UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/987,111	01/04/2016	Kensuke MASUDA	12199US03CON	9519

154930 7590 01/02/2020

XSENSUS LLP
200 Daingerfield Road
Suite 201
Alexandria, VA 22314

EXAMINER	
KHALID, OMER	

ART UNIT	PAPER NUMBER
2422	

NOTIFICATION DATE	DELIVERY MODE
01/02/2020	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Arlene.Hudgens@Xsensus.com
Faith.Baggett@xsensus.com
anaquadocketing@Xsensus.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte KENSUKE MASUDA, NORIYUKI TERAO, YOSHIAKI IRINO, TOMONORI TANAKA, NOZOMI IMAE, TORU HARADA, HIROKAZU TAKENAKA, HIDEAKI YAMAMOTO, SATOSHI SAWAGUCHI, and HIROYUKI SATOH

Appeal 2018-004734
Application 14/987,111
Technology Center 2400

Before BRADLEY W. BAUMEISTER, MICHAEL J. STRAUSS, and RUSSELL E. CASS, *Administrative Patent Judges*.

CASS, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant[1] appeals under 35 U.S.C. § 134(a) from the Examiner's final rejection of claims 2–4 under 35 U.S.C. § 103. Appeal Br. 3–4.[2] An oral hearing was held on December 9, 2019. We have jurisdiction under 35 U.S.C. § 6(b). We reverse.

---

[1] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant lists RICOH Company, Ltd. as the real party in interest. Appeal Brief filed December 4, 2017 ("Appeal Br.") 1.

[2] Throughout this Opinion, we refer to the above-noted Appeal Brief, as well as the following documents for their respective details: the Final Action mailed June 16, 2017 ("Final Act."); the Examiner's Answer mailed March 8, 2018 ("Ans."); and the Reply Brief filed April 3, 2018 ("Reply Br.").

BACKGROUND

The present invention relates to an optical system with lenses for use in an imaging system. Spec. ¶ 1. The Specification explains that imaging systems exist for capturing images in all directions at one time using a plurality of wide-angle lenses. *Id.* ¶ 2. According to the Specification, a wide angle lens for such an imaging system often has different magnification at the center of the lens as compared to the magnification at the edge portions of the lens. *Id.* In such systems, it is necessary to increase the magnification in the edge portion of the lens so that it is higher than at the center of the lens, in order to compensate for image quality deterioration in the edge portion. *Id.* ¶ 3. However, the Specification explains, when the imaging magnification is increased in the edge portions, the entire length of the lens is likely to increase. *Id.* ¶ 4.

According to the Specification, the invention seeks to address this perceived problem by providing an optical system comprising a central portion and a circumferential portion. *Id.* ¶ 7. The central portion has a magnification per unit angle of view that increases from the center to the outside portion at a particular rate of increase. *Id.* The circumferential portion outside the central portion has a magnification per unit of view that increases from the central portion to an outside portion at an increase rate smaller than the increase rate of the central portion. *Id.* According to the Specification, this approach allows the imaging optical system to be easily designed and manufactured at a low cost while ensuring an adequate thickness necessary for processing. *Id.* ¶ 110.

Claim 2 is illustrative of the claims at issue:

> 2. An optical system, comprising:
>
> a plurality of lenses,
>
> wherein:
>
> > a first area of an angle of view of the optical system, which is an area where a subject image incident on each of the lenses is not overlapped, includes a magnification per unit angle of view which increases with an angle of view,
> >
> > a second area of an angle of view which is outside the first area includes a magnification per unit angle of view which changes with the angle of view with a rate of increase of the magnification per unit angle of view being reduced as the angle of view increases, and
> >
> > the second area is an area where images, from two lenses of the plurality of lenses, overlap each other.

Appeal Br. 6 (Claims Appendix).

THE EXAMINER'S REJECTION AND APPELLANT'S CONTENTIONS

The prior art relied on by the Examiner is set forth in the following table:

Name	Reference	Date
McCall	US 2009/0040291 A1	Feb. 12, 2009
Ortiz	US 2010/0131533 A1	May 27, 2010

Final Act. 7–9.

In the Final Office Action, the Examiner rejected claims 2–4 under 35 U.S.C. § 103 as being unpatentable over Ortiz in view of McCall. *Id*.

With respect to claim 2, the Examiner relies on Figure 12B of Ortiz to teach the claimed "first area of an angle of view" and "second area of an angle of view." Final Act. 8. The Examiner finds that Figure 12B of Ortiz teaches "a magnification per unit angle of view which changes with the angle of view with a rate of increase of the magnification per unit angle of view being reduced as the angle of view increases." *Id.* The Examiner finds that "Ortiz does not explicitly disclose a magnification per unit angle of view [that] increases with an angle of view," but McCall "teaches a magnification per unit angle of view [that] increases with an angle of view." *Id.* (citing McCall ¶¶ 86, 112).

Appellant argues that "[n]either Figure 12B or the description in Ortiz discloses or suggests anything related to 'a ***rate of increase*** of the magnification per unit angle of view,' as claimed." Appeal Br. 4. Appellant further contends that the prior art does not "identify first and second areas, as claimed." *Id.* As to McCall, Appellant argues that McCall does not disclose "what happens to the rate of increase of the magnification per unit angle of view when the field of view is great[er] than 180º," and does not "explain that there are any different lens properties for sections of a lens where the field of view is greater than 180º." *Id.*

In the Answer, the Examiner acknowledges that "[t]he references do not explicitly teach a 'rate of increase of the magnification per unit angle of view,'" but finds that McCall teaches to "magnify or scale the image (zoom in and out) electronically." Ans. 5 (citing McCall ¶¶ 26, 78). The Examiner further determines that a "magnification per unit angle of view is an abstract way of saying that the magnification is non-linear, non-constant, hence non-uniform, which is taught in McCall." *Id.* at 6.

Appellant responds that the Examiner never identifies the claimed "first" and "second" areas in the prior art. Reply Br. 1. As to Ortiz, Appellant argues that the Examiner does not explain "exactly what part of Figure 12B constitutes the first area and what part constitutes the second area." *Id.* Appellant also argues the claimed increase in the magnification per unit angle of view is a property of the lens, and McCall's teaching that the magnification can be modified is unrelated to the structure of the lens itself. *Id.* at 2–3.

ANALYSIS

We agree with Appellant that the Examiner has not established that the cited references reasonably teach or suggest the claimed "first" and "second" areas, wherein the second area is outside of the first area and includes a "magnification per unit angle of view which changes with the angle of view with a rate of increase of the magnification per unit angle of view being reduced as the angle of view increases."

As to Ortiz, the Examiner has not established that Figure 12B shows first and second regions at all, much less a second region in which the rate of increase of the magnification per unit angle of view is reduced as the angle of view increases. Figure 12B, reproduced below, shows an imaging device that captures a single large image from which areas that are a subset of the larger image may be derived:

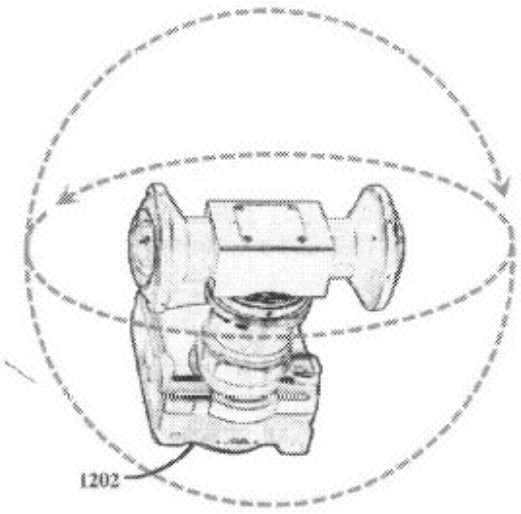

Figure 12 B

Figure 12B shows a device used to capture one or more views a an workflow structure that relies on an imaging device that captures a single large image view from which view areas that are a subset of the larger image view may be derived. Ortiz, Fig. 12B, ¶ 89.

More specifically, Ortiz discloses that in Figure 12B, "a single sensor captures 2 opposing 180 degree views through a fisheye lens." Ortiz ¶ 89. The Examiner, however, has not introduced sufficient evidence to establish that this fisheye lens would include the claimed two regions, including a second region in which the rate of increase of the magnification per unit angle of view is reduced as the angle of view increases. The Examiner, therefore, fails to establish that Ortiz teaches this limitation.

As to McCall, the Examiner also fails to present sufficient evidence to support a conclusion that the reference teaches "first" and "second" areas with the claimed properties. *See* Final Act. 8; Ans. 5–6; McCall ¶¶ 86, 112. The Examiner points to portions of the reference that disclose zooming, panning, and tilting the image, but does not adequately demonstrate that the ability to zoom, pan, and tilt requires a lens with a second area in which the

rate of increase of the magnification per unit angle of view is reduced as the angle of view increases. *Id.*

Therefore, we find that the Examiner has failed to establish that Ortiz and McCall teach the "first" and "second" areas as recited in claim 2. Consequently, we reverse the Examiner's rejection of claim 2. We also reverse the Examiner's rejection of dependent claims 3 and 4, which are dependent on claim 2.

CONCLUSION

We reverse the Examiner's rejection of claims 2–4 under 35 U.S.C. § 103.

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
2–4	103	Ortiz, McCall		2–4

REVERSED