

IN THE HIGH COURT OF DELHI AT NEW DELHI
(ORDINARY ORIGINAL COMMERCIAL JURISDICTION)

CS(COMM) NO. 795 OF 2022

IN THE MATTER OF

Largan Precision Co., Ltd.

...Plaintiff

Versus

Motorola Mobility India Pvt. Ltd. & Ors.

...Defendants

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Note: All parties have been served. Plaintiff has been represented by
Saikrishna & Associates.

Shruti Jain
D/2102/2019

Shruti Jain (D/2102/2019)

Saikrishna and Associates

Counsels for the Plaintiff

57, Jor Bagh, New Delhi- 110003

Shruti.j@saikrishnaassociates.com

+91-9582085884

NEW DELHI

Date: 2 June 2023

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MOTOROLA MOBILITY
EXHIBIT 1028

(a)

Expert Report of Dr. Julie L. Bentley

Declaration

I declare that all statements made herein are true to the best of my knowledge, information and belief, and nothing has been concealed therefrom.

Date: 1 June 2023

A handwritten signature in cursive script that reads "Julie Bentley".

Dr. Julie L. Bentley

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I. QUALIFICATIONS AND EXPERTISE

1. I described my relevant qualifications and expertise in my report dated 18 April 2023.
2. My opinions are based on the documents provided to me in this case, publicly available data including technical specifications, research conducted by me as well as additional information and data generated by Largan under my guidance, all are listed more specifically in my report and/or in Annexures. In addition, my opinions are based on my experience, education, training, skill, and knowledge in the relevant fields.

II. PURPOSE OF THIS REPORT

3. My report dated 18 April 2023 was based on the documents filed by the parties as enumerated below:
 - a. Copy of the '203 patent complete specification,
 - b. Copy of the Complaint filed by Largan against the Defendants,
 - c. Copy of the Interim Injunction application filed by Largan against the Defendants,
 - d. Copy of device testing report of Mr. Wen-Cheng Huang filed by Largan ("Huang affidavit"),
 - e. Copy of expert report of Mr. Lin-An Chang filed by Largan ("Chang Affidavit"),
 - f. Copy of Def. 1 and Def. 2's reply to Interim Injunction application ("Motorola's reply"),
 - g. Copy of documents filed by Def. 1 and Def. 2 on 12 January 2023 containing the Defendants' expert report of Mr. Xiaolin Jiang ("Jiang affidavit"), claim mapping charts and copies of prior arts (D1: US 20150022896 A1, D2: US 20160161702 A1, D3: US 7457052 B2, D4: JP 4283195 B2, D5: JP 4292130 B2) relied upon by the Defendants,
 - h. Copy of Def. 3's reply to Interim Injunction application,
 - i. Copy of images of the cross-section of the accused light blocking sheets of Moto G31, Moto G60 and Motorola Edge 30 Pro relied upon in Chang and Huang affidavit with and without superimposed measurement markers shared by Largan.

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4. I was further requested by counsel for Largan Precision Co. Ltd. (“Largan”) to provide technical assistance in relation to the new documents filed by the Defendants in the present Suit and Largan’s Replication (Largan’s reply to Def. 1 and 2’s Written Statement), which are being enumerated below:
 - a. Copy of Written Statement filed by Def. 1 and Def. 2 (“Written Statement”),
 - b. Copy of documents filed by Def. 1 and Def. 2 on 20 March 2023 containing the Defendants’ expert report of Mr. Zhengjin Ye (“Ye affidavit”), claim mapping charts relied upon by the Defendants,
 - c. Copy of Written Statement filed by Def. 3,
 - d. Replication filed by Largan in response to Written Statement filed by Def. 1 and Def. 2.
5. I have been asked by the counsel for Largan to review the aforementioned documents and undertake the same analysis (reproduced below) as I had performed earlier and opined in my report dated 18 April 2023:
 - a) whether the features of the ’203 patent are present in the Defendants’ products - Moto G31, Moto G60 and Motorola Edge 30 Pro;
 - b) whether the prior art documents relied upon by the Defendants mention as is or suggest the invention of the ’203 patent;
 - c) whether the invention of the ’203 patent is sufficiently described in the complete specification such that it can be easily practiced by an average skilled person and a skilled person;
 - d) whether the claim language is clear and definitive.
6. Further, I directed Largan to perform fresh confirmatory testing of any of the devices of Moto G31, Moto G60 and Motorola Edge 30 Pro models, under my guidance so as to reconfirm the testing protocols and results obtained therefrom, indicating the presence of features of the ’203 patent in the Defendants’ product(s).

III. SUMMARY OF MY OPINIONS

7. I reiterate that pursuant to my analysis of the ’203 patent, the various tests conducted and the various images and data provided to me, the Chang affidavit, the Huang affidavit, the Jiang affidavit and the pleadings of the Defendants and Largan, I am of the view that the testing methodology adopted by Largan is an appropriate and standard way of analyzing lens assemblies and their components. Thus, the

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Defendants' products, i.e., Moto G31, Moto G60 and Motorola Edge 30 Pro devices, are fully covered by the '203 patent, especially the claims.

8. Also, based on my review of the Ye affidavit and the new documents filed by the Defendants, my opinion rendered in my previous report dated 18 April 2023 is valid and remains unchanged. Additionally, my opinion on infringement and validity of Largan's testing protocol is further strengthened based on the confirmatory testing performed under my supervision and guidance and results obtained from the same.
9. I agree with Largan's comments and analysis/reasoning presented in its Replication to Def. 1 and 2's Written Statement, which were prepared with my consultation.
10. I believe that the Defendants' arguments in the new documents are also not convincing and lack technical merits. I have already noted the deficiencies in the Jiang affidavit in my previous report dated 18 April 2023. Similarly, the Ye affidavit is also replete with inconsistencies and contradictions. In fact, the Jiang affidavit and the Ye affidavit contradict each other and are inconsistent, in terms of data and images submitted as part of these two affidavits. These inconsistencies will be dealt with in the paragraphs to follow.
11. Further, I have already provided my analysis, in my previous report dated 18 April 2023, on each of the prior art relied upon by the Defendants and the combination of prior arts created by the Defendants. I observe that a new prior art and a new combination have been relied upon by the Defendants, and my analysis of the same reveal that even the new prior art and the new combination do not mention or suggest the invention of the '203 patent and cannot be seen as being identical or similar to the same.
12. Even in view of the new documents filed by the Defendants, my opinion on the sufficiency of the disclosure in the '203 patent remains unchanged. Therefore, I reiterate that in my assessment, the invention of the '203 patent is described in detail by the complete specification such that it can be easily practiced by an average skilled person and a skilled person.
13. Even in view of the new documents filed by the Defendants, my opinion on the claim language being clear and definitive does not change.
14. I have already provided a technical background of the '203 patent in my report dated 18 April 2023 and I am not repeating the same to maintain brevity.

IV. INFRINGEMENT ANALYSIS

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15. I reiterate that Largan has accused the P1-P2 light blocking sheet of Moto G31 and P1-P2 light blocking sheet of Moto G60. The same has been referred to as "Sp1" by the Defendants. Largan has also accused the P2-P3 light blocking sheet of Motorola Edge 30 Pro, which is referred to as "Sp2" by the Defendants.

16. I have already reviewed, analyzed and opined on:

- a. the Huang affidavit detailing the testing methodology adopted by Largan,
- b. the images of the cross-section of the accused light blocking sheet of Moto G31, Moto G60 and Motorola Edge 30 Pro that were relied upon by Largan,
- c. the Chang affidavit and the claim mapping charts placed on record by Mr. Lin-An Chang.

I agree with the above exercise and the results showing various dimensions, measurement points etc., all of which indicate that all the elements of the '203 patent claims are implemented in Moto G31, Moto G60 and Motorola Edge 30 Pro.

17. I have reviewed the written statement of all the Defendants and Ye affidavit. I notice that, like before, Def. 3 relies on the written statement of Def. 1 and Def. 2. I notice that the Defendants have argued non-infringement based on new testing and analysis of light blocking sheets by Mr. Ye and also by attempting to demonstrate that '203 patent is invalid in light of prior art D1-D5 and a new prior art D6 and due to certain other deficiencies.

18. I will provide my comments on Defendants' infringement analysis and other technical arguments of Ye affidavit in subsequent paragraphs. I will also elucidate the contradictions between Jiang affidavit and Ye affidavit.

19. The Defendants' reasoning for non-infringement can be summarized as follows:

a. Defendants say that the light blocking sheets have been manufactured by

chemical etching. "The etching process causes unpredictable, randomized roughening of the entire light-blocking sheet, including the two surface layers and the inner layer. The inner layer may corrode faster than the surface layer and cause an etching gap, but the size of the etching gap may vary greatly. Further, chemical etching is performed based on experience of individual operators of the assembly line and it is impossible to control the randomized topology of the spacer after etching." (Para 8.10.6 of Written Statement or Para 19 of Ye affidavit, Para 8.3.1.7 on Page 20-21 of Def. 1 and Def. 2's reply to interim injunction application, Para 19 of Jiang affidavit),

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- b. Defendants say that the air layer denoted by Φ_{smin} is not constant at all points throughout the inner substrate layer. *“Thus, Φ_{smin} changes at every reference point of the substrate layer and cannot be used to satisfy claim 1 which, when read in light of the description and Fig. 2A, requires Φ_{smin} to remain constant throughout the light blocking lens/spacer.”* (Para 8.6(vi), Para 8.6(ix) and Para 8.6(xii) of Written Statement and Para 21-23 of Ye affidavit, Para 8.3.1.9 on Pages 22-23 of Def. 1 and Def. 2’s reply to interim injunction application, Para 24 Jiang affidavit),
 - c. Defendants say that the supposed testing data in Para 21-23 of Jiang affidavit and Para 21-23 of Ye affidavit indicate that the accused spacers are not infringing,
 - d. Defendants say that the analysis is not accurate - *“For an invention that relates to measurements in micrometers or micron (μm) and where 1 μm equals 1×10^{-6} metre, the analysis depicts images that fail to show the accuracy of the measurements done by Plaintiff’s employees. For example, in figures 11, 19 and 26 of Huang’s affidavit, it is not clear where the measurements of parameters $\Phi 1$ and $\Phi 2$ begin and end, which is unclear from the figures shown in the affidavit, ...”* (Para 8.7.2 of Written Statement, Para 8.3.2.2 on Page 25 of Def. 1 and Def. 2’s reply to interim injunction application).
20. I disagree with the above. My observations, already submitted by Largan as part of their Replication after consulting with me, are as follows:
- a. I reiterate that regarding the etching process causing unpredictable, randomized roughening of the entire light blocking sheet, I disagree with the statements of the Defendants, Mr. Xiaolin Jiang and Mr. Zhengjin Ye. Based on my experience, I believe that the etching process is controllable. It is true that topology of the etched surface can be uneven, however, the depth of material removed from the surface can be controlled by various factors such as etching time, temperature, different types and/or concentrations of etching agent, overlap between various sheets, cleaning, drying, and so on. Even Defendants mentions so in Para 8.6(iv) and 8.10.6 of Written Statement and Para 8.3.1.7 on Page 20 of Def. 1 and Def. 2’s reply to interim injunction application. Accordingly, I believe that the chemical etching process can be designed so that a specific range of diameters i.e. $\Phi 1$, $\Phi 2$, and Φ_{smin} can be obtained as required. And it is almost certain that the person performing the etching process

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will be given a set of instructions (operation procedures) detailing how each step in the etching process should be performed, such as which etchant to be used and for how long, whether and how to perform the cleaning or drying process, etc. And it would not be surprising that all these factors were carefully evaluated and determined through a series of experiments before mass production. In contrast, if chemical etching would have been an uncontrollable phenomenon, the target material could corrode completely after some length of time of running the process and disappear completely. The fact that the chemical etching process is used in high tolerance components at a scale of 1×10^{-6} m, in itself, suggests that it can be controlled with a great degree of precision and accuracy. If chemical etching was so uncontrolled and unpredictable, it would not be the preferred process for manufacturing high end and sophisticated products requiring dimensional characteristics at miniscule level such as chipsets in the semiconductor industry, or light blocking sheets in miniature camera lenses for smartphones. Accordingly, in my humble opinion, this argument of the Defendants lacks technical merit.

- b. Further, I observe that Ye also talks about the design and shaping of the light blocking sheets and arbitrarily picks a figure of $10 \mu\text{m}$ as an allowed tolerance value resulting from the shaping processes for light blocking sheets. However, Ye has not presented any information or analysis to show that this is a standardized tolerance value. In contrast, I noticed that Jiang previously obtained the “measured value of diameters” of each outer layer exactly same as its design value (i.e. $866 \mu\text{m}$), as per Para 21 of Jiang affidavit.
- c. As discussed in my previous report dated 18 April 2023, with regard to Φ_{min} not being constant at all reference points and that the '203 patent envisages only a uniform air layer with Φ_{min} being constant, I disagree with the Defendants. In my opinion, the Defendants are incorrectly fixating on only one of the figures of the '203 patent (Fig. 2A) and ignoring the other figures. First and foremost, the claims or the specification or drawings of the '203 patent do not suggest that the air layer should be uniform through the light blocking sheet as is being wrongly argued by the Defendants in Para 6.6, 8.3.1.9, 8.3.1.10 of Def. 1 and Def. 2's reply to interim injunction application, Para 24 Jiang affidavit, Para 8.6(vi), Para 8.6(ix) and Para 8.6(xii) of Written Statement and Para 21-23 of Ye affidavit. Instead, the specification and claims define Φ_{min} as “a minimum

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diameter of the substrate opening” which is broad enough to encompass both a constant and a variable diameter of the substrate opening. This is also supported by Figs. 2C, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 and 14 (all reproduced on pages 17-21 of my previous report dated 18 April 2023), all showing the diameters of the substrate opening varying along the depth of the light blocking sheet and all being conveniently ignored by the Defendants.

- d. I re-emphasize that in so far as the value of Φ_{min} changing for every reference point on the circumference of the light blocking sheet is concerned, I disagree with the Defendants here as well since the phrase “*a minimum diameter of the substrate opening*” is broad enough to encompass a variable diameter of the substrate opening. As long as Φ_{min} in the Defendants’ products at even one reference point on the circumference falls within the claimed range ($2.0 \mu\text{m} < (\Phi_{\text{min}} - \Phi_1)/2 < 200 \mu\text{m}$ or $2.0 \mu\text{m} < (\Phi_{\text{min}} - \Phi_2)/2 < 200 \mu\text{m}$), the concerned light blocking sheet will be seen as meeting the requirement of the claims. In this regard, I rely on figures of ’203 patent (Fig. 2C, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 and 14) on pages 17-21 of my previous report dated 18 April 2023 to show that the phrase “*a minimum diameter of the substrate opening*” is broad enough to encompass all variations.
- e. In the same context, I observe that Ye also relies upon Fig. 2C (below) of the ’203 patent and accepts that “*The features relating to the light blocking sheet, depicted in claims 1, 8, and 11 have shown in figure 2C of the IN’203 Patent, reproduced below.*” (page 11 of Documents filed by Def. 1 and Def. 2 on 20 March 2023).

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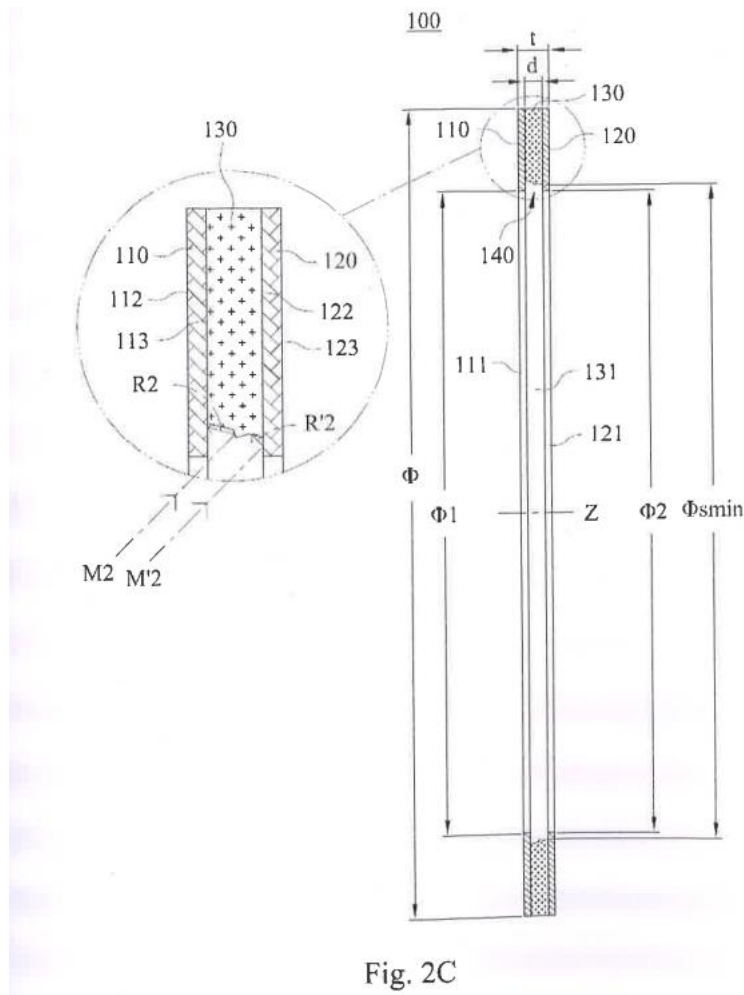
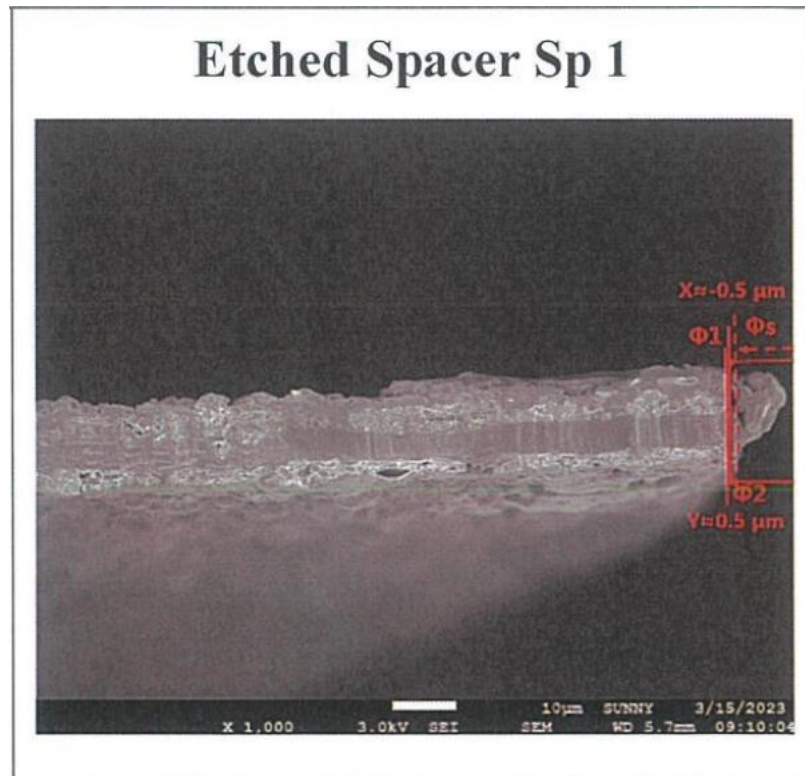


Fig. 2C

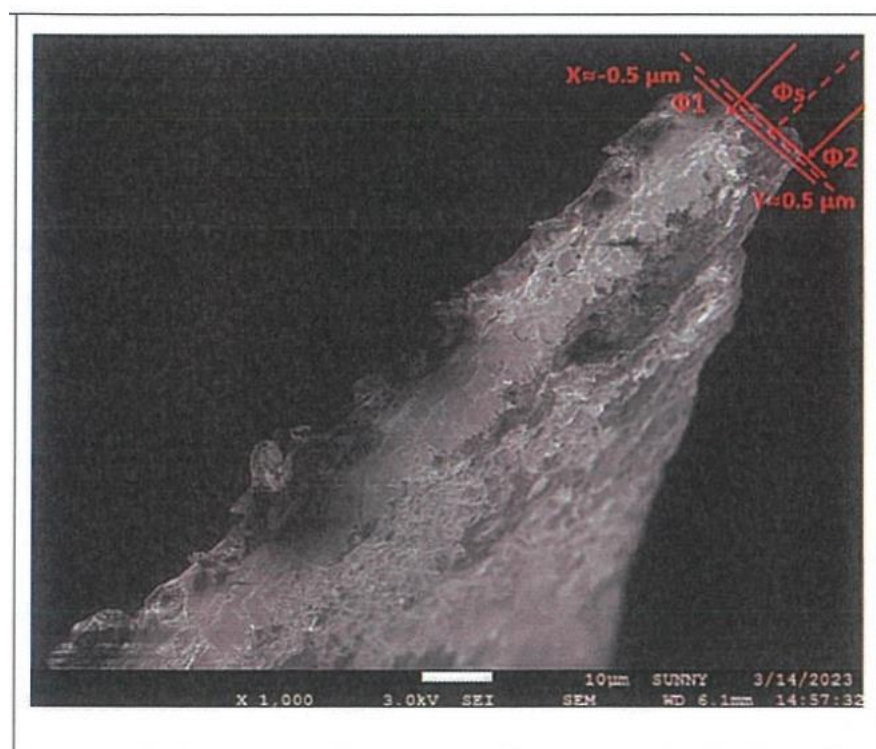
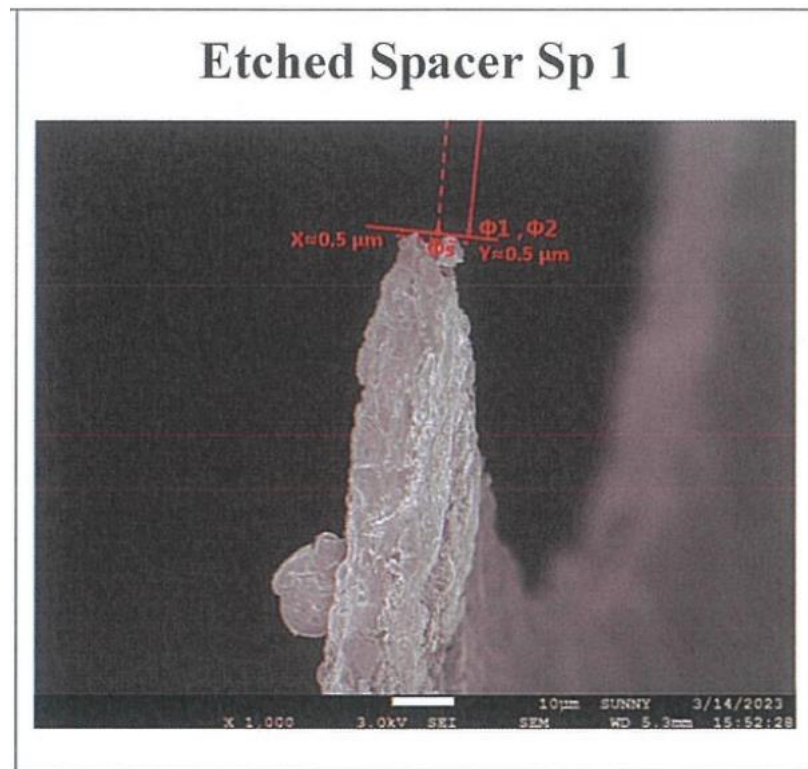
- f. With regard to the non-infringement analysis in the Ye affidavit, I also have serious concerns about its content, measurements performed, calculations, images and conclusion. My concerns regarding the Ye affidavit are summarized below:
- i. Reading the Ye affidavit tells me that Ye attempted to cover up the mistakes Jiang made during his analysis and in his report. However, some contradictions and mistakes of the Jiang affidavit are repeated in the Ye affidavit.
 - ii. I observe that Ye has submitted a completely different set of images than what was submitted by Jiang in his affidavit. As I said, it is possible that Ye attempted to cover up the problems and gaps in the analysis highlighted by Largan and reconfirmed by me as mentioned in my previous report dated 18 April 2023.

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iii. I observe that, similar to Jiang, Ye also employed a manual cutting method for obtaining the cross-section of the accused light blocking sheets. As I explained earlier in my report dated 18 April 2023, manual cutting of miniaturized components has short-comings and is not at all reliable for taking measurements for the purpose of infringement analysis. Refer to the images below from Pages 19, 22 and 25 of the Documents filed by Def. 1 and Def. 2 on 20 March 2023 (Ye affidavit).



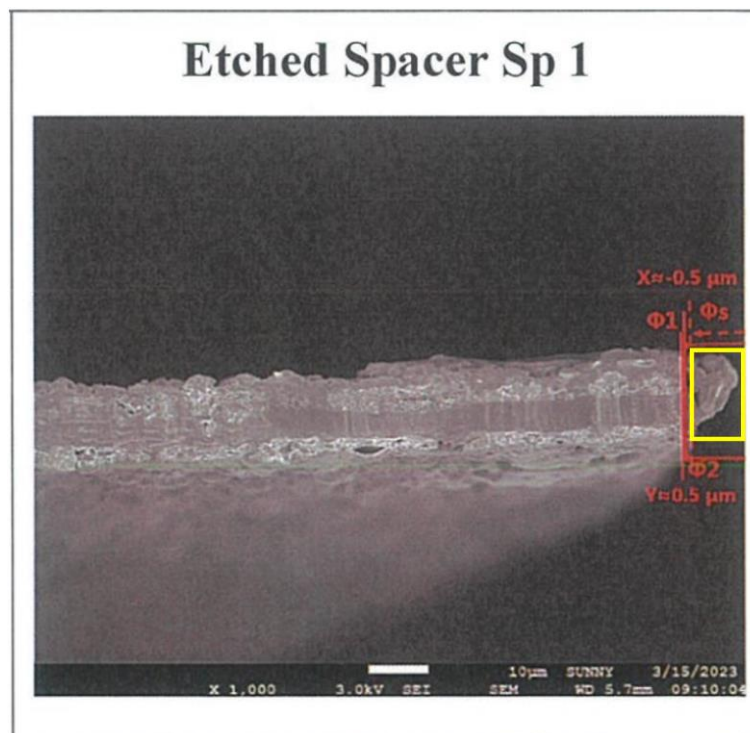
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- iv. One can see in the above images that the layer boundaries are distorted and appear roughened, which occurs when a poor cutting of the cross-section is performed. Such images produced from poorly cut light blocking sheets are not good candidates for any reliable measurement analysis. It is well understood that the cutting method for cross sections will significantly

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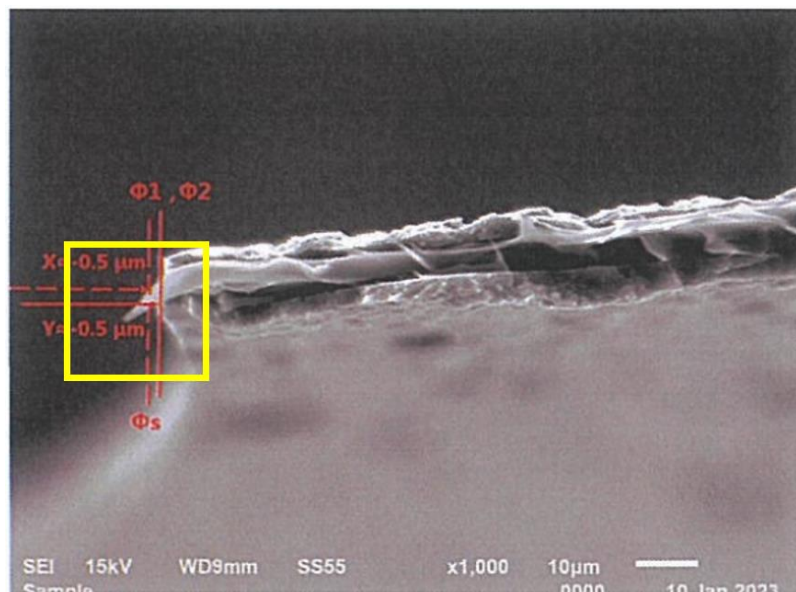
impact the clarity of the light blocking sheet structure as these sheets are rather fragile and miniature in size. As such, improper handling may remove the evidence of the infringing feature (such as an air layer) and may render inaccurate or incorrect images, which will lead to unreliable, incorrect and non-precise measurements. The final cross section image can be greatly distorted or blocked by plastic flash/undetached residues resulting from improper cutting. For example, see the image below (from Para 21 of the Ye affidavit pertaining to P1-P2 light blocking sheet or Sp1 of Moto G31), where a big chunk of residue from the outer layer after cutting (within yellow box) can be seen. That this is an undetached residue is clear from the fact that Ye himself has not considered this residue (yellow box) for any measurements and has put all the measuring points outside the yellow box i.e. away from the undetached residue. More importantly, due to the residue caused by the poor cutting but ignored by Ye, he appears to randomly choose and decide the measurement points for $\Phi 1$ and Φs (and the point of measurement is nowhere close to any boundary).



- v. Similarly, the image below (from page 33 of the Documents filed by Def. 1 and Def. 2 on 20 March 2023 (Ye affidavit)) shows the inner layer (white material, within yellow box) being pulled to the left side after cutting, and creating a protrusion as a result. Here also the pulled white material is

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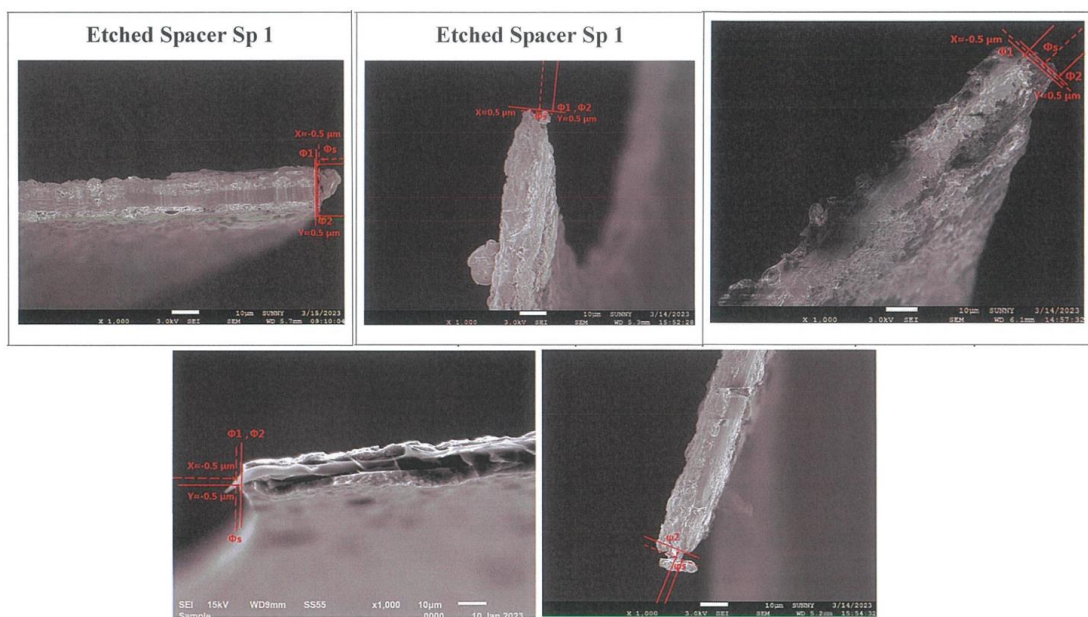
undesired residue resulting from a poor cutting method. That the same is undesired is evident from the fact that Ye himself has not considered this residue to be relevant for measurements and has put all of the measurement points beyond the pulled white material, especially when referring to the measurement points for Φ_s , which should have been on the extreme end of the pulled white material/protrusion. Additionally, the measurement points of Φ_1 and Φ_2 are also erroneous in this image since both Φ_1 and Φ_2 are represented by single line (indicating them to be equal) whereas one can clearly see from naked eye that the two outer layers cannot be represented by a single line as their edges are not vertically aligned. This image is also in contradiction to what will be achieved from chemical etching since the inner substrate layer can be seen as protruding or being pulled out. As per Ye (and Jiang), chemical etching will result in faster corrosion of inner substrate layer which will never result in a protrusion. However, this image shows a protruding inner substrate layer which, therefore, evidently has resulted from poor cutting.



- vi. Another stark observation that I make in the Ye affidavit is that the images presented by him do not show a consistent view of the captured light blocking sheets. The most appropriate view for the kind of analysis and measurements that are required in this matter is a front view as has been presented by Largan in its images. Using a correct view is extremely crucial to obtaining accurate measurements since the measurements are made using images and not actual

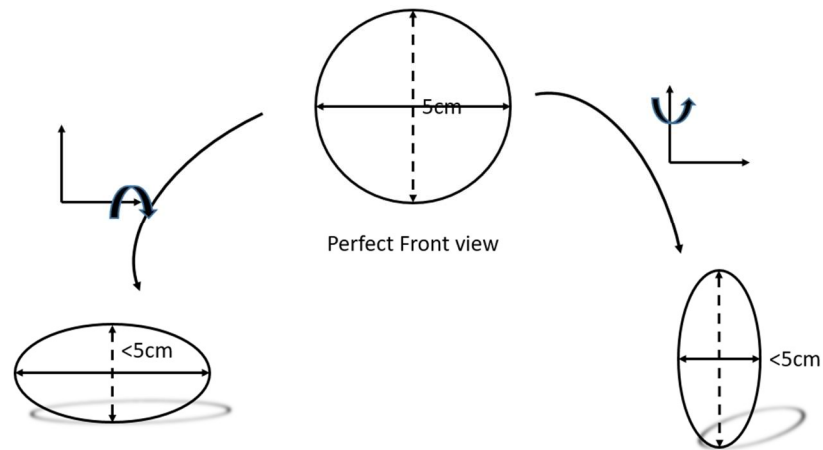
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products. For example, see the following images (Pages 19, 22, 25 and 33 of the Documents filed by Def. 1 and Def. 2 on 20 March 2023 (Ye affidavit)) obtained from the spacers of Moto G31, Moto G60 and Motorola Edge 30 Pro. Each image has been taken from a different angle/view and clearly highlight the inconsistency. I want to emphasize that Ye has given near orthogonal views for at least some images (top left, bottom left), although not perfectly orthogonal. I wonder why Ye did not produce similar views for other images as well. All images in perfect orthogonal view would have been ideal for conducting measurements.

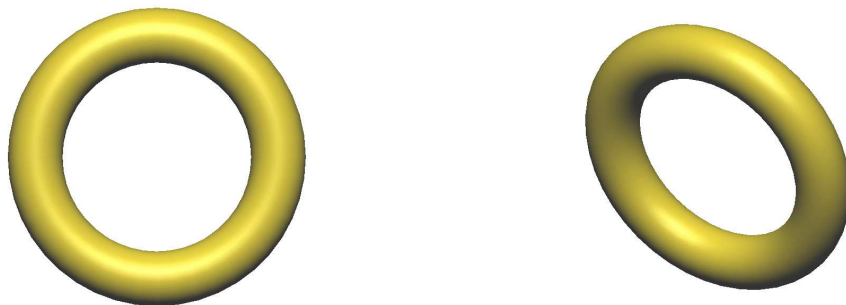


- vii. With regard to the accuracy of the measurement, a correct view plays an extremely crucial role since the measurements, in this case, have been performed on images instead of actual products. See the images below of a circle of diameter 5 cm. In a perfect front view, one can easily and accurately measure the actual diameter i.e. 5 cm. Whereas, in a perspective view of the same circle as captured in the second image, the diameter appears much smaller due to the tilt/angle.

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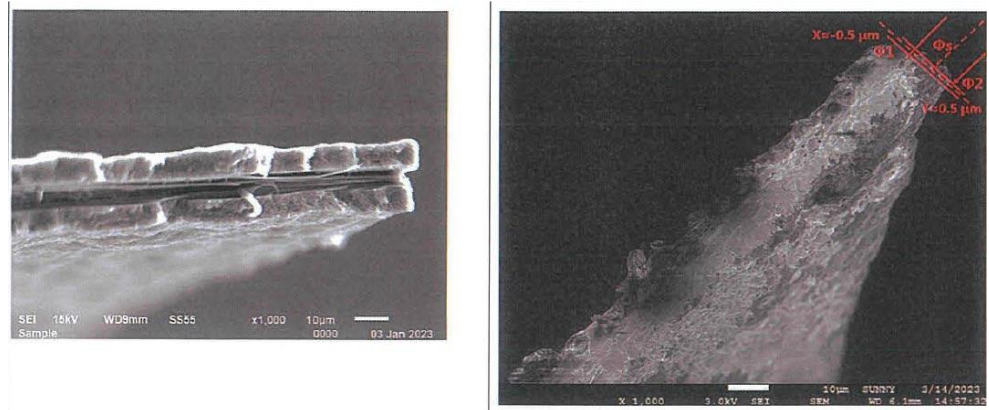
viii. The difference between a front/orthogonal view and a perspective view becomes clear from the comparison below, where a ring can be seen in an orthogonal view (bottom left below) and a perspective view (bottom right below). Measurements of the same ring when taken from the two different images will differ between the two views.



ix. Another critical discrepancy that I observe in the Ye affidavit is with regard to Ye's use of *different* settings (e.g. voltages and view of capturing images) for the etched and non-etched spacer supposedly for the same device. For instance, the images for non-etched spacers are captured at a voltage of 15kV whereas the images for etched spacers are captured at voltage of 3kV (see below images obtained from Para 23 of the Ye affidavit). Images taken with 15kV (as done for non-etched spacer) result in better sharpness and clarity of the captured light blocking sheet. Additionally, the view of the captured light blocking sheet is different between the two. It is unclear to me as to why Ye did not capture the images for the etched spacer at the same settings (e.g., voltages and view angle) which would have resulted in better clarity and

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sharpness. The images submitted as of now have very poor clarity with no demarcation of outer layer or inner substrate layer etc. The knowledge, infrastructure and capability for obtaining high resolution images was certainly at the disposal of Ye, (e.g. see the images of non-etched spacers), yet Ye did not generate high resolution images for the etched spacers, which are most relevant (as they are impugned) for determination of infringement.



- x. I notice that non-etched images on pages 19 (for Moto G31), 22 (for Moto G60) and 25 (for Motorola Edge 30 Pro) were all captured on 3 January 2023 and the etched images on these aforementioned pages were all captured 2 months later i.e. on 14-15 March 2023. In this regard, I wish to point out that Ye states that the impugned spacers (Sp1 of Moto G31 and G60 and Sp2 of Motorola Edge 30 Pro) are etched. It is understandable that Ye would be able to cut and capture images for etched spacers (Sp1 and Sp2 as above) installed in the corresponding devices. What I am unable to understand is how was Ye able to cut and capture non-etched images for etched Sp1 (Moto G31 and Moto 60) and Sp2 (Motorola Edge 30 Pro). The impugned devices only had etched Sp1 (Moto G31 and Moto 60) and Sp2 (Motorola Edge 30 Pro) and since there is nothing like non-etched Sp1 and Sp2 in the impugned devices, then how have the non-etched images been produced is my concern. Obtaining non-etched images of Sp1 (Moto G31 and Moto 60) and Sp2 (Motorola Edge 30 Pro) is possible only if the images are captured prior to their etching i.e. prior to installation in devices. This in turn indicates that the images submitted by Ye are not of spacers installed in the devices but are of some other spacers. This also correlates with Jiang and Ye's statement "*Subsequently, we manually cut open one or more cross-sections on each light-blocking sheets....*" (Para 12 of Ye affidavit) where they do not state

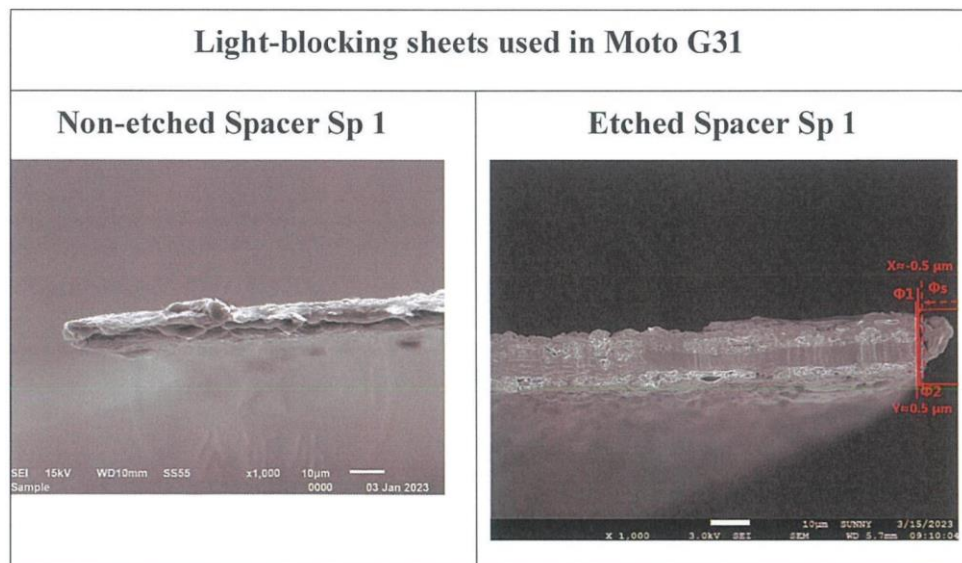
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any details about the devices, their tear-down and extraction of camera modules.

- xi. Besides the above general observations on the Ye affidavit, I have additional observations on his device specific analysis which I will present below.

Moto G31

- xii. In para 21 of the Ye affidavit (Page 25 of the Written Statement), there are two images provided of light blocking sheets used in Moto G31. As per Ye, one image is of Sp1 taken before etching and the second image is of the same spacer Sp1 after etching. I would like to reiterate my concern here about the source of the image showing the Sp1 spacer before etching. For the reasons as I explained above, these images cannot be compared as in all likelihood they do not correspond to the same light blocking sheet of the same device since once an etched light blocking sheet is installed in a device the etching cannot be reversed for the purpose of taking an image.

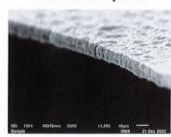
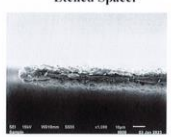


- xiii. I reiterate my concern on the poor resolution chosen for capturing the image for Sp1 (after etching). As I explained above, 15 kV was used to capture the image of Sp1 before etching which is sharper and clearer as compared to the image of Sp1 after etching, which is captured using 3 kV. There is no quarrel that the relevant spacer for infringement analysis is the etched spacer Sp1 which has been accused by Largan. Yet, Ye chose to submit an image with extremely deteriorated image quality for such a crucial examination and much better quality for the non-relevant non-etched spacer. Due to the

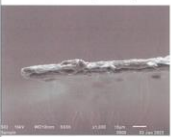
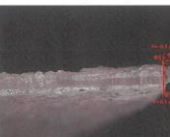
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settings Ye used for capturing the image for the etched spacer 1 (on the right side above), the image clarity is so bad that one cannot even clearly distinguish between the different layers of the captured light blocking sheet.

xiv. I reiterate that the images for Sp1 for Moto G31 submitted in Para 21 of the Ye affidavit (Page 25 of Written Statement) are different from the images submitted by Jiang for this device i.e. Moto G31. It is clear that Ye performed his own tests and therefore obtained his own images which are different from Jiang's images. I also note that in Jiang's affidavit that 15 kV was used to capture images of both a non-etched spacer and an etched spacer. In Ye's affidavit, however, 15 kV was only used to capture the image of the non-etched spacer (but not etched spacer) without any explanation. Also, in the grid below the images (see below), Ye presents "designed" inner diameter ($\Phi 1$ and $\Phi 2$) and "designed" outer diameter of Sp1, Sp2, Sp3 and Sp4, values of which are identical to those presented by Jiang (on page 17 of the Jiang affidavit). If the images presented by the two experts are different, it is highly unlikely that their corresponding dimensions are identical (out to 3 decimal places) for all dimensions. This again emphasizes that such data (which is the same in both affidavits) do not correspond to any actual product and instead represent "designed" (theoretical or intended) data, which is irrelevant for infringement analysis.

Light-blocking sheets used in Moto G31 and Moto G60				
Non-etched Spacer		Etched Spacer		
				
Spacer:	Sp 1(703) Etched	Sp 2(704) Non-etched	Sp 3(705) Non-etched	Sp 4(706) Etched
Designed Inner diameter ($\Phi 1$ and $\Phi 2$) (mm)	0.866	1.52	2.08	2.96
Designed Outer diameter (mm)	4.3	4.5	4.7	5
Thickness (mm)	0.018	0.016	0.016	0.016
Vertical View (Design Drawing)				

Para 21 of Jiang Affidavit

Light-blocking sheets used in Moto G31				
Non-etched Spacer Sp 1		Etched Spacer Sp 1		
				
Spacer:	Sp 1(703) Etched	Sp 2(704) Non-etched	Sp 3(705) Non-etched	Sp 4(706) Etched
Designed Inner diameter ($\Phi 1$ and $\Phi 2$) (mm)	0.866	1.52	2.08	2.96
Designed Outer diameter (mm)	4.3	4.5	4.7	5
Thickness (mm)	0.018	0.016	0.016	0.016
Vertical View (Design Drawing)				

Para 21 of Ye Affidavit

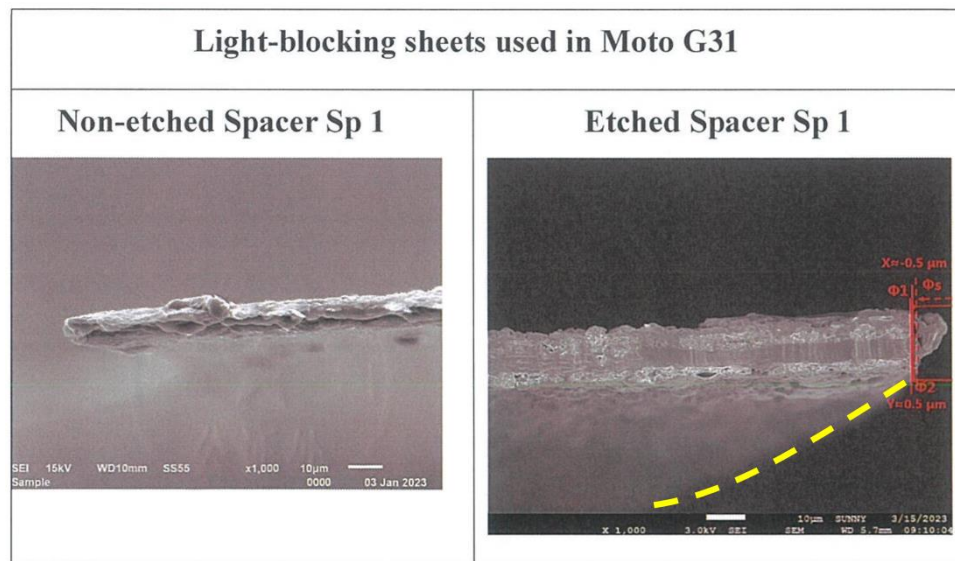
xv. From my reading of the Ye affidavit, I can confidently say that Ye has not presented any actual measurement for $\Phi 1$, $\Phi 2$ and Φ_{smin} for Moto G31.

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Instead, Ye has only given the “measured” value for $(\Phi_{\text{min}} - \Phi_1)/2$ and $(\Phi_{\text{min}} - \Phi_2)/2$.

- xvi. Be that as it may, just like Jiang, Ye also concludes that the inner substrate layer in Sp1 of Moto G31 is protruding ($(\Phi_{\text{min}} - \Phi_1)/2$ and $(\Phi_{\text{min}} - \Phi_2)/2$ are stated to be $-0.5 \mu\text{m}$) which contradicts his statement that the inner substrate layer would have air gaps due to faster etching of the inner substrate layer (para 19 of the Ye affidavit). Moreover, Jiang had concluded that $(\Phi_{\text{min}} - \Phi_1)/2$ and $(\Phi_{\text{min}} - \Phi_2)/2$ would be either 0 or $-0.5 \mu\text{m}$, meaning that the inner substrate layer would either be flushed with outer layers or protruded with respect to outer layers. Ye’s findings are different from Jiang as Ye does not conclude that $(\Phi_{\text{min}} - \Phi_1)/2$ and $(\Phi_{\text{min}} - \Phi_2)/2$ would be 0 i.e. inner substrate layer is flushed. It is surprising for me that two different experts from the same company are coming to different conclusions about the same spacer of the same device.
- xvii. I have another serious concern about the images submitted in Para 21 of the Ye affidavit (Page 25 of Written Statement) for Sp1 of Moto G31. My concern is on the part of the cross-section present in the images, particularly whether the part shown in the images pertain to the inner diameter or outer diameter of the spacer. Please see Fig. 2C of the ’203 patent (reproduced below) to help clarify my concern. In the below figure, the relevant part of the cross-section is encircled in green and pertains to inner diameter whereas the part of the cross-section encircled in red is irrelevant as it pertains to outer diameter.

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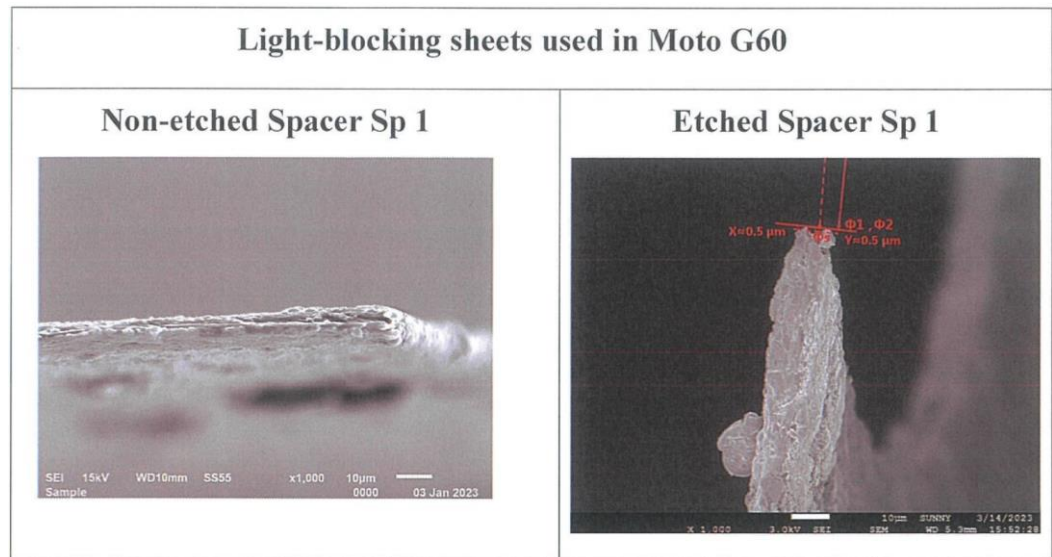


- xix. I reiterate my observations (mentioned above) regarding poor cutting methodology, lack of sharpness and clarity in the etched spacer image, inconsistency in the view and the part of the cross-section presented in the images, and the time gap between the capturing of the two images.
- xx. Given my above observations, it is clear that Ye's and Jiang's data, images, analysis and findings with respect to Sp1 of Moto G31 cannot be relied upon at all.

Moto G60

- xxi. In para 22 of the Ye affidavit (Page 26 of the Written Statement), there are two images provided of light blocking sheets used in Moto G60. As per Ye, one image is of Sp1 taken before etching and the second image is of the same spacer Sp1 after etching. I would like to reiterate my concern that the source of the image showing Sp1 spacer before etching is not clear to me. For the reasons I explained above, these images cannot be compared as in all likelihood they do not correspond to the same light blocking sheet of the same device since once an etched light blocking sheet is installed in a device the etching cannot be reversed for the purpose of taking an image.

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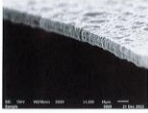
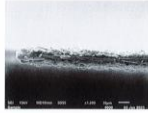
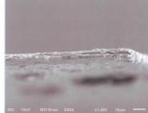


xxii. I reiterate my concern on the poor resolution chosen for capturing the image for Sp1 (after etching). As I explained above, 15 kV was used to capture the image of Sp1 before etching which is sharper and clearer as compared to the image of Sp1 after etching, which is captured using just 3 kV. There is no quarrel that the relevant spacer for infringement analysis is the etched spacer Sp1 which has been accused by Largan. Yet, Ye chose to submit an image with extremely deteriorated image quality for such crucial evidence and much better quality for the non-relevant non-etched spacer. Just like the images for Moto G31, due to the low resolution used for capturing the image for etched spacer 1 (on the right side above), the image clarity for Moto G60 is so bad that one cannot even clearly distinguish between the different layers of the captured light blocking sheet. Moreover, due to poor resolution, the measurement points chosen by Ye are also unclear. This raises questions on the accuracy of data furnished by Ye.

xxiii. I reiterate that the images for Sp1 for Moto G60 submitted in para 22 of the Ye affidavit (Page 26 of Written Statement) are different from the images submitted by Jiang for this device i.e. Moto G60. It appears that Ye performed his own tests and therefore obtained his own images which are different from Jiang's images. In the grid below the images (see below), Ye presents "designed" inner diameter ($\Phi 1$ and $\Phi 2$) and "designed" outer diameter of Sp1, Sp2, Sp3 and Sp4, values of which are identical to those presented by Jiang (in para 21 of Jiang affidavit). If the images presented by the two experts are different, it is highly unlikely that their corresponding

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dimensions are identical (out to 3 decimal places) for all quantities. This again emphasizes that such data (which is same in both affidavits) does not correspond to any actual product and instead represents “designed” (theoretical or intended) data, which is irrelevant for infringement analysis.

Light-blocking sheets used in Moto G31 and Moto G60					Light-blocking sheets used in Moto G60				
Non-etched Spacer		Etched Spacer			Non-etched Spacer Sp 1		Etched Spacer Sp 1		
									
Spacer:	Sp 1(703) Etched	Sp 2(704) Non-etched	Sp 3(705) Non-etched	Sp 4(706) Etched	Spacer:	Sp 1(703) Etched	Sp 2(704) Non-etched	Sp 3(705) Non-etched	Sp 4(706) Etched
Designed Inner diameter (Φ1 and Φ2) (mm)	0.866	1.52	2.08	2.96	Designed Inner diameter (Φ1 and Φ2) (mm)	0.866	1.52	2.08	2.96
Designed Outer diameter (mm)	4.3	4.5	4.7	5	Designed Outer diameter (mm)	4.3	4.5	4.7	5
Thickness (mm)	0.018	0.016	0.016	0.016	Thickness (mm)	0.018	0.016	0.016	0.016
Vertical View (Design Drawing)					Vertical View (Design Drawing)				

Para 21 of Jiang Affidavit

Para 22 of Ye Affidavit

- xxiv. From my reading of the Ye affidavit, I can confidently say that similar to Moto G60, Ye has not presented any actual measurement for $\Phi 1$, $\Phi 2$ and Φ_{min} . Instead, Ye has only given the “measured” value for $(\Phi_{\text{min}} - \Phi 1)/2$ and $(\Phi_{\text{min}} - \Phi 2)/2$. I already stated that the measured data cannot be obtained from designed data and instead can only be obtained from measurements taken from actual products.
- xxv. Here, for Moto G60, Ye concludes that the inner substrate layer in Sp1 of Moto G60 is recessed ($(\Phi_{\text{min}} - \Phi 1)/2$ and $(\Phi_{\text{min}} - \Phi 2)/2$ are stated to be $0.5 \mu\text{m}$). However, Jiang had concluded that $(\Phi_{\text{min}} - \Phi 1)/2$ and $(\Phi_{\text{min}} - \Phi 2)/2$ would be either 0 or $-0.5 \mu\text{m}$, meaning that the inner substrate layer would either be flushed with outer layers or protruded with respect to outer layers. Ye’s findings are different from Jiang as Ye does not conclude that $(\Phi_{\text{min}} - \Phi 1)/2$ and $(\Phi_{\text{min}} - \Phi 2)/2$ would be 0 or $-0.5 \mu\text{m}$. Ye’s findings (i.e. inner substrate is recessed) is in stark contrast with Jiang’s findings (i.e. inner substrate layer is flushed or protruded surface). Considering the two experts are not aligned and have different findings on the same device, reliability of data from both the experts comes into question.
- xxvi. For Moto G60 as well, I reiterate my observations (mentioned above) regarding poor cutting methodology, lack of sharpness and clarity in the

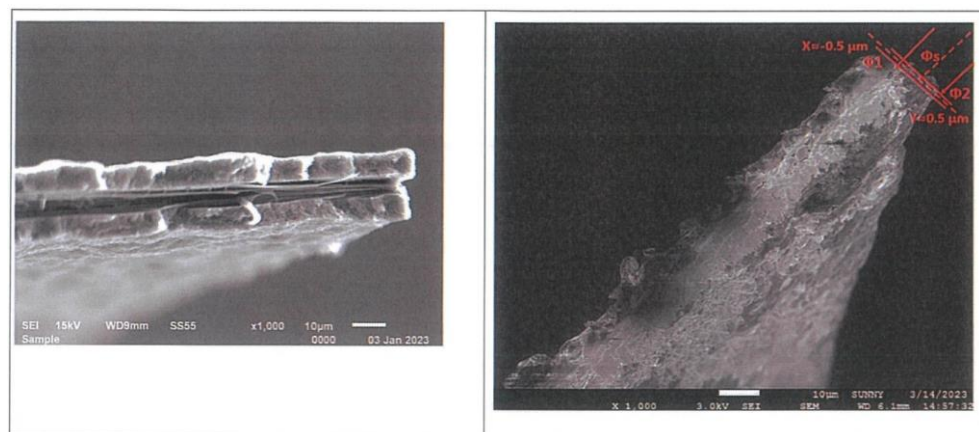
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etched spacer image, inconsistency in the view and the part of the cross-section presented in the images, and the time gap between the capturing of two images.

xxvii. Given my above observations, it is clear that Ye's and Jiang's data, images, analysis and findings with respect to Sp1 of Moto G60 cannot be relied upon at all.

Motorola Edge 30 Pro

xxviii. In para 23 of the Ye affidavit (Page 27 of the Written Statement), there are two images provided of light blocking sheets used in Motorola Edge 30 Pro. As per Ye, one image is of Sp2 taken before etching and the second image is of same spacer Sp2 after etching. I would like to reiterate my concern here about the source of the image showing Sp2 spacer before etching. For the reasons as I explained above, these images cannot be compared as in all likelihood they do not correspond to the same light blocking sheet of the same device since once an etched light blocking sheet is installed in a device the etching cannot be reversed for the purpose of taking an image.

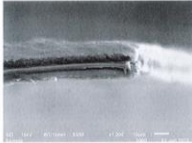
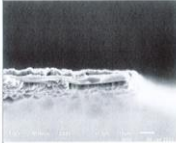


xxix. I reiterate my concern on the poor resolution chosen for capturing the image of Sp2 (after etching). As I explained above, 15 kV was used to capture the image of Sp2 before etching which is sharper and clearer as compared to image of Sp2 after etching, which is captured using just 3 kV. There is no quarrel that the relevant spacer for infringement analysis is the etched spacer Sp2 which has been accused by Largan. Yet, Ye chose to submit an image with extremely deteriorated image quality for such crucial evidence and an

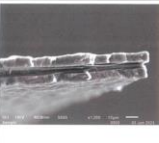
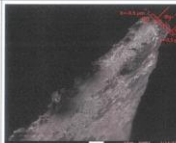
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image with much better quality for the non-relevant non-etched spacer. The low resolution has resulted in an image where the three layers cannot be distinguished easily. I also note that in Jiang's affidavit that 15 kV was used to capture an image of both a non-etched spacer and an etched spacer for Motorola Edge 30 Pro. In Ye's affidavit, however, 15 kV was only used to capture an image of a non-etched spacer (but not an etched spacer) without any explanation.

xxx. I reiterate that the images for Sp2 for Motorola Edge 30 Pro submitted on Page 25 of the Documents filed by Def. 1 and Def. 2 on 20 March 2023 (Ye affidavit) (Page 27 of Written Statement) are different from the images submitted by Jiang for this device i.e. Motorola Edge 30 Pro. It is clear that Ye performed his own tests and therefore obtained his own images which are different from Jiang's images. In the grid below the images (see below), Ye presents "designed" inner diameter ($\Phi 1$ and $\Phi 2$) and "designed" outer diameter of Sp1, Sp2, Sp3 and Sp4 and Sp5, values of which are identical to those presented by Jiang (on pages 20-21 of Jiang affidavit). If the images presented by the two experts are different, it is highly unlikely that their corresponding dimensions are identical (out to 3 decimal places) for all quantities. This again emphasizes that such data (which is the same in both affidavits) does not correspond to any actual product and instead represents "designed" (theoretical or intended) data, which is irrelevant for infringement analysis.

Light-blocking sheets used in Moto Edge 30 Pro					
Non-Etched Spacer			Etched Spacer		
					
Spacer	Sp 1(703) Etched	Sp 2 (704) Etched	Sp 3(705) Etched	Sp 4(706) Non-etched	Sp 5(707) Etched
Designed Inner diameter (mm)	2.33	1.3	1.73	2.53	4.13
Designed Outer diameter (mm)	6.1	4.88	4.88	6.4	6.5
Thickness (mm)	0.018	0.018	0.018	0.019	0.019
Vertical View (Design Drawing)					

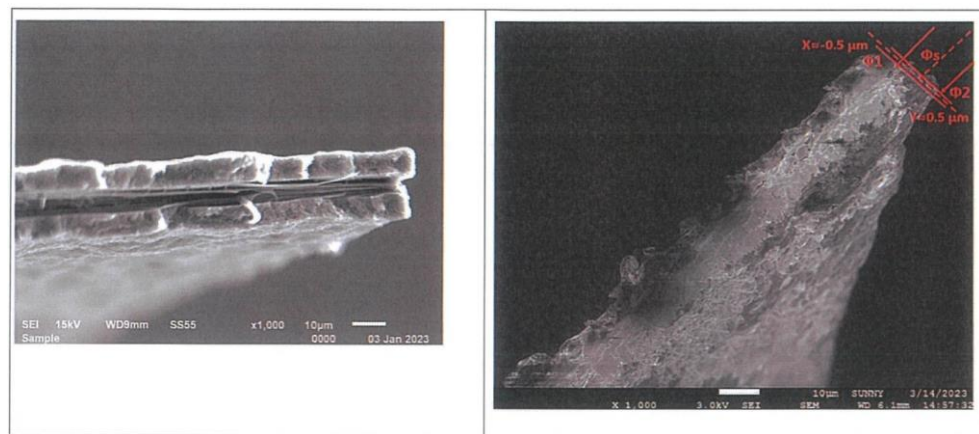
Para 23 of Jiang Affidavit

Light-blocking sheets used in Moto Edge 30 Pro					
Non-Etched Spacer Sp 2			Etched Spacer Sp 2		
					
Spacer	Sp 1(703) Etched	Sp 2 (704) Etched	Sp 3(705) Etched	Sp 4(706) Non-etched	Sp 5(707) Etched
Designed Inner diameter (mm)	2.33	1.3	1.73	2.53	4.13
Designed Outer diameter (mm)	6.1	4.88	4.88	6.4	6.5
Thickness (mm)	0.018	0.018	0.018	0.019	0.019
Vertical View (Design Drawing)					

Para 23 of Ye Affidavit

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- xxxi. From my reading of the Ye affidavit, I can confidently say that Ye has not presented any actual measurement for $\Phi 1$, $\Phi 2$ and Φ_{min} for this device as well like the other two devices. Instead, Ye has only given “measured” value for $(\Phi_{\text{min}} - \Phi 1)/2$ and $(\Phi_{\text{min}} - \Phi 2)/2$. Once again I say, measured data cannot be obtained from designed data and instead can only be obtained from measurements taken from actual products.
- xxxii. Be that as it may, from a review of the image of etched Sp2 in para 23 of the Ye affidavit (Page 27 of Written Statement), it is highly ambiguous as to which points are considered for measurements because the image quality is extremely poor. Further, in my opinion, the image presents an extremely inappropriate view for taking any measurements. As discussed above, a front view (as submitted by Largan) is the only view that can render accurate measurements. Moreover, from the image of etched Sp2 by Ye, it is unclear whether the image pertains to the irrelevant outer diameter part or the relevant inner diameter part. I reiterate that it will be a serious error if measurements are in any way taken from such an image pertaining to outer diameter, as seems to have been done by Ye. I also observe that a portion of the outer layer was omitted by Ye while marking the measurement points for the outer layer, without giving any explanation or reasoning. This again raises question on the rigor of Ye while testing the devices.



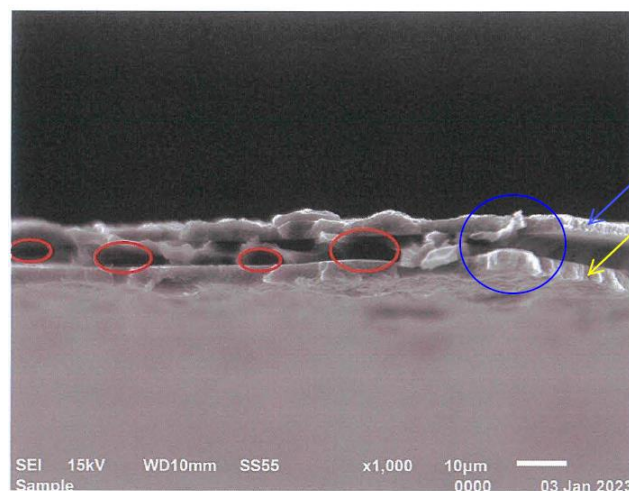
- xxxiii. Moreover, the calculation for $\Phi 1$ and $\Phi 2$ (in the table on Page 27 of Documents filed by Def. 1 and Def. 2 on 20 March 2023 (Ye affidavit); as reproduced below) does not match the SEM image (on the right; as shown above) shown for Moto Edge 30 Pro, as $\Phi 1$ and $\Phi 2$ are clearly different as

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indicated by measuring arrows yet $\Phi 1 / \Phi 2$ is given as ~ 1 in the table which only occurs when $\Phi 1$ is $\sim$ equal to $\Phi 2$.

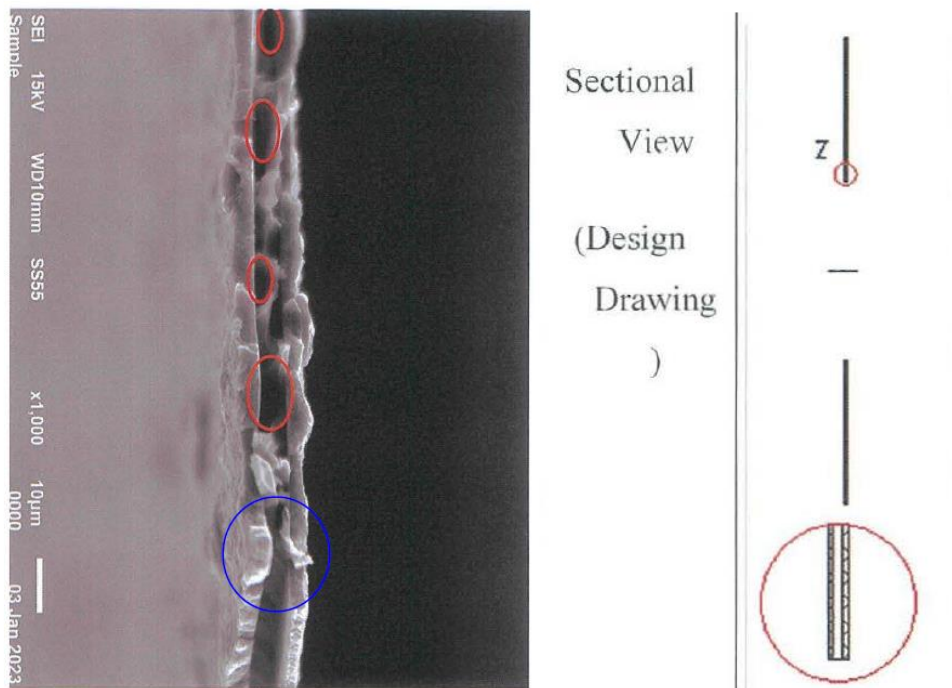
$X = (\Phi_{\text{smin}} - \Phi 1) / 2$ (in μm)	$Y = (\Phi_{\text{smin}} - \Phi 2) / 2$ (in μm)	$\Phi 1 / \Phi 2$
$\approx -0.5 \mu\text{m}$	$\approx 0.5 \mu\text{m}$	≈ 1

xxxiv. I also observe that Ye has submitted an image in para 25 of his affidavit related to a non-impugned spacer (Sp4) of Motorola Edge 30 Pro. Although the analysis of the non-impugned spacer is completely irrelevant in this case, I noticed another issue with this image. It seems to me that Ye has misconstrued the '203 patent or is attempting to create a false picture by saying that “.... *There is no uniform air layer which is close to the first opening and the second opening, as clearly seen in the following figure showing the cross-section of an etched spacer (Sp4) of the ultrawide lens of Moto Edge 30 Pro in a position far away from the inner perimeter thereof:*”. Below is the image presented in para 25 of Ye’s affidavit which clearly shows an air layer (circled in blue) as claimed the '203 patent, and such air layer is close to both the first opening of the first outer layer (indicated by the blue arrow) and the second opening of the second outer layer (indicated by the yellow arrow). Those air pockets circled in red by Ye are irrelevant to this case.



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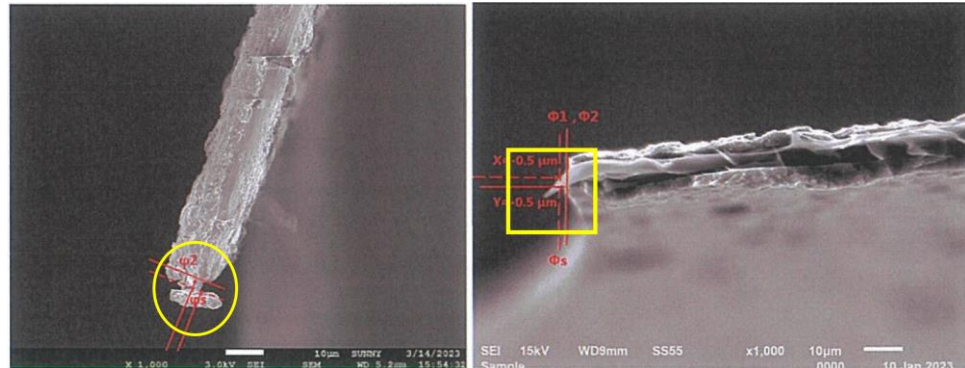
xxxv. This is clearer when comparing the image in para 25 of Ye's affidavit (on the left which is rotated 90 degrees, as shown below) and the "Sectional View" of "Design Drawing" provided in para 23 of Ye's affidavit (on the right) as shown below. As can be seen, according to Ye's own design drawing, what is circled in red in the right image is what should be considered as close to the first opening of the first outer layer and the second opening of the second outer layer (i.e., the air layer circled in blue in the left image). The air pockets circled in red by Ye in the left image are irrelevant.



xxxvi. I observe that there are two images on Page 33 of the Documents filed by Def. 1 and Def. 2 on 20 March 2023 (Ye affidavit), however, no devices or spacers have been identified for these images. And again, these two images are taken with a different power (i.e. 3kV v. 15kV) without any explanation. I have already mentioned my concerns about the right image (below) in the above paragraphs and will not repeat the same for sake of brevity. Regarding the left image (below), the image does not show an inner substrate layer as clearly discernible from the outer layers. It is also unclear as to how Ye selected measurement points for $\Phi 1$, $\Phi 2$ and Φ_{smn} when the layers are not discernible. Most importantly, there is a prominent structure (encircled in

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yellow) which seems to have been completely ignored by Ye at the time of selecting measurement points for $\Phi 1$, $\Phi 2$ and Φ_{smin} . Indeed, Ye's approach to ignore the prominent structures of these two images and to mark measuring points without any logic makes me question the overall measurement approach and understanding of Ye as an expert.



xxxvii. For Motorola Edge 30 Pro as well, I reiterate my observations (mentioned above) regarding poor cutting methodology, lack of sharpness and clarity in the etched spacer image, inconsistency in the view and the part of the cross-section presented in the images, and the time gap between the capturing of two images.

xxxviii. Given my above observations, it is clear that Ye's and Jiang's data, images, analysis and findings with respect to Sp2 of Moto Edge 30 Pro cannot be relied upon at all.

g. It is reiterated that Jiang and Ye, who according to the Defendants are technical experts, have not made any negative observations about the clarity or quality of images or the measurements being inaccurate or ambiguous in the selection of the measurement points. Such comments on the accuracy of the measurement or clarity have only been made by the Defendants. I have reviewed Largan's images showing their measurements and I agree with the selection of measurement points used for the analysis by Largan. I also directed Largan to perform fresh confirmatory tests under my guidance and supervision and share the results from the fresh confirmatory tests with me. The methodology and data pertaining to the confirmatory tests will be presented in the paragraphs below. The results and images yielded from the confirmatory tests reconfirm that the dimensions of the accused light blocking sheet falls within the claimed ranges of the '203 patent and I agree with the measurement points selected by Largan in the images yielded from the confirmatory tests.

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21. It is clear from the above that the Defendants' analysis for Moto G31, Moto G60 and Moto Edge 30 Pro cannot be relied upon for non-infringement either due to inconsistencies or due to absence of crucial information.
22. Most importantly, I observe that neither the Defendants nor Jiang or Ye have raised any questions or doubts on the testing protocol adopted by Largan, the measurements obtained during the testing of the devices or the analysis. That the Defendants have failed to show non-infringement can be concluded from the following:
- a. No comments raised on Largan's testing, analysis and findings directly affirms the same,
 - b. Testing protocol (based on the manual cutting of a cross-section of a light blocking sheet) adopted by Defendants' experts Jiang and Ye being flawed,
 - c. Contradictions between Defendants'/their experts' statements on chemical etching and images/data of etched surface,
 - d. Failure of Defendants/their experts to present any actual measurements of the light blocking sheet, such as Jiang's failure to provide measurement points for $\Phi 1$, $\Phi 2$ and Φ_{min} , and Ye's failure to provide measurement for $\Phi 1$ and $\Phi 2$,
 - e. Reliance only on theoretical "design" dimensions,
 - f. Failure to analyze and present any data for the accused Sp2 or P2-P3 light blocking sheet of Motorola Edge 30 Pro by Jiang,
 - g. Failure to identify the relevant spacers and devices for the figures/images presented for Moto G31, Moto G60 and Motorola Edge 30 Pro by Jiang,
 - h. Providing unclear images with lower resolution for impugned etched spacers by using different settings (e.g. 3kV for etched spacers vs using 15kV for non-etched spacers by Ye),
 - i. Use of poor cutting methodology by Ye and his imprecise/illogical selection of measurement points,
 - j. Selection of incorrect parts (pertaining to outer diameter) of the cross-section used for measurements by Ye or it is unclear as to whether the part of cross-section shown in the image pertains to outer diameter or inner diameter,
 - k. Unreliable data: Source of spacers (non-etched or etched) has not been identified by Ye. Strangely, providing non-etched images of etched spacers indicating that either the images are taken from different light blocking sheet and devices or Ye has failed to furnish all relevant details of the devices, sheets, methodology used during the testing and production of images,

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1. Contradiction between Ye and Jiang's data and conclusions.

23. In view of the above, I am able to conclude that Defendants'/their expert's arguments of non-infringement have no merit and are flawed and unreliable.

V. CONFIRMATORY TEST

24. As an independent expert, I wanted Largan to perform a fresh confirmatory test under my supervision/guidance so that I could reconfirm the testing protocol and results obtained therefrom. Thereafter, Largan performed a fresh test under my supervision and guidance for Moto G31 and obtained results showing that all elements of the '203 patent claims are implemented in the Moto G31 model.

25. I discussed the testing methodology with Largan's lens analysis team in detail in early May 2023 and a sequence of steps were finalized to perform the testing by Largan's lens analysis team. The methodology will be discussed in the paragraphs below.

26. Moto G31 was randomly picked out of the three accused Motorola devices for testing. I was informed that Largan had procured a new Moto G31 device from an Indian retailer through their Indian counsels, Saikrishna & Associates. The photographs of the shipped package, contents of the box and the sticker on the box are reproduced below.

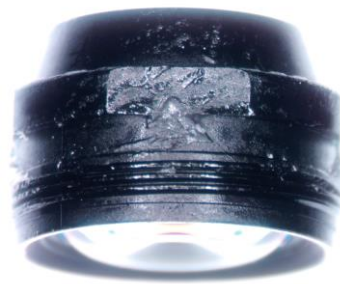


27. First, the ultra-wide lens module (top-most) of Moto G31 was retrieved through device tear-down, as can be seen in the below images.

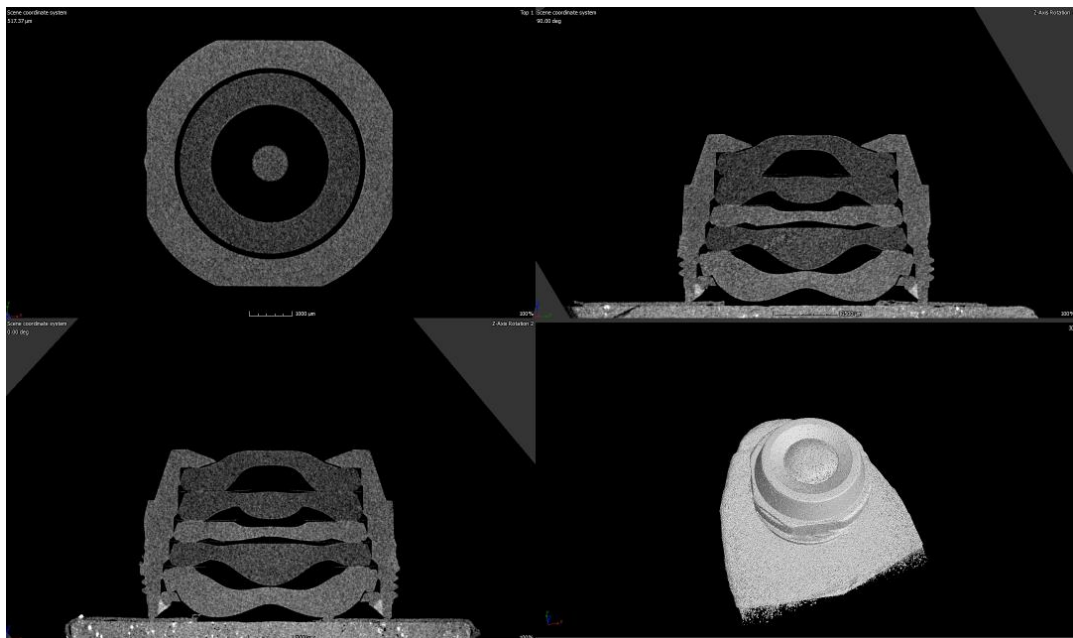
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28. Next, the lens assembly was retrieved from the ultra-wide lens module of Moto G31, as shown in the images below.



29. As a third step, Micro-CT was used to scan and obtain the following structural images of the lens assembly of the ultra-wide lens module of the Moto G31.



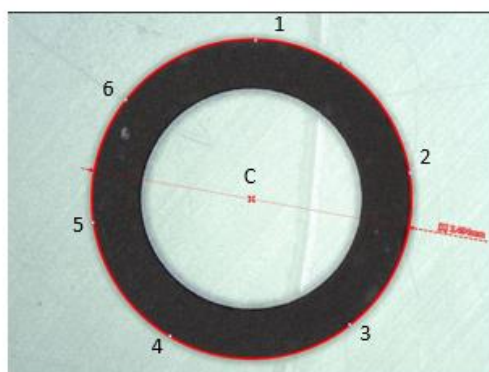
30. Next, the relevant P1-P2 light blocking sheet (spacer Sp1) of lens assembly of ultra-wide lens module of Moto G31 was extracted. The inner and outer diameters of the P1-P2 light blocking sheet (spacer Sp1) was measured using the Toolmaker

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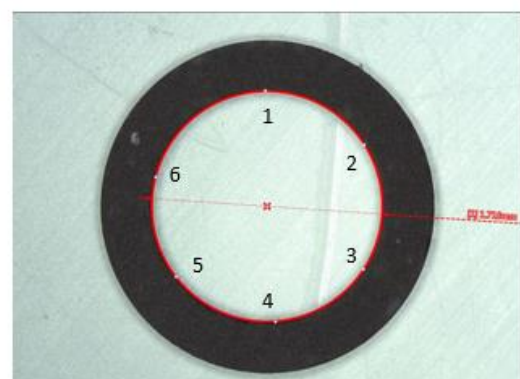
Microscope. The following sequence of steps were followed to measure the inner and outer diameters of the P1-P2 light blocking sheet:

- a. For the measurement of the outer diameter:
 - i. The light blocking sheet was put onto the measurement platform of the toolmaker microscope (Nikon MM-800 series),
 - ii. Then, several outer points were marked on the outer boundary as shown below in the left image, the marked points (1-6 white dots) were fit to a circle using edge recognition which was performed by the software bundled with Nikon MM-800,
 - iii. The outer diameter was then calculated according to the fit outer circle,
- b. For the measurement of the inner diameter:
 - i. The light blocking sheet was put onto the measurement platform of the toolmaker microscope (Nikon MM-800 series),
 - ii. Then, several points were marked on the inner boundary as shown below on the right image, the marked points (1-6 white dots) were fit to a circle using edge recognition which was performed by the software bundled with Nikon MM-800,
 - iii. The inner diameter was then calculated according to the fit inner circle,
 - iv. The center of the light blocking sheet was then also determined using the Nikon bundled measuring software, shown below the letter C as “x” (below left image),

31. Exemplary images (not pertaining to the P1-P2 light blocking sheet) illustrating the measurement technique are reproduced below:



For outer diameter



For inner diameter

32. The data pertaining to inner and outer diameters of the 4 light blocking sheets of the lens assembly of the ultra-wide lens module of the Moto G31 are presented below:

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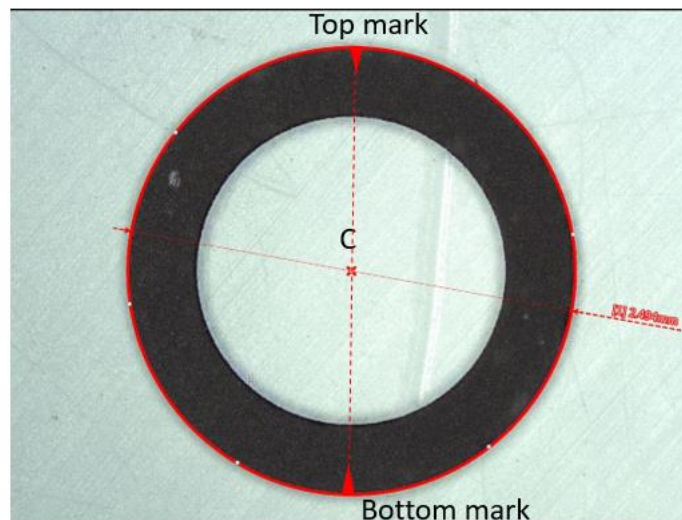
ITEM	Inner diameter (mm)	Outer diameter (mm)
P1-P2 light blocking sheet	0.874	4.294
P2-P3 light blocking sheet	1.523	4.480
P3-P4 light blocking sheet	2.079	4.689
P4-P5 light blocking sheet	2.964	4.981

33. After measuring the outer and inner diameter dimensions, the markings for the cross-section along the diameter are placed on the P1-P2 light blocking sheet (spacer Sp1) of Moto G31. The following sequence of steps were followed to place the marking for cross-section along the diameter:

- a. Light blocking sheet was attached with a more rigid support sheet on one side of the light blocking sheet (with adhesive),
- b. One end (such as the Top mark shown on the image below) was marked on the outer boundary of the light blocking sheet.
- c. Using the software, the other end of the diameter (i.e., using the Top mark and the center of the circle for identification of the other end) was determined,
- d. The other end (such as the Bottom mark shown on the image below) on the outer boundary of the light blocking sheet was marked.

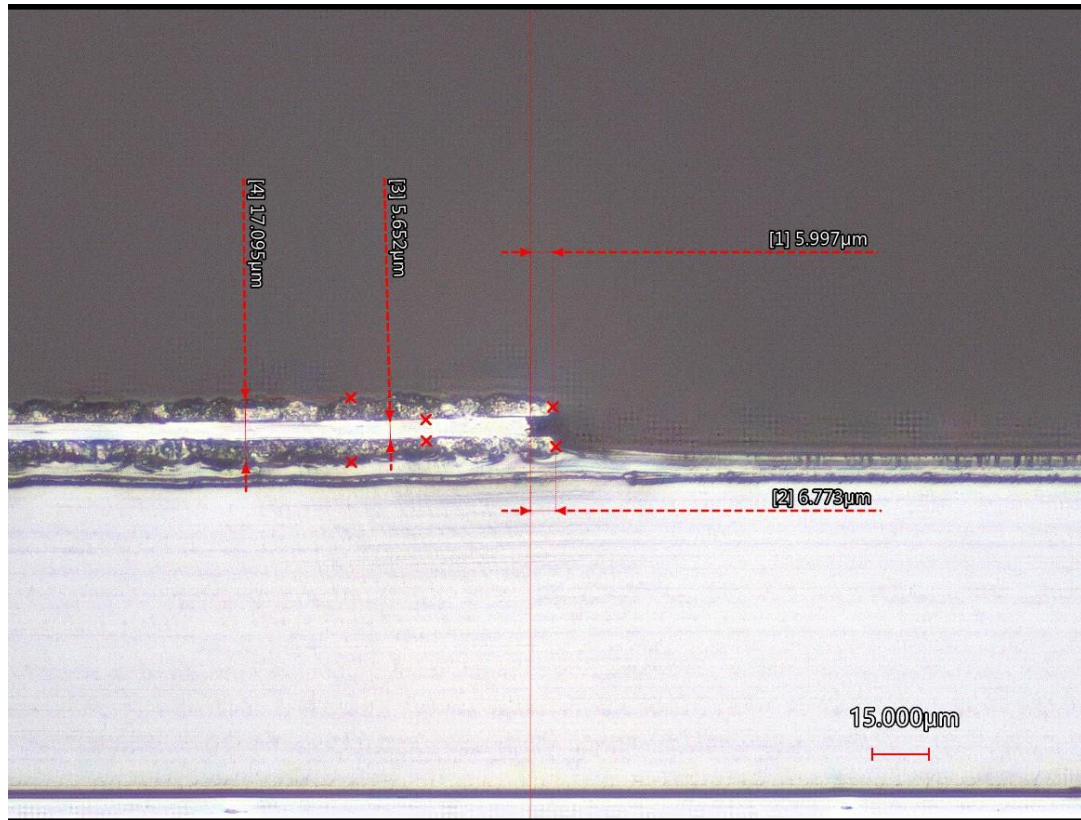
34. Exemplary image (not pertaining to the P1-P2 light blocking sheet) illustrating the placement of cross-section markings are reproduced below:

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35. After placing the cross-section markings, Largan's in-house customized Microtome, which I am informed as being similar to Leica HistoCore Biocut available in market, is used to obtain a cross-section. The marked light blocking sheet was transferred onto the cutting platform of Microtome. The cutting line of Microtome was aligned with the two marked ends and the light blocking sheet was held in place while the cross-section was cut.
36. Next, the obtained cross-section was analyzed using a 3D Surface Profiler (Keyence VK-X3000) and measurement markers were placed to measure the relevant parameters, as shown below. The distance between any two measurement markers is calculated through software, which counts pixel numbers and then converts the pixel number (by multiplying through an appropriate conversion factor) to actual distance between the two measurement markers.

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37. As shown in the above figure, I instructed Largan to identify the minimum point of the inner substrate layer (right-most point of inner substrate layer in the above image) and measure its depth with respect to the two outer openings (pertaining to $\Phi 1$ and $\Phi 2$). This is another routine way of determining the relevant parameters $(\Phi_{\text{min}} - \Phi 1)/2$ and $(\Phi_{\text{min}} - \Phi 2)/2$. The measurement data in the above image is captured in the below table.

Item	$(\Phi_{\text{min}} - \Phi 1)/2$ (μm)	$(\Phi_{\text{min}} - \Phi 2)/2$ (μm)	Thickness of the substrate layer, d (μm)	Thickness of the light blocking sheet, t (μm)
P1-P2 light blocking sheet (spacer Sp1)	5.997	6.773	5.652	17.095

38. By using the data in the above table, other relevant quantities are obtained as follows:

- $(\Phi_{\text{min}} - \Phi 1)/2 = 5.997 \mu\text{m}$ ([1] in above image),
- $(\Phi_{\text{min}} - \Phi 2)/2 = 6.773 \mu\text{m}$ ([2] in above image),
- Diameter of second opening ($\Phi 2$) = 0.874 mm or 874 μm ,

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- d. Diameter of first opening ($\Phi 1$) = $874 \mu\text{m} + (6.773 \mu\text{m} - 5.997 \mu\text{m}) * 2 = 875.55 \mu\text{m}$,
- e. Thickness of the substrate layer (d) = $5.652 \mu\text{m}$ ([3] in above image),
- f. Thickness of the light blocking sheet (t) = $17.095 \mu\text{m}$ ([4] in above image),
- g. Outer diameter of the light blocking sheet (Φ) = 4.294 mm ,
- h. $\Phi 1 / \Phi 2 = 1.0018$.

39. The following is clear from the above:

- a. $(\Phi_{\text{min}} - \Phi 1) / 2$ falls within the claimed range as $2 \mu\text{m} < 5.997 \mu\text{m} < 200 \mu\text{m}$,
- b. $(\Phi_{\text{min}} - \Phi 2) / 2$ falls within the claimed range as $2 \mu\text{m} < 6.773 \mu\text{m} < 200 \mu\text{m}$,
- c. $(\Phi 1 / \Phi 2)$ falls within the claimed range as $0.93 < 1.0018 < 1.07$.

Therefore, it is also clear that all the features of the independent claims 1, 8 and 11 are present in the Moto G31 model.

VI. VALIDITY OF THE '203 PATENT

40. The Defendants have relied upon several prior art D1-D6 to show that the invention of the '203 patent was known before its filing, making the patent invalid. In this context, I observe that the Defendants appear to admit to the novelty of the '203 invention since all prior art have only been used by the Defendants to show lack of inventiveness in the '203 invention and none for showing lack of novelty.

41. The Defendants have argued that the '203 patent lacks inventive step in view of combination of prior art D1, D4 and D5, in combination of D1, D2 and D4 and in combination of D1 and D6 with D2, D4 and/or D5. I have addressed the combination of D1, D4 and D5 and D1, D2 and D4 in my previous report dated 18 April 2023. I will address the combination of D1 and D6 with D2, D4 and/or D5 in the following paragraphs:

- a. From review of Fig. 2 of D6 (reproduced below), that the spacer ring of D6 is a single layered structure having a recess on its inner surface facing the center. As per the claim of '203 patent $\Phi 1$ is a diameter of opening formed by first outer layer, $\Phi 2$ is a diameter of opening formed by second outer layer and Φ_{min} pertains to a minimum diameter of the inner substrate layer. Considering D6 does not have first outer layer, second outer layer and inner substrate layer, it lacks $\Phi 1$, $\Phi 2$ and Φ_{min} as envisaged by the claim of '203 patent. Therefore, D6 cannot teach, among other things, the claimed ranges in the '203 patent.

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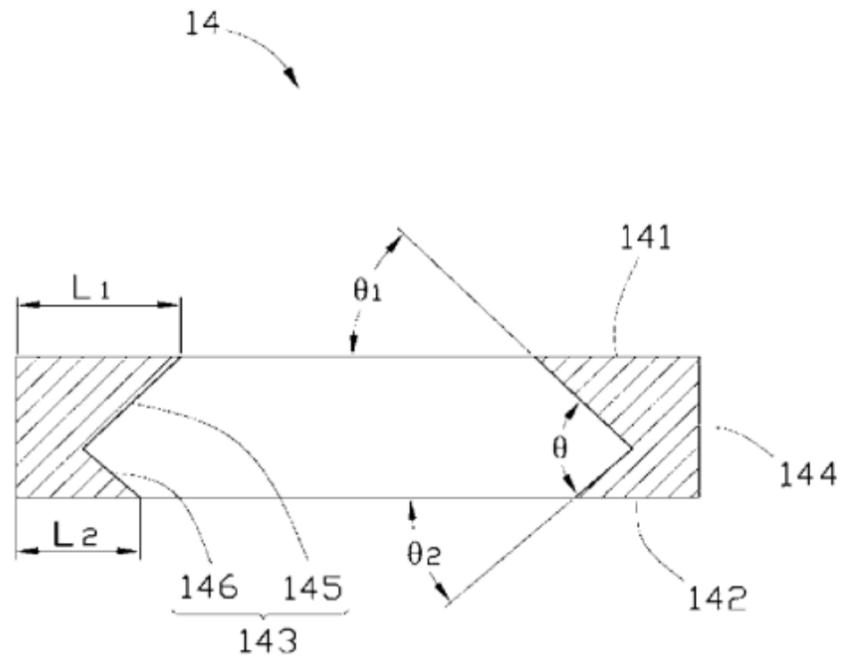
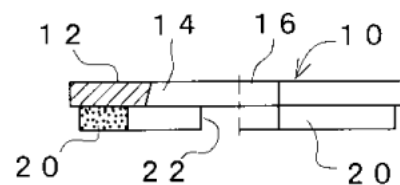


Figure 2

- b. As far as D1 is concerned, the Defendants admit that the air layer is missing in this prior art as well. Absence of air layer in D1 is extremely crucial since without the air layer, there certainly cannot be any teachings related to the claimed ranges/conditions defining the air layer.
- c. I disagree with Defendants' view that the feature pertaining to air layer of the '203 patent is mapped to D4 (JP 4283195 B2) by stating that "*JP4283195B2 teaches the inner diameter of the adhesive layer 20 is larger than the diameter of the opening 14, so therefore, there will an air gap closer to the opening than the adhesive layer 20 (Para [0044]);*" and relying on Fig. 2 of D4 (reproduced below).

【 図 2 】

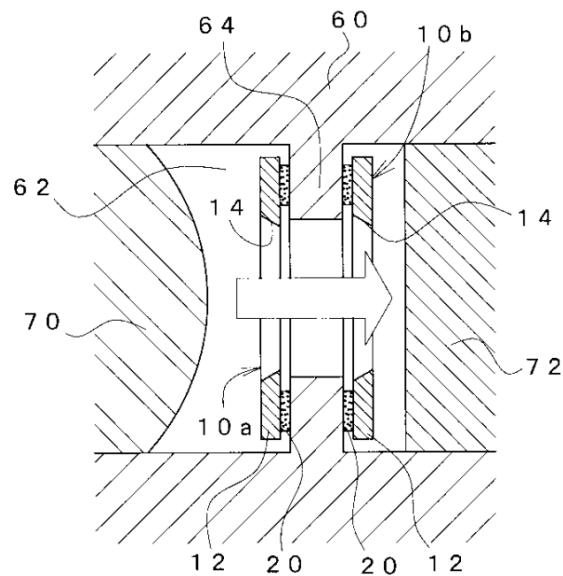


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I reiterate that the explanation given by the Defendants (in relation to the air layer) to be misleading. Para [0066] of D4 (Page 141 of Documents filed by Def. 1 and Def. 2 on 12 January 2023) contains the reference signs list where 10 is light shielding member, 12 is light shielding piece, 14 is light passage hole and 20 is adhesive layer. It is quite clear that D4 teaches a light blocking sheet (12) which has only 1 layer. It does not teach a three layered structure as required by the '203 patent, specifically the claims. Since D4 only teaches a single layered light blocking sheet, there can be no possibility of D4 teaching an air layer similar to the '203 patent because such air layer cannot be formed in a single layered light blocking sheet and instead requires the three-layered structure of the '203 patent. While Defendants have admitted that the air layer is missing in D5, it suffers from same defects as D4 since it pertains to a similar single layered structure of light shield member without an air gap, as in D4. As far as D1 is concerned, the Defendants admit that the air layer is missing in this prior art as well. Despite the absence of air layer, the Defendants on Page 66 of the Documents filed by Def. 1 and Def. 2 on 12 January 2023 have argued that *"Measured from figure 13 or 5 of JP4283195B2/JP4292130B2, the skilled in the art may estimate $\Phi 1$ is approximately equal to $\Phi 2$, and Φ_{smin} is approximately 110% of $\Phi 1$ or $\Phi 2$. It is well known in the field that the diameter of an aperture may be 1 -4 mm."* In my opinion, this approach by the Defendants is clearly incorrect. In '203 patent, $\Phi 1$, $\Phi 2$ and Φ_{smin} belong to a single component of the lens assembly i.e. the light blocking sheet whereas in D4 (Fig. 13, reproduced below) or D5, $\Phi 1$, $\Phi 2$ and Φ_{smin} belong to three different components (i.e., 12 light shielding piece, 20 adhesive layer, 64 peripheral frame) of the lens assembly and only one of these three components is arguably directed to a light blocking sheet (i.e., 12 light shielding piece). Therefore, such a mapping of the feature is clearly incorrect and it seems that only after looking at the unique and inventive solution provided by the '203 patent, the Defendants are trying to misconstrue the prior art to arrive at the invention of the '203 patent.

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【图 1 3】



- d. With regard to D2, the same again teaches a single layered light blocking sheet. Therefore, D2 does not bridge the gap (pertaining to air layer and conditions defining its dimensions) in D6, D1, D4 and D5.
- e. Accordingly, D6 combined with D1, D2, D4 and/or D5 also does not teach the presence of the air layer between inner and outer layer and the dimensional ranges of the air layer as required by the claims of '203 patent. Therefore, this combination is of no relevance.

42. Regarding the other query that was posed to me pertaining to sufficient description of the invention in the '203 patent, upon reading the complete specification, I reiterate that the disclosure is sufficient and detailed enough that all the characteristics of the light blocking sheet such as opening diameter, thickness of layers, assembly, material etc. have been disclosed in great detail and have been supported by several examples that anybody wanting to replicate the light blocking sheet of the '203 patent will easily be able to do so since they would have access to all the characteristics and dimensions of the sheet. I also observe that the ranges of various dimensions of lens assembly components or the light blocking sheet as provided in the patent are narrow or precise enough that no further research would be required to reach the '203 invention. With regard to the Defendants' argument that the method of manufacturing is not disclosed in the '203 patent, I believe Largan did not intend to protect the same. Their claims are limited to the light blocking sheet, lens assembly and electronic

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devices containing the same. Depending upon the product requirements and various other factors, the process parameters can be varied to yield the desired outcome. Since the '203 patent fully describes the desired characteristics (including dimensions) of the light blocking sheet, it would be easy for any manufacturer to formulate the process parameters that when executed would result in the desired characteristics. In this context, Defendants themselves agree that the process of chemical etching (also for spacers) was already known. Therefore, it is my understanding for this case that if product details are known or understood, an average skilled or skilled person can work backwards to formulate process parameters to achieve that product.

43. Further, regarding another query put to me pertaining to the claim language being clear and definitive, as mentioned above, I re-emphasize that the complete specification, especially figures of the '203 patent, clearly describes the claimed light blocking sheet. Claims when read with the drawings gives a clear articulation of the structure of the claimed light blocking sheet. I do not find any ambiguity with the claimed language. In this context, I observe that Defendants have presented a comment on the spaced apart values of $\Phi 1$ and $\Phi 2$ and have argued that the values for $\Phi 1$ and $\Phi 2$ are either too low or too high and have been arbitrarily picked. I have thought about this issue and I am convinced that the Defendants have either not understood the '203 patent claims properly or are trying to raise issues that don't exist. In this regard, I wish to emphasize that there is absolutely no problem in picking any value (spaced apart or placed closely or clustered) since $\Phi 1$ and $\Phi 2$ only signify the diameters of the outer layer openings. Irrespective of what the value of $\Phi 1$ and $\Phi 2$ is, the claim requires $(\Phi_{\text{min}} - \Phi 1)/2$, $(\Phi_{\text{min}} - \Phi 2)/2$ and $\Phi 1/\Phi 2$ to lie within a specific range. In my view, the fact that Largan provided a variety of values for $\Phi 1$ and $\Phi 2$, as examples in its specification, only shows that the invention can be worked for outer layer openings of various sizes. I reiterate that I do not find any ambiguity with the claim language.

VII. CONCLUSIONS

44. Based on my own analysis and a review of documents provided to me or researched by me, and referred to in this report and based on the confirmatory tests performed under my supervision/validation, I conclude the following:

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- i. I have reviewed the mapping performed by Largan of its claims vis-à-vis Defendants' product (Moto G31, Moto G60 and Motorola Edge 30 Pro) and found the same to be adequate and correct.
- ii. I have reviewed the expert report of Mr. Xiaolin Jiang and Mr. Zhengjin Ye and find it replete with inconsistencies and contradictions. Further, I am also concerned about the rigor behind the analysis performed by Jiang and Ye based on the contradictory statements in the Jiang affidavit and the Ye affidavit. Based on the affidavits of Jiang and Ye, there is no reliable data to indicate that the elements of the claims of the '203 patent are absent in the impugned models. Summary of the gap and inconsistencies I found in the Jiang affidavit and the Ye affidavit are captured in, for example Para 20(b), 20(f)(xvi) and 20(f)(xxv), of this report.
- iii. I validated the steps of the confirmatory testing and agree with the results showing that all the claimed features/elements are present in the accused spacer of the accused model of the Defendants. Refer the section "Confirmatory Test" of this report.
- iv. I have reviewed the '203 patent in detail. In my assessment, the invention claimed in the '203 patent finds no mention or suggestion in the prior arts relied upon by the Defendants. Moreover, I am convinced that the '203 patent and claims sufficiently and clearly describes the invention. Refer the section "validity of the '203 patent" of this report as well as my earlier report dated 18 April 2023 for my observations on each prior art and mosaic created by the Defendants.



Dr. Julie L. Bentley

Dated: 1 June, 2023

Place: Rochester, New York, USA