, and terminal, in which an image comprises, in summary, pixels arranged in rows and columns where interpolation generates sub-pixels. During the Appeal stage, a technical examination was conducted regarding the patentability of invention PI0211263-9 and it was found that the modified Claim Table corrected the wording of the Claims in relation to Articles 25 and 32 of the IP Law and met the patentability criteria related to inventive activity under Articles 8 and 13 of the IP Law. INPI granted approval and reversed the initial rejection decision, which was published in RPI No. 2477 of 06/26/2018, with the Patent Certificate issued on 10/02/2018 and published in RPI No. 2491 of 10/23/2018.

The Applicant filed a declaratory action in the 4th Federal Civil Court of the Federal District – TRF1 – (No. 1043634-48.2020.4.01.3400) for INPI to express its views on the novelty and inventive activity of PI0211263-9 in light of four prior documents US5594813 (D1), TML6 (D2), US5521642 (D3), and EP05762990 (D4). In this way, the Regional Federal Prosecutor's Office of the 1st Region (PRF1) issued Official Letter No. 00988/2020/GCMER-REG-PRF1/PGF/AGU for INPI to provide documentation and express its opinion.

The Defendant, Lenovo Tecnologia Brasil Ltda, submitted a Defense, electronically signed on 09/28/2020, in response to the action proposed by the Applicant.

INPI analyzed this Defense, electronically signed on 09/30/2020, in response to the action proposed by the Plaintiff, attached to the electronic process INPI No. 52402.008590/2020-41, and requested technical elements (included in order No. SEI 0314427, dated 06/26/2018), which stated that documents US 5,594,813 (D1), TML6 (D2), US 5521642 (D3),

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and EP 0576290 (D4) do not constitute grounds for modifying the scope of protection and the rights conferred by this patent, as they do not negate the novelty or inventive activity of invention patent PI0211263-9.

The Regional Federal Prosecutor's Office of the 1st Region (PRF1) issued Official Letter No. 00128/2020/SUBET/PFMT/PGF/AGU, on 12/16/2020, for INPI to present a statement on whether it maintains its previously presented position.

In compliance with the request from the Federal Attorney General's Office in order No. SEI 0356483, dated 12/16/2020 and attached to the electronic process INPI No. 52402.0085902020-41, the relevant considerations follow.

3. Description of the claimed object in Patent PI0211263-9

The invention patent PI0211263-9 relates to a method of interpolation to generate sub-pixel values. This method was proposed and claimed due to the known methods, at the time of filing for union priority of invention patent PI0211263-9 (09/17/2001), applied to Test Models TML5 and TML6 (Test Models 5 and Test Models 6), which required high arithmetic precision in both the encoder and decoder, demanding more computation and memory. Thus, there was a need to develop a sub-pixel value interpolation method with satisfactory performance in both the encoder and decoder (Descriptive Report of the patent letter, page 21, lines 17 to 30 and page 22, lines 1 to 9) that would reduce memory and CPU usage in encoding equipment.

For this optimization purpose, invention patent PI0211263-9 claims (Patent letter Claim Table, Independent Claim 1) the interpolation method in video encoding, video encoder for encoding an image and communication terminal, in which an image comprises pixels arranged in rows and columns and represented by values having a specified dynamic range, the pixels in the rows residing in horizontal unit locations and the pixels in the columns residing in vertical unit locations, interpolated to generate values for the sub-pixels at fractional horizontal and vertical locations, the fractional horizontal and vertical locations being defined according to $1/2^x$, where *x* is a positive integer within the range of 1 to N, $1/2^x$ representing a particular level of sub-pixel interpolation and N representing a maximum level of sub-pixel interpolation, characterized by the steps:

a) interpolating values for sub-pixels located at horizontal unit and vertical unit locations $1/2^{N-1}$, and for sub-pixels located at vertical unit location $1/2^{N-1}$ and horizontal unit, using weighted sums of pixels that reside at the respective horizontal and vertical unit locations;

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b) interpolate a value for a sub-pixel located at a vertical unit location $1/2^{N-1}$ and a horizontal unit location $1/2^{N-1}$ using a first weighted sum of the interpolated values for sub-pixels residing at vertical and horizontal unit locations $1/2^{N-1}$, or a second weighted sum of the interpolated values for sub-pixels residing at vertical unit location $1/2^{N-1}$ and horizontal unit location obtained in step a); and

c) interpolate a value for a sub-pixel located at a horizontal unit location $1/2^{N}$ and a vertical unit location $1/2^{N}$ using:

- a weighted average of the value of a first sub-pixel located at a horizontal unit location $1/2^{N-m}$ and a vertical unit location $1/2^{N-n}$, and the value of a second sub-pixel located at a horizontal unit location $1/2^{N-p}$ and a vertical unit location $1/2^{N-q}$, or
- a weighted average of the value of a pixel located at a horizontal unit location and a vertical unit location, and the value of a sub-pixel located at a horizontal unit location $1/2^{N-m}$ and a vertical unit location $1/2^{N-n}$

where the variables *m*, *n*, *p*, and *q* take integer values within the range of 1 to N, so that the respective first and second sub-pixels or respective pixel and sub-pixel **are located diagonally with respect to the sub-pixel** at horizontal unit location $1/2^{N}$ and vertical unit location $1/2^{N}$ that is interpolated.

This Claim Table in the patent letter of Invention Patent PI0211263-9 contains an additional forty-six (46) claims which, for conciseness, will not be presented in this technical subsidy opinion, as the inventive object of Invention Patent PI0211263-9 is clearly and precisely defined in Independent Claim 1 of the Claim Table in the patent letter of Invention Patent PI0211263-9.

4. Arguments of the Defendant to support the nullity of patent PI0211263-9 and arguments of INPI

Before presenting the arguments of the Plaintiff in the legal action, we would like to record that the analyses and considerations expressed here will be limited to the application of Law 9.279/96 (LPI). Thus, arguments/evidence that do not concern matters regulated by Law 9.279/96 (LPI) will not be subject to examination. These exclusions include

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claims of a commercial or economic nature, etc., as well as decisions from past or ongoing judicial processes brought by the Plaintiff in this case.

REFERENCE to items I, II, and III - No comments.

REFERENCE to item IV – MERIT

Regarding sub-items 53 to 55 – No comments.

Regarding sub-item 56 - We agree that documents D1 and D2 were not examined by the INPI during the administrative examination phase of patent PI0211263-9.

Regarding sub-item 57 - No comments.

Regarding sub-items 58 to 63 – We disagree that document US 5,594,813 (D1) discloses and/or suggests all the technical features of the subject matter of PI0211263-9, lack of novelty and/or inventive step.

Document US 5,594,813 (D1) relates to a low-cost programmable architecture and method for motion estimation in digital video (D1, page 1, lines 61 to 67), in which the programmable architecture contains two memories and an arithmetic unit (D1, page 2, lines 10 to 12) for the arithmetic operation of pixel groups. One of the memories stores the addressable locations of N pixels in width and a read port, accessible in parallel in one address cycle, and the other memory stores addressable locations wider than N pixels with a read port, and any contiguous N pixels are accessible in parallel in one address cycle (D1, page 2, lines 12 to 21). Furthermore, it is described that, to improve prediction accuracy, half-pixel and quarter-pixel estimations are performed after the integral pixel estimation (D1, page 5, lines 26 to 49), and interpolation of fractional pixel positions is carried out (D1, page 6, lines 2 to 17), where pixels $A_{r,c}$ of block A (72) are horizontally interpolated at half-pixel locations, pixels $B_{r,c}$ of block B (74) are interpolated vertically, and pixels $C_{r,c}$ are interpolated at half-pixel locations, preferably vertically, horizontally, or also diagonally.

Specifically, diagonal interpolation is described in D1, page 6, lines 54 to 67, which can be better understood in conjunction with Figure 4 of D1, as follows:

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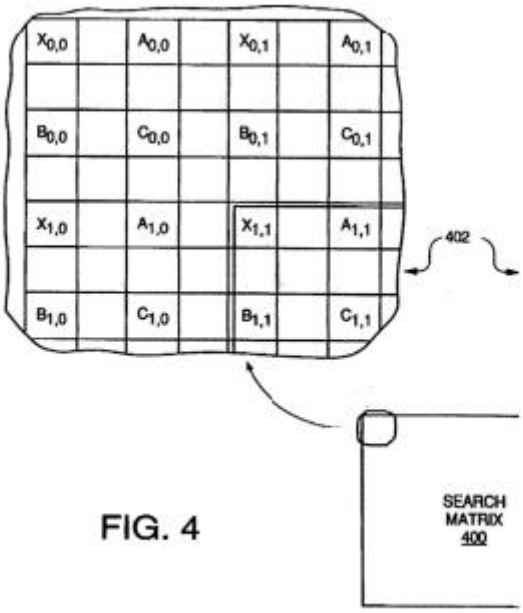
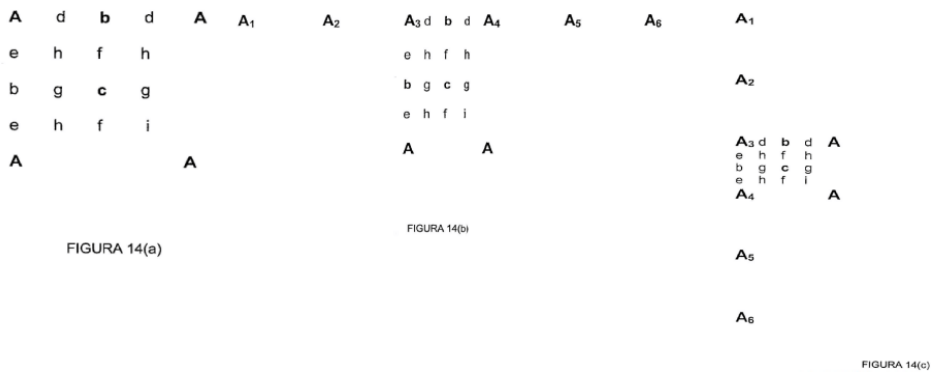


FIG. 4

In this case of diagonal interpolation of block X 70 to form block C 76, a group of pixels from block X 70 is addressed to port A of the DPCM memory 130, and a group of pixels from an immediately adjacent line of block X 70, with the same column location, is addressed to port B of the DPCM memory 130. One of the pixel groups is shifted by one pixel, and together with the unshifted pixel, each is presented to inputs A and B of ALU 154, which performs a division by two and rounding. The result is directed to the appropriate address locations of block C 76 in the DPCM memory 130.

Descriptions of the estimates from the first to the eighth quarter-pixel and their equations (page 8, line 37, to page 10, line 58), equations that perform a simple average between two values, are also provided.

Concerning the patent letter of invention patent PI0211263-9, in the Descriptive Report, pages 59 to 65, along with Figures 14a, 14b, and 14c, as follows:



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The calculation of ½ and ¼ pixel interpolations is described in accordance with what is claimed in the Claims Table of the invention patent PI0211263-9, Independent Claim 1.

The values of ½ sub-pixels, designated “b” in figures 14a, 14b, and 14c, are obtained by calculating an intermediate value “b” through a Kth-order filter, where,

b = x1.A1 + x2.A2 + ... + xk.Ak, where xi is the filter coefficient vector, Ai is a vector of original values A, located in the horizontal and vertical unit, and K is the filter order.

The pixels Ai are arranged symmetrically with respect to the ½ resolution sub-pixel “b” being interpolated and neighboring “b”. For example, in figure 14b, the sub-pixel element “b”, located halfway along the horizontal location and in the vertical unit, the pixels Ai are arranged horizontally with respect to the element “b” to be interpolated (A3 and A4). If the sub-pixel element “b”, Figure 14c, is located in the horizontal unit and halfway along the vertical location, the pixels Ai are arranged vertically with respect to the element “b” to be interpolated (A3 and A4).

The final value for the ½ resolution sub-pixel “b” is calculated by dividing the intermediate value “b” by a constant scale1, truncating it to obtain an integer, and restricting the result to remain within the range [0, 2n -1]. Preferably, the constant scale1 is chosen to be equal to the sum of the filter coefficients xi.

The values for the ½ resolution sub-pixels, designated “c” in figures 14a, 14b, and 14c, are obtained in the same way as for the sub-pixels “b”; however, the final value for the ½ resolution sub-pixel “c” is calculated by dividing the intermediate value “c” by a constant scale2, where the constant scale2 is equal to scale1 * scale1.

For the calculation of values for the ¼ resolution sub-pixels designated “h”, linear interpolation is used along the diagonal line, connecting the ½ resolution sub-pixels to the ¼ resolution sub-pixel “h”. The value for the sub-pixel “h” is calculated by averaging the values of the two closest ½ resolution sub-pixels “b” to sub-pixel “h”. For the values of the ¼ resolution sub-pixels “d” and “g”, the calculation involves the values of the nearest horizontal neighbors, using linear interpolation; that is, for “d” the values of A and “b” are used, and for “g”, the values of “b” and “c” are used. Consequently, for the calculation of values for the ¼ resolution sub-pixels “e”, “f”, and “i”, the nearest neighbors are used through linear interpolation, in the same manner as before.

Specifically, as clarified between document D1 and the invention patent PI0211263-9, it was not found in D1 the calculation of ½ sub-pixel values using a first calculation and a second calculation by means of weighted averages by scale1 and scale2, and the calculation of all ¼ sub-pixel values based on the original pixel values A or ½ sub-pixel values

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using linear interpolation, that is, using the method as claimed in Independent Claim 1 of the invention patent PI0211263-9 (Claims Table of the invention patent PI0211263-9).

Thus, according to the "Steps for Novelty Verification," subitem (iii), item 4.3, Chapter IV of INPI/PR Resolution No. 169/2016, "determine and point out if all elements of the claim were explicitly or inherently combined in the document, for a person skilled in the art, in a way that anticipates the claim," it is considered that the document US5,594,813 (D1) does not present all the technical features claimed in the invention patent PI0211263-9 and, therefore, does not present a combination of technical features that would allow a person skilled in the art to anticipate the claim of invention patent PI0211263-9. Therefore, the document US5,594,813 (D1) should not be used for novelty assessment purposes (Art. 8 and 11 of the LPI) regarding invention patent PI0211263-9.

Regarding subitems 64 to 75 - We disagree that the documents Test Model 6 (D2), US 5521642 (D3), and EP 0576290 (D4), individually or in combination, are sufficient for a person skilled in the art to reproduce and achieve the claimed object in invention patent PI0211263-9.

The cited Test Model 6 document (**D2**) refers to three (3) documents: "VCEG-L45 H.26L Test Model Long Term Number 6 (TML-6) draft0," generated on 03/03/2001 (**D2a**), "VCEG-M44 – Direct Interpolation Filters in TML-6," generated on 03/26/2001 (**D2b**), and "VCEG-M28 – A simplified 1/3 pixel prediction method," generated on 03/21/2001 (**D2c**).

Document D2a is version 0 of TML6, including modifications in TML-5: direct interpolation of 1/4 pixel; reduction of loop filter complexity; and prediction decision mode in B frames.

Although document D2a, in section 3.6.1, page 15, defines fractional pixel accuracy, or sub-pixel, and defines, in step 1, the generation of ½ horizontal pixel values using a "6 tap" filter with values (1, -5, 20, 20, -5, 1)/32 (i.e., filter coefficients, where the division is performed by summing the filter coefficients), based on horizontal pixel values, and the generation of ½ vertical pixels, using the same "6 tap" filter, based on vertical pixel values, and the result is rounded to the nearest integer and clipped to the range of 0 to 255. Also, in D2a, in section 3.6.1, page 15, the generation of ¼ sub-pixels is defined, based on ½ sub-pixels, where horizontal ¼ sub-pixels

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are produced by linear interpolation (average of neighboring ½ sub-pixel positions) and vertical ¼ sub-pixels are produced by vertical linear interpolation, with truncation.

We agree with the Descriptive Report of the invention patent PI0211263-9, page 68, lines 2 to 10, that the direct interpolation of TML-6 generates a large number of bits to store the high-precision intermediate values associated with each ½ and ¼ resolution sub-pixel, due to the pre-calculation of these sub-pixels. In the case of the invention patent PI0211263-9, there is a reduction in memory storage due to all ¼ sub-pixel values being calculated based on the values of the original pixels A or the values of ½ sub-pixels using linear interpolation, in a diagonal manner. That is, the ½ resolution sub-pixels can be interpolated in advance, and the ¼ resolution sub-pixels can be calculated on demand, as needed. This on-demand interpolation of the ¼ sub-pixel values requires the linear interpolation of the ½ resolution sub-pixels (Descriptive Report of the invention patent PI0211263-9, page 67, lines 17 to 30), as claimed in the Claims Table, Independent Claim 1, item c):

> c) interpolate a value for a sub-pixel located at a horizontal unit position $1/2^N$ and a vertical unit position $1/2^N$ using:
>
> – a weighted average of the value of a first sub-pixel located at a horizontal unit position $1/2^{N-m}$ and a vertical unit position $1/2^{N-n}$ and the value of a second sub-pixel located at a horizontal unit position $1/2^{N-p}$ and a vertical unit position $1/2^{N-q}$, or
> – a weighted average of the value of a pixel located at a horizontal unit position and a vertical unit position and the value of a sub-pixel located at a horizontal unit position $1/2^{N-m}$ and a vertical unit position $1/2^{N-n}$

with the variables *m*, *n*, *p*, and *q* obtaining integer values in the range from 1 to N, so that the respective first and second sub-pixels or respective pixel and sub-pixel are located diagonally in relation to the sub-pixel at the horizontal unit position $1/2^N$ and vertical unit position $1/2^N$ being interpolated.

Regarding documents D2b and D2c, the former details the direct interpolation filter of TML6, analyzing the complexity of interpolation in the decoder, and the latter presents a simplified prediction method for 1/3 pixel, both without adding technical features to the direct interpolation method presented in document D2a that, together, might motivate a person skilled in the art to reproduce the object claimed in invention patent PI0211263-9.

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Regarding documents US 5521642 (D3) and EP 0576290 (D4), these were considered as prior art documents in the technical examination of the first and second administrative instances at INPI.

D3 – US5521642 - "Decoding system for compact high definition television receivers," published on 05/28/1996, owned by Daewoo Elect. Co. Ltd., describes a decoding system to provide a reduced image for a high-definition TV receiver using D.C. transform coefficients, where the system selectively decodes and inversely quantizes D.C. coefficients to produce a different data set, each representing the average pixel difference values between a two-dimensional block of an image and the corresponding block of the previous image. Each of the two-dimensional motion vectors is also decoded and modified to compensate for the reduced image. The pixel derived from these modifications and the average values are combined to generate the reduced image.

In document D3, page 2, lines 13 to 35, the problem to be solved is to use a portable HDTV receiver with a small screen, requiring simplified decoding to display a small image compatible with HDTV. The solution proposed by D3, page 2, lines 40 to 54, to display an HDTV image on a small screen is to use DCT (Discrete Cosine Transform) coefficients, where the decoding decodes and inverts the DCT coefficients, producing a set of data differences, each representing an average pixel difference value between a two-dimensional block of a source frame and a corresponding block of the previous frame. Each of the two-dimensional motion vectors is also decoded and modified to compensate for the image reduction and derive pixel data from the reduced source frame based on the modified motion vector. The reduced image is generated based on the derived pixel data and the average pixel difference data.

In D3, page 4, lines 41 to 67, together with Figure 3, the operation of pixel interpolator 41 is described, where the pixel data for Head Hi is directly derived from a pixel when Head Hi coincides with the pixel, as in the example, H1 is derived from the previous pixel P, and Hi is derived from W. Each of the pixel data for such Heads, which are located in a vertical or horizontal line connecting pixels, is derived from two neighboring pixels in the line, multiplied by appropriate weights. When a Head is located within a square formed by the four closest pixels, the pixel data is interpolated from the four pixels applying appropriate weights.

From the excerpts specified and presented from D3, it can be concluded that the problem to be solved in D3 is not the reduction of storage or CPU complexity, as presented in invention patent PI0211263-9 (Descriptive Report of the patent letter, page 21, lines 29 to 30, and page 22, lines 1 to 9), nor does it present a sub-pixel interpolation method that calculates the sub-pixel value through first and second weighted sums on demand, and all ¼ sub-pixel values are calculated based on the values of the original pixels or the values of ½ sub-pixels using linear interpolation, in a diagonal manner. In other words, the ½

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resolution sub-pixels can be pre-interpolated, and the ¼ resolution sub-pixels can be calculated on demand, when necessary. This on-demand interpolation of the ¼ sub-pixel values requires linear interpolation of the ½ resolution sub-pixels as claimed in the Claim Chart of the patent letter, Independent Claim 1.

D4 – EP0576290 - "Picture signal coding and decoding," published on 12/29/1993, owned by Sony Corp., describes a method and apparatus for high-definition image coding and decoding for when the image is displayed on a low-resolution system. The encoder and decoder adjust it to achieve a *smooth motion* effect in interlaced structures. This adjustment is made by using an orthogonal transform on a first block of image data and an inverse orthogonal transform on a second data block, where the second block has a smaller range than the first block. After the transformations, a data coefficient in the second block is replaced with a corresponding data coefficient from the first block.

In document D4, page 4, lines 53 to 59, and page 5, lines 4 to 18, the problem to be solved occurs when low-resolution frames are produced from high-resolution frames where only low-frequency components are sampled, resulting in the loss of the interlaced structure included in the high-frequency components and, consequently, the low-resolution frame does not exhibit smooth motion. The solution proposed by D4, page 5, lines 26 to 38, to recover smooth motion, consists of a method of decoding a frame containing coefficients of a first block formed by orthogonal transformation of frame elements, coefficients of a second block with a smaller range than the first block, and performing the inverse orthogonal transform for the coefficients of the second block by replacing at least one coefficient in the second block with a coefficient corresponding to a coefficient in the first block that is outside the second block.

In D4, page 10, lines 46 to 51, it is described that the motion vector detection circuit 50 produces a sum of absolute values of prediction errors, which is used to determine which predictions the predictive discriminator circuit 54 will choose.

And in D4, page 17, lines 29 to 42, it is described that the motion vector detection circuit 50 performs B-frame processing after the data from the I and P frames are stored in the direct predictive frame section 63a and reverse section 63b, respectively. It also describes that the predictive mode switching circuit 52 and the predictive discriminator circuit 54 configure the predictive modes.

As an example, in D4, page 25, lines 47 to 57, it is described that, in the absence of an original frame element from the second field (corresponding to element b), of high resolution, in the second low-resolution field (¼ resolution), if b' coincides with b, the frame element (3b' + z')/4 is produced at the position that coincides with element b.

From the excerpts highlighted and presented from D4, it can be concluded that the problem to be solved in D4 is not the reduction of storage or CPU complexity, as presented in the invention patent PI0211263-9 (Descriptive Report of the patent letter, page 21, lines 29

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to 30, and page 22, lines 1 to 9). Nor is a sub-pixel interpolation method presented that calculates the sub-pixel value through a first and second weighted sum on demand, and where all ¼ sub-pixel values are calculated based on the values of the original pixels or the values of ½ sub-pixels using linear interpolation, diagonally. In other words, the ½ resolution sub-pixels can be pre-interpolated, and the ¼ resolution sub-pixels can be calculated on demand, when necessary. This on-demand interpolation of the ¼ sub-pixel values requires the linear interpolation of the ½ resolution sub-pixels as claimed in the Claim Chart of the patent letter, Independent Claim 1.

We could not identify in D3 or D4, nor in the combination of these documents, that ¼ sub-pixel values are calculated, on demand, based on the values of ½ sub-pixels, thereby reducing the computational and storage complexity of the encoder, nor that the first weighted sum and second weighted sum are used for sub-pixel interpolation calculations, diagonally.

Thus, in accordance with the "Steps for Assessing Inventive Step," sub-item (iii), item 5.9, and item 5.20 of Chapter V of INPI/PR Resolution No. 169/2016, respectively, "to determine whether, given the technical problem considered, and starting from the closest prior art, the invention is obvious or not to a person skilled in the art" and "whether there is a motivation to apply the said distinguishing features of the invention to the closest prior art to solve the existing technical problem," the technical problem is considered to be the reduction of computational complexity, reducing storage, and the solution proposed in invention patent PI0211263-9, the on-demand calculation of ¼ sub-pixel values with ½ sub-pixel values and original pixel values, still using first and second weighted sums in the interpolation calculation, as an inventive step, a step beyond the ordinary, with no motivation for a skilled person to apply the technical features of documents TML6 (D2), US 5521642 (D3), and EP 0576290 (D4) to solve the existing problem in a manner similar to what is claimed in invention patent PI0211263-9. Therefore, documents TML6 (D2), US 5521642 (D3), and EP 0576290 (D4) do not contain technical features that, together or separately, would be considered obvious by a skilled person to achieve what is claimed in invention patent PI0211263-9, thus, it is considered that invention patent PI0211263-9 meets the criteria for inventive step (Articles 8 and 13 of the IP Law).

5. Conclusion

From what is described and discussed in this technical opinion for a declaratory judicial action, it was found that document US 5,594,813 (D1) does not anticipate all the technical features claimed in Independent Claim 1 of the Claim Chart of the

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invention patent letter PI0211263-9, and this invention patent PI0211263-9 is therefore novel (Articles 8 and 11 of the IP Law). Therefore, we disagree with the Defendant.

Considering the patent letter of invention patent PI0211263-9, compared to documents TML6 (D2), US 5521642 (D3), and EP 0576290 (D4), it was found that these documents do not contain sufficient technical features to motivate a person skilled in the art to reproduce the object claimed in invention patent PI0211263-9, meaning this invention patent PI0211263-9 is endowed with an inventive step (Articles 8 and 13 of the IP Law). Therefore, we disagree with the Defendant.

Thus, it is considered that invention patent PI0211263-9 meets the patentability requirements required by Law 9.279/96 (IP Law). Therefore, we disagree with the Defendant.

In view of the above, we consider that documents US 5,594,813 (D1), TML6 (D2), US 5521642 (D3), and EP 0576290 (D4) do not constitute grounds for modifying the scope of protection and rights conferred by this patent, as they do not remove the novelty or inventive step of invention patent PI0211263-9. Therefore, we maintain our previous position.

Rio de Janeiro, January 12, 2021.

Renato de Castro Dutra
Industrial Property Researcher
ID No. 1546896
INPI/PR Ordinance No. 143/17 of 08/23/2015
CGREC/COREP

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ORDER

Ref.
INPI Process No. 52402.008590/2020-41
Subject: **Submission of Opinion**

To Renato Castro Dutra,

To the Litigation Support Service, the opinion (0368023) related to the referenced Judicial Action is enclosed.

Heleno José Costa Bezerra Netto
Acting Technical Coordinator
INPI-CGREC-COREP

Document electronically signed by **HELENO JOSE COSTA BEZERRA NETTO, Acting Coordinator**, on 01/12/2021, at 11:26, Brasília official time, based on Article 6, § 1 of Decree No. 8,539, dated October 8, 2015.

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Declaration of Dr. Huang Gao

1. I, Huang Gao hereby certify that I am competent to translate from Portuguese into English.

2. I hereby certify that I prepared the translation appearing as **COMMON CIVIL PROCEDURE for 043634-48.2020.4.01.3400** and that it is, to the best of my knowledge and belief, a true and accurate English translation of said document.

3. All statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true. I further understand that willful false statements and the like are punishable by fine or imprisonment, or both under Section 1001 of Title 18 of the United States Code. I declare under penalty of perjury that the foregoing is true and correct.

Executed on: 11/14/2024

Signed: _____

Dr. Huang Gao