IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

IMMERSION CORPORATION, Plaintiff, v. META PLATFORMS, INC., F/K/A FACEBOOK, INC. Defendant.	)	Case No. 6:22-cv-541 **JURY TRIAL DEMANDED**

COMPLAINT

Plaintiff Immersion Corporation ("Immersion") files this Complaint against Defendant Meta Platforms, Inc. f/k/a Facebook, Inc. ("Meta").

NATURE OF THE CASE

1. This is an action for the infringement of six United States Patents: U.S. Patent Nos. 8,469,806 ("the '806 patent"); 8,896,524 ("the '524 patent"); 9,727,217 ("the '217 patent"); 10,248,298 ("the '298 patent"); 10,269,222 ("the '222 patent"); and 10,664,143 ("the '143 patent") (collectively, "the Patents-in-Suit").

2. Defendant Meta has been making, using, selling, offering for sale, and/or importing virtual reality systems such as Meta Quest 2 ("Quest 2")[1] that integrate multiple game engines[2] including, for example and without limitation, Unity, Unreal Engine, and Native Development, and related software including, for example and without limitation, *Horizon Worlds*, *First Steps*, *Beat Saber*, and *Creed: Rise to Glory*, and the corresponding dedicated

[1] *See, e.g.*, https://store.facebook.com/quest/products/quest-2/ (last visited May 25, 2022).
[2] *See, e.g.*, https://developer.oculus.com/get-started-platform/ (last visited May 25, 2022).

servers for this software (collectively, "the Accused Instrumentalities"), that infringe the Patents-in-Suit in violation of 35 U.S.C. § 271.

3. Immersion seeks appropriate damages, injunctive relief, and prejudgment and post-judgment interest for Meta's infringement of the Patents-in-Suit.

THE PARTIES

4. Founded in 1993, Immersion is widely known as the pioneering and leading innovator of haptic technology. "Haptics" refers to the science of touch. Haptics in consumer electronic devices provide tactile sensations to the users of electronic devices. Immersion creates software for implementing advanced haptic effects in video game systems and controllers and other handheld computers. Immersion also owns and licenses a broad portfolio of pioneering patents related to the use of haptics technology. Immersion's software is found in products that are sold and used worldwide. Immersion's patented technology is used even more widely, subject to patent licenses between Immersion and many of the world's most recognizable companies. Immersion's hard work and ingenuity in the field of haptics has resulted in extensive intellectual property protection for Immersion's innovations. This protection includes more than 1,400 world-wide granted and pending patents, including the Patents-in-Suit. During its nearly 30-year history, Immersion redefined how haptics are implemented in consumer technology. The recent proliferation of haptics-enabled consumer electronics demonstrates the importance of Immersion's innovations. Immersion continues to invest in research and development today.

5. Immersion is a Delaware corporation with its principal place of business located at 2999 N. E. 191st Street, Suite 610, Aventura, Florida 33180. Immersion owns the Patents-in-Suit.

6. Meta is a corporation organized and existing under the laws of Delaware. Meta

has a place of business at 300 W 6th Street, Austin, Texas 78701.[3] Meta also has a registered agent at Corporation Service Company, 211 E. 7th Street Suite 620, Austin, Texas 78701.

JURISDICTION AND VENUE

7. This is an action for patent infringement arising under the Patent Laws of the United States, Title 35 of the United States Code.

8. This Court has original subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a).

9. This Court has personal jurisdiction over Meta because, *inter alia*, Meta has a continuous presence in, and systematic contact with, this District and has registered to conduct business in the state of Texas. In addition, Meta, directly or through subsidiaries or intermediaries (including distributors, retailers, and others), conducts its business extensively throughout Texas by shipping, distributing, offering for sale, selling, and advertising (including through the provision of an interactive web page) its products and/or services in the State of Texas and the Western District of Texas. Meta, directly and through subsidiaries or intermediaries (including distributors, retailers, and others), has purposefully and voluntarily placed one or more of the Accused Instrumentalities into the stream of commerce with the intention and expectation that they will be purchased and used by consumers in the Western District of Texas. The Accused Instrumentalities have been and continue to be purchased and used by consumers in the Western District of Texas.

10. Meta has committed and continues to commit acts of infringement of the Patents-

[3] Meta was formerly known as Facebook, Inc. On October 28, 2021, CEO Mark Zuckerberg announced the formation of Meta to "bring[] together our apps and technologies under one new company brand." *See* https://about.fb.com/news/2021/10/facebook-company-is-now-meta/ (last visited May 25, 2022). The press released announced that "Meta's focus will be to bring the metaverse to life and help people connect, find communities and grow businesses" by allowing users to "share immersive experiences with other people even when you can't be together." *Id.*

in-Suit in violation of the United States Patent Laws, and has used the Accused Instrumentalities within this District. Meta's infringement has caused substantial injury to Immersion, including within this District.

11. Meta's Austin, Texas office employs more than 2,000 individuals[4] and has hundreds of open job postings.[5] Meta also recently leased 589,000 square feet of office space across 33 floors of a commercial property in Austin, which is the second-largest single office lease in the city.[6]

12. On March 31, 2022, Meta announced that it would invest $800 million and create 100 jobs at the Hyperscale Data Center in Temple, Texas, a 900,000 square foot facility in Bell County just 35 miles from this Court.[7]

13. Meta's operations in the Western District of Texas are substantial and varied, and include employees and open positions that relate to augmented reality and virtual reality ("AR/VR") involving haptics. For example, Meta employees in Austin, Texas, list varied job titles on LinkedIn such as Design Director, Virtual Reality at Meta,[8] Software Engineer at Oculus VR[9], Director, Head of Design for Virtual Reality,[10] and Technical Sourcer – Specialized Tech (AR/VR) at Reality Labs.[11]

14. Meta also advertises that it is currently hiring for positions related to AR/VR in

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[4] *See* https://www.bloomberg.com/news/articles/2022-01-09/meta-expands-in-texas-with-major-office-lease-in-downtown-austin (last visited May 25, 2022).
[5] *See* https://www.metacareers.com/jobs?offices[0]=Austin%2C%20TX (last visited May 25, 2022).
[6] *See* https://www.businessinsider.com/meta-signs-lease-austin-texas-sixth-guadalupe-largest-skyscraper-property-2022-1 (last visited May 25, 2022).
[7] *See* https://templeedc.com/meta-data-center-temple-texas/ (last visited May 25, 2022).
[8] *See*, e.g., https://www.linkedin.com/in/alex-chambers-492b4848 (last visited May 25, 2022)
[9] *See* https://www.linkedin.com/in/david-sassen-6292722 (last visited May 25, 2022).
[10] *See* https://www.linkedin.com/in/jonathanatkins27 (last visited May 25, 2022).
[11] *See*, e.g., https://www.linkedin.com/in/elizabeth-hawthorne (last visited May 25, 2022).

Austin, Texas, including Consumer Communications Manager, Reality Labs; Director, Reality Labs Productivity Partnerships (Work and Home); Lead Counsel, Reality Labs; and Research Lab Design Engineer for Oculus VR.[12] Meta has further recently advertised for many other positions related to AR/VR in Austin, Texas, including Silicon Strategy & Planning Manager – Accelerators for Oculus VR; Embedded Systems Development Engineer for Oculus; Associate General Counsel, Reality Labs Product; and Director, Compensation Business Partner, Reality Labs.[13]

15. In addition, Meta allows its full-time employees in this District, including those at its Austin facilities, to elect to work primarily from their homes "if their jobs allowed it,"[14] including, on information on belief, using *Horizon Workrooms*, which Meta describes as a "VR space for teams to connect, collaborate and develop ideas, together."[15]

16. By registering to conduct business in Texas and by maintaining facilities in at least the cities of Austin and Temple, Meta has multiple regular and established places of business within the Western District of Texas.

17. Venue is proper in this District. Meta resides in this District within the meaning of 28 U.S.C. § 1400(b). Meta has committed acts of infringement within this District and has regular and established places of business here.

HAPTIC TECHNOLOGY

18. Haptic feedback provides touch or tactile sensations to users of electronic devices

[12] *See*, e.g., https://www.linkedin.com/jobs/search/?f_PP=104472865&f_WT=1&keywords=meta&sortBy=R (last visited May 25, 2022).
[13] *See*, e.g., https://www.linkedin.com/jobs/search/?f_PP=104472865&f_WT=1&keywords=meta&sortBy=R (last visited April 27, 2022).
[14] *See* https://www.hcamag.com/us/specialization/benefits/meta-embraces-work-from-anywhere-ahead-of-return-to-office/400130 (last visited May 25, 2022).
[15] *See* https://www.oculus.com/workrooms/ (last visited May 25, 2022).

and may include tactile sensations produced by an actuator, such as a motor, a linear resonant actuator, or a piezoelectric actuator. Because of the importance of the sense of touch to the way people perceive their surroundings and the things with which they interact, haptics can greatly enhance the usability and functionality of consumer electronic devices. For example, when haptic technology is implemented in video game systems and controllers, users can experience vibrating forces that mimic real-life forces as they push a virtual button, select a graphical object, carry a virtual item, or block a punch in a virtual boxing game. The Accused Instrumentalities include haptic feedback technology. The presence of haptics in the Accused Instrumentalities provides enhanced user interaction through haptic cues, which give users a richer and more immersive user experience.

19. In electronic devices, haptic effects are typically managed and controlled by embedded software, and integrated into device user interfaces and applications via embedded control software application programming interfaces ("APIs"). Applications running on an electronic device call these APIs to implement haptic effects. These APIs in turn cause specific haptic effect commands to be sent to an actuator in the electronic device, resulting in the associated haptic effect. More sophisticated applications may provide a variety of tactile sensations. For example, user actions may trigger different haptic effects and thus communicate different types of information. This information may be conveyed, for example, by varying the type, duration, intensity, or frequency of the tactile sensations. This enables the creation of different haptic effects so that users can easily distinguish different actions in a virtual environment.

20. Meta is capitalizing on Immersion's innovation and success by selling and otherwise monetizing video game systems, controllers, games, and applications that infringe

Immersion's patents, including the Patents-in-Suit. Meta is using Immersion's patented inventions without license or authority from Immersion. Immersion has brought this action to remedy Meta's infringement.

META'S CONTROL OVER THE ACCUSED INSTRUMENTALITIES

21. To facilitate the development and deployment of games and applications for the Accused Instrumentalities, Meta exercises control over how games and applications are designed for and sold through the Accused Instrumentalities, and exercises ongoing control over the operation of the Accused Instrumentalities after each is sold.

22. Meta exercises control over how games and applications are designed for and sold through the Accused Instrumentalities, for example and without limitation, in at least the following ways: (a) setting design requirements;[16] (b) actively curating the Quest Store by reviewing games and applications to ensure that there are no technical issues and that the content is designed and developed to meet user expectations;[17] (c) providing developer resources such as design guides,[18] marketing resources,[19] and design best practices for user input,[20] locomotion,[21] and other features;[22] (d) implementing and funding a royalty payment program under which Meta has arranged for the Unreal Engine license to be royalty-free for the first five-million US

[16] *See* https://developer.oculus.com/resources/publish-quest-req/ (last visited May 25, 2022) ("Quest Store and App Lab apps must meet or exceed Virtual Reality Check (VRC) guidelines to be considered for distribution. These VRC guidelines are provided to help you build high quality apps for Oculus Quest and Quest 2.").
[17] *See* https://developer.oculus.com/resources/app-submission-success (last visited May 25, 2022).
[18] *See* https://developer.oculus.com/resources/bp-generalux/ (last visited May 25, 2022).
[19] *See* https://developer.oculus.com/resources/vr-marketing-channels/ (last visited May 25, 2022).
[20] *See* https://developer.oculus.com/resources/bp-userinput/ (last visited May 25, 2022).
[21] *See* https://developer.oculus.com/resources/bp-locomotion/ (last visited May 25, 2022).
[22] *See* https://developer.oculus.com/resources/insight-sdk-tips-tricks/ (last visited May 25, 2022).

dollars (USD $5,000,000) of revenue generated from sales on the Oculus Store;[23] and (e) teaching developers how to add haptics to games and applications that run on the Accused Instrumentalities.[24]

23. Meta exercises ongoing control over the operation of the Accused Instrumentalities after each is sold, for example and without limitation, in at least the following ways: (a) forcing users of the Accused Instrumentalities to log into a Facebook account controlled by Meta on the Quest 2 and only allowing use behind an authentication wall;[25] (b) dictating the haptic APIs used with the Quest 2 and automatically updating those APIs;[26] (c) requiring that the Accused Instrumentalities be in communication with Meta's servers when in use on an internet connection;[27] and (d) retaining discretion to actively monitor gameplay in real time, for example and without limitation, in the *Horizon Worlds* and *Horizon Workrooms* games and applications, and storing data related to use of the Accused Instrumentalities on its servers.[28]

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[23] *See* https://developer.oculus.com/documentation/unreal/unreal-oculus-license/ (last visited May 25, 2022).

[24] *See* https://developer.oculus.com/documentation/unreal/unreal-haptics/ (last visited May 25, 2022); https://developer.oculus.com/documentation/unity/unity-haptics/ (last visited May 25, 2022).

[25] *See* https://support.oculus.com/fb/ (last visited May 25, 2022) ("Facebook account requirements for Oculus devices. For Oculus Quest 2: Quest 2 requires everyone to use a Facebook account to log in.")

[26] *See* https://www.oculus.com/blog/you-got-a-quest-2-heres-how-to-set-it-up/ (last visited May 25, 2022); https://www.youtube.com/watch?v=HjHZHoz53pk&t=109s (last visited May 25, 2022) ("After connecting your headset to WiFi, your headset will update with the latest software[.]")

[27] *See* https://www.androidcentral.com/oculus-quest-true-offline-mode (last visited May 25, 2022) ("[w]hen Quest headsets have an active internet connection, they check in with Meta's servers before doing anything else. If that account check fails, everything else beyond that also fails.").

[28] *See* https://www.oculus.com/legal/monitoring-recording-safety-horizon/ (last visited May 25, 2022) ("Notice of Monitoring and Recording to Improve Safety in Horizon Worlds … When you use Horizon Worlds, your device will record (through a rolling buffer processed locally on-device) your and other users' most recent audio and other interactions in Horizon Worlds. Captured audio data from this rolling buffer is not stored on our servers unless a report is

24. Meta's ongoing control over the Accused Instrumentalities is so pervasive that regulatory authorities in Germany determined Meta's requirement that users access the Quest 2 only through a Facebook account potentially violated competition laws,[29] leading Meta to stop selling the Quest 2 in Germany.[30]

25. In addition, Meta encourages developers to create multiplayer games and applications,[31] and multiplayer games and applications comprise a substantial portion of the market for the Accused Instrumentalities and require interfacing using Meta equipment and services[32]:

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submitted. However, other data, including data collected through platform services and integrations, about your experience in Horizon Worlds may be stored by us on our servers…How We Monitor and Review for Harmful Conduct As it Happens. If you mute, block, or report someone in Horizon Worlds, a trained safety specialist may remotely observe and record the situation in real time, including the person you reported and others nearby.")

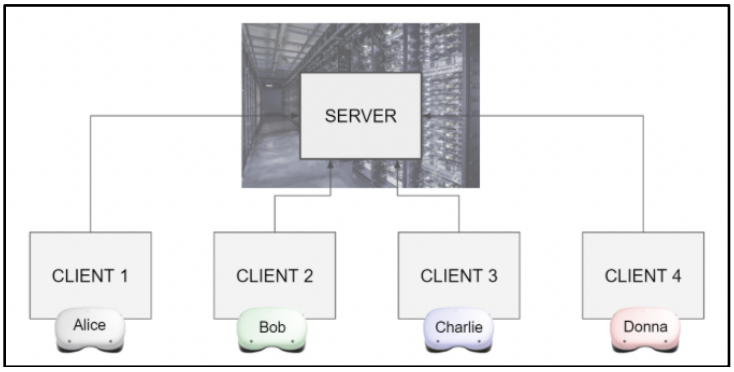
[29] *See* https://www.theverge.com/2020/12/10/22167509/germany-fco-investigation-facebook-oculus-account-requirements-competition (last visited May 25, 2022) ("Germany's competition watchdog is investigating Facebook for tying its social app to its Oculus virtual reality headsets. Today, the Bundeskartellamt or Federal Cartel Office (FCO) announced a probe of the increasingly close link between Facebook and Oculus, arguing that it could hurt competition in both VR and social networking. The new Oculus Quest 2 headset requires signing in with a Facebook account rather than a separate Oculus ID, and that's raised antitrust concerns. 'Linking virtual reality products and the group's social network in this way could constitute a prohibited abuse of dominance by Facebook,' said FCO president Andreas Mundt. Mundt noted that Facebook is a dominant social network in Germany and plays a large role in the emerging VR market. 'We intend to examine whether and to what extent this tying arrangement will affect competition in both areas of activity.'").

[30] *See* https://support.oculus.com/articles/orders-and-purchases/headsets-and-app-purchases/where-to-buy-quest-2/ (last visited May 25, 2022) ("We have temporarily paused selling Oculus devices to consumers in Germany.")

[31] *See* https://developer.oculus.com/resources/social-apis/ (last visited May 25, 2022).

[32] *See* https://www.facebook.com/RealityLabs/videos/422431035983250/ (last visited May 25, 2022).

26. For example, the Oculus VR Developer Tools team provides an open-source project, called SharedSpaces, to demonstrate how developers can quickly get people together in VR.[33] The SharedSpaces documentation further explains that multiplayer games and applications can be implemented under a client-server model, with Quest 2 headsets running as clients connecting to a dedicated server that typically runs in a data center:



27. On information and belief, Meta hosts such dedicated servers and implements interactions with the Quest 2, including for example in multiplayer games and applications, such as, *Horizon Worlds* and *Horizon Workrooms*. As part of that role, on information and belief Meta's dedicated servers monitor inputs from the Quest 2 to enforce the rules of these games and

[33] *See* https://github.com/oculus-samples/Unreal-SharedSpaces/blob/main/Documentation/SharedSpaces.md (last visited May 25, 2022).

to replicate relevant game objects across each connected client.[34] Further, Meta provides support and APIs for instructing the Quest 2 regarding haptic feedback.[35]

28. In addition to generating revenue from the sale of each Quest 2, Meta generates or plans to generate revenue in various ways from the Accused Instrumentalities after each Quest 2 unit is sold, including for example and without limitation, by realizing a financial benefit from games and applications sold on the Quest Store,[36] collecting a percentage of sales of virtual assets sold through the Accused Instrumentalities,[37] and selling advertisements that run on the Accused Instrumentalities.[38]

THE PATENTS-IN-SUIT

29. The '806 patent is titled "System and method for providing complex haptic stimulation during input of control gestures, and relating to control of virtual equipment" and was issued by the United States Patent Office to inventors Danny A. Grant, Robert W. Heubel, David M. Birnbaum, and Erin B. Ramsay on June 25, 2013. The earliest application related to the '806 patent was filed on July 22, 2009. A true and correct copy of the '806 patent is attached as Exhibit A.

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[34] *See id.*

[35] *See, e.g.*, https://developer.oculus.com/documentation/native/pc/dg-input-touch-haptic/ (last visited May 25, 2022)

[36] *See id.* https://s21.q4cdn.com/399680738/files/doc_financials/2021/q4/Meta-Q4-2021-Earnings-Call-Transcript.pdf (last visited May 25, 2022) ("On the hardware front, we're seeing real traction with Quest 2. People have spent more than $1B on Quest store content, helping virtual reality developers grow and sustain their business.")

[37] *See* https://www.cnbc.com/2022/04/13/meta-plans-to-take-a-nearly-50percent-cut-on-nft-sales-in-its-metaverse.html (last visited May 25, 2022)

[38] *See* https://www.economist.com/business/2022/04/09/from-apple-to-google-big-tech-is-building-vr-and-ar-headsets (last visited May 25, 2022) ("Meta's VR strategy still revolves around ads. It is selling headsets as fast as it can in order to build an audience for advertisers, says George Jijiashvili of Omdia, a firm of analysts. *Horizon Worlds* and *Venues*, its virtual spaces for hanging out, claim 300,000 monthly visitors. To the irritation of some of them, Meta has already experimented with running ads there.").

30. Immersion is the owner of all right, title, and interest in and to the ’806 patent with the full and exclusive right to bring suit to enforce the ’806 patent.

31. The ’806 patent is valid and enforceable under the United States Patent Laws.

32. The ’524 patent is titled “Context-dependent haptic confirmation system” and was issued by the United States Patent Office to inventors David Birnbaum, Christopher J. Ullrich, and Marcus Aurelius Bothsa on November 25, 2014. The earliest application related to the ’524 patent was filed on August 24, 2012. A true and correct copy of the ’524 patent is attached as Exhibit B.

33. Immersion is the owner of all right, title, and interest in and to the ’524 patent with the full and exclusive right to bring suit to enforce the ’524 patent.

34. The ’524 patent is valid and enforceable under the United States Patent Laws.

35. The ’217 patent is titled “Haptically enhanced interactivity with interactive content” and was issued by the United States Patent Office to inventors David M. Birnbaum, Danny A. Grant, and Robert W. Heubel on August 8, 2017. The earliest application related to the ’217 patent was filed on September 30, 2010. A true and correct copy of the ’217 patent is attached as Exhibit C.

36. Immersion is the owner of all right, title, and interest in and to the ’217 patent with the full and exclusive right to bring suit to enforce the ’217 patent.

37. The ’217 patent is valid and enforceable under the United States Patent Laws.

38. The ’298 patent is titled “Haptically enhanced interactivity with interactive content” and was issued by the United States Patent Office to inventors David M. Birnbaum, Danny A. Grant, and Robert W. Heubel on April 2, 2019. The earliest application related to the ’298 patent was filed on September 30, 2010. A true and correct copy of the ’298 patent is

attached as Exhibit D.

39. Immersion is the owner of all right, title, and interest in and to the ’298 patent with the full and exclusive right to bring suit to enforce the ’298 patent.

40. The ’298 patent is valid and enforceable under the United States Patent Laws.

41. The ’222 patent is titled “System with wearable device and haptic output device” and was issued by the United States Patent Office to inventors Allan Visitacion, Trevor Jones, Daniel Gregory Parker, Kohei Imoto, Keith Reed, Jesica E. Ferro, Aaron Kapelus, Neil Olien, Danny A. Grant, and Robert Lacroix on April 23, 2019. The earliest application related to the ’222 patent was filed on March 15, 2013. A true and correct copy of the ’222 patent is attached as Exhibit E.

42. Immersion is the owner of all right, title, and interest in and to the ’222 patent with the full and exclusive right to bring suit to enforce the ’222 patent.

43. The ’222 patent is valid and enforceable under the United States Patent Laws.

44. The ’143 patent is titled “Haptically enhanced interactivity with interactive content” and was issued by the United States Patent Office to inventors David M. Birnbaum, Danny A. Grant, and Robert W. Heubel on May 26, 2020. The earliest application related to the ’143 patent was filed on September 30, 2010. A true and correct copy of the ’143 patent is attached as Exhibit F.

45. Immersion is the owner of all right, title, and interest in and to the ’143 patent with the full and exclusive right to bring suit to enforce the ’143 patent.

46. The ’143 patent is valid and enforceable under the United States Patent Laws.

47. The Patents-in-Suit generally teach novel systems and methods for establishing haptically enhanced interactivity with virtual objects within a virtual environment. The claimed

systems and methods combine specific hardware and software components in unconventional ways. In contrast, conventional systems provided rudimentary mechanisms for applying static effects that merely informed users that basic events occurred. Through novel innovations, the Patents-in-Suit expand haptic stimulation to provide users feedback through real-world equipment corresponding to real-world controls to simulate a wide array of experiences, such as: that a control gesture has been received, that virtual or real objects have collided, exploded, or imploded, that an ambient force is present (e.g., simulated or real wind, rain, magnetism, and/or other virtual forces), and/or that other phenomena have occurred. The combinations of features are uniquely technological, and each claim improves on known systems and methods for providing haptic feedback.

48. For example, the ’806 patent teaches applying haptic stimulation in conjunction with the performance of “control gestures” through which the user inputs commands into, for example, a game or virtual world via a real-world controller. Such control gestures comprise of separate portions with different haptic feedback over the duration of the gesture—resulting in a more intuitive and immersive user experience.

49. The ’524 patent further teaches the use of “context metadata,” which includes, for example, metadata generated when a user interacts with a user interface element such as pushing a virtual button. The confirmation haptic effect can be a modification of, for example, magnitude, duration, frequency, and waveform. Thus, the haptic confirmation system can generate multiple possible confirmation haptic events for a single user interface element, where each confirmation haptic event is individually customized based on context metadata.

50. The ’217 and ’298 patents disclose the use of multiple peripherals, such as a controller for each hand, that freely move through the real-world. This enables users to

manipulate a physical object in the real world to interact with a virtual object through, for example, at least three degrees of freedom—providing a physical sense of interaction with virtual objects.

51. The ’222 patent teaches the use of a wearable device, including a wearable device configured as headwear that can include a plurality of hardware, software, and/or firmware components operating together, that can generate haptic feedback based on events that occur in an environment related to the wearable device. This enables users to better recognize objects in virtual and/or augmented reality environments.

52. Lastly, the ’143 patent teaches the use of a peripheral worn on the head, which is tracked in real space, to interact with a virtual environment. This allows for viewing different displayed interactive content and experiencing different haptic feedback based in part on the user’s head position.

FIRST CAUSE OF ACTION
(PATENT INFRINGEMENT UNDER 35 U.S.C. § 271 OF THE ’806 PATENT)

53. Immersion re-alleges and incorporates by reference all of the foregoing paragraphs.

54. Meta has infringed and continues to infringe, either literally or under the doctrine of equivalents, one or more claims, including at least claim 11, of the ’806 patent in violation of 35 U.S.C. § 271, et seq., by using in this District and in the United States certain products including, but not limited to those, relating to the Accused Instrumentalities.

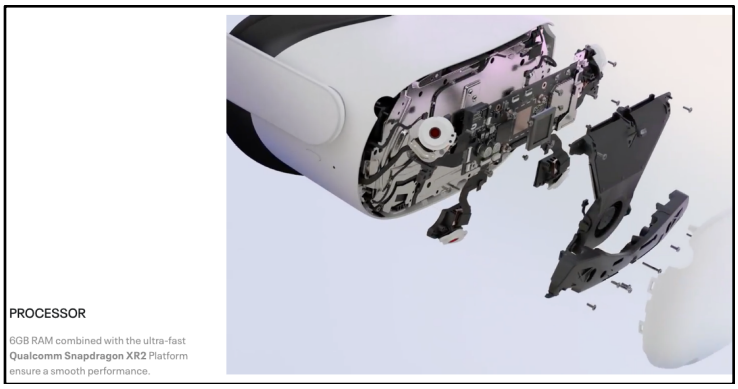
55. Claim 11 of the ’806 patent provides:

> [Preamble] A computer-implemented method of providing haptic stimulation to a user of a system, the method being implemented in the system which includes a haptic device and one or more physical processors configured to execute computer program modules, the method comprising:

> [11A] monitoring, on the one or more processors, performance of a control gesture by a user, wherein the control gesture is a gesture associated with a command input to the system, and includes an initial portion, a first intermediate portion, and an ending portion;
>
> [11B] determining, on the one or more processors, haptic stimulation associated with performance of the control gesture to be generated for the user, wherein the haptic stimulation includes a first stimulation determined responsive to performance of the initial portion of the control gesture, and a second stimulation that is different from the first stimulation and is determined responsive to performance of the first intermediate portion of the control gesture; and
>
> [11C] generating, with the haptic device, the determined stimulation during performance of the control gesture.

56. Based on publicly available information, Meta's Accused Instrumentalities meet all elements of at least claim 11 of the '806 patent.

57. Regarding the preamble of claim 11, to the extent the preamble is determined to be limiting, the Accused Instrumentalities provide the features described in the preamble, which recites a "computer-implemented method of providing haptic stimulation to a user of a system, the method being implemented in the system which includes a haptic device and one or more physical processors configured to execute computer program modules." For example, the Quest 2 headset includes a Qualcomm Snapdragon XR2[39]:



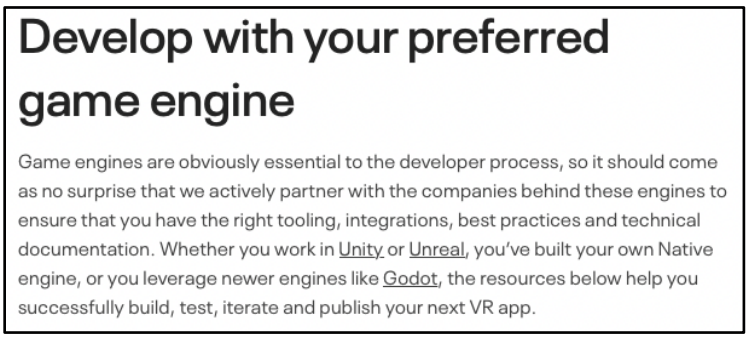
58. Additionally, on information and belief, Meta hosts dedicated game servers and

[39] *See* https://store.facebook.com/quest/products/quest-2/ (last visited May 25, 2022).

implements interactions with the Quest 2, including for example in multiplayer games, such as *Horizon Worlds*. On information and belief Meta's dedicated servers enforce the rules of these games and replicate relevant game objects across each connected client Quest 2.[40]

59. Further, the Quest 2 includes touch controllers[41] that can provide haptic feedback:

60. Further, the Quest 2 supports multiple game engines, including Unity, Unreal, and Native Development[42]:

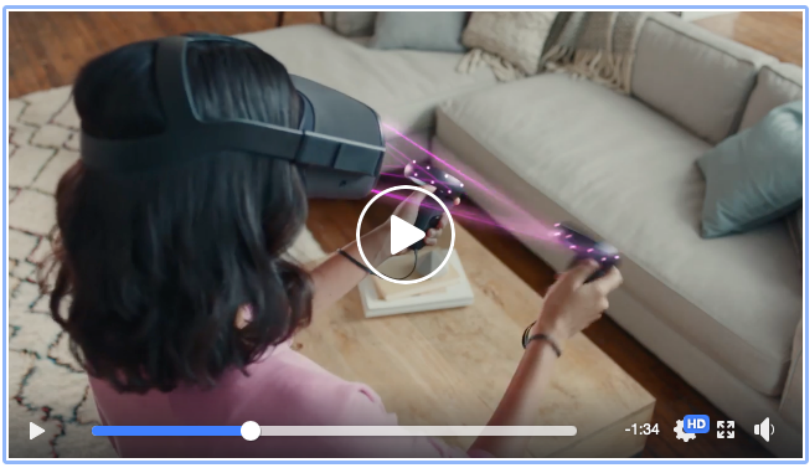


61. Accordingly, the Accused Instrumentalities meet the preamble of claim 11.

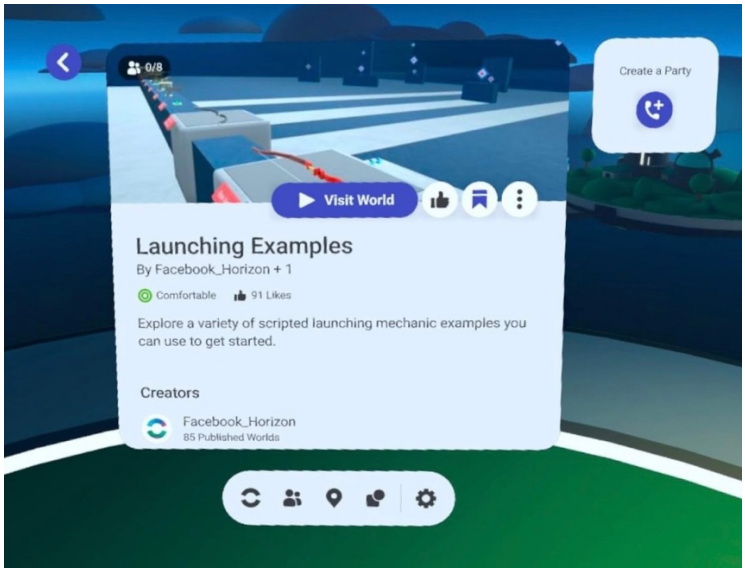
62. Limitation A requires "monitoring, on the one or more processors, performance of a control gesture by a user, wherein the control gesture is a gesture associated with a command input to the system, and includes an initial portion, a first intermediate portion, and an ending

[40] *See* https://github.com/oculus-samples/Unreal-SharedSpaces/blob/main/Documentation/SharedSpaces.md (last visited May 25, 2022).
[41] *See* https://store.facebook.com/quest/products/quest-2/ (last visited May 25, 2022).
[42] *See* https://developer.oculus.com/get-started-platform/ (last visited May 25, 2022).

portion." The Accused Instrumentalities through, for example and without limitation, Meta's monitoring also meet all the requirements of limitation A of claim 11. For example, Oculus Insight, Facebook's VR system, tracks the touch controllers[43]:

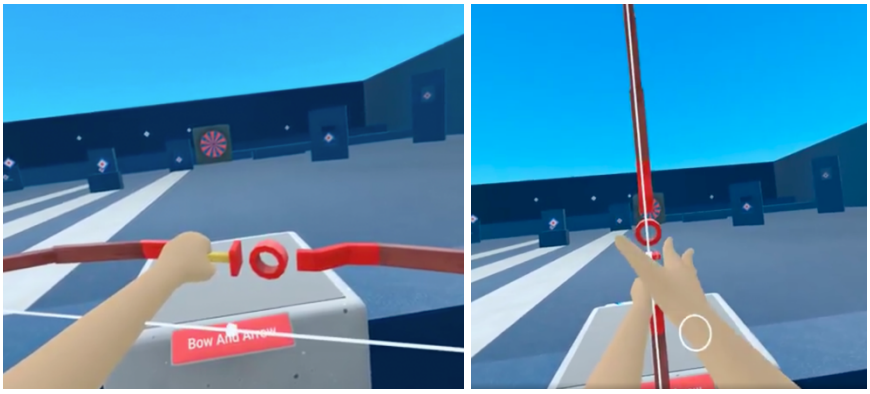


63. Further, the figures below are screenshots taken from a Quest 2 while testing this functionality. As explained in the figure below, the Facebook_Horizon creator published the *Launching Examples* world within *Horizon Worlds,* which allows users to explore a variety of scripting launching mechanic examples:[44]

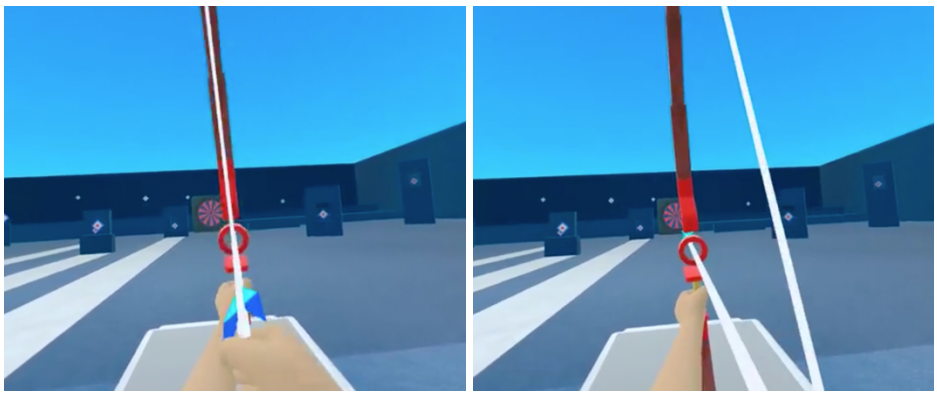


[43] *See* https://ai.facebook.com/blog/powered-by-ai-oculus-insight/ (last visited May 25, 2022).
[44] *See generally* https://www.oculus.com/horizon-worlds/ (last visited May 25, 2022).

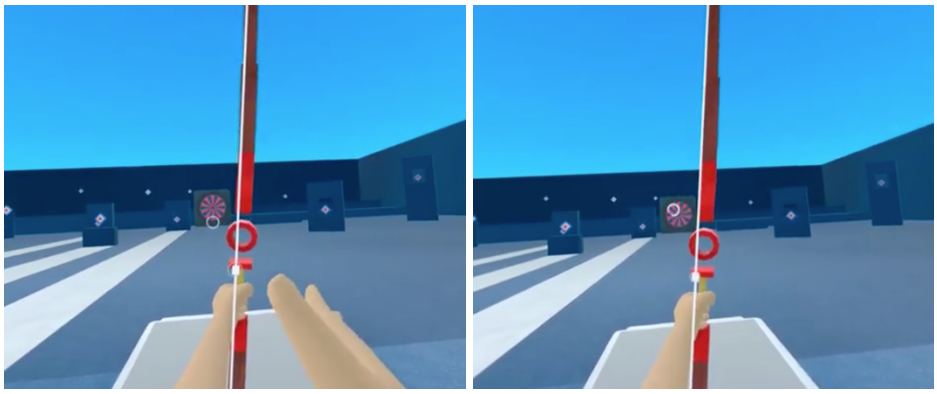
64. As one example from *Launching Examples*, the Accused Instrumentalities allow users to grab a bow and arrow and grab the bowstring as depicted below:



65. The Accused Instrumentalities then allow users to draw back the bowstring at different lengths as depicted below. The figure on the left depicts how the Accused Instrumentalities represent a bow that is partially drawn. The figure on the right depicts how the Accused Instrumentalities represent an arrow that is more fully drawn.



66. The Accused Instrumentalities allow users to release the arrow at different pull lengths, resulting in different trajectories for where the arrow hits a target, which the Accused Instrumentalities depict as white circles, as shown in the figures below. The figure on the left depicts how the Accused Instrumentalities represent the release of a partially-drawn arrow. The figure on the right depicts how the Accused Instrumentalities represent the release of a more fully-drawn arrow.



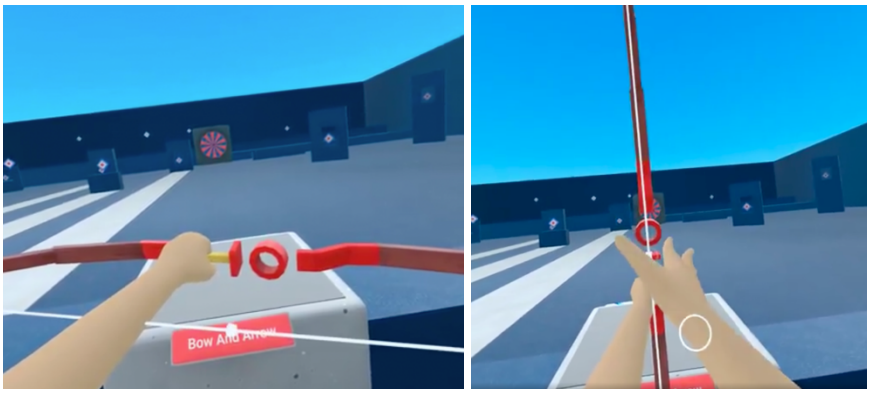
67. On information and belief, Meta's dedicated game servers monitor these inputs to enforce the rules of these games and replicate relevant game objects across each connected client Quest 2.[45]

68. Meta makes the Accused Instrumentalities, with which Meta performs the claimed step under Meta's control for Meta's benefit.

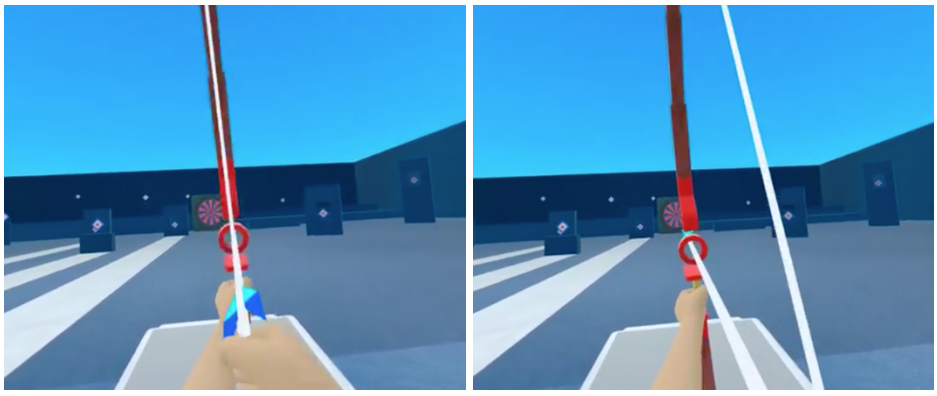
69. Accordingly, the Accused Instrumentalities perform limitation A of claim 11.

70. Limitation B requires "determining, on the one or more processors, haptic stimulation associated with performance of the control gesture to be generated for the user, wherein the haptic stimulation includes a first stimulation determined responsive to performance of the initial portion of the control gesture, and a second stimulation that is different from the first stimulation and is determined responsive to performance of the first intermediate portion of the control gesture." The Accused Instrumentalities also meet all the requirements of limitation B of claim 11. For example, the *Launching Examples* world includes a bow and arrow, as described in limitation A. The figures below were taken from a Quest 2 device while testing this functionality. The Accused Instrumentalities allow users to grab a bow and arrow and first grab the bowstring, and the Accused Instrumentalities provide haptic confirmation accordingly:

[45] *See* https://github.com/oculus-samples/Unreal-SharedSpaces/blob/main/Documentation/SharedSpaces.md (last visited May 25, 2022).

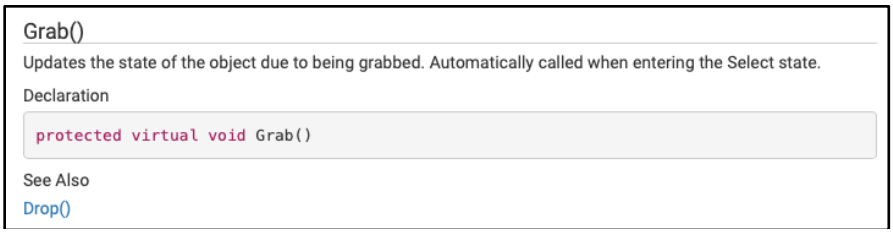


71. The Accused Instrumentalities then allow users to draw back the bowstring at different lengths. The figure on the left below depicts how the Accused Instrumentalities represent a partially-drawn bow. The figure on the right depicts how the Accused Instrumentalities represent a more fully-drawn bow. The Accused Instrumentalities provide a different haptic feedback during the draw.



72. Further, the Accused Instrumentalities can implement this infringing functionality in a number of ways. As just one example for how this infringing functionality could be implemented, the Unity Engine provides an interactable component that allows basic "grab" functionality, including with the following methods:[46]

[46] *See* https://docs.unity3d.com/Packages/com.unity.xr.interaction.toolkit@2.0/api/UnityEngine.XR.Interaction.Toolkit.XRGrabInteractable.html (last visited May 25, 2022).



Grab()

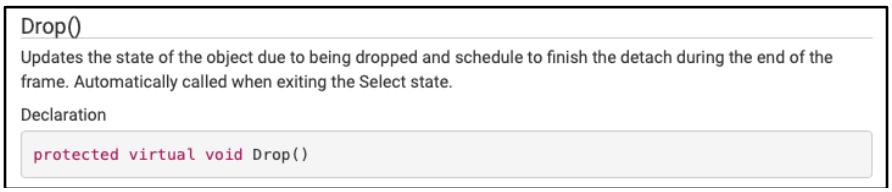
Updates the state of the object due to being grabbed. Automatically called when entering the Select state.

Declaration

```
protected virtual void Grab()
```

See Also

Drop()



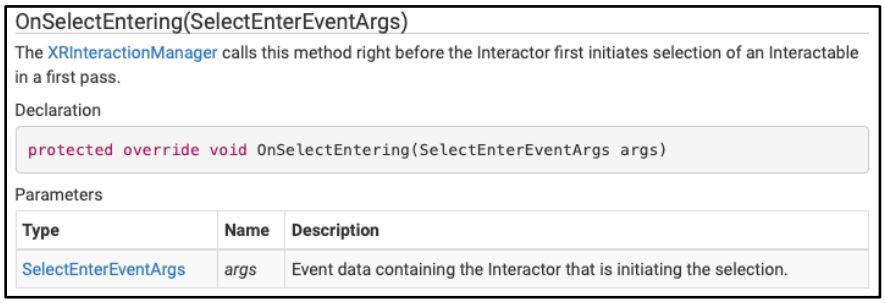
Drop()

Updates the state of the object due to being dropped and schedule to finish the detach during the end of the frame. Automatically called when exiting the Select state.

Declaration

```
protected virtual void Drop()
```

73. For example and without limitation, the Unity Engine further provides the following event handling methods to implement functionality, including haptic effect logic, on Select state changes:



OnSelectEntering(SelectEnterEventArgs)

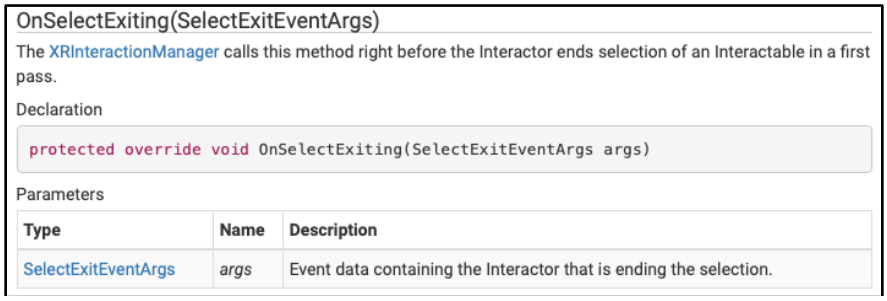
The XRInteractionManager calls this method right before the Interactor first initiates selection of an Interactable in a first pass.

Declaration

```
protected override void OnSelectEntering(SelectEnterEventArgs args)
```

Parameters

Type	Name	Description
SelectEnterEventArgs	*args*	Event data containing the Interactor that is initiating the selection.



OnSelectExiting(SelectExitEventArgs)

The XRInteractionManager calls this method right before the Interactor ends selection of an Interactable in a first pass.

Declaration

```
protected override void OnSelectExiting(SelectExitEventArgs args)
```

Parameters

Type	Name	Description
SelectExitEventArgs	*args*	Event data containing the Interactor that is ending the selection.

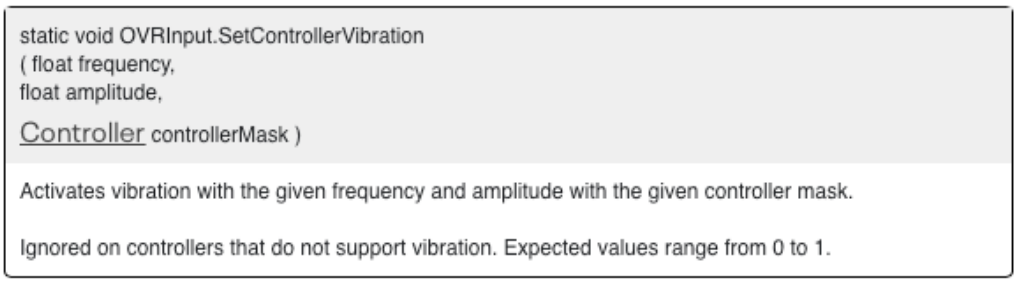
74. Meta makes the Accused Instrumentalities, with which Meta performs the claimed step under Meta's control for Meta's benefit.

75. Accordingly, the Accused Instrumentalities perform limitation B of claim 11.

76. Limitation C requires "generating, with the haptic device, the determined stimulation during performance of the control gesture." The Accused Instrumentalities also meet

all the requirements of limitation C of claim 11. For example, the user experiences the haptic stimulation described in limitation B, which indicates that the Accused Instrumentalities generate, with the haptic device, the determined stimulation during performance of the control gesture.

77. The Accused Instrumentalities can implement this infringing functionality in a number of ways. As just one example for how this infringing functionality could be implemented with the Unity engine, Oculus developer documentation instructs developers on the following API for providing haptic feedback:[47]


static void OVRInput.SetControllerVibration
(float frequency,
float amplitude,
Controller controllerMask)

Activates vibration with the given frequency and amplitude with the given controller mask.

Ignored on controllers that do not support vibration. Expected values range from 0 to 1.

78. Meta makes the Accused Instrumentalities, with which Meta performs the claimed step under Meta's control for Meta's benefit.

79. Accordingly, the Accused Instrumentalities perform limitation C of claim 11.

80. Thus, Meta directly infringes at least claim 11 of the '806 patent. For example, the Accused Instrumentalities with which Meta performs all the of the claimed steps as described in the examples above under Meta's control for Meta's benefit.

81. As a result of Meta's infringement of the '806 patent, Immersion has suffered and continues to suffer substantial injury and is entitled to recover all damages caused by Meta's infringement to the fullest extent permitted by the Patent Act, together with prejudgment and post-judgment interest and costs for Meta's wrongful conduct.

[47] *See* https://developer.oculus.com/reference/unity/v38/class_o_v_r_input (last visited May 25, 2022).

82. Immersion has no adequate remedy at law to prevent future infringement of the '806 patent. Immersion suffers and continues to suffer irreparable harm as a result of Meta's patent infringement and is, therefore, entitled to injunctive relief to enjoin Meta's wrongful conduct.

SECOND CAUSE OF ACTION
(PATENT INFRINGEMENT UNDER 35 U.S.C. § 271 OF THE '524 PATENT)

83. Immersion re-alleges and incorporates by reference all of the foregoing paragraphs.

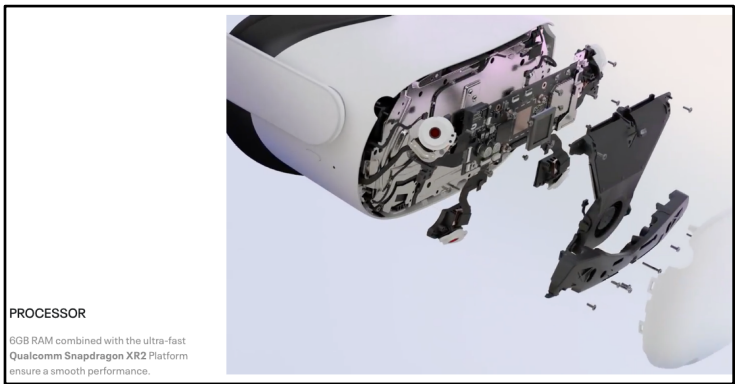
84. Meta has infringed and continues to infringe, either literally or under the doctrine of equivalents, one or more claims, including at least claim 1, of the '524 patent in violation of 35 U.S.C. § 271, et seq., by making, using, selling, offering for sale, and/or importing in this District and into the United States certain products including, but not limited to those, relating to the Accused Instrumentalities.

85. Claim 1 of the '524 patent provides:

> [Preamble] A non-transitory computer-readable medium having instructions stored thereon that, when executed by a processor, cause the processor to generate a confirmation haptic effect, the generating the confirmation haptic effect comprising:
>
> [1A] receiving context metadata associated with a user interaction of a user interface element, wherein the context metadata comprises at least one of: data indicating a functionality of the user interface element, or data indicating a history of the user interface element;
>
> [1B] mapping the received context metadata to one or more haptic parameters;
>
> [1C] generating a haptic signal based at least in part on the one or more haptic parameters; and
>
> [1D] sending the haptic signal to an actuator to generate the confirmation haptic effect.

86. Based on publicly available information, Meta's Accused Instrumentalities meet all elements of, and therefore infringe, at least claim 1 of the '524 patent.

87. Regarding the preamble of claim 1, to the extent the preamble is determined to be limiting, the Accused Instrumentalities provide the features described in the preamble, which recites a "non-transitory computer-readable medium having instructions stored thereon that, when executed by a processor, cause the processor to generate a confirmation haptic effect, the generating the confirmation haptic effect comprising." For example, the Quest 2 headset includes a Qualcomm Snapdragon XR2[48]:



Further, the Quest 2 includes touch controllers[49] that can provide haptic feedback:

88. Further, Quest 2 supports multiple game engines, including Unity, Unreal, and

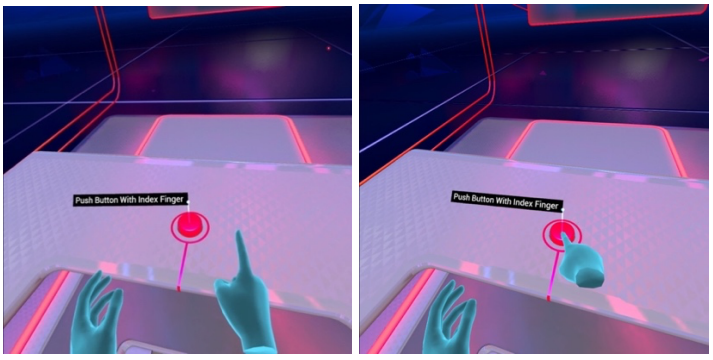
[48] *See* https://store.facebook.com/quest/products/quest-2/ (last visited May 25, 2022).
[49] *Id.*

Native Development[50]:

> **Develop with your preferred game engine**
>
> Game engines are obviously essential to the developer process, so it should come as no surprise that we actively partner with the companies behind these engines to ensure that you have the right tooling, integrations, best practices and technical documentation. Whether you work in Unity or Unreal, you've built your own Native engine, or you leverage newer engines like Godot, the resources below help you successfully build, test, iterate and publish your next VR app.

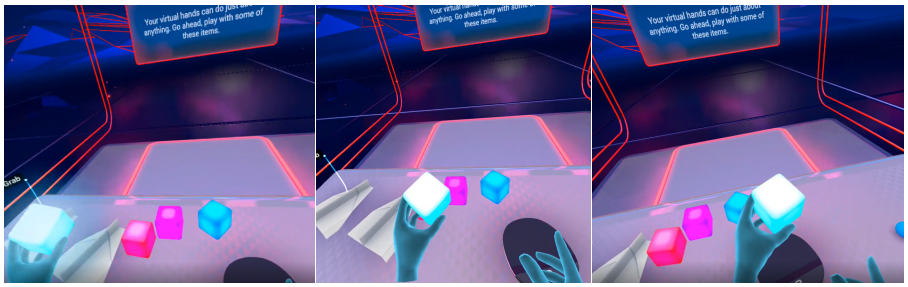
Accordingly, the Accused Instrumentalities meet the preamble of claim 1.

89. Limitation A requires "receiving context metadata associated with a user interaction of a user interface element, wherein the context metadata comprises at least one of: data indicating a functionality of the user interface element, or data indicating a history of the user interface element." The Accused Instrumentalities also meet all the requirements of limitation A of claim 1. For example, the *First Steps* application provides users with an introductory tutorial for familiarizing themselves with the touch controllers.[51] The figures below are screenshots taken from a Quest 2 while testing this functionality. One task includes gradually pressing a button down until it is completely pressed down:



Another task includes, picking up a cube and moving it from left to right:

[50] *See* https://developer.oculus.com/get-started-platform/ (last visited May 25, 2022).
[51] *See* https://www.oculus.com/experiences/quest/1863547050392688/ (last visited May 25, 2022).



On information and belief, these tasks require receiving a history of interaction with the exemplary user interface elements. Accordingly, the Accused Instrumentalities meet limitation A of claim 1.

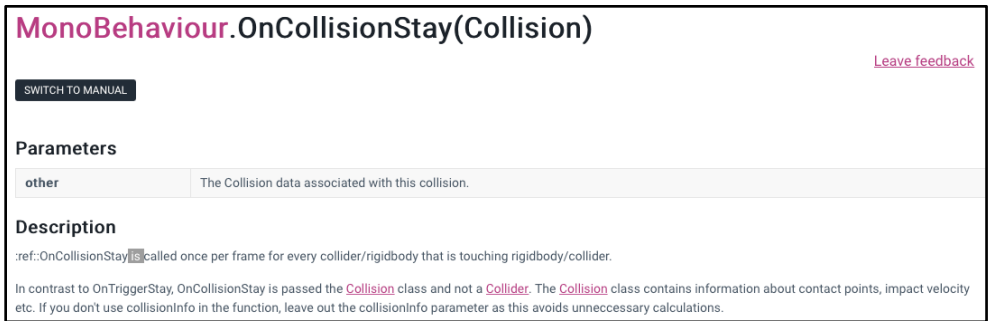
90. Limitation B requires "mapping the received context metadata to one or more haptic parameters." The Accused Instrumentalities also meet all the requirements of limitation B of claim 1. For example, the Quest 2 supports multiple game engines, including Unity, Unreal, and Native Development for implementing this functionality[52]:

> **Develop with your preferred game engine**
>
> Game engines are obviously essential to the developer process, so it should come as no surprise that we actively partner with the companies behind these engines to ensure that you have the right tooling, integrations, best practices and technical documentation. Whether you work in Unity or Unreal, you've built your own Native engine, or you leverage newer engines like Godot, the resources below help you successfully build, test, iterate and publish your next VR app.

Accordingly, the Accused Instrumentalities also meet all the requirements of limitation B of claim 1.

91. The Accused Instrumentalities can implement this infringing functionality in a number of ways. As just one example for how this infringing functionality could be implemented, the Unity engine provides the following event handling method, which is passed the Collision class, which contains information about contact points, impact velocity, etc.:

[52] *See* https://developer.oculus.com/get-started-platform/ (last visited May 25, 2022).

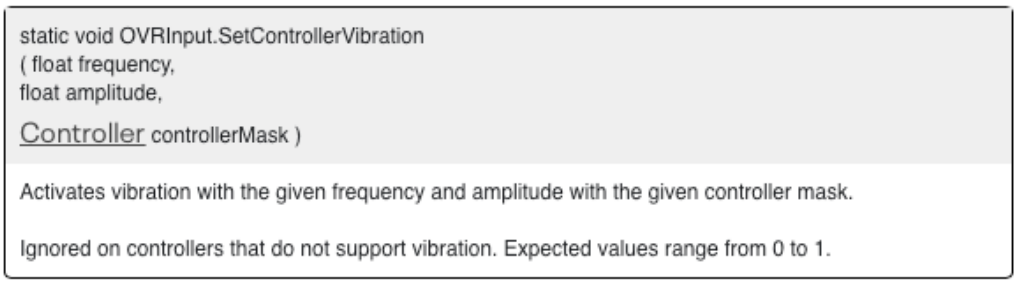


Such information could then be used while invoking the method discussed in limitation C. Accordingly, the Accused Instrumentalities also meet all the requirements of limitation B of claim 1.

92. Limitation C requires "generating a haptic signal based at least in part on the one or more haptic parameters." The Accused Instrumentalities also meet all the requirements of limitation C of claim 1. For example as described in limitation A, the *First Steps* application includes a task for gradually pressing a button down until it is completely pressed down and another task for picking up a cube and moving it side-to-side. Testing on the Quest 2 confirms that users experience different haptic effects during these tasks, which indicates that the Accused Instrumentalities generate a haptic signal based at least in part on the one or more haptic parameters. Accordingly, the Accused Instrumentalities meet limitation C of claim 1.

93. The Accused Instrumentalities can implement this infringing functionality in a number of ways. As just one example for how this infringing functionality could be implemented with the Unity engine, Oculus developer documentation instructs developers on the following API for generating haptic feedback passed at least in part on the one or more haptic parameters[53]:

[53] *See* https://developer.oculus.com/reference/unity/v38/class_o_v_r_input (last visited May 25, 2022).


static void OVRInput.SetControllerVibration
(float frequency,
float amplitude,
Controller controllerMask)

Activates vibration with the given frequency and amplitude with the given controller mask.

Ignored on controllers that do not support vibration. Expected values range from 0 to 1.

94. Limitation D requires "sending the haptic signal to an actuator to generate the confirmation haptic effect." The Accused Instrumentalities also meet all the requirements of limitation D of claim 1. For example, each of the touch controllers comprises an actuator, and users experience the haptic effects described in limitation C, which indicates that the Accused Instrumentalities send the haptic signal to an actuator to generate the confirmation haptic effect. Accordingly, the Accused Instrumentalities meet limitation D of claim 1.

95. Accordingly, the Accused Instrumentalities meet all the limitations of at least claim 1 of the '524 patent.

96. Thus, Meta directly infringes at least claim 1 of the '524 patent. For example, by integrating these exemplary game engines and providing the underlying infrastructure that implements the documented APIs, Meta makes the Accused Instrumentalities. As another example, because the Accused Instrumentalities are products under Meta's control for Meta's benefit, Meta uses the Accused Instrumentalities. As another example, Meta sells, offers for sale, and/or imports in this District and into the United States the Accused Instrumentalities.

97. As a result of Meta's infringement of the '524 patent, Immersion has suffered and continues to suffer substantial injury and is entitled to recover all damages caused by Meta's infringement to the fullest extent permitted by the Patent Act, together with prejudgment and post-judgment interest and costs for Meta's wrongful conduct.

98. Immersion has no adequate remedy at law to prevent future infringement of the

'524 patent. Immersion suffers and continues to suffer irreparable harm as a result of Meta's patent infringement and is, therefore, entitled to injunctive relief to enjoin Meta's wrongful conduct.

THIRD CAUSE OF ACTION
(PATENT INFRINGEMENT UNDER 35 U.S.C. § 271 OF THE '217 PATENT)

99. Immersion re-alleges and incorporates by reference all of the foregoing paragraphs.

100. Meta has infringed and continues to infringe, either literally or under the doctrine of equivalents, one or more claims, including at least claim 1, of the '217 patent in violation of 35 U.S.C. § 271, et seq., by making, using, selling, offering for sale, and/or importing in this District and into the United States certain products including, but not limited to those, relating to the Accused Instrumentalities.

101. Claim 1 of the '217 patent provides:

> [Preamble] A system comprising:
>
> [1A] a manipulatable input device movable through real space in at least three degrees of freedom, the manipulatable input device incorporating a haptic output device;
>
> [1B] a processor in communication with the haptic output device;
>
> [1C] a memory on which instructions executable by the processor are stored for causing the processor to:
>
> [1D] receive one or more sensor signals indicating a position of the manipulatable input device in the at least three degrees of freedom and an identification of the manipulatable input device;
>
> [1E] establish a communication pathway between the manipulatable input device and the processor;
>
> [1F] after establishing the communication pathway, determine a feedback parameter based at least in part on the position of the manipulatable input device in the at least three degrees of freedom and the identification of the manipulatable input device; and

> [1G] transmit a haptic signal to the haptic output device, the haptic signal configured to cause the haptic output device to output a haptic effect according to the feedback parameter.

102. Meta's Accused Instrumentalities meet all elements of at least claim 1 of the '217 patent.

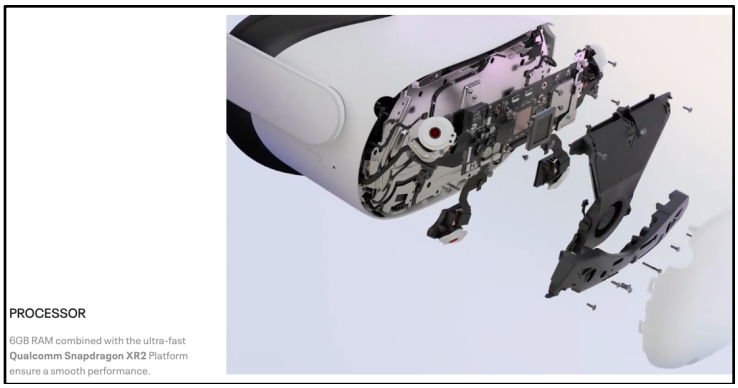
103. Regarding the preamble of claim 1 of the '217 patent, to the extent the preamble is determined to be limiting, the Accused Instrumentalities comprise a system.

104. Limitation A requires "a manipulatable input device movable through real space in at least three degrees of freedom, the manipulatable input device incorporating a haptic output device." The Accused Instrumentalities also meet all the requirements of limitation A of claim 1. For example, the Quest 2 includes two controllers that allow the user to "[f]eel like your virtual hands are your own with touch controllers"[54]:

These controllers are movable through real space in at least three degrees of freedom and provide haptic feedback. Accordingly, the Accused Instrumentalities meet limitation A of claim 1.

105. Limitation B requires "a processor in communication with the haptic output device." The Accused Instrumentalities also meet all the requirements of limitation B of claim 1. For example, the Quest 2 headset includes a Qualcomm Snapdragon XR2[55]:

[54] *See* https://store.facebook.com/quest/products/quest-2/ (last visited May 25, 2022).
[55] *Id*.

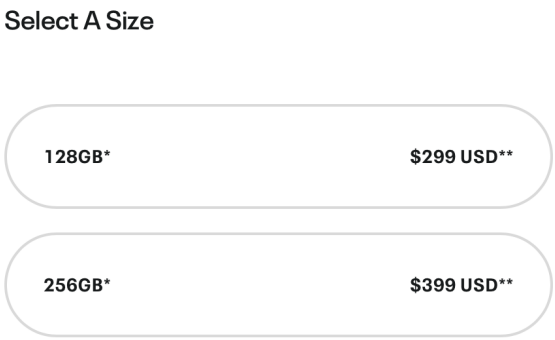


Further, the Quest 2 includes touch controllers on communication with the Quest 2 headset that can provide haptic feedback[56]:

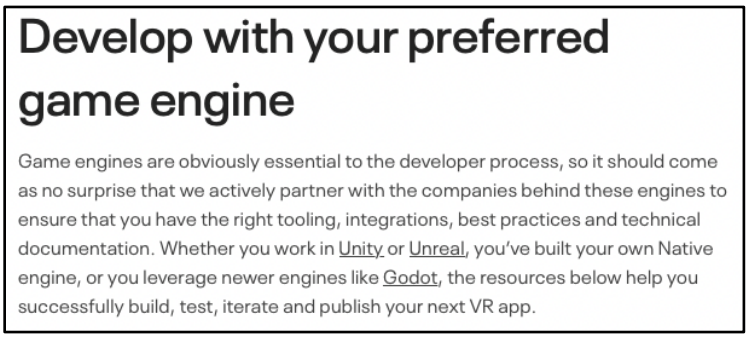
Accordingly, the Accused Instrumentalities meet limitation B of claim 1.

106. Limitation C requires "a memory on which instructions executable by the processor are stored for causing the processor to." The Accused Instrumentalities also meet all the requirements of limitation B of claim 1. For example, Quest 2 devices have memory on which instructions are executable by the processor and are available in two sizes, 128 GB of memory or 256 GB of memory[57]:

[56] *See* https://store.facebook.com/quest/products/quest-2/ (last visited May 25, 2022).
[57] *Id.*



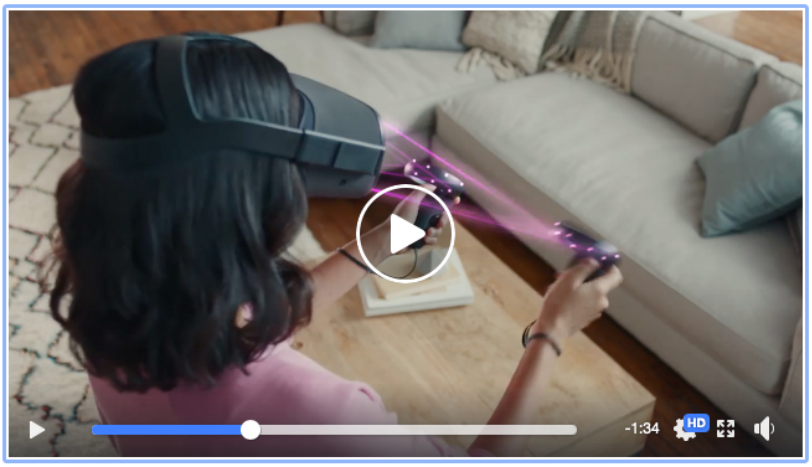
107. Further, Quest 2 supports multiple game engines, including Unity, Unreal, and Native Development[58]:



Accordingly, the Accused Instrumentalities meet limitation C of claim 1.

108. Limitation D requires "receive one or more sensor signals indicating a position of the manipulatable input device in the at least three degrees of freedom and an identification of the manipulatable input device." The Accused Instrumentalities also meet all the requirements of limitation D of claim 1. For example, Oculus Insight, Facebook's VR system, tracks each controller[59]:

[58] *See* https://developer.oculus.com/get-started-platform/ (last visited May 25, 2022).
[59] *See* https://ai.facebook.com/blog/powered-by-ai-oculus-insight/ (last visited May 25, 2022).



Accordingly, the Accused Instrumentalities receive one or more sensor signals indicating a position of the touch controllers in the at least three degrees of freedom and an identification of each touch controller, meeting limitation D of claim 1.

109. Limitation E requires "establish a communication pathway between the manipulatable input device and the processor." The Accused Instrumentalities also meet all the requirements of limitation E of claim 1. For example, the controllers are paired such that they automatically connect with the Quest 2 headset every time it is turned on[60]:

Pairing and unpairing Oculus Touch controllers

To pair your Oculus Touch controllers:

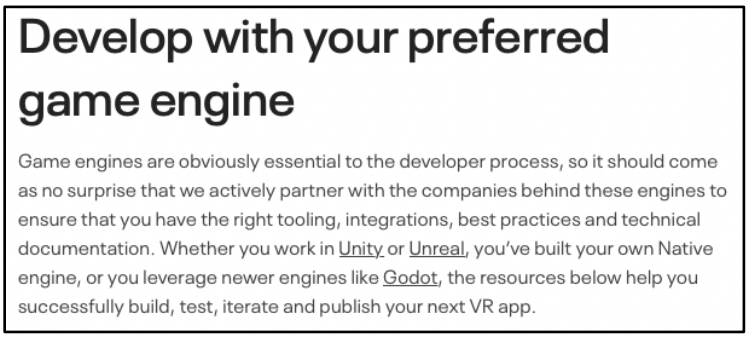
1. Open the Oculus mobile app on your phone.
2. Tap **Oculus Quest 2** or **Oculus Quest** in the top left corner of your Oculus app.
3. Tap **Devices** in the bottom right corner of your app.
4. Tap **Controllers** then tap **Left** or **Right** to choose which controller you'd like to pair.
5. Press and hold the and buttons on your right controller or and on your left controller until the controller LED blinks and then lights up to finalize the pairing.

Once you've paired your controllers, the controllers will automatically connect to your headset each time you turn it on, if it's nearby.

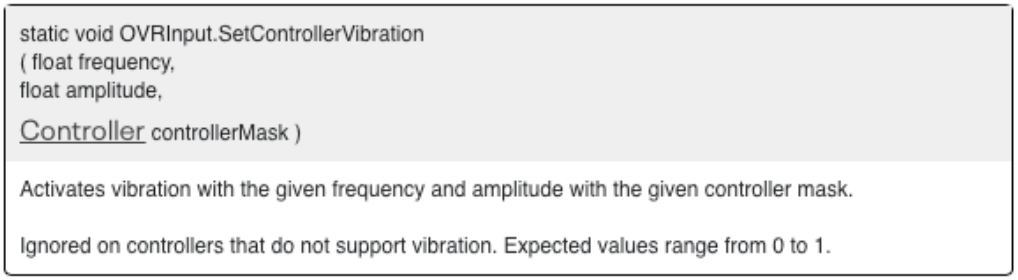
Accordingly, the Accused Instrumentalities meet limitation E of claim 1.

[60] *See* https://support.oculus.com/articles/getting-started/getting-started-with-quest-2/manually-pair-touch-controllers-quest-2/ (last visited May 25, 2022).

110. Limitation F requires "after establishing the communication pathway, determine a feedback parameter based at least in part on the position of the manipulatable input device in the at least three degrees of freedom and the identification of the manipulatable input device." The Accused Instrumentalities also meet all the requirements of limitation F of claim 1. For example, the Quest 2 supports multiple game engines, including Unity, Unreal, and Native Development for implementing this functionality[61]:



111. The Accused Instrumentalities can implement this infringing functionality in a number of ways. As just one example for how this infringing functionality could be implemented with the Unity engine, Oculus developer documentation instructs developers on the following API for providing haptic feedback after determining feedback parameters[62]:



112. This documentation further describes the possible values for the controller mask

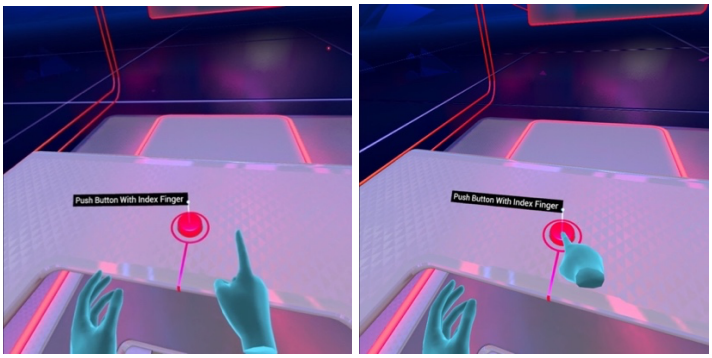
[61] *See* https://developer.oculus.com/get-started-platform/ (last visited May 25, 2022).
[62] *See* https://developer.oculus.com/reference/unity/v38/class_o_v_r_input (last visited May 25, 2022).

parameter referenced above, including[63]:

LTouch	Left Oculus Touch controller. Virtual input mapping differs from the combined L/R Touch mapping.
RTouch	Right Oculus Touch controller. Virtual input mapping differs from the combined L/R Touch mapping.

113. Accordingly, the Accused Instrumentalities meet limitation F of claim 1.

114. Limitation G requires "transmit a haptic signal to the haptic output device, the haptic signal configured to cause the haptic output device to output a haptic effect according to the feedback parameter." The Accused Instrumentalities also meet all the requirements of limitation G of claim 1. For example, the *First Steps* application provides users with an introductory tutorial for familiarizing themselves with the touch controllers.[64] The figures below are screenshots taken from a Quest 2 while testing this functionality. One task includes gradually pressing a button down until it is completely pressed down:



Testing on the Quest 2 confirms that users experience a haptic effect during this task. Accordingly, the Accused Instrumentalities meet limitation G of claim 1.

---

[63] *See* https://developer.oculus.com/reference/unity/v38/class_o_v_r_input/#a5c86f9052a9cbb0b73779ff5704d60a8 (last visited May 25, 2022).

[64] *See* https://www.oculus.com/experiences/quest/1863547050392688/ (last visited May 25, 2022).

115. Thus, Meta directly infringes at least claim 1 of the ’217 patent. For example, by integrating these exemplary game engines and providing the underlying infrastructure that implements the documented APIs, Meta makes the Accused Instrumentalities. As another example, because the Accused Instrumentalities are products under Meta’s control for Meta’s benefit, Meta uses the Accused Instrumentalities. As another example, Meta sells, offers for sale, and/or imports in this District and into the United States the Accused Instrumentalities.

116. As a result of Meta’s infringement of the ’217 patent, Immersion has suffered and continues to suffer substantial injury and is entitled to recover all damages caused by Meta’s infringement to the fullest extent permitted by the Patent Act, together with prejudgment and post-judgment interest and costs for Meta’s wrongful conduct.

117. Immersion has no adequate remedy at law to prevent future infringement of the ’217 patent. Immersion suffers and continues to suffer irreparable harm as a result of Meta’s patent infringement and is, therefore, entitled to injunctive relief to enjoin Meta’s wrongful conduct.

FOURTH CAUSE OF ACTION
(PATENT INFRINGEMENT UNDER 35 U.S.C. § 271 OF THE ’298 PATENT)

118. Immersion re-alleges and incorporates by reference all of the foregoing paragraphs.

119. Meta has infringed and continues to infringe, either literally or under the doctrine of equivalents, one or more claims, including at least claim 9, of the ’298 patent in violation of 35 U.S.C. § 271, et seq., by making, using, selling, offering for sale, and/or importing in this District and into the United States certain products including, but not limited to those, relating to the Accused Instrumentalities.

120. Claim 1 of the ’298 patent provides:

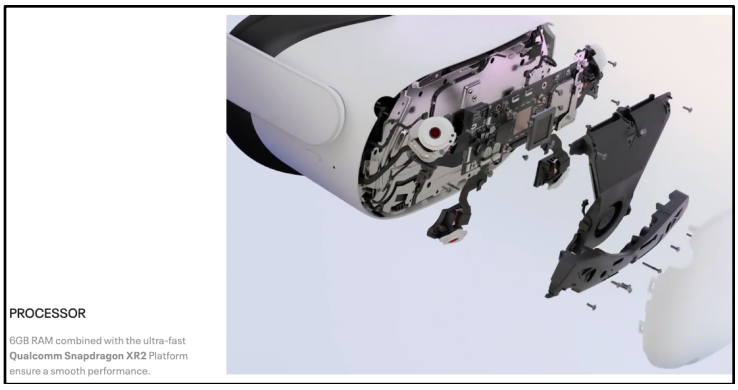
> [Preamble] A system comprising:
>
> [1A] a processor; and;
>
> [1B] a memory device comprising program code that is executable by the processor to cause the processor to:
>
> [1C] display a virtual environment via an electronic display;
>
> [1D] detect an interaction with a virtual object in the virtual environment based on a peripheral being at a particular position in free space with respect to the virtual object; and
>
> [1E] based on detecting the interaction:
>
> [1F] determine a first feedback parameter that depends on an identifier of the peripheral and a second feedback parameter that depends on the particular position of the peripheral in free space; and;
>
> [1G] transmit a haptic signal configured to cause a haptic output device to output haptic feedback in accordance with the first feedback parameter and the second feedback parameter.

121. Meta's Accused Instrumentalities meet all elements of, and therefore infringe, at least claim 1 of the '298 patent.

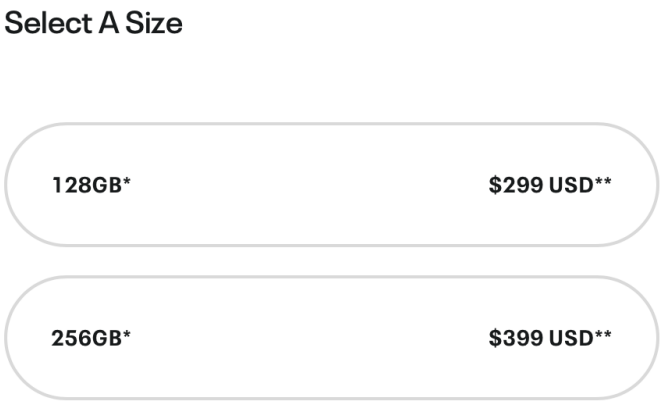
122. Regarding the preamble of claim 1 of the '298 patent, to the extent the preamble is determined to be limiting, the Accused Instrumentalities comprise a system.

123. Limitation A requires "a processor." The Accused Instrumentalities meet all of the requirements of limitation A of claim 1. For example, the Quest 2 headset includes a Qualcomm Snapdragon XR2[65]:

[65] *See* https://store.facebook.com/quest/products/quest-2/ (last visited May 25, 2022).



124. Limitation B requires "a memory device comprising program code that is executable by the processor." The Accused Instrumentalities also meet all the requirements of limitation B of claim 1. For example, Quest 2 devices have a memory device comprising program code that is executable by the processor and are available in two sizes, 128 GB of memory or 256 GB of memory[66]:

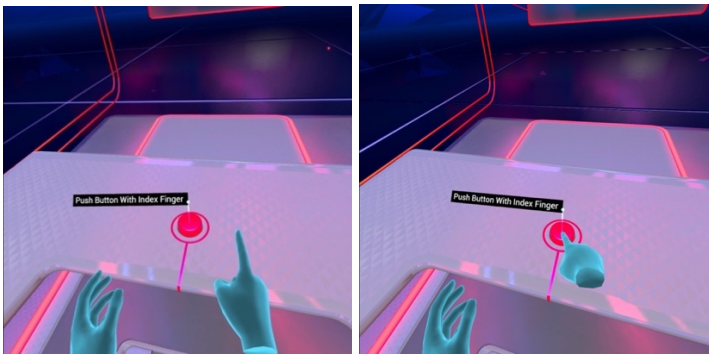


125. Further, the program code on the processor is executable by the processor to cause the processor to meet limitations C and D of claim 1 of the '298 patent, which are discussed below.

126. Limitation C requires the processor to "display a virtual environment via an electronic display." The Accused Instrumentalities also meet all the requirements of limitation C of claim 1. For example, the *First Steps* application provides users with an introductory tutorial

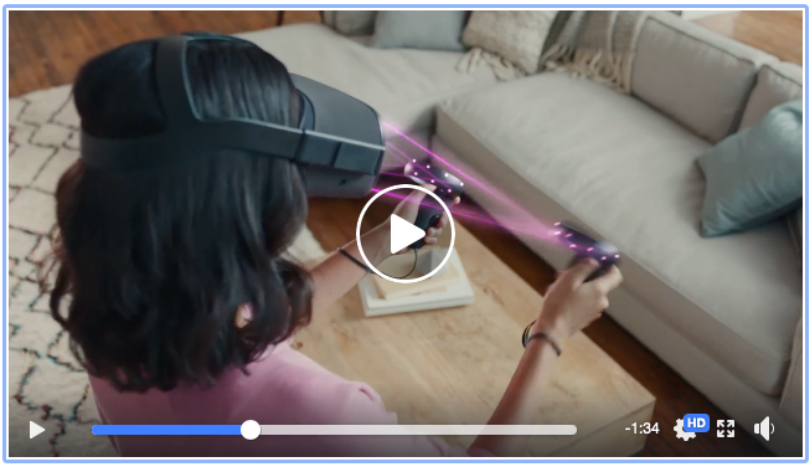
[66] *Id.*

for familiarizing themselves with the touch controllers.[67] The figures below are screenshots taken from a Quest 2 while testing this functionality. The screenshots show a displayed virtual environment via an electronic display:



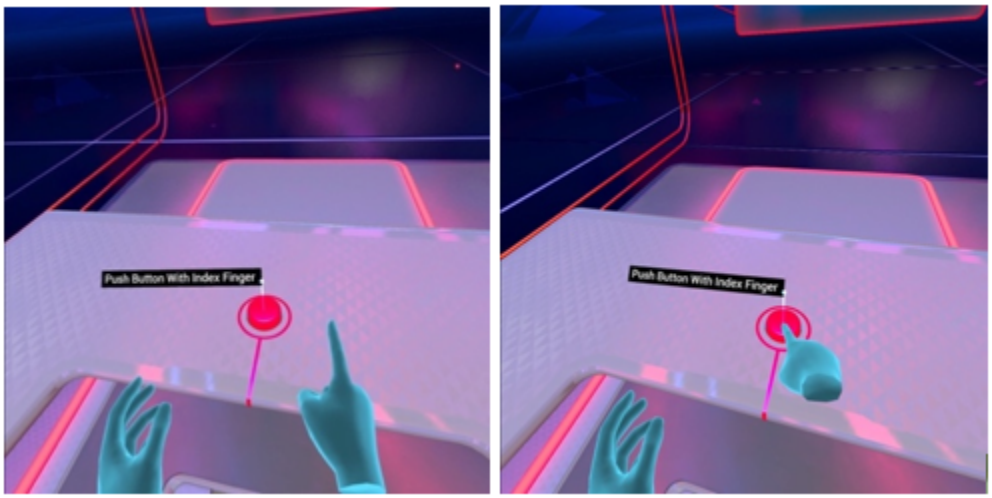
Accordingly, the Accused Instrumentalities meet limitation C of claim 1.

127. Limitation D requires the processor to "detect an interaction with a virtual object in the virtual environment based on a peripheral being at a particular position in free space with respect to the virtual object." The Accused Instrumentalities also meet all the requirements of limitation D of claim 1. For example, Oculus Insight, Facebook's VR system, tracks the touch controllers[68]:

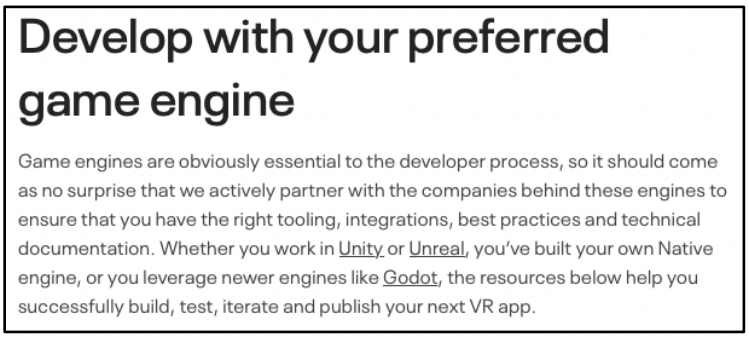


[67] See https://www.oculus.com/experiences/quest/1863547050392688/ (last visited May 25, 2022).
[68] *See* https://ai.facebook.com/blog/powered-by-ai-oculus-insight/ (last visited May 25, 2022).

128. The figures below are screenshots taken from a Quest 2 while testing this functionality. For example, the *First Steps* application includes a task that requires the user to gradually press a button down until it is completely pressed down. The screenshots show virtual objects in a displayed virtual environment via an electronic display. As shown, the Accused Instrumentalities can detect an interaction with a virtual objected based on a peripheral being at a particular position in free space with respect to the virtual object:



129. Further, Quest 2 supports multiple game engines, including Unity, Unreal, and Native Development for implementing this functionality[69]:



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Game engines are obviously essential to the developer process, so it should come as no surprise that we actively partner with the companies behind these engines to ensure that you have the right tooling, integrations, best practices and technical documentation. Whether you work in Unity or Unreal, you've built your own Native engine, or you leverage newer engines like Godot, the resources below help you successfully build, test, iterate and publish your next VR app.

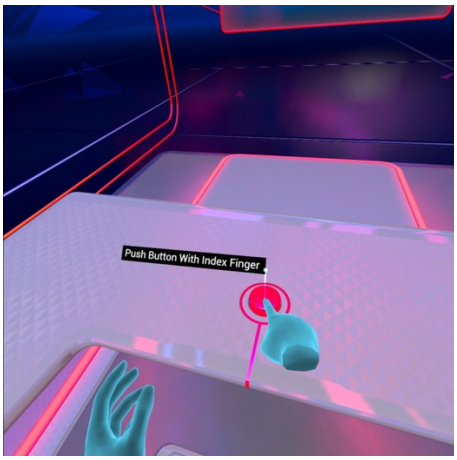
130. Accordingly, the Accused Instrumentalities meet limitation D of claim 1.

131. Limitation E requires limitations F and G to occur "based on detecting the

[69] *See* https://developer.oculus.com/get-started-platform/ (last visited May 25, 2022).

interaction" of limitation D. The Accused Instrumentalities also meet all the requirements of limitation E, F, and G of claim 1 as discussed below.

132. Limitation F requires the processor of limitation A, based on detecting the interaction of limitation D, to "determine a first feedback parameter that depends on an identifier of the peripheral and a second feedback parameter that depends on the particular position of the peripheral in free space." The Accused Instrumentalities also meet all the requirements of limitation F of claim 1. For example, the First Steps application, described in limitation A, instruct users to "Push Button With Index Finger." The figure below was taken from a Quest 2 device while performing this task. Testing on the Quest 2 confirms that users experience continuous haptic feedback in the hand pressing the button until completely pressing the button down:



133. The Accused Instrumentalities can implement this infringing functionality in a number of ways. As just one example for how this infringing functionality could be implemented with the Unity engine, Oculus developer documentation instructs developers on the following API for providing haptic feedback after determining feedback parameters [70]:

[70] *See* https://developer.oculus.com/reference/unity/v38/class_o_v_r_input (last visited May 25, 2022).

static void OVRInput.SetControllerVibration
(float frequency,
float amplitude,
Controller controllerMask)

Activates vibration with the given frequency and amplitude with the given controller mask.

Ignored on controllers that do not support vibration. Expected values range from 0 to 1.

134. This documentation further describes the possible values for the controller mask parameter referenced above, including: [71]

LTouch	Left Oculus Touch controller. Virtual input mapping differs from the combined L/R Touch mapping.
RTouch	Right Oculus Touch controller. Virtual input mapping differs from the combined L/R Touch mapping.

135. Accordingly, the Accused Instrumentalities meet limitation F of claim 1.

136. Limitation G requires the processor of limitation A, based on detecting the interaction of limitation D, to "transmit a haptic signal configured to cause a haptic output device to output haptic feedback in accordance with the first feedback parameter and the second feedback parameter." The Accused Instrumentalities also meet all the requirements of limitation F of claim 1. The Accused Instrumentalities also meet all the requirements of limitation G of claim 1. For example, testing on a Quest 2 confirms that users experience the haptic feedback described in limitation F, which indicates that the Accused Instrumentalities transmit a haptic signal configured to cause a haptic output device to output haptic feedback in accordance with the first feedback parameter and the second feedback parameter. Accordingly, the Accused Instrumentalities meet limitation G of claim 1.

[71] *See* https://developer.oculus.com/reference/unity/v38/class_o_v_r_input/#a5c86f9052a9cbb0b73779ff5704d60a8 (last visited May 25, 2022).

137. Thus, Meta directly infringes at least claim 1 of the ’298 patent. For example, by integrating these exemplary game engines and providing the underlying infrastructure that implements the documented APIs, Meta makes the Accused Instrumentalities. As another example, because the Accused Instrumentalities are products under Meta’s control for Meta’s benefit, Meta uses the Accused Instrumentalities. As another example, Meta sells, offers for sale, and/or imports in this District and into the United States the Accused Instrumentalities.

138. As a result of Meta’s infringement of the ’298 patent, Immersion has suffered and continues to suffer substantial injury and is entitled to recover all damages caused by Meta’s infringement to the fullest extent permitted by the Patent Act, together with prejudgment and post-judgment interest and costs for Meta’s wrongful conduct.

139. Immersion has no adequate remedy at law to prevent future infringement of the ’298 patent. Immersion suffers and continues to suffer irreparable harm as a result of Meta’s patent infringement and is, therefore, entitled to injunctive relief to enjoin Meta’s wrongful conduct.

FIFTH CAUSE OF ACTION
(PATENT INFRINGEMENT UNDER 35 U.S.C. § 271 OF THE ’222 PATENT)

140. Immersion re-alleges and incorporates by reference all of the foregoing paragraphs.

141. Meta has infringed and continues to infringe, either literally or under the doctrine of equivalents, one or more claims, including at least claim 1, of the ’222 patent in violation of 35 U.S.C. § 271, et seq., by making, using, selling, offering for sale, and/or importing in this District and into the United States certain products including, but not limited to those, relating to the Accused Instrumentalities.

142. Claim 1 of the ’222 patent provides:

[Preamble] A system comprising:

[1A] a wearable device;

[1B] a second device remote from and in communication with the wearable device;

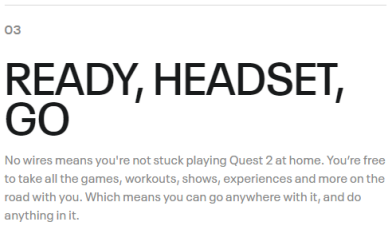
[1C] a processor configured to generate at least a first control signal and a second control signal representative of a first event and a second event, respectively, occurring in an environment related to the wearable device and/or the second device, the first event and the second event being different events; and

[1D] a haptic output device configured to provide a first haptic feedback signal and a second haptic feedback signal based on the first control signal and the second control signal, respectively.

143. Meta's Accused Instrumentalities meet all elements of, and therefore infringe, at least claim 1 of the '222 patent.

144. Regarding the preamble of claim 1 of the '222 patent, to the extent the preamble is determined to be limiting, the Accused Instrumentalities comprise a system.

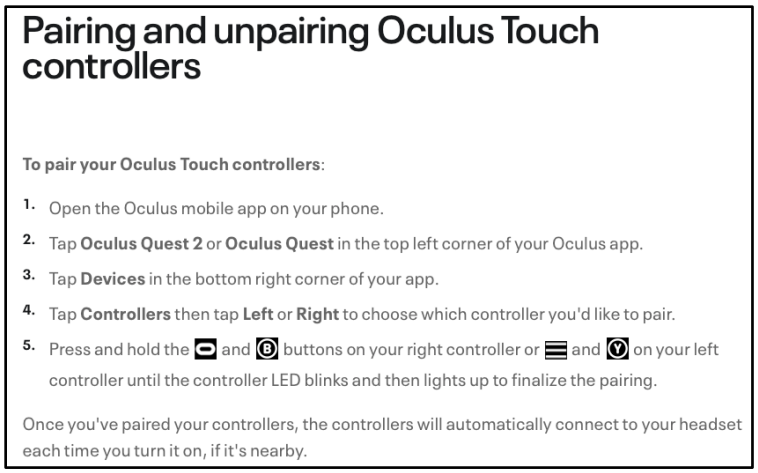
145. Limitation A requires "a wearable device." The Accused Instrumentalities meet all of the requirements of limitation A of claim 1. For example, Quest 2 comprises a wearable headset[72]:



[72] *See* https://store.facebook.com/quest/products/quest-2/ (last visited May 25, 2022).

146. Limitation B requires "a second device remote from and in communication with the wearable device." The Accused Instrumentalities meet all of the requirements of limitation B of claim 1. For example, Quest 2 comprises touch controllers[73]:

147. The touch controllers are remote from the headset, and are in communication with the headset because, for example, they are paired such that they automatically connect with the headset every time it is turned on[74]:



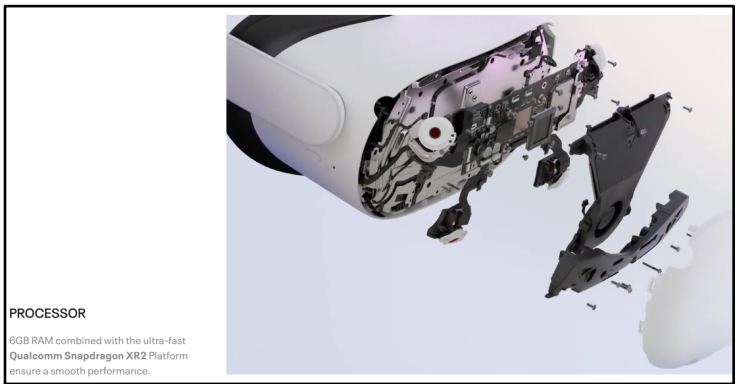
Accordingly, the Accused Instrumentalities meet limitation B of claim 1.

148. Limitation C requires "a processor configured to generate at least a first control signal and a second control signal representative of a first event and a second event, respectively, occurring in an environment related to the wearable device and/or the second device, the first

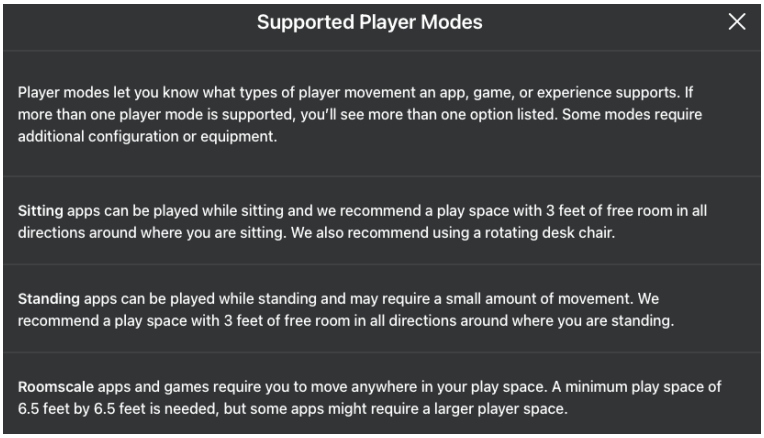
[73] *Id.*

[74] *See* https://store.facebook.com/help/quest/articles/getting-started/getting-started-with-quest-2/manually-pair-touch-controllers-quest-2/ (lasted visited May 25, 2022).

event and the second event being different events." The Accused Instrumentalities also meet all the requirements of limitation C of claim 1. For example, the Quest 2 headset includes a Qualcomm Snapdragon XR2[75]:



149. Further, in one example, a processor generates a first control signal and a second control signal representative of a first event and a second event, respectively, occurring in an environment related to the wearable device and/or the second device, when the Accused Instrumentalities operate in "roomscale" mode, which allows players to move anywhere in their play space:[76]



150. Setting up roomscale requires the user to define their play area environment

[75] *See* https://store.facebook.com/quest/products/quest-2/ (last visited May 25, 2022).
[76] *See* https://www.oculus.com/experiences/quest/2448060205267927/ (last visited May 25, 2022).

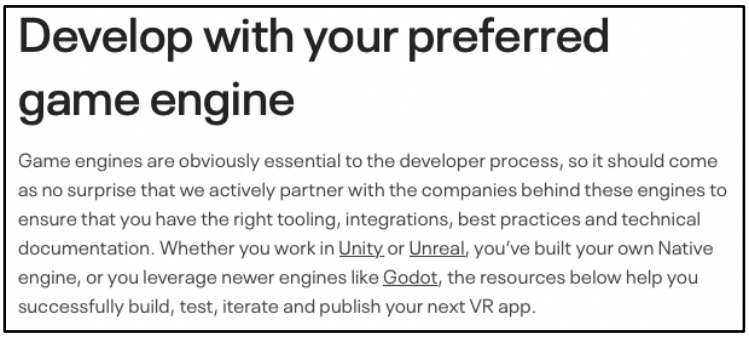
relative to the headset and the touch controllers[77]:

151. One exemplary roomscale game is *Beat Saber*, developed and published for Quest 2 subject to Meta's requirements by Beat Games.[78] The figure below is a screenshot taken from a Quest 2 while testing this functionality in *Beat Saber* in 360 mode. The image on the left shows how the Accused Instrumentalities require the player to first turn to the right in their environment in order strike two boxes. The image on the right shows how the Accused Instrumentalities next require the player to turn to the left in their environment to strike another box. The guidelines under the boxes indicate the direction the user should face.

[77] *See* https://www.youtube.com/watch?v=zh5ldprM5Mg (last visited May 25, 2022).
[78] *See* https://www.oculus.com/experiences/quest/2448060205267927/ (last visited May 25, 2022).

152. Accordingly, the Accused Instrumentalities meet limitation C of claim 1.

153. Limitation D requires "a haptic output device configured to provide a first haptic feedback signal and a second haptic feedback signal based on the first control signal and the second control signal, respectively." The Accused Instrumentalities also meet all the requirements of limitation D of claim 1. For example, Quest 2 supports multiple game engines, including Unity, Unreal, and Native Development for implementing this functionality[79]:



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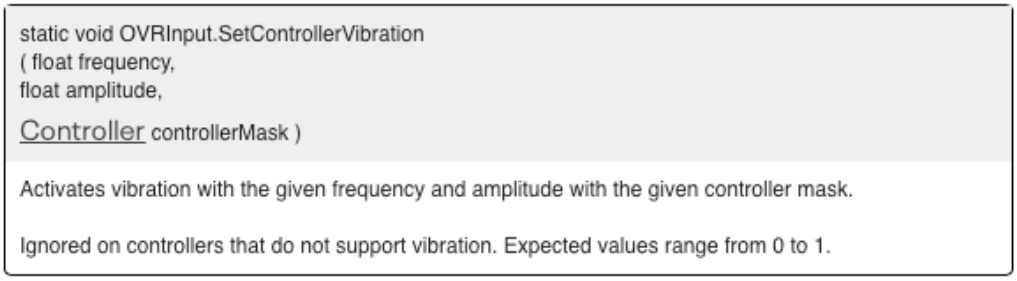
Game engines are obviously essential to the developer process, so it should come as no surprise that we actively partner with the companies behind these engines to ensure that you have the right tooling, integrations, best practices and technical documentation. Whether you work in Unity or Unreal, you've built your own Native engine, or you leverage newer engines like Godot, the resources below help you successfully build, test, iterate and publish your next VR app.

154. The Accused Instrumentalities can implement this infringing functionality in a number of ways. As just one example for how this infringing functionality could be implemented with the Unity engine, Oculus developer documentation instructs developers on the following

[79] *See* https://developer.oculus.com/get-started-platform/ (last visited May 25, 2022).

API for providing haptic feedback:[80]



155. The Accused Instrumentalities output a first haptic feedback signal to both touch controllers when the player strikes the two boxes described above, and a second haptic feedback signal to the left touch controller when striking the single box described above. Accordingly, the Accused Instrumentalities meet limitation D of claim 1.

156. Thus, Meta directly infringes at least claim 1 of the '222 patent. For example, by integrating these exemplary game engines and providing the underlying infrastructure that implements the documented APIs, Meta makes the Accused Instrumentalities. As another example, because the Accused Instrumentalities are products under Meta's control for Meta's benefit, Meta uses the Accused Instrumentalities. As another example, Meta sells, offers for sale, and/or imports in this District and into the United States the Accused Instrumentalities.

157. As a result of Meta's infringement of the '222 patent, Immersion has suffered and continues to suffer substantial injury and is entitled to recover all damages caused by Meta's infringement to the fullest extent permitted by the Patent Act, together with prejudgment and post-judgment interest and costs for Meta's wrongful conduct.

158. Immersion has no adequate remedy at law to prevent future infringement of the '222 patent. Immersion suffers and continues to suffer irreparable harm as a result of Meta's patent infringement and is, therefore, entitled to injunctive relief to enjoin Meta's wrongful

[80] *See* https://developer.oculus.com/reference/unity/v38/class_o_v_r_input (last visited May 25, 2022).

conduct.

SIXTH CAUSE OF ACTION
(PATENT INFRINGEMENT UNDER 35 U.S.C. § 271 OF THE '143 PATENT)

159. Immersion re-alleges and incorporates by reference all of the foregoing paragraphs.

160. Meta has infringed and continues to infringe, either literally or under the doctrine of equivalents, one or more claims, including at least claim 1, of the '143 patent in violation of 35 U.S.C. § 271, et seq., by making, using, selling, offering for sale, and/or importing in this District and into the United States certain products including, but not limited to those, relating to the Accused Instrumentalities.

161. Claim 1 of the '143 patent provides:

> [Preamble] A system comprising:
>
> [1A] a position sensor;
>
> [1B] a processor; and
>
> [1C] a non-transitory computer-readable medium comprising program code that is executable by the processor to cause the processor to:
>
> [1D] output first interactive content to a display, the first interactive content comprising a virtual environment;
>
> [1E] receive one or more sensor signals from the position sensor;
>
> [1F] determine a position of a peripheral in real space based on the one or more sensor signals, the peripheral configured to be worn on a user's head;
>
> [1G] output second interactive content to the display based on the position of the peripheral in real space, the second interactive content being different from the first interactive content;
>
> [1H] determine a haptic signal based on the position of the peripheral in real space and the second interactive content; and

> [1I] transmit the haptic signal to a haptic output device, the haptic output device being configured to receive the haptic signal and output haptic feedback.

162. Meta's Accused Instrumentalities meet all elements of, and therefore infringe, at least claim 1 of the '143 patent.

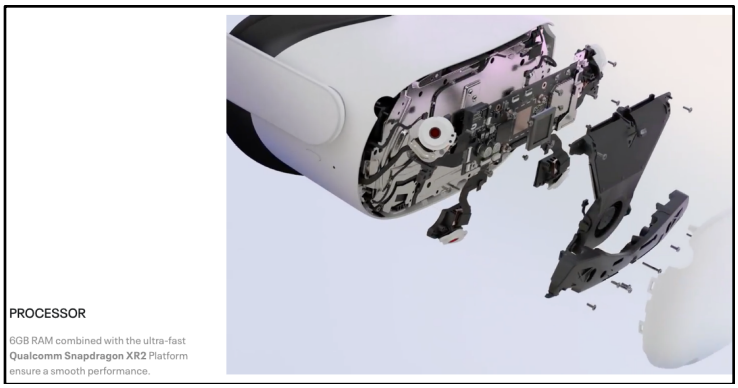
163. Regarding the preamble of claim 1 of the '143 patent, to the extent the preamble is determined to be limiting, the Accused Instrumentalities comprise a system.

164. Limitation A requires "a position sensor." The Accused Instrumentalities also meet all the requirements of limitation A of claim 1. For example, Oculus Insight, Facebook's VR system, uses visual-inertial SLAM to track the position of a user's head[81]:

Accordingly, the Accused Instrumentalities meet limitation A of claim 1.

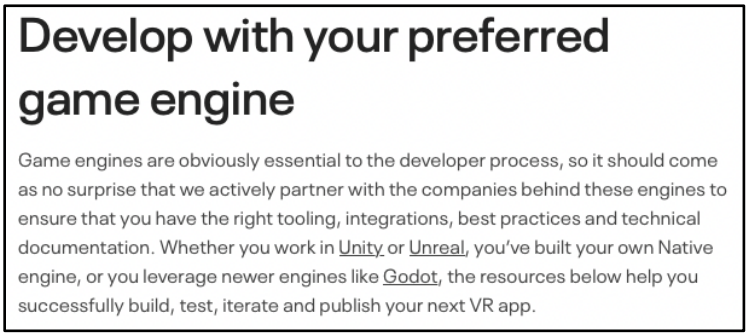
165. Limitation B requires "a processor." The Accused Instrumentalities also meet all the requirements of limitation B of claim 1. For example, the Quest 2 headset includes a Qualcomm Snapdragon XR2[82]:

[81] *See* https://ai.facebook.com/blog/powered-by-ai-oculus-insight/ (last visited May 25, 2022).
[82] *See* https://store.facebook.com/quest/products/quest-2/ (last visited May 25, 2022).



166. Accordingly, the Accused Instrumentalities meet limitation B of claim 1.

167. Limitation C requires "a non-transitory computer-readable medium comprising program code that is executable by the processor to." The Accused Instrumentalities also meet all the requirements of limitation C of claim 1. For example, Quest 2 supports multiple game engines, including Unity, Unreal, and Native Development for implementing this functionality[83]:



Accordingly, the Accused Instrumentalities meet limitation C of claim 1.

168. Limitation D requires causing a processor to "output first interactive content to a display, the first interactive content comprising a virtual environment." The Accused Instrumentalities also meet all the requirements of limitation D of claim 1. For example, in *Creed: Rise to Glory*, developed and published for Quest 2 subject to Meta's requirements by

[83] *See* https://developer.oculus.com/get-started-platform/ (last visited May 25, 2022).

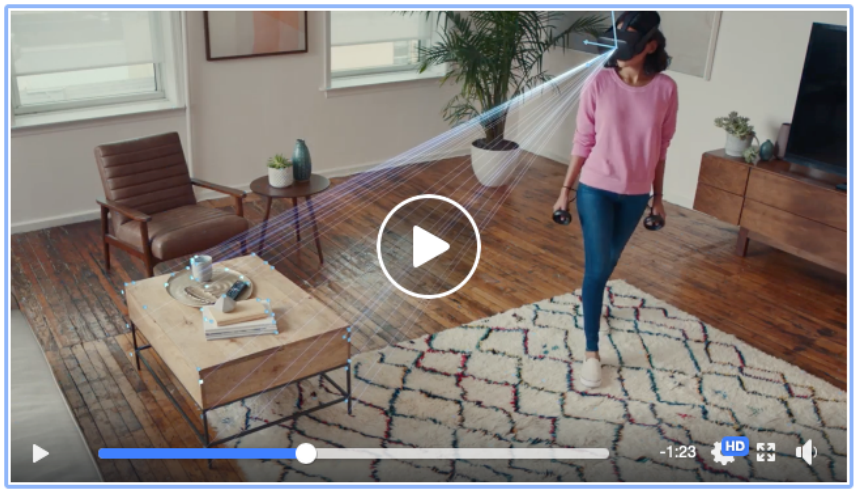
Survios,[84] a first interactive content comprising a virtual environment is output to a display. The figure below is a screenshot taken from a Quest 2 while testing this functionality.

169. Accordingly, the Accused Instrumentalities meet limitation D of claim 1.

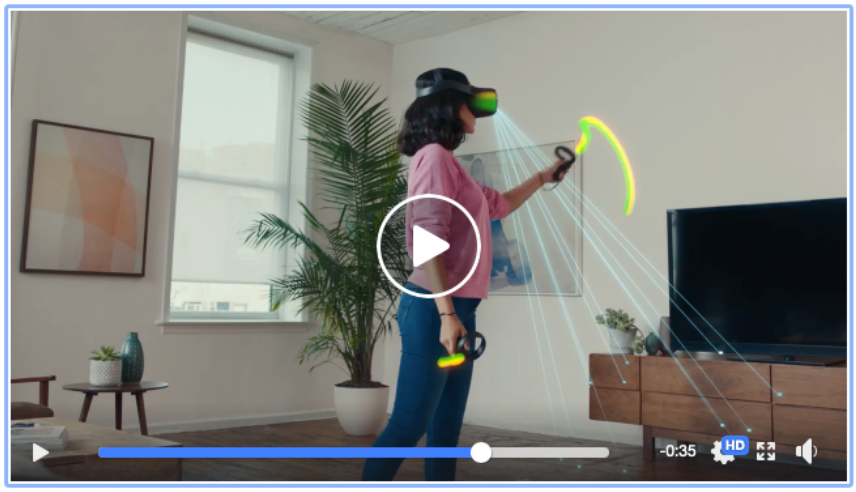
170. Limitation E requires causing a processor to "receive one or more sensor signals from the position sensor." The Accused Instrumentalities also meet all the requirements of limitation E of claim 1. For example, as mentioned in limitation A, Oculus Insight uses visual-inertial SLAM to track the position of a user's head, which indicates that the processor receives one or more sensor signals from the position sensor. Accordingly, the Accused Instrumentalities meet limitation E of claim 1.

171. Limitation F requires causing a processor to "determine a position of a peripheral in real space based on the one or more sensor signals, the peripheral configured to be worn on a user's head." The Accused Instrumentalities also meet all the requirements of limitation F of claim 1. For example, Oculus Insight detects unique image features in the real space and triangulates those points in 3D[85]:

[84] *See* https://www.oculus.com/experiences/quest/2366245336750543/ (last visited May 25, 2022).
[85] *See* https://ai.facebook.com/blog/powered-by-ai-oculus-insight/ (last visited May 25, 2022).



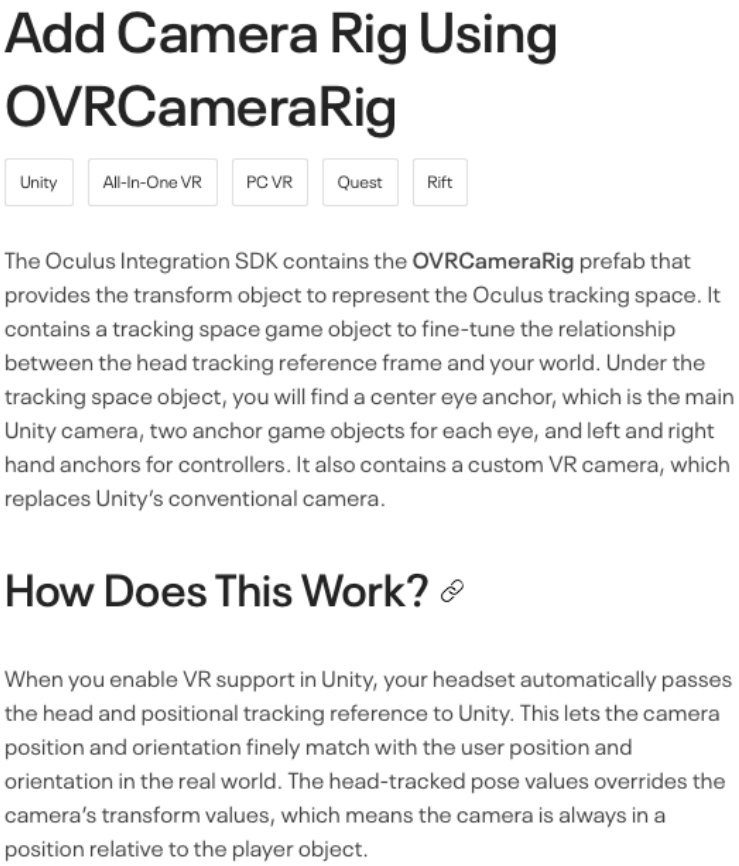
172. Further, Oculus Insight uses visual-inertial SLAM to track the position of a user's head in real space (relative to detected objects) and the Quest 2 headset on the user's head:



See "Powered by AI: Oculus Insight."[86]

173. Further, the Accused Instrumentalities can implement this infringing functionality in multiple ways. As just one example for how this infringing functionality could be implemented with the Unity engine, Oculus developer documentation instructs developers on the OVRCameraRig as described below:[87]

[86] *See* https://ai.facebook.com/blog/powered-by-ai-oculus-insight/ (last visited May 25, 2022).
[87] *See* https://developer.oculus.com/documentation/unity/unity-add-camera-rig (last visited May 25, 2022).



Add Camera Rig Using OVRCameraRig

Unity | All-In-One VR | PC VR | Quest | Rift

The Oculus Integration SDK contains the **OVRCameraRig** prefab that provides the transform object to represent the Oculus tracking space. It contains a tracking space game object to fine-tune the relationship between the head tracking reference frame and your world. Under the tracking space object, you will find a center eye anchor, which is the main Unity camera, two anchor game objects for each eye, and left and right hand anchors for controllers. It also contains a custom VR camera, which replaces Unity's conventional camera.

How Does This Work?

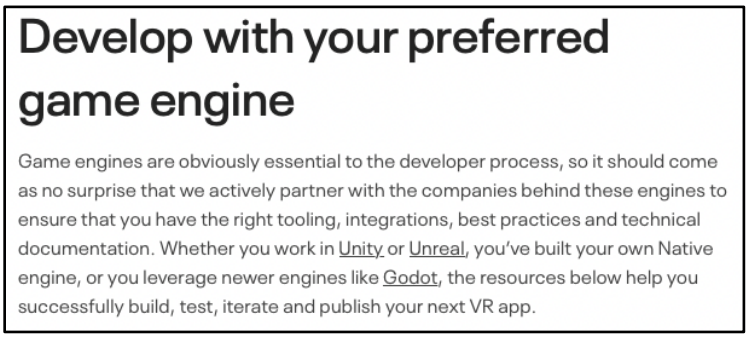
When you enable VR support in Unity, your headset automatically passes the head and positional tracking reference to Unity. This lets the camera position and orientation finely match with the user position and orientation in the real world. The head-tracked pose values overrides the camera's transform values, which means the camera is always in a position relative to the player object.

174. Accordingly, the Accused Instrumentalities meet limitation F of claim 1.

175. Limitation G requires causing a processor to "output second interactive content to the display based on the position of the peripheral in real space, the second interactive content being different from the first interactive content." The Accused Instrumentalities also meet all the requirements of limitation G of claim 1. For example, in *Creed: Rise to Glory*, users can perform a "dodge" move by positioning the headset and controllers, which causes a second interactive content different from the first interactive content to be displayed. The figure below is a screenshot taken from a Quest 2 while testing this functionality.

Accordingly, the Accused Instrumentalities meet limitation G of claim 1.

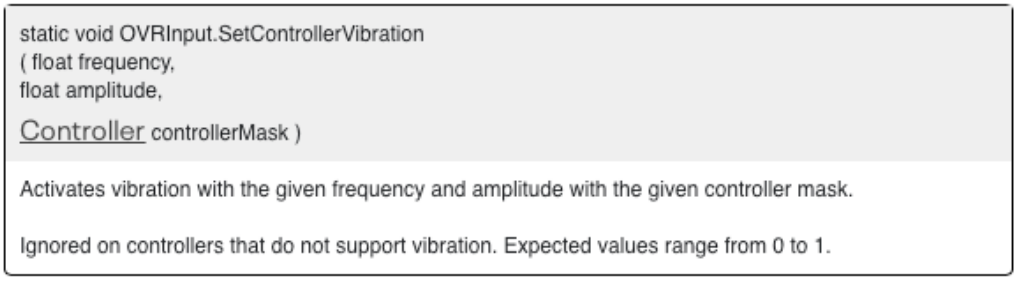
176. Limitation H requires causing a processor to "determine a haptic signal based on the position of the peripheral in real space and the second interactive content." The Accused Instrumentalities also meet all the requirements of limitation H of claim 1. For example, Quest 2 supports multiple game engines, including Unity, Unreal, and Native Development for implementing this functionality[88]:



177. The Accused Instrumentalities can implement this infringing functionality in a number of ways. As just one example for how this infringing functionality could be implemented with the Unity engine, Oculus developer documentation instructs developers on the following API for providing haptic feedback based on the position of the peripheral in real space and the

[88] *See* https://developer.oculus.com/get-started-platform/ (last visited May 25, 2022).

second interactive content:[89]



178. Accordingly, the Accused Instrumentalities meet limitation H of claim 1.

179. Limitation I requires causing a processor to "transmit the haptic signal to a haptic output device, the haptic output device being configured to receive the haptic signal and output haptic feedback." The Accused Instrumentalities also meet all the requirements of limitation I of claim 1. For example, in *Creed: Rise to Glory*, when a user performs a "dodge" move as described above, testing on the Quest 2 confirms that a haptic signal is transmitted to a controller on the side from which the user is dodging a punch. Accordingly, the Accused Instrumentalities meet limitation I of claim 1.

180. Thus, Meta directly infringes at least claim 1 of the '143 patent. For example, by integrating these exemplary game engines and providing the underlying infrastructure that implements the documented APIs, Meta makes the Accused Instrumentalities. As another example, because the Accused Instrumentalities are products under Meta's control for Meta's benefit, Meta uses the Accused Instrumentalities. As another example, Meta sells, offers for sale, and/or imports in this District and into the United States the Accused Instrumentalities.

181. As a result of Meta's infringement of the '143 patent, Immersion has suffered and continues to suffer substantial injury and is entitled to recover all damages caused by Meta's infringement to the fullest extent permitted by the Patent Act, together with prejudgment and

[89] *See* https://developer.oculus.com/reference/unity/v38/class_o_v_r_input (last visited May 25, 2022).

post-judgment interest and costs for Meta's wrongful conduct.

182. Immersion has no adequate remedy at law to prevent future infringement of the '143 patent. Immersion suffers and continues to suffer irreparable harm as a result of Meta's patent infringement and is, therefore, entitled to injunctive relief to enjoin Meta's wrongful conduct.

PRAYER FOR RELIEF

WHEREFORE, Immersion respectfully requests judgment against Meta as follows:

A. That this Court adjudge that Meta, to the extent not enjoined, infringes the '806 patent, the '524 patent, the '217 patent, the '298 patent, the '222 patent, and the '143 patent;

B. that the Court enter an injunction prohibiting Meta and its agents, officers, servants, employees, and all persons in active concert or participation with Meta from deploying, operating, maintaining, testing, and using the Accused Instrumentalities, and from otherwise infringing any of the Patents-in-Suit;

C. that this Court ascertain and award Immersion damages under 35 U.S.C. § 284 sufficient to compensate for Meta's infringement, including but not limited to infringement occurring before the filing of this lawsuit;

D. that this Court ascertain and award Immersion any post-judgment ongoing royalties under 35 U.S.C. § 284 as may be appropriate;

E. that this Court award Immersion any applicable prejudgment and post-judgment interest; and

F. that this Court award Immersion such other relief at law or in equity as the Court deems just and proper.

JURY DEMAND

Immersion requests that all claims and causes of action raised in this Complaint against Meta be tried to a jury to the fullest extent possible.

Date: May 26, 2022

Respectfully submitted,

FOLIO LAW GROUP PLLC

/s/ Stefan Szpajda
Stefan Szpajda, WA Bar No. 50106
Cristofer I. Leffler, WA Bar No. 35020
David Schumann, CA Bar No. 223936
C. Maclain Wells, CA Bar No. 221609 (Admission *pro hac vice* pending)
Sam Kim, CA Bar No. 282582
Palani Pradeep Rathinasamy, CA Bar No. 269852
Cliff Win, Jr., CA Bar No. 270517
Steven Skelley, WA Bar No. 53017
1200 Westlake Ave. N., Suite 809
Seattle, WA 98109
Tel: (206) 880-1802
Email:
stefan@foliolaw.com
cris.leffler@foliolaw.com
david.schumann@foliolaw.com
maclain@foliolaw.com
sam.kim@foliolaw.com
palani@foliolaw.com
cliff.win@foliolaw.com
steve.skelley@foliolaw.com

Joseph M. Abraham, TX Bar No. 24088879
Timothy F. Dewberry, TX Bar No. 24090074
13492 Research Blvd., Suite 120, No. 177
Austin, TX 78750
Tel: (737) 234-0201
Email: joseph.abraham@foliolaw.com
timothy.dewberry@foliolaw.com

Attorneys for Immersion Corporation