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PRIOR ART SUBMISSION INTO A PATENT FILE UNDER 37 CFR 1.501

APPLICATION # **16603928**

PATENT # **11203211**

U.S. Patents

Cite #	Patent #	Kind Code[1]	Issue Date (YYYY/MM/DD)	First Named Inventor
1	9290016		2016/03/22	Benzion Landa

U.S. patent application publications

Cite #	Publication #	Kind Code[1]	Publication Date (YYYY/MM/DD)	First Named Inventor
1	US 2011-0221835		2011/09/15	Kouji MARUYAMA
2	US 2001-0017085		2001/08/30	Naoki Kubo
3	Certificate-Of-Service			
4	US 2007-0098430		2007/05/03	Matthew Hoffman

Foreign patents and published foreign patent applications

Cite #	Foreign Document #[3]	Country Code[2]	Kind Code[1]	Publication Date (YYYY/MM/DD)	Applicant, patentee or first named inventor	Translation
1	EP1905890	EP		2008/04/02	NIDEK CO., LTD.	☐
2	EP3115215	EP		2017/01/11	OCHROMBEL	☐
3	WO2015155646	WO		2015/05/15	De La Vega	☐

Non-patent publications

Cite #	Author (if any), title of the publication, page(s) being submitted, publication date, publisher (where available), place of publication (where available).	Translation	Evidence of Publication

Patent owner claim statement documents

Cite #	Document Description	Translation Attached

Signature

I have attached an explanation of the pertinence and manner of applying the submitted reference(s) in accordance with 37 CFR 1.501(b).

Signature	Name	Registration #
/Aaron R. Feigelson/	AARON FEIGELSON	59022

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent of RODRIGUEZ, *et al.*

U.S. Patent No. 11,203,211

Filing date: April 28, 2017

Issue date: December 21, 2021

For: System and method for coating a lens

Mail Stop: Post Issue
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

THIRD-PARTY SUBMISSION UNDER 35 U.S.C. § 301

Hon. Commissioner:

Pursuant to the provisions of 35 USC §301 and 37 CFR §1.501, it is hereby requested that the citations of the prior art and the explanation thereof become a part of the official file of U.S. Patent No. 11,203,211 to Rodriguez, *et al.* ("RODRIGUEZ"), filed on April 28, 2017.

The undersigned herewith submits in the above-identified patent the following prior art (including copies thereof) which is pertinent and applicable to the patent and is believed to have a bearing on the patentability of claims 1-15 thereof:

1. European Patent Application Publication EP1905890 A2 April 2, 2008; ("Nidek Co.");
2. European Patent Application EP3115215A1 January 11, 2017; ("Ochrombel");
3. US Patent No. 9,290,016 March 22, 2016; ("Landa *et al.*);
4. International Publication WO2015155646A1 May 15, 2015 (De La Vega *et al.*);
5. US Patent Application Publication 2011/0221835 ("Maruyama") September 15, 2011;

6. US Patent Application Publication 2001/0017085 ("Kubo *et al.*") August 30, 2001; and
7. US Patent Application Publication 2007/0098430A1 ("Hoffman *et al.*") May 3, 2007.

This request is being submitted anonymously under 37 CFR §1.501(d).

1. FILING REQUIREMENTS

Pursuant to 37 CFR § 1.501(a)(1), this written submission contains the following information:

- Prior art consisting of patents or printed publications which are believed to have a bearing on the patentability of any claim of RODRIGUEZ.

Pursuant to 37 CFR § 1.501(b), this written submission contains:

- An explanation in writing of the pertinence and manner of applying, to at least one claim of RODRIGUEZ, the prior art submitted under 37 CFR § 1.501(a)(1).

Pursuant to 37 CFR § 1.501(e), the attached Certificate of Service indicates that a copy of this Request, in its entirety, has been, at the consent of the Patent Owner, electronically served on Patent Owner at the following address:

The Webb Law Firm/Transitions Optical
One Gateway Center
420 Ft. Duquesne Blvd., Suite 1200
Pittsburgh, PA 15222
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Pursuant to 37 CFR §1.501(d), the submission papers are being submitted anonymously.

2. THE CLAIMS AND DISCUSSION OF APPLICABILITY OF PRIOR ART TO EACH CLAIM

The following is a listing of the claims to which at least one of the aforementioned prior art publications is relevant, and a discussion of the applicability of the relevant publications to each claim.

Claim #	Page
1	5
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2.1 Claim 1

1. A system for coating a lens using a plurality of inkjet print bars, comprising:

a plurality of inkjet print bars;

at least one processor in communication with the plurality of inkjet print bars;

a lens conveyance mechanism in communication with the at least one processor, wherein the plurality of inkjet print bars are arranged in-line along the lens conveyance mechanism, such that the plurality of inkjet print bars is configured to print on the lens in sequence as the lens is moved along the lens conveyance mechanism; and

a computer-readable medium including program instructions that, when executed by the at least one processor, cause the at least one processor to:

generate at least one graphical user interface configured to facilitate the automation of the creation or selection of an image to be printed on the lens;

generate a plurality of image layers based on the lens geometry, target product, and number of print bars;

control the lens conveyance mechanism to move the lens between at least two inkjet print bars of the plurality of inkjet print bars for printing of the plurality of image layers; and

control the at least two inkjet print bars to print the image on the lens, such that each of the at least two inkjet print bars prints at least one image layer of the plurality of image layers.

2.1.1 Application of the prior art to claim 1

Claim 1 is obvious under 35 USC §103 over Nidek Co. in view of Ochrombel.

Nidek Co. discloses a system for indirect printing on a lens 10 using an inkjet printer 103. *[paragraph 0012: 'A base body producing apparatus 100 includes a monitor (a display unit) 101, a computer an arithmetic unit) 102, and an inkjet printer (a printing unit) 103.']*

The inkjet printer 103 in Nidek Co. is used to print transferable dyes in multiple colors [0014] onto a transfer paper called a 'base body', and the transferable dyes are subsequently transferred to the lens. Thus, Nidek Co. does not disclose directly printing on the lens.

Nidek Co. also does not disclose using multiple print bars. The term 'print bar' is used in RODRIGUEZ to mean 'a single print head, or a plurality of print heads acting as a unit' (col. 3, line 67 – col. 4, line 2). Thus, by disclosing 'an inkjet printer' without further detail, Nidek Co. is most likely only disclosing use of a single print bar, such as, for example, the single print bar comprising multiple print heads found in office or home inkjet printers. However, the use of multiple print bars according to the definition of RODRIGUEZ is conventional in industrial applications, as will be described below.

Nidek Co. further discloses a computer processor 102 that is in communication with the inkjet printer 103 *[paragraph 0012, Figs. 1 and 2, reproduced below]*

FIG. 1

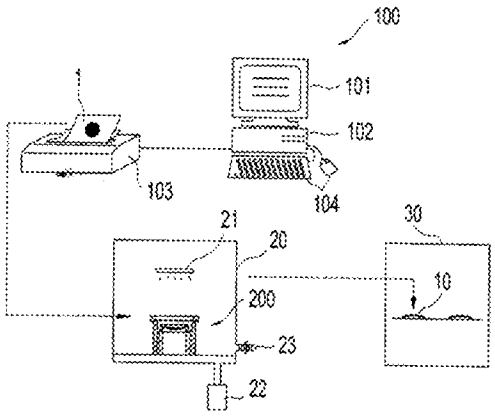
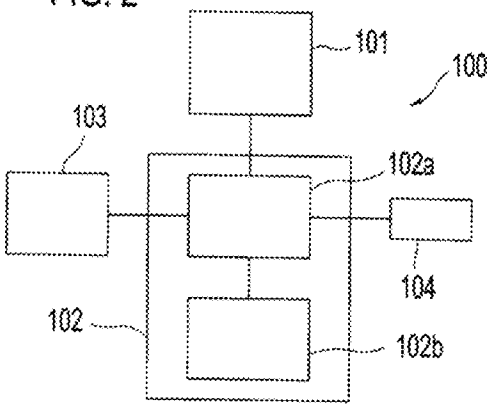


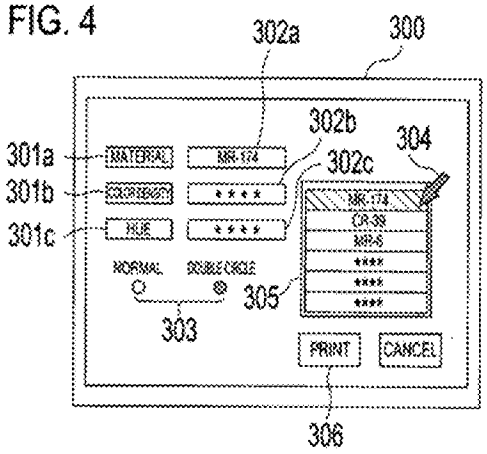
FIG. 2



Nidek Co. further disclose a computer-readable medium including program instructions *[paragraph 0012: The arithmetic control part 102a controls the printer 103 by using a program for producing a dyeing base body 1, the program having been stored in the memory part 102b.]* executed by the at least one processor 102.

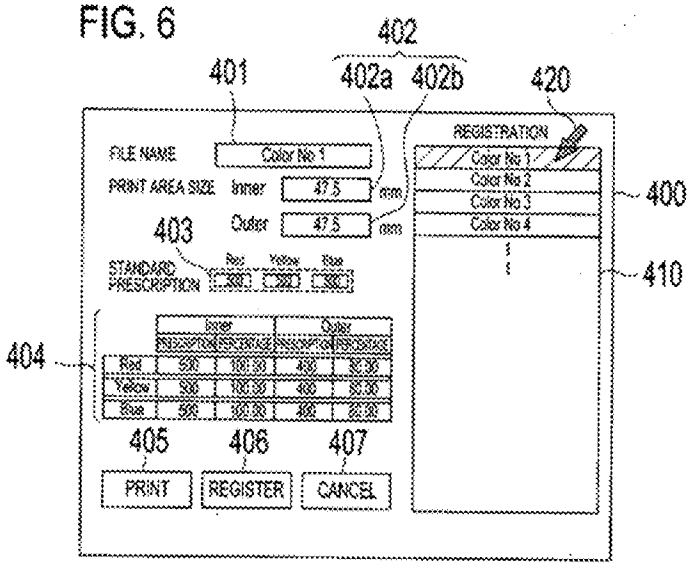
Nidek Co. further discloses that the at least one processor 102 generates at least one graphical user interface *[paragraphs 0021-22 in their entirety, Fig. 4]* configured to facilitate the automation of the creation or selection of an image to be printed on the lens *[Fig. 4, reproduced below]*.

FIG. 4



Nidek Co. further discloses that the at least one processor 102 generates a plurality of image layers *['magenta/red, yellow cyan/blue, yellow' in paragraphs 0014, 0037, Fig. 6, reproduced below]*

FIG. 6



Nidek Co. discloses printing in plural colors, and it would have been obvious to provide plural print bars for the purpose of enabling the device to print in plural colors and to print at a higher throughput.

Nidek Co. further discloses that the generation of the image layers is based on the lens geometry *['curvature' and 'diameter' in paragraphs 0024-27, 0035]* and target product *['curvature' and 'diameter' 0024-27], ['lens material' paragraph 0021, Fig. 4]*.

We note that the claimed term 'target product' is not defined anywhere in RODRIGUEZ. A reasonable interpretation is that the target product can be one of: the lens, the printed lens or the printed image on the lens. The printed lens is defined by a combination of its geometry and material.

Nidek Co. further discloses that the at least one processor 102 controls the inkjet print bar 103 to print the image, such that the inkjet print bar 103 prints at least one image layer of the plurality of image layers *[paragraph 0033: 'When the print button 306 is clicked, the arithmetic control part 102 a controls the printer 103 to eject inks from ink cartridges based on the conditions entered with the buttons 301 a to 301 c, thereby forming a predetermined-shaped print area on the base body 1']*.

Nidek Co. does **not** appear to disclose:

- printing directly on the lens.
- using a plurality of print bars
- a lens conveyance mechanism in communication with the at least one processor, wherein the plurality of inkjet print bars are arranged in-line along the lens conveyance mechanism, such that the plurality of inkjet print bars is configured to print on the lens in sequence as the lens is moved along the lens conveyance mechanism
- that the processor controls the lens conveyance mechanism to move the lens between at least two inkjet print bars of the plurality of inkjet print bars for printing of the plurality of image layers
- that the processor controls the at least two inkjet print bars to print the image on the lens, such that each of the at least two inkjet print bars prints at least one image layer of the plurality of image layers

Ochrombel discloses printing directly on the lens *[paragraph 0009, claim 1, etc.: 'The present invention relates to a method for applying a predetermined dot pattern to a surface of an ophthalmic lens or of an ophthalmic lens mold.']*.

Ochrombel discloses using a plurality of print bars *['printheads 19, 20 21' in paragraph 0043, Fig. 5, reproduced below]*.

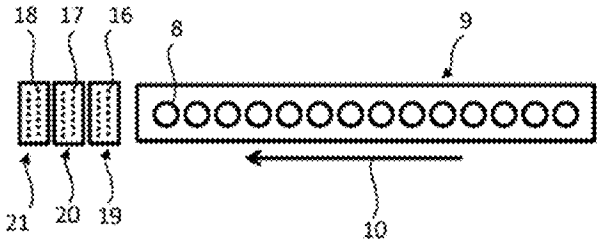


Fig. 5

Ochrombel refers to 'printheads' 19, 20, 21 and not 'print bars'. However, according to the definition in RODRIGUEZ, the printheads of Ochrombel qualify as print bars, in that each one comprises 'a single print head, or a plurality of print heads acting as a unit'.

To remove any doubt: in Landa *et al.*, similar printing arrangements are called **print bars** 22 (see Landa et al. Fig. 1 immediately below)

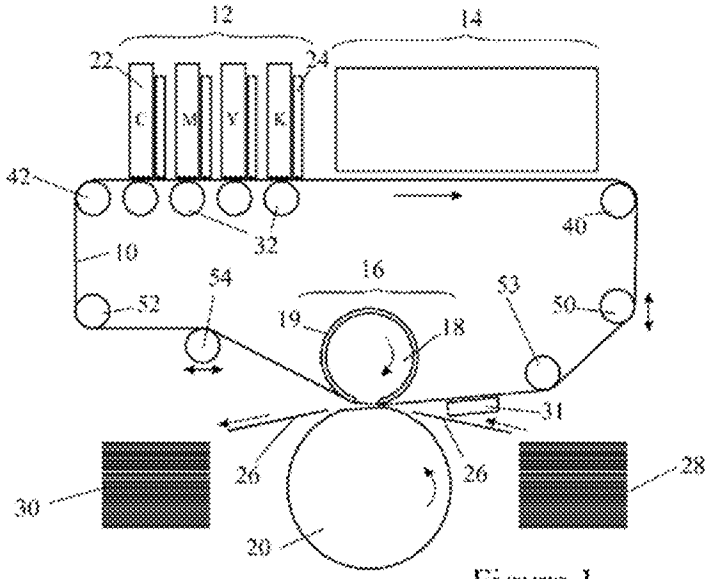


Figure 1

Ochrombel discloses a lens conveyance mechanism *['carrier 9' in paragraph 0043, Fig. 5]* in communication with the at least one processor (e.g., the processor 102 of Nidek Co.), wherein the plurality of inkjet print bars 19, 20, 21 are arranged in-line along the lens conveyance mechanism 9 *[Ochrombel paragraph 0043, Fig. 5]*, such that the plurality of inkjet print bars is configured to print on the lens in sequence as the lens is moved along the lens conveyance mechanism *[Ochrombel paragraph 0043: 'The carrier 9 with the ophthalmic lens molds 8 arranged thereon is movable along a straight line representing the direction of movement 10 (see arrow) indicated in Fig. 5. As can be seen in Fig. 5, the inkjet printheads 19, 20, 21 are successively arranged (one after another) when viewed in the direction of movement of the carrier 9 (see arrow 10)"]*.

Ochrombel repeatedly equates the printing on ophthalmic lenses with printing on ophthalmic lens molds, e.g., in paragraph 0009: 'According to the invention, the method for applying a predetermined dot pattern to a surface of an ophthalmic lens or of an ophthalmic lens mold comprises the steps of...'. The molds 8 of Fig. 5 of Ochrombel have

the same geometry as lenses and it would be obvious to apply its teachings to direct printing on lenses.

We note that at the time of filing RODRIGUEZ, printing directly on lenses was a known technique in the industry, not only from Ochrombel, but also, e.g., from De La Vega *et al.*

Ochrombel discloses that the processor (e.g., the processor 102 of Nidek Co.) controls the lens conveyance mechanism 9 to move the lens between at least two inkjet print bars 19, 20, 21 of the plurality of inkjet print bars for printing of the plurality of image layers. *[As above, from Ochrombel paragraph 0043: The carrier 9 with the ophthalmic lens molds 8 arranged thereon is* ***movable*** *along a straight line representing the direction of movement 10 (see arrow) indicated in Fig. 5. As can be seen in Fig. 5, the inkjet printheads 19, 20, 21 are successively arranged (one after another) when viewed in the direction of movement of the carrier 9 (see arrow 10)].*

Ochrombel discloses that the processor (e.g., the processor 102 of Nidek Co.) controls at least two inkjet print bars (19, 20, 21) to print the image on the lens, such that each of the at least two inkjet print bars (19, 20, 21) prints at least one image layer of the plurality of image layers *[Ochrombel paragraphs 0045-47, e.g., 'the respective third ink layer 13 can be applied with the aid of the third ink dot nozzles 18 of the third inkjet printhead 21 in the same manner as already described for the application of the second ink layer 12']*.

It would have been obvious to one having ordinary skill in the art at the time the application of RODRIGUEZ was filed to directly print on the lens, as suggested by Ochrombel, since the direct printing does not require the complex vacuum system (20) of Nidek Co.

Further, it would have been obvious to one having ordinary skill in the art at the time the application of RODRIGUEZ was filed to provide plural print bars arranged along a conveyor path for the purpose of enabling the device to print in plural colors and to print at a higher throughput, and to further modify the system of Nidek Co. with the foregoing features of Ochrombel, or in the alternative, with the foregoing features of Ochrombel and Landa *et al.* – which in combination disclose all of the features of RODRIGUEZ claim 1.

2.2 Claim 2

2. The system of claim 1, wherein the program instructions, when executed by the at least one processor, further cause the at least one processor to configure the at least two inkjet print bars in the system based on product data for the lens,

wherein configuring the at least two inkjet print bars comprises at least one of the following: setting a jetting temperature of at least one inkjet print bar based on the product data, setting a pressure or pressure target of at least one inkjet print bar based on the product data, setting a throw distance of at least one inkjet print bar based on the product data, setting a jetting frequency of at least one inkjet print bar based on the product data, setting a print bar DPI of at least one inkjet print bar based on the product data, or any combination thereof.

2.2.1 Application of the prior art to claim 2

Claim 2 is obvious under 35 USC §103 over Nidek Co. in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*), and further in view of De La Vega *et al.* and Maruyama.

The language of the claim recites the parameters of the product data in the alternative, and so prior disclosure in the art of any one of the parameters would suffice to satisfy the claim element. Nonetheless, it can be shown that setting all of the recited parameters is well known in the art.

De La Vega *et al.* disclose setting temperature, jetting frequency, and DPI.

We note that the term 'product data' is not defined in RODRIGUEZ, and the term appears only in the claims. An attempt is made herein to interpret the term according to the broadest reasonable interpretation. As described above, we have interpreted the undefined claim term 'target product' as being one of: the lens, the printed lens or the printed image on the lens. The printed lens is defined by a combination of its geometry

and material. A broadest reasonable interpretation of 'product data' would similarly include data of the lens, of the printed lens, or of the printed image on the lens.

Temperature is disclosed, e.g., at page 10, lines 9-12 of De La Vega *et al.*: 'In order to control the viscosity at jetting, the printhead may be heated, e.g., to a temperature within a range of 30°C to 60°C, or 35°C to 55°C. In order to control the spreading of the drops on the optical substrate, the substrate may be heated to 30°C to 60°C, 35°C to 60°C, 40°C to 60°C, or 45°C to 60°C.'

Jetting frequency is disclosed, e.g., at page 24, lines 20-27 of De La Vega *et al.*: 'EXAMPLE 22 Printing procedure … Printing was performed on an Omni Jet 100 (Unijet), using a Dimatix™ print head (Fujifilm Dimatix™ 10 PL model #DMCLCP - 11610/PN 700-11670-01). The ink was filtered using syringe filters (1 micrometer). The print head was pre-heated to 40°C. The drop characteristics were then optimized using a stroboscope mounted on the printer (camera and light source synchronized with the jetting frequency). The waveform was optimized for the ink, jetted at a frequency of 1500 Hz.'

DPI is disclosed in De La Vega *et al.* indirectly, i.e., DPI itself is not disclosed but is easily calculated from any two of: coverage ratio, gaps between dots, and dot diameter.

- Coverage ratio is disclosed, e.g., at page 5, lines 3-13 of De La Vega *et al.*: 'According to still further features in the described preferred embodiments, the functional dots are distributed over a nominal surface area, the functional dots having a total coverage area, a ratio of the total coverage area to the nominal surface area being at most 0.98, at most 0.96, at most 0.94, at most 0.92, at most 0.90, at most 0.85, at most 0.80, at most 0.75, at most 0.70, at most 0.65, at most 0.60, at most 0.55, at most 0.50, at most 0.45, at most 0.40, or at most 0.35.

  'According to still further features in the described preferred embodiments, this ratio is at least 0.35, at least 0.40, at least 0.45, at least 0.50, or at least 0.55.

'According to still further features in the described preferred embodiments, this ratio is within a range of 0.50 to 0.98, 0.50 to 0.90, 0.55 to 0.90, 0.60 to 0.90 or 0.65 to 0.90.'

- Gap between dots is disclosed, e.g., at page 4, line 10 to page 5, line 28 of De La Vega *et al.*: 'According to still further features in the described preferred embodiments, within each area of the multi-functional areas, a gap between adjacent functional dots belonging to the first and second groups, respectively, is at least 5 μm, at least 8 μm, at least 10 μm, at least 12 μm, at least 15 μm, or at least 20 μm.

  According to still further features in the described preferred embodiments, the gap is at most 50 μm, at most 45 μm, at most 40 μm, at most 35 μm, at most 30 μm, or at most 25 μm.'

  'According to still further features in the described preferred embodiments, within each area of the multi-functional areas, a gap between adjacent functional dots belonging to the first and second groups, respectively, is at least 5 μπι, at least 8 μπι, or at least 10 μπι, and at most 100 μπι, at most 50 μπι, at most 45 μm, at most 40 μm, at most 35 μm, at most 30 μm, or at most 25 μm, at most 20 μm, at most 18 μm, or at most 15 μm.'

  'According to still further features in the described preferred embodiments, within each area of said multi-functional areas, a gap between adjacent functional dots belonging to the first and second groups, respectively, is at most 100 μm, at most 50 μm, at most 45 μm, at most 40 μm, at most 35 μm, at most 30 μm, or at most 25 μm, at most 20 μm, at most 18 μm, or at most 15 μm, the adjacent functional dots being physically discrete.'

- Dot diameter is disclosed, e.g., at page 29, lines 11-18 of De La Vega *et al.*: "EXAMPLE 38 … The ink dots of Example 36 had a characteristic diameter of approximately 50 micrometers, and a characteristic height of approximately 6.5 micrometers. The ink dots of Example 37 had a characteristic diameter of

> approximately 50 micrometers, and a characteristic height of approximately 0.9 micrometers.'

Maruyama discloses setting an inkjet pressure in the title ("Pressure regulating valve for inkjet printer") and throughout the specification. Setting inkjet pressure is manifestly conventional.

It would have been obvious to the skilled practitioner to further modify Nidek Co., modified in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*), in view of De La Vega *et al.* and Maruyama, in light of the setting of the inkjetting parameters being well known in the art.

2.3 Claim 3

> 3. The system of claim 1, wherein the program instructions, when executed by the at least one processor, further cause the at least one processor to automatically modify the image based on product data for the lens,
>
> wherein the product data comprises at least one of lens diameter and lens curvature.

2.3.1 Application of the prior art to claim 3

Claim 3 is obvious under 35 USC §103 over Nidek Co. in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*).

Modifying the image based on at least one of lens diameter and lens curvature is disclosed in Nidek Co., **diameter**, for example, at paragraph 0025: *'If the "NORMAL" of the button 303 is previously selected, the printer 103 is controlled to form a single circular print area having a slightly larger diameter than that of the surface of the lens 10 to be dyed (the predetermined surface area of the lens 10 to be dyed)*, and **curvature**, for example at paragraph 0024: *'In the present embodiment, therefore, if the lens 10 has low (weak) minus power (small curvature), the "NORMAL" (the*

"NORMAL" pattern) of the button 303 is selected. If the lens 10 has high (strong) minus power (large curvature, e.g., 8 or more base curve), the "DOUBLE CIRCLE" (the "DOUBLE CIRCLE" pattern) of the button 303 is selected.'

2.4 Claim 4

4. The system of claim 1, wherein the at least one processor controls the at least two inkjet print bars by:

controlling a first inkjet print bar of the plurality of inkjet print bars to print at least one first image layer of the plurality of image layers on the lens based on the lens product data;

automatically moving the lens from the first inkjet print bar to a second inkjet print bar of the plurality of inkjet print bars; and

controlling the second inkjet print bar to print at least one second image layer of the plurality of image layers on the lens based on the lens product data.

2.4.1 Application of the prior art to claim 4

Claim 4 is obvious under 35 USC §103 over Nidek Co. in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*).

Again, 'product data' is not defined in RODRIGUEZ, and the term appears only in the claims. An attempt is made herein to interpret the term according to the broadest reasonable interpretation. As described above, we have interpreted the undefined claim term 'target product' as being one of: the lens, the printed lens or the printed image on the lens. The printed lens is defined by a combination of its geometry and material. A broadest reasonable interpretation of 'product data' would similarly include data of the lens, of the printed lens, or of the printed image on the lens.

In the broadest reasonable interpretation, the term 'the lens product data' can be interpreted as meaning 'product data of the lens', which while still undefined, at least does not refer back to a term (lens product data) that does not appear in the parent claim, claim 1.

In any case, claim 4 achieves at best only a semantic narrowing of the last two clauses of claim 1: 'control the lens conveyance mechanism to move the lens between at least two inkjet print bars of the plurality of inkjet print bars for printing of the plurality of image layers; and control the at least two inkjet print bars to print the image on the lens, such that each of the at least two inkjet print bars prints at least one image layer of the plurality of image layers.'

The two 'controlling' steps of claim 4 are disclosed by Ochrombel, for example in paragraph 0045: 'To produce such pattern, once an ophthalmic lens mold 8 is passing underneath the nozzles 16 of the first inkjet printhead 19, the first inkjet nozzles 16 arranged along the two straight lines perpendicular to the direction of movement 10 apply a first ink layer 11...', and in paragraph 0046: 'The respective second ink layer 12 of each individual ink dot 1 is applied on top of the respective first ink layer 11 of the respective individual ink dot 1 with the aid of the second inkjet nozzles 17 of the second inkjet printhead 20 in the same manner as already described for the application of the first ink layer 11'.

2.5 Claim 5

5. The system of claim 1, wherein each inkjet print bar of the plurality of inkjet print bars prints at least a portion of at least one image layer of the plurality of image layers.

2.5.1 Application of the prior art to claim 5

Claim 5 is obvious under 35 USC §103 over Nidek Co. in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*).

Claim 5 recites that 'each inkjet print bar of the plurality of inkjet print bars prints at least **a portion of at least one image layer** of the plurality of image layers.'

However, claim 1, from which claim 5 depends, recites that the program instructions cause the at least one processor to: 'control the at least two inkjet print bars to print the image on the lens, such that each of the at least two inkjet print bars prints **at least one image layer** of the plurality of image layers.'

Printing at least one image layer, as recited in claim 1, appears to be more limiting than printing at least a portion of at least one image layer, as recited in claim 5, and therefore claim 5 appears to be broader in scope than its parent claim, claim 1.

Moreover, printing at least a portion of at least one image layer is inherent in printing at least one image layer, and therefore claim 5 adds no inventive subject matter to claim 1.

Consequently, claim 5 is obvious for the same reasons that claim 1 is obvious.

2.6 Claim 6

> 6. The system of claim 1, wherein the at least one graphical user interface is further configured to facilitate the automation of image creation based on parameters specified by existing lens product data, a specific set of parameters entered by the user, visual data regarding the lens collected by a camera in communication with the at least one processor, or any combination thereof.

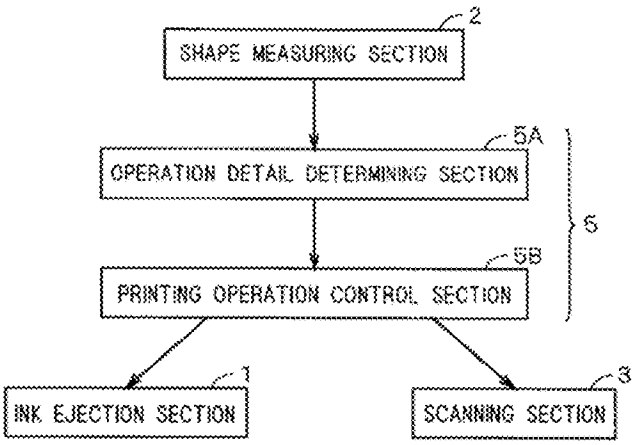
2.6.1 Application of the prior art to claim 6

Claim 6 is obvious under 35 USC §103 over Nidek Co. in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*) and further in view of Kubo *et al.*

Nidek Co. discloses that the at least one graphical user interface is further configured to facilitate the automation of image creation based on parameters specified by existing lens product data, a specific set of parameters entered by the user. See, for example, Figs. 4 and 6 of Nidek Co., reproduced above.

Kubo *et al.* disclose measuring the shape of a three-dimensional substrate using camera means, for example at paragraph 0221 and in Fig. 19, reproduced below:

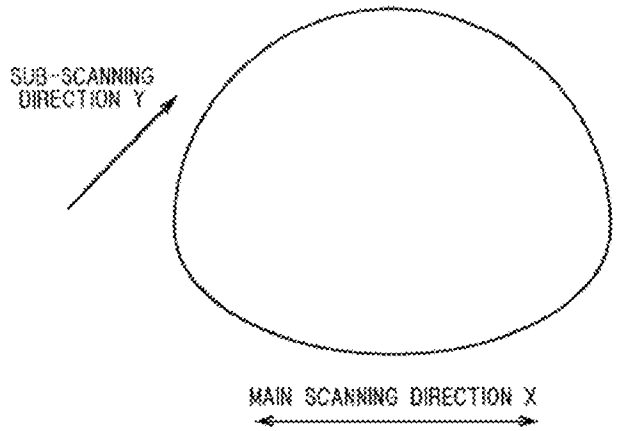
FIG. 19



[Paragraph 0221]: '*The shape measuring section 2 described herein is assumed to comprise an optical displacement sensor 2A. The optical displacement sensor 2A of the shape measuring section 2 includes a phototransmitter 21 and a photoreceiver 22. The phototransmitter 21 directs laser light downwardly in the Z direction, and the photoreceiver 22 including a line sensor (CCD, PSD (optical position detecting device) or the like) and a lens receives light diffuse-reflected from the surface of the object 7. Thus, the optical displacement sensor 2A can measure a distance by a triangulation technique. Hence, the surface shape of the three-dimensional object is recognized.*'

Fig. 11A in Kubo *et al.*, reproduced below, shows an example of visually measuring the shape of an 'object having a smoothly curved surface' as per paragraph 0053.

FIG. 11A



It would have been obvious to the skilled practitioner to further modify Nidek Co., modified in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*), in view of Kubo *et al.*, in order to automate and speed up the uptake of lens geometry data by image processing in the context of the GUI disclosed by Nidek Co.

2.7 Claim 7

> 7. The system of claim 1, wherein the program instructions, when executed by the at least one processor, further cause the at least one processor to rasterize the image and/or each image layer of the plurality of image layers.

2.7.1 Application of the prior art to claim 7

Claim 7 is obvious under 35 USC §103 over Nidek Co. in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*) and further in view of Hoffman *et al.*

Rasterization, according to Wikipedia, is 'the task of taking an image described in a vector graphics format (shapes) and converting it into a raster image (a series of pixels, dots or lines, which, when displayed together, create the image which was represented via

shapes). The rasterized image may then be displayed on a computer display, video display or printer, or stored in a bitmap file format.'

Rasterization of images for inkjet printing is manifestly conventional, as inkjet printing is based on printing arrangements of dots, as for example, in Ochrombel [abstract: '*A method for applying a predetermined dot pattern (3, 30) to a surface of an ophthalmic lens...*'].

Hoffman *et al.* discloses causing the at least one processor to rasterize the image and/or each image layer of the plurality of image layers, for example in paragraph 0039: '*The control system 106 receives the images to be rendered in the form of a print job which may comprise one or more pages and determines the image content of each page to be rendered in a raster image processing step.*'

In light of rasterization being a necessary step between image creation and inkjet printing, it would have been obvious to the skilled practitioner to further modify Nidek Co., modified in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*), in view of Hoffman *et al.*

2.8 Claim 8

8. The system of claim 1, wherein the at least one graphical user interface is further configured to facilitate user selection of the lens from a plurality of lenses,

wherein the program instructions, when executed by the at least one processor, further cause the at least one processor to automatically create the image based on product data for the lens, and

wherein the image is automatically created based at least partially on an index of refraction, lens curvature, and a diameter of the lens.

2.8.1 Application of the prior art to claim 8

Claim 8 is obvious under 35 USC §103 over Nidek Co. in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*).

As per the discussion above of claim 3, lens curvature and diameter are disclosed by Niked Co. in paragraphs 0032-35:

Creating or modifying the image based on at least one of lens diameter and lens curvature is disclosed by Nidek Co., **diameter**, for example, at paragraph 0025: *'If the "NORMAL" of the button 303 is previously selected, the printer 103 is controlled to form a single circular print area having a slightly larger diameter than that of the surface of the lens 10 to be dyed (the predetermined surface area of the lens 10 to be dyed)*, and **curvature**, for example at paragraph 0024: *'In the present embodiment, therefore, if the lens 10 has low (weak) minus power (small curvature), the "NORMAL" (the "NORMAL" pattern) of the button 303 is selected. If the lens 10 has high (strong) minus power (large curvature, e.g., 8 or more base curve), the "DOUBLE CIRCLE" (the "DOUBLE CIRCLE" pattern) of the button 303 is selected.'*

Creating or modifying the image based on lens material is disclosed by Nidek Co., for example at paragraph 0021: '*The button **301** a is used to enter (set or select) the material of the lens **10**, for example, information about materials such as MR-174, CR-39, and MR-8*' and in Fig. 4, reproduced hereinabove.

Index of refraction is an aspect of lens material. For example in paragraph 0016 of Nidek Co.: '*a high-refractive material such as thiourethane resin (MR-6 to 8), and thioepoxy resin (MR-174)*'.

It would have been obvious to the skilled practitioner to modify Nidek Co. in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*), in order to practice this combination of known features.

2.9 Claim 9

9. A method for coating a lens using a plurality of inkjet print bars arranged in-line, comprising:

generating, using at least one processor in communication with the plurality of inkjet print bars, at least one graphical user interface

configured to facilitate the automation of the creation or selection of an image to be printed on a lens;

generating, using the at least one processor, a plurality of image layers based on the lens geometry, target product, and number of print bars;

controlling, using the at least one processor, a lens conveyance mechanism to move the lens between at least two inkjet print bars of the plurality of inkjet print bars for printing of the plurality of image layers, wherein the plurality of inkjet print bars are arranged in-line along the lens conveyance mechanism, such that the plurality of inkjet print bars is configured to print on the lens in sequence as the lens is moved along the lens conveyance mechanism; and

controlling, using the at least one processor, the at least two of the plurality of inkjet print bars to print the image on the lens, such that each of the at least two inkjet print bars prints at least one image layer of the plurality of image layers.

2.9.1 Application of the prior art to claim 9

Claim 1 is obvious under 35 USC §103 over Nidek Co. in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*).

Nidek Co. discloses indirect printing on a lens 10 using an inkjet printer 103. *[paragraph 0019: 'A base body producing apparatus 100 includes a monitor (a display unit) 101, a computer an arithmetic unit) 102, and an inkjet printer (a printing unit) 103.']*. Nidek Co. does not disclose directly printing on the lens.

Nidek Co. also does not disclose using multiple print bars. The term 'print bar' is used in RODRIGUEZ to mean 'a single print head, or a plurality of print heads acting as a unit' (col. 3, lin3 67 – col. 4, line 2). Thus, by disclosing 'an inkjet printer' without further detail, Nidek Co. disclose use of a single print bar, e.g., such as, for example, the single print bar comprising multiple print heads found in office or home inkjet printers.

However, the use of multiple print bars according to the definition of RODRIGUEZ is conventional in industrial applications, as will be described below.

Nidek Co. further discloses a computer processor 102 that is in communication with the inkjet printer 103 *[paragraph 0012, Figs. 1 and 2, reproduced below]*

FIG. 1

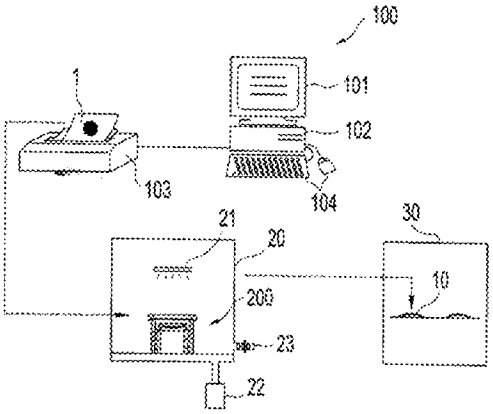
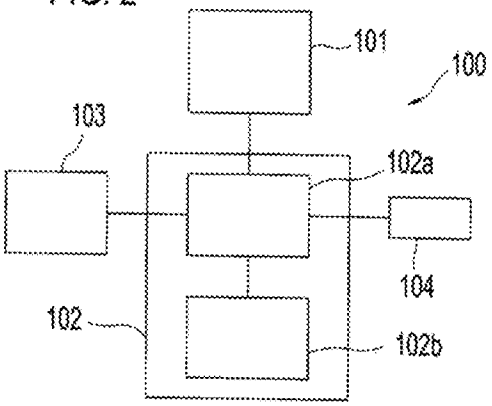
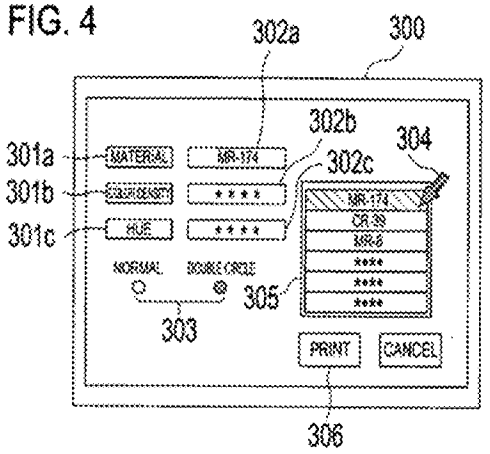


FIG. 2



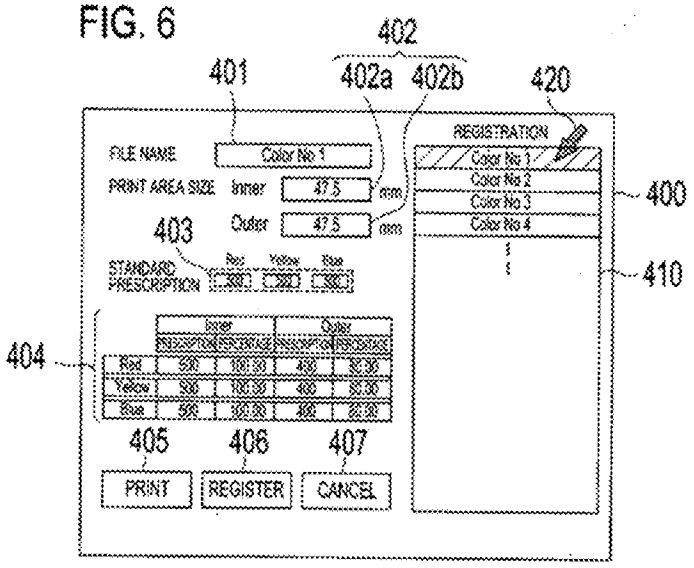
Nidek Co. further discloses using the at least one processor 102 to generate at least one graphical user interface *[paragraphs 0021-22 in their entirety, Fig. 4]* configured to facilitate the automation of the creation or selection of an image to be printed on the lens *[Fig. 4, reproduced below]*.

FIG. 4



Nidek Co. further discloses using the at least one processor 102 to generate a plurality of image layers *[('magenta/red, yellow cyan/blue, yellow' in paragraphs 0014, 0037, Fig. 6, reproduced below]*

FIG. 6



Printing multiple colors by an inkjet printer is possible only by printing multiple image layers, where each image layer includes a monochromatic bitmap for a respective color.

Nidek Co. further disclose that generating the image layers is based on the lens geometry *['curvature' and 'diameter' in paragraphs 0024-27, 0035]* and target product *['curvature' and 'diameter' in paragraphs 0024-27], ['lens material' paragraph 0021, Fig. 4]*.

We note that the claimed term 'target product' is not defined anywhere in RODRIGUEZ. A reasonable interpretation is that the target product can be one of: the lens, the printed lens or the printed image on the lens. The printed lens is defined by a combination of its geometry and material.

Nidek Co. further discloses that the at least one processor 102 controls the inkjet print bar 103 to print the image, such that the inkjet print bar 103 prints at least one image layer of the plurality of image layers *[paragraph 0025: 'When the print button 306 is clicked, the arithmetic control part 102 a controls the printer 103 to eject inks from ink cartridges based on the conditions entered with the buttons 301 a to 301 c, thereby forming a predetermined-shaped print area on the base body 1']*.

Nidek Co. does **not** appear to disclose:

- printing directly on the lens.
- using a plurality of print bars
- controlling, using the at least one lens conveyance mechanism in communication with the at least one processor, to move the lens between at least two inkjet print bars of the plurality of inkjet print bars for printing of the plurality of image layers wherein the plurality of inkjet print bars are arranged in-line along the lens conveyance mechanism, such that the plurality of inkjet print bars is configured to print on the lens in sequence as the lens is moved along the lens conveyance mechanism
- that the processor controls the lens conveyance mechanism to move the lens between at least two inkjet print bars of the plurality of inkjet print bars for printing of the plurality of image layers
- control, using the at least one processor, the at least two inkjet print bars to print the image on the lens, such that each of the at least two inkjet print bars prints at least one image layer of the plurality of image layers

Ochrombel discloses printing directly on the lens *[paragraph 0009, claim 1, etc.: 'The present invention relates to a method for applying a predetermined dot pattern to a surface of an ophthalmic lens or of an ophthalmic lens mold.']*.

Ochrombel discloses using a plurality of print bars *['printheads 19, 20 21' in paragraph 0043, Fig. 5, reproduced below]*.

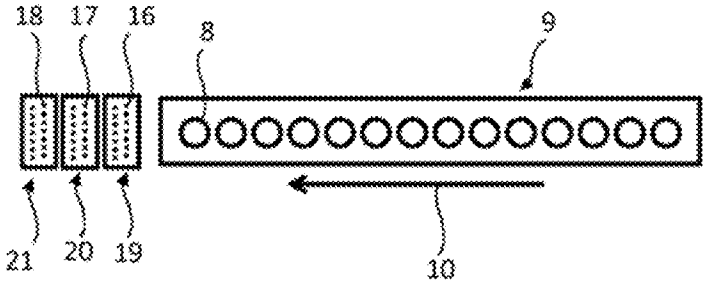


Fig. 5

Ochrombel refers to 'printheads' 19, 20, 21 and not 'print bars'. According to the definition in RODRIGUEZ, the printheads of Ochrombel qualify as print bars, in that each one comprises 'a single print head, or a plurality of print heads acting as a unit'.

To remove any doubt, in Landa *et al.*, similar printing arrangements are called **print bars** 22 (see Landa *et al.* Fig. 1 immediately below)

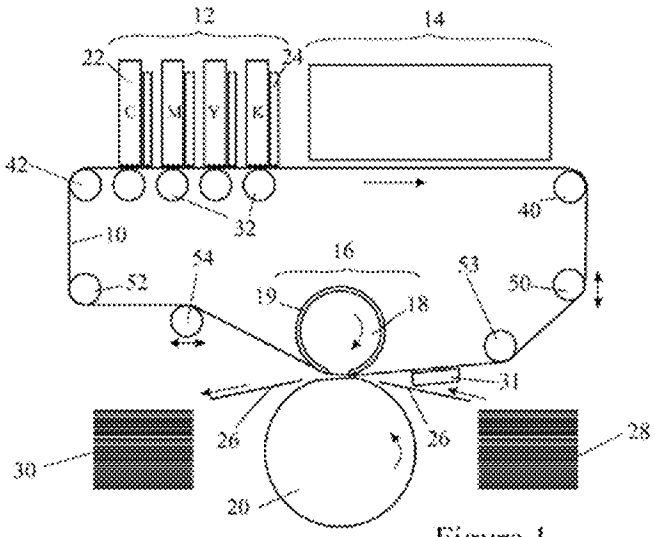


Figure 1

Ochrombel discloses controlling a lens conveyance mechanism *['carrier 9' in paragraph 0043, Fig. 5]* being in communication with the at least one processor (e.g., the processor 102 of Nidek Co.), wherein the plurality of inkjet print bars 19, 20, 21 are arranged in-line along the lens conveyance mechanism 9 *[Ochrombel paragraph 0043, Fig. 5]*, such

that the plurality of inkjet print bars is configured to print on the lens in sequence as the lens is moved along the lens conveyance mechanism *[Ochrombel paragraph 0043: 'The carrier 9 with the ophthalmic lens molds 8 arranged thereon is movable along a straight line representing the direction of movement 10 (see arrow) indicated in Fig. 5. As can be seen in Fig. 5, the inkjet printheads 19, 20, 21 are successively arranged (one after another) when viewed in the direction of movement of the carrier 9 (see arrow 10)']*.

Ochrombel repeatedly equates the printing on ophthalmic lenses with printing on ophthalmic lens molds, e.g., in paragraph 0009: 'According to the invention, the method for applying a predetermined dot pattern to a surface of an ophthalmic lens or of an ophthalmic lens mold comprises the steps of...'. The molds 8 of Fig. 5 have the same geometry as lenses and it would be obvious to apply its teachings to direct printing on lenses.

Ochrombel discloses that the processor (e.g., the processor 102 of Nidek Co.) controls the lens conveyance mechanism 9 to move the lens between at least two inkjet print bars 19, 20, 21 of the plurality of inkjet print bars for printing of the plurality of image layers. *[As above, from paragraph 0043: "The carrier 9 with the ophthalmic lens molds 8 arranged thereon is* ***movable*** *along a straight line representing the direction of movement 10 (see arrow) indicated in Fig. 5. As can be seen in Fig. 5, the inkjet printheads 19, 20, 21 are successively arranged (one after another) when viewed in the direction of movement of the carrier 9 (see arrow 10)"]*.

Ochrombel discloses that the processor (e.g., the processor 102 of Nidek Co.) controls at least two inkjet print bars 19, 20, 21 to print the image on the lens, such that each of the at least two inkjet print bars 19, 20, 21 prints at least one image layer of the plurality of image layers *[0045-47, e.g., 'the respective third ink layer 13 can be applied with the aid of the third ink dot nozzles 18 of the third inkjet printhead 21 in the same manner as already described for the application of the second ink layer 12']*.

It would have been obvious to one having ordinary skill in the art at the time the application of RODRIGUEZ was filed to directly print on the lens, as suggested by

Ochrombel since the direct printing does not require the complex vacuum system (20) of Nidek Co.

Further, it would have been obvious to one having ordinary skill in the art at the time the application of RODRIGUEZ was filed to provide plural print bars arranged along a conveyor path for the purpose of enabling the device to print in plural colors and to print at a higher throughput, and to further modify the system of Nidek Co. with the foregoing features of Ochrombel, or in the alternative, with the foregoing features of Ochrombel and Landa *et al.* – which in combination disclose all of the features of RODRIGUEZ claim 9.

2.10 Claim 10

10. The method according to claim 9, further comprising configuring, using the at least one processor, at least two inkjet print bars in the system based on product data for the lens,

wherein configuring the at least two inkjet print bars comprises at least one of the following: setting a jetting temperature of at least one inkjet print bar based on the product data, setting a pressure or pressure target of at least one inkjet print bar based on the product data, setting a throw distance of at least one inkjet print bar based on the product data, setting a jetting frequency of at least one inkjet print bar based on the product data, setting a print bar DPI of at least one inkjet print bar based on the product data, or any combination thereof.

2.10.1 Application of the prior art to claim 10

Claim 10 is obvious under 35 USC §103 over Nidek Co. in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*), and further in view of De La Vega *et al.* and Maruyama.

De La Vega *et al.* disclose setting temperature, jetting frequency, and DPI.

We note that the term 'product data' is not defined in RODRIGUEZ, and the term appears only in the claims. An attempt is made herein to interpret the term according to the broadest reasonable interpretation. As described above, we have interpreted the undefined claim term 'target product' as being one of: the lens, the printed lens or the printed image on the lens. The printed lens is defined by a combination of its geometry and material. A broadest reasonable interpretation of 'product data' would similarly include data of the lens, of the printed lens, or of the printed image on the lens.

Temperature is disclosed, e.g., at page 10, lines 9-12 of De La Vega et al.: 'In order to control the viscosity at jetting, the printhead may be heated, e.g., to a temperature within a range of 30°C to 60°C, or 35°C to 55°C. In order to control the spreading of the drops on the optical substrate, the substrate may be heated to 30°C to 60°C, 35°C to 60°C, 40°C to 60°C, or 45°C to 60°C.'

Jetting frequency is disclosed, e.g., at page 24, lines 20-27 of De La Vega et al.: 'EXAMPLE 22 Printing procedure … Printing was performed on an Omni Jet 100 (Unijet), using a Dimatix™ print head (Fujifilm Dimatix™ 10 PL model #DMCLCP - 11610/PN 700-11670-01). The ink was filtered using syringe filters (1 micrometer). The print head was pre-heated to 40°C. The drop characteristics were then optimized using a stroboscope mounted on the printer (camera and light source synchronized with the jetting frequency). The waveform was optimized for the ink, jetted at a frequency of 1500 Hz.'

DPI is disclosed in De La Vega *et al.* indirectly, i.e., DPI itself is not disclosed but is easily calculated from any two of: coverage ratio, gaps between dots, and dot diameter.

- Coverage ratio is disclosed in De La Vega *et al.*, e.g., at page 5, lines 3-13: 'According to still further features in the described preferred embodiments, the functional dots are distributed over a nominal surface area, the functional dots having a total coverage area, a ratio of the total coverage area to the nominal surface area being at most 0.98, at most 0.96, at most 0.94, at most 0.92, at most

0.90, at most 0.85, at most 0.80, at most 0.75, at most 0.70, at most 0.65, at most 0.60, at most 0.55, at most 0.50, at most 0.45, at most 0.40, or at most 0.35.

'According to still further features in the described preferred embodiments, this ratio is at least 0.35, at least 0.40, at least 0.45, at least 0.50, or at least 0.55.

'According to still further features in the described preferred embodiments, this ratio is within a range of 0.50 to 0.98, 0.50 to 0.90, 0.55 to 0.90, 0.60 to 0.90 or 0.65 to 0.90.'

- Gap between dots is disclosed, e.g., at page 4, line 10 to page 5, line 28:
'According to still further features in the described preferred embodiments, within each area of the multi-functional areas, a gap between adjacent functional dots belonging to the first and second groups, respectively, is at least 5 μm, at least 8 μm, at least 10 μm, at least 12 μm, at least 15 μm, or at least 20 μm.

According to still further features in the described preferred embodiments, the gap is at most 50 μm, at most 45 μm, at most 40 μm, at most 35 μm, at most 30 μm, or at most 25 μm.

'According to still further features in the described preferred embodiments, within each area of the multi-functional areas, a gap between adjacent functional dots belonging to the first and second groups, respectively, is at least 5 μπι, at least 8 μπι, or at least 10 μπι, and at most 100 μπι, at most 50 μπι, at most 45 μm, at most 40 μm, at most 35 μm, at most 30 μm, or at most 25 μm, at most 20 μm, at most 18 μm, or at most 15 μm.'

'According to still further features in the described preferred embodiments, within each area of said multi-functional areas, a gap between adjacent functional dots belonging to the first and second groups, respectively, is at most 100 μm, at most 50 μm, at most 45 μm, at most 40 μm, at most 35 μm, at most 30 μm, or at most 25 μm, at most 20 μm, at most 18 μm, or at most 15 μm, the adjacent functional dots being physically discrete.'

- Dot diameter is disclosed, e.g., at page 29, lines 11-18 of De La Vega: "EXAMPLE 38 … The ink dots of Example 36 had a characteristic diameter of approximately 50 micrometers, and a characteristic height of approximately 6.5 micrometers. The ink dots of Example 37 had a characteristic diameter of approximately 50 micrometers, and a characteristic height of approximately 0.9 micrometers.'

Maruyama discloses setting and inkjet pressure in the title ("Pressure regulating valve for inkjet printer") and throughout the specification.

It would have been obvious to the skilled practitioner to further modify Nidek Co., modified in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*), in view of De La Vega *et al.* and Maruyama, in light of the setting of the inkjetting parameters being well known in the art.

2.11 Claim 11

11. The method according to claim 9, further comprising:

automatically modifying, using the at least one processor, the image based on product data for the lens,

wherein the lens product data comprises at least one of lens diameter and lens curvature.

2.11.1 Application of the prior art to claim 11

Claim 11 is obvious under 35 USC §103 over Nidek Co. in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*).

Modifying the image based on at least one of lens diameter and lens curvature is disclosed in Nidek Co., **diameter**, for example, at paragraph 0025: *'If the "NORMAL" of the button 303 is previously selected, the printer 103 is controlled to form a single circular print area having a slightly larger diameter than that of the surface of the lens 10 to be dyed (the predetermined surface area of the lens 10 to be dyed)*, and

curvature, for example at paragraph 0024: *'In the present embodiment, therefore, if the lens 10 has low (weak) minus power (small curvature), the "NORMAL" (the "NORMAL" pattern) of the button 303 is selected. If the lens 10 has high (strong) minus power (large curvature, e.g., 8 or more base curve), the "DOUBLE CIRCLE" (the "DOUBLE CIRCLE" pattern) of the button 303 is selected.'*

2.12 Claim 12

12. The method according to claim 9, further comprising:

controlling a first inkjet print bar of the plurality of inkjet print bars to print at least one first image layer of the plurality of image layers on the lens based on the lens product data;

automatically moving the lens from the first inkjet print bar to a second inkjet print bar of the plurality of inkjet print bars; and

controlling the second inkjet print bar to print at least one second image layer of the plurality of image layers on the lens based on the lens product data.

2.12.1 Application of the prior art to claim 12

Claim 12 is obvious under 35 USC §103 over Nidek Co. in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*).

Again, 'product data' is not defined in RODRIGUEZ, and the term appears only in the claims. An attempt is made herein to interpret the term according to the broadest reasonable interpretation. As described above, we have interpreted the undefined claim term 'target product' as being one of: the lens, the printed lens or the printed image on the lens. The printed lens is defined by a combination of its geometry and material. A broadest reasonable interpretation of 'product data' would similarly include data of the lens, of the printed lens, or of the printed image on the lens.

In the broadest reasonable interpretation, the term 'the lens product data' can be interpreted as meaning 'product data of the lens', which while still undefined, at least does not refer back to a term (lens product data) that does not appear in the parent claim, claim 1.

In any case, claim 12 achieves at best only a semantic narrowing of the last two clauses of claim 9: 'control the lens conveyance mechanism to move the lens between at least two inkjet print bars of the plurality of inkjet print bars for printing of the plurality of image layers; and control the at least two inkjet print bars to print the image on the lens, such that each of the at least two inkjet print bars prints at least one image layer of the plurality of image layers.'

The two 'controlling' steps of claim 12 are disclosed by Ochrombel, for example in paragraph 0045: 'To produce such pattern, once an ophthalmic lens mold 8 is passing underneath the nozzles 16 of the first inkjet printhead 19, the first inkjet nozzles 16 arranged along the two straight lines perpendicular to the direction of movement 10 apply a first ink layer 11' ... and in paragraph 0046: 'The respective second ink layer 12 of each individual ink dot 1 is applied on top of the respective first ink layer 11 of the respective individual ink dot 1 with the aid of the second inkjet nozzles 17 of the second inkjet printhead 20 in the same manner as already described for the application of the first ink layer 11'.

In light of claim 12 not reciting any additional features not anticipated by claim 9, practicing the refined controlling steps of the method would have been obvious.

2.13 Claim 13

13. The method of claim 9, wherein each inkjet print bar of the plurality of inkjet print bars prints at least a portion of at least one image layer of the plurality of image layers.

2.13.1 Application of the prior art to claim 13

Claim 13 is obvious under 35 USC §103 over Nidek Co. in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*).

Claim 13 recites that each inkjet print bar of the plurality of inkjet print bars prints at least a portion of at least one image layer of the plurality of image layers

However, claim 9, from which claim 13 depends, recites that that each of the at least two inkjet print bars prints at least one image layer of the plurality of image layers.

Printing at least one image layer, as recited in claim 9, appears to be more limiting than printing at least a portion of at least one image layer, as recited in claim 13, and therefore claim 13 appears to be broader in scope than its parent claim, claim 9.

Moreover, printing at least one image layer **includes** printing at least a portion of at least one image layer, because inkjet technology prints a layer as a sequence of drop depositions, and it has to print a portion of an image layer before completing the entire image layer.

It is clear that claim 13 adds no inventive subject matter to claim 9, and consequently, claim 13 is obvious for the same reasons that claim 9 is obvious.

2.14 Claim 14

14. The method of claim 9, wherein the at least one graphical user interface is further configured to facilitate the automation of image creation based on parameters specified by existing product lens data, a specific set of parameters entered by the user, visual data regarding the lens collected by a camera in communication with the at least one processor, or any combination thereof, and

wherein the program instructions, when executed by the at least one processor, further cause the at least one processor to rasterize the image and/or each image layer of the plurality of image layers.

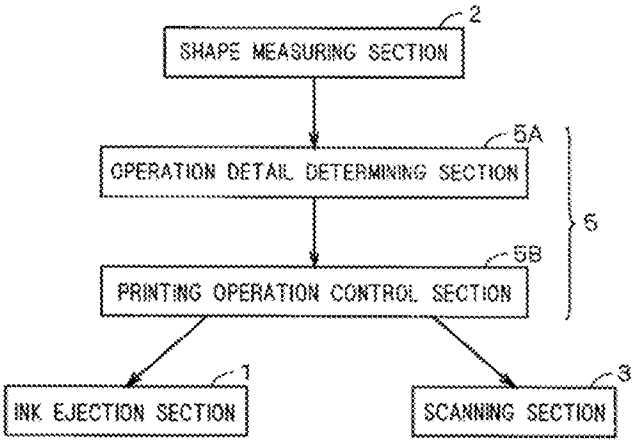
2.14.1 Application of the prior art to claim 14

Claim 14 is obvious under 35 USC §103 over Nidek Co. in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*). and further in view of Kubo *et al.*

Niked Co. disclose that the at least one graphical user interface is further configured to facilitate the automation of image creation based on parameters specified by existing lens product data, a specific set of parameters entered by the user. See, for example, Figs. 4 and 6, reproduced above.

Kubo *et al.* discloses measuring the shape of a three-dimensional substrate using camera means, for example at paragraph 0221 and in Fig. 19, reproduced below:

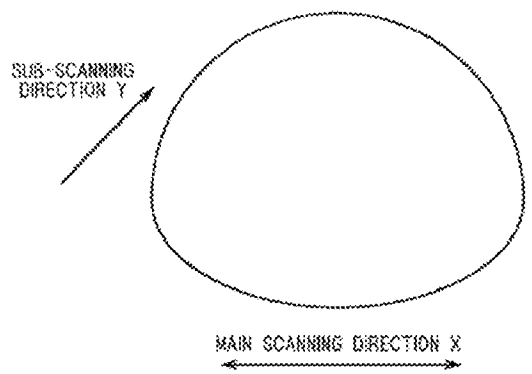
FIG. 19



[Paragraph 0221]: '*The shape measuring section 2 described herein is assumed to comprise an optical displacement sensor 2A. The optical displacement sensor 2A of the shape measuring section 2 includes a phototransmitter 21 and a photoreceiver 22. The phototransmitter 21 directs laser light downwardly in the Z direction, and the photoreceiver 22 including a line sensor (CCD, PSD (optical position detecting device) or the like) and a lens receives light diffuse-reflected from the surface of the object 7. Thus, the optical displacement sensor 2A can measure a distance by a triangulation technique. Hence, the surface shape of the three-dimensional object is recognized.*'

Fig. 11A in Kubo *et al.* (reproduced below) shows an example of visually measuring the shape of an 'object having a smoothly curved surface' as per paragraph 0053.

FIG. 11A



It would have been obvious to the skilled practitioner to further modify Nidek Co., modified in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*), in view of Kubo *et al.*, in order to automate and speed up the uptake of lens geometry data by image processing in the context of the GUI disclosed by Nidek Co.

2.15 Claim 15

15. The method of claim 9, wherein the at least one graphical user interface is further configured to facilitate user selection of the lens from a plurality of lenses,

wherein the program instructions, when executed by the at least one processor, further cause the at least one processor to automatically create the image based on product data for the lens, and

wherein the image is automatically created based at least partially on an index of refraction, curvature, and/or diameter of the lens.

2.15.1 Application of the prior art to claim 15

Claim 15 is obvious under 35 USC §103 over Nidek Co. in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*).

As per the discussion above of claim 11, lens curvature and diameter are disclosed by Nidek Co. in paragraphs 0024-27:

Creating or modifying the image based on at least one of lens diameter are disclosed by Nidek Co, **diameter**, for example, at paragraph 0025: *'If the "NORMAL" of the button 303 is previously selected, the printer 103 is controlled to form a single circular print area having a slightly larger diameter than that of the surface of the lens 10 to be dyed (the predetermined surface area of the lens 10 to be dyed)*, and **curvature**, for example at paragraph 0024: *'In the present embodiment, therefore, if the lens 10 has low (weak) minus power (small curvature), the "NORMAL" (the "NORMAL" pattern) of the button 303 is selected. If the lens 10 has high (strong) minus power (large curvature, e.g., 8 or more base curve), the "DOUBLE CIRCLE" (the "DOUBLE CIRCLE" pattern) of the button 303 is selected.'*

Creating or modifying the image based on lens material is disclosed by Nidek Co., for example at paragraph 0071: '*The button **301** a is used to enter (set or select) the material of the lens **10**, for example, information about materials such as MR-174, CR-39, and MR-8*' and in Fig. 4, reproduced hereinabove.

Index of refraction is an aspect of lens material. For example in paragraph 0016 of Nidek Co.: '*a high-refractive material such as thiourethane resin (MR-6 to 8), and thioepoxy resin (MR-174)*'.

It would have been obvious to the skilled practitioner to modify Nidek Co. in view of Ochrombel (or, in the alternative, Ochrombel and Landa *et al.*), in order to practice this combination of known features.

Respectfully submitted,

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Date: June 16, 2026

CERTIFICATE OF SERVICE

I hereby certify that, on June 16, 2026, a true and correct copy of this **THIRD-PARTY SUBMISSION UNDER 35 U.S.C. § 301** was served in its entirety via U.S. MAIL, upon the following attorneys of record as listed on USPTO Patent Center:

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