

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UATP IP, LLC,
Petitioner,

v .

SLICK SLIDE LLC,
Patent Owner.

Case PGR2024-00054
U.S. Patent No. 11,998,854

DECLARATION OF DR. STEPHEN SPIEGELBERG

TABLE OF CONTENTS

I. INTRODUCTION	3
II. ADDITIONAL OPINIONS.....	3
III. SECONDARY CONSIDERATIONS OF NON-OBVIOUSNESS	16
1. Independent Claim 1	16
a. The Preamble [1pre]	16
b. Limitation [1a-i].....	17
c. Limitation [1a-ii].....	19
d. Limitation [1b-i]	19
e. Limitation [1b-ii]	20
f. Limitation [1b-iii]	21
g. Limitation [1c]	21
2. Independent Claim 22	22
a. The Preamble [22pre]	22
b. Limitation [22a-i].....	23
c. Limitations [22a-ii]-[22a-iv].....	23
d. Limitation [22b].....	24
3. Independent Claim 25	25
a. The Preamble [25pre]	25
b. Limitation [25a-i].....	25
c. Limitations [25a-ii]-[25a-iv].....	25
d. Limitation [25b].....	26
IV. CONCLUSION	27

I. INTRODUCTION

I, Dr. Stephen Spiegelberg PhD. declare that:

1. I have been retained by Wood, Herron & Evans, LLP, on behalf of Slick Slide, LLC (“Patent Owner”), as an independent expert consultant in this post grant review (“PGR”) proceeding before the United States Patent and Trademark Office.
2. I previously submitted the Declaration of Dr. Stephen Spiegelberg on January 9, 2025. I incorporate by reference that Declaration herein.

II. ADDITIONAL OPINIONS

3. The ‘854 patent: In my previous declaration, I described the ‘854 patent in detail. The ‘854 patent describes the claim term “mesh layer” as follows: “[T]he mesh material is a woven mesh” and “the mesh material 46 includes a number of warp threads 70 which extend generally perpendicular to a number of weft threads 72 to form a plurality of interstitial openings 74 therebetween.” EX1001, 10:19-25. The specification of the ‘854 patent provides that “the interstitial openings 74 may be within a range of between about 45 micron to about 1200 micron, for example, and the open area of the mesh material 46 may be within a range of between about 25% to about 65%, for example.” *Id.*, 10:30-35.
4. Passages in the specification and one independent claim (claim 22) refer to the open area of the mesh as certain percentage ranges, *i.e.*, 25% to 65% and 35%

to 50%. See also Ex. 1001, 13:6–8 (“the open area of the mesh layer is within a range of between about 35% to about 50%).

5. The specification provides additional description with regard to the embodiment of Figure 5: “The open area of the mesh material 46 refers to the total percentage of open space or voids in the mesh structure. It represents the portion of the mesh material 46, and the bottom surface 56 of the ride vehicle 14, that is not occupied by solid material such as threads.” Ex. 1001, 10:46–50.

6. The specification goes on to provide the range of diameters of the warp and weft threads in the mesh material of Figure 5 and their density, measured in threads per centimeter of mesh material. *Id.* at 11:10–14.

7. Claim 25 describes a mesh layer that “includes a plurality of weft threads each having a thread diameter within a range of between 0.1 mm to 0.6 mm and a plurality of warp threads each having a thread diameter within a range of between 0.1 mm to 0.6 mm.” *Id.* at 14:19–23; see also *id.* at 2:37–46, 3:25–29.

8. These portions of the specification and claim language demonstrate to a POSITA that “mesh layer” means a layer of material which is characterized by open spaces between threads. The passages in the specification and independent claim 22 refer to the open area of the mesh as certain percentage ranges, providing examples and demonstrating that a “mesh layer” is characterized by open spaces. In addition, portions of the specification and claim language describe the warp and weft threads,

having a particular thread diameter. This is consistent with a POSITA's understanding that what those threads comprise, *i.e.*, a "mesh layer," is characterized by open spaces.

9. A POSITA would understand from the specification that "coefficient of friction" means the ratio of the frictional force between two surfaces to the normal force pressing the surfaces together, as determined using the ASTM D1894 test method. EX2026, ¶¶63-66.

10. While the '854 patent provides that the coefficient of friction between surfaces of the mesh material 46 and the slide surface 18 "may" be determined using ASTM D1894, a POSITA would understand that ASTM D1894 is the most common standardized test method for determining coefficient of friction. In addition, as a POSITA would expect, there is no other standardized test method mentioned in the '854 patent.

11. Phillips: In my previous declaration, I described the Phillips reference in detail. Phillips does not use the term "mesh" to describe the low friction, durable sheeting material for use with the sliding vehicles. EX1004. Instead, Phillips consistently describes the material as membranes or sheeting materials. *Id.*, 1:22-25; 4:40-41.

12. Phillips distinguishes the low friction, durable sheeting material from "nylon netting." In this regard, Phillips describes the use of nylon netting for attaching "various sliding elements 1606" which "can be added end-to-end or side-to-side to

slide element 1602 in order to create slides of additional length and/or width.”

EX1004, 9:50-52. Specifically, Phillips describes that “[a]ttachment can be by any well-recognized means such as through the use of Velcro hook and loop connectors, snaps, zippers, ropes, springs, nylon netting and similar expedients.” *Id.*, 9:53-55.

13. Thus, the referenced “nylon netting” is not used for forming the bottom surface of the ride vehicle. EX1004, 9:50-55. Rather, it is only disclosed as attaching slide surfaces together. *Id.*

14. In doing so, Phillips demonstrates that sheeting is to be used for forming the bottom of the ride vehicle, and that nylon netting is not to be used for that purpose. This distinction highlights to a POSITA that nylon netting serves a different purpose than and is not equivalent to the low friction, durable sheeting material central to Phillips’ slide and sliding vehicle embodiments.

15. Sheeting is durable, and more durable than mesh. Sheeting is more durable than mesh because it incorporates more material per unit area and hence allows greater distribution of applied loads to the material, which will result in greater durability than mesh made from the same material.

16. For the sports board (100), Phillips describes that the “durable low friction sheeting material 114 can be applied to bottom surface 116 by applying adhesive 115 to sheeting material 114 and adhering it to board 111.” Ex.1004, 7:10-12.

Likewise, for the sliding element (120), Phillips describes that the “low friction durable sheeting material 121 is adhered to a body section 122.” Ex. 1004, 7:23-25.

Notably, in every disclosed embodiment, Phillips describes attaching the low friction, durable sheeting material to sliding vehicles using adhesive.

17. A POSITA would know from Phillips that adhesive would need to be utilized to adhere the material forming the bottom of the ride vehicle to the bottom of the ride vehicle. This would cause even worse coefficient of friction than already attendant to combining a mesh layer with Phillips. For example, it would result in a tacky substance between the bottom of the ride vehicle and the slide surface, causing even worse results. A POSITA would therefore avoid using a mesh with an adhesive, because it would result in a tacky surface with a higher coefficient of friction.

18. Specifically, if a mesh were used as the bottom of the ride vehicle, a POSITA would know that the adhesive would permeate through the mesh. At least some adhesive would be present on the surface. A POSITA would therefore avoid using a mesh or an adhesive because it is a tacky material. Adhesive penetration through the mesh creates additional surface roughness and friction, including at the underside of the ride vehicle.

19. I also note that Phillips's slide is inflatable, and therefore deformable. A POSITA would understand that friction between deformable surfaces, particularly between cloth fabrics and deformable bodies, is "highly complex," "nonlinear, anisotropic, and even asymmetric." EX2034.

20. The more deformable the body, the higher the resulting coefficient of friction when sliding against the same cloth material (see EX2034, Fig. 9b, showing sponge, which is more deformable and yielding higher friction, compared to cotton, plastic foam, and sheepskin).

21. Thus, the coefficients of friction reported in Table 2 of Kothari (EX1009) would necessarily be higher if measured against a deformable body such as Phillips's slide surface.

22. EX1009: In connection with my previous declaration, I described EX1009 in detail. The coefficient of friction data therein is not for WN0400, but rather for a mesh in the form of "fine mesh nylon monofilament bolting fabric," "medium mesh nylon monofilament bolting fabric," and "coarse mesh nylon monofilament bolting fabric." EX1003, ¶¶137, 251, referring to EX1009, at Tables 1, 2, Fabric Nos. 13-15.

23. The lowest coefficient of friction for any such mesh that could possibly be applicable here is 0.26. EX1009, at Table 2, Fabric No. 15. To explain, Petitioner's expert claims that EX1009 demonstrates that "the finest meshes hav[e] a higher coefficient of friction than the coarsest meshes." Therefore, Petitioner's expert is referring to the "Fabric-to-Fabric" columns of Table 2. That is because the data for "Fabric-to-Metal" does not demonstrate that "the finest meshes hav[e] a higher coefficient of friction than the coarsest meshes" upon which Petitioner's expert relies, as I explained in my previously declaration.

24. None of the coefficient of friction data can be relied upon because neither “Fabric-to-Fabric,” “Fabric-to-Leather,” or “Fabric-to-Metal,” would have comparable friction characteristics to the circumstances presented by the ‘854 patent. Specifically, the interaction of the materials is not fairly reflected by EX1009, and the data is not a good comparison.

25. A POSITA would not consider the data in EX1009, because this situation does not involve “Fabric-to-Fabric,” “Fabric-to-Leather,” or “Fabric-to-Metal.” In addition, a POSITA would not consider the data in EX1009, because the data discloses a worse coefficient of friction than that disclosed in Phillips.

26. If anything was considered by a POSITA in connection with EX1009, it would be Fabric No. 11. That is because it demonstrates the lowest coefficient of friction. Fabric No. 11 is not a mesh.

27. EX1027: In connection with my previous declaration, I described EX1027 in detail. The data provided in EX1027 is for a flat sliding surface. Because mesh is not a flat sliding surface, the data provided in EX1027 is not for or applicable to a mesh material.

28. In connection with my previous declaration, I provided my opinion regarding CoF measurements. I explained that morphology impacts those measurements. A POSITA would expect that the morphology of a mesh would result in a much greater coefficient of friction than that of a flat sliding surface reported in EX1027.

That is because the morphology of a mesh would result in more interaction with the fibers, and a higher coefficient of friction.

29. Sheeting demonstrates a low coefficient of friction, and much lower than mesh. Indeed, this is a fact well known by a POSITA, and is demonstrated by the same references relied upon by Petitioner and Petitioner's expert. For example, EX1027 and the low coefficient of friction data reported by Petitioner's expert at Paragraph 109, is for a flat sliding surface which is not a mesh. This low coefficient of friction data demonstrated by sheeting is better than the best coefficient of friction data for mesh offered by Petitioner. EX1009.

30. A POSITA would understand that, with respect to plain-woven fabrics such as sailcloth, as pick density decreases the fabric becomes less compact, which creates greater differences between high and low peaks and thereby increases surface friction. Surface roughness values decrease as the weft yarn get finer and finer. EX2035, 46; EX2036, 27. By contrast, when pick density increases, the fabric structure becomes tighter and more compact, producing a smoother surface ("the surface smoothness of the fabrics increases as the pick density of the fabrics increases"). EX2035, 46; EX2036, 27.

31. A denser, compact weave more closely resembles the Phillips sheeting material, which is associated with lower frictional resistance desired by Phillips. Thus, a POSITA would not look to looser weaves even within the class of plain-woven fabrics, and certainly would not turn to mesh fabrics characterized by open

spaces. A POSITA would further recognize that these frictional problems would increase by orders of magnitude if a mesh material were used.

32. Indeed, sheeting is more durable, and demonstrates a lower coefficient of friction, than mesh. These facts are well known to a POSITA, as is demonstrated by at least the same references relied upon by Petitioner and Petitioner's expert.

33. CoF measurements are dependent upon the condition of the contacting surfaces. These measurements are also dependent upon the chemistry of the contacting surfaces and testing setup. And, as explained above, morphology of the contacting surfaces would also affect CoF measurements. Indeed, Petitioner's expert relies upon a reference that states that there are at least ten (10) different factors that influence coefficient of friction data. EX1027. This is based on literature relied upon by Petitioner's expert, further demonstrating that a POSITA would have detailed experience with CoF measurements, sufficient to know these complexities and the impact on CoF data.

34. In sum, a POSITA understands that coefficient of friction data is dependent upon these material, morphology, and testing conditions. For example, the same fibers made into a different morphology or structure are going to result in different coefficient of data.

35. For these reasons, a POSITA would have at least 5 years of measurement and analysis experience in the field of coefficient of friction.

36. Without at least 5 years of measurement and analysis experience in the field of coefficient of friction, a POSITA would not understand, and would likely misuse, reported results of coefficient of friction data. Supporting my opinion is the fact that Petitioner's own references acknowledge that coefficient of friction data cannot be relied upon to demonstrate data under specified conditions, such as those specified by the '854 patent. EX1003, ¶¶77-78, 172; EX1027 ("Readers should be aware of this shortcoming and use the values only as very approximate guides").

37. I have extensive experience in the study, testing, measurements, and analysis of coefficient of friction. My company and I have been conducting coefficient of friction measurements for our clients for over 20 years. I have helped design and build coefficient of friction test equipment compliant with ASTM standards. I have designed materials with targeted coefficient of friction properties.

38. Petitioner's expert's Supplemental Declaration: I understand that Petitioner's expert has attempted to further bolster Petitioner's lack of enablement arguments. In my opinion, Petitioner's expert's comments do not demonstrate lack of enablement.

39. For example, Petitioner's expert cites to a study (EX1039) that "friction coefficient value and volume wear rate of the composite decreases with increasing MoS₂ content up to 4% by weight, but above 4% by weight MoS₂, the measured friction coefficient and wear rate begin to increase." EX1043, ¶6. This comment demonstrates that a POSITA knows that adjusting a commonly used dry lubricant

can impact, and decrease, the measured coefficient of friction. As already demonstrated, molybdenum disulfide, a commonly used dry lubricant, can achieve coefficient of friction levels in the claimed range EX1026, ¶251, citing Vazirisereshk, M.R. et al, “Solid lubrication with MoS₂: A Review, Lubricants, 7, 57, 2019 (Ex. 2023).

40. Petitioner’s expert also references an academic paper relating to the effects of curing temperature, curing agent, and particle shape, on tribological properties including dynamic friction and wear. EX1043, ¶7. While it might be accurate to state generically that curing temperature, curing agent, and particle shape, can impact tribological properties including dynamic friction and wear, that does not contradict the fact that a POSITA would understand that coefficient of friction values between 0.03 and 0.06 are achievable (EX2026, ¶251) and that a POSITA would understand that these low frictional CoF values are achievable with a composition combining a resin, thermal conductor, hardener, and lubricant material, as the lubricant coating reduces the coefficient of friction. (EX2026, ¶¶253-254).

41. Petitioner’s expert also references an academic paper relating to filler materials including graphene and graphite. EX1043, ¶8. This merely demonstrates that low coefficients of friction can be achieved by reliance upon these filler materials. Such materials are not excluded from the dry lubricant material disclosed and claimed in claim 8 of the ‘854 patent.

42. That graphene and graphite are known filler materials only supports the fact that a POSITA would understand that low coefficient of friction values are achievable (EX2026, ¶251) and that a POSITA would understand that these low frictional CoF values are achievable with a composition combining a resin, thermal conductor, hardener, and lubricant material, as the lubricant coating reduces the coefficient of friction (EX2026, ¶¶253-254). The academic paper also demonstrates that a POSITA knows that filler can be used to achieve a desired coefficient of friction, and also demonstrates that determining the amount of filler is a routine matter for a POSITA. It would be a simple and routine matter for a POSITA to add lubricant to obtain a mixture. EX2026, ¶256.

43. Petitioner's expert acknowledges that the '854 patent describes commercial epoxies containing silicone or PTFE for coating the slide. EX1043, ¶¶13-14; EX1001, 7:21-35. The fact that the '854 patent does so is understood by a POSITA to provide extensive direction from the inventor, and the existence of working examples. Contrary to Petitioner's expert's suggestion, this provides support to a POSITA and provides further instruction regarding how to make and use the claimed invention. It also reduces significantly the quantity of experimentation needed to make or use the invention based on the content of these very specific disclosures.

44. In my opinion, Petitioner's expert is wrong when he declares that "[a] POSITA would not have been able to determine how much lubricant to add to an

epoxy to achieve a desired friction coefficient.” Each and every one of the references relied upon, *i.e.*, EX1039, EX1040, and EX1041, all demonstrate that a POSITA knows to adjust the coefficient of friction by the addition of lubricant. In light of the guidance provided by the ‘854 patent, including extensive direction from the inventor and the existence of working examples, doing so is routine for a POSITA.

45. Petitioner’s expert suggests that adding lubricant fillers would also involve “adjust[ing] amounts of other components” and “surface modification.” As set forth in EX1039, doing so is well documented and known by a POSITA. In addition, the ‘854 patent discloses specific working examples that already address these issues and provide direction to a POSITA. Regardless, adjusting the amounts of components and ensuring they combine with each other are routine matters for a POSITA, including based on the direction provided by the references relied upon. Furthermore, multiple references demonstrate that the coefficient of friction of commercial epoxies can be modified by simply blending in fillers before curing the epoxy without requiring surface modification of the fillers. Upadhyay blended in fullerene and carbon nanotubes into epoxy purchased from Huntsman, and was able to achieve coefficient of friction values down to 0.07. EX2037. Tian and co-workers modified epoxies by blending in titanium dioxide and short chain carbon fibers and obtained coefficient of frictions between 0.04-0.06. EX2038. Kumar, who was referenced by Plaintiff’s expert, achieved coefficient of frictions down to

0.042 for epoxy blended with graphene and a liquid lubricant. Ex 1041 Kumar did not perform surface treatment.

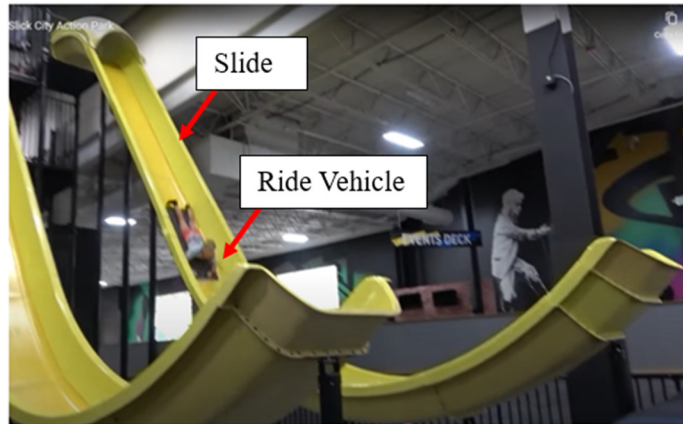
III. SECONDARY CONSIDERATIONS OF NON-OBVIOUSNESS

46. As I previously noted, I do not believe that any of the Challenged Claims are rendered obvious by the prior art references cited by Petitioner. However, even if the individual features of the Challenged Claims could be located somewhere in the prior art, I understand that Patent Owner has presented evidence of commercial success and industry praise regarding its products and technology. I have been asked to provide an opinion regarding independent claims 1, 22, and 25, which recite features of Slick Slide's the recreational slide system.

47. Based on my review of Slick Slide's recreational slide systems, as set out below, it is my opinion that those systems are coextensive with at least independent claims 1, 22, and 25 of the '854 Patent.

1. Independent Claim 1 **a. The Preamble [1pre]**

48. The preamble [1pre] of claim 1 requires "A recreational slide system." EX1001. The "recreational slide system," requires at least "a slide" and "a ride vehicle." *Id.* Slick Slide's recreational slide systems include both a slide and a ride vehicle, and therefore practice this limitation. For example, the image below depicts Slick Slide's Launch recreational slide system, which includes both a slide and a ride vehicle.



Slick Slide's Launch Slide
Recreational Slide System

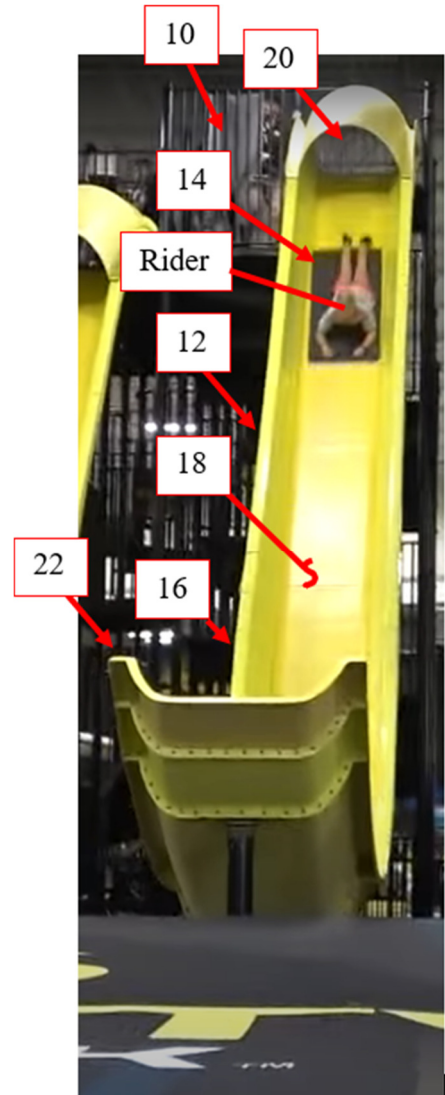
b. Limitation [1a-i]

49. The imitation [1a-i] requires “a slide.” Slick Slide’s recreational slide system practices this limitation. As can be seen in the image above, Slick Slide’s recreational slide system includes a slide. I understand that Slick Slide’s recreational slide system may include a variety of different slide designs, several of which are depicted below as installed in a Slick City Action Park location in Columbus, Ohio. EX2042. However, in each instance, Slick Slide’s recreational slide system includes a slide.



c. Limitation [1a-ii]

50. Limitation [1a-ii] requires that the slide include “a slide body with a non-wet lubricated slide surface that extends between a top entrance of the slide and a bottom exit of the slide.” EX1001.Slick Slide’s recreational slide system practices this limitation. As an example, Slick Slide’s recreational slide system that includes its flagship Launch slide, shown to the right, includes a slide body 16 that defines a slide surface 18. The slide body 16 extends between a top entrance 20 of the slide 12 to an opposite bottom exit 22. The slide surface 18 is a non-wet lubricated slide surface as the slide surface 18 is free of any fluid or wet lubricant flowing down the slide surface 18 and between a rider or the ride vehicle 14 and the slide surface 18.



d. Limitation [1b-i]

51. Limitation [1b-i] requires “a ride vehicle configured to support a rider down the slide.” EX1001.Slick Slide’s recreational slide system practices this limitation. As an example, the image above depicts Slick Slide’s recreational slide system that includes its flagship Launch slide 12 and the ride vehicle 14 for use with the slide

12. As shown, the rider is positioned atop the ride vehicle 14, and the ride vehicle 14 is configured to support the rider down the slide 12.

e. Limitation [1b-ii]

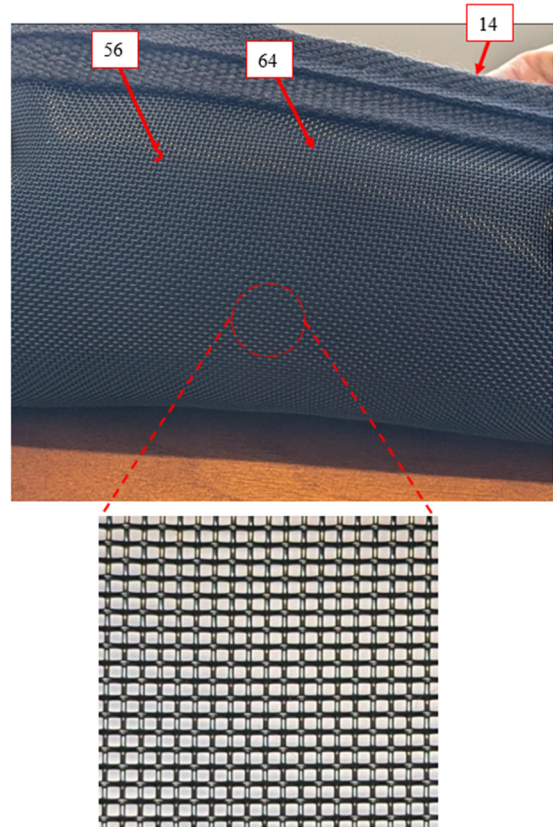
52. Limitation [1b-ii] requires “the ride vehicle including a top surface configured to contact the rider.” EX1001. The ride vehicle of Slick Slide’s recreational slide system practices this limitation. Slick Slide’s ride vehicle 14 is depicted to the right. As shown, ride vehicle 14 includes a top surface 54 configured to contact the rider. As can be seen in the figure above that depicts Slick Slide’s Launch slide 12, the top surface 54 includes handles configured to be gripped by the rider while supported atop the ride vehicle 14 and in contact with the top surface 54.



f. Limitation [1b-iii]

53. Limitation [1b-iii] requires “a mesh layer that forms a bottom surface configured to contact the slide surface.”

EX1001. The ride vehicle of Slick Slide’s recreational slide system practices this limitation. The underside of Slick Slide’s ride vehicle 14 is depicted to the right. As shown, the ride vehicle 14 includes a mesh layer 64 that forms a bottom surface 56 of the ride vehicle 14 that is configured to contact the slide surface 18. The mesh material that forms the mesh layer 64 is formed by warp and weft threads arranged to create open spaces with regular and uniform spacing; the mesh material is characterized by these open spaces and therefore is a mesh layer.



g. Limitation [1c]

54. Limitation [1c] requires “wherein a coefficient of friction between the mesh layer of the ride vehicle and the non-wet lubricated slide surface is within a range of between about 0.03 to about 0.2.” EX1001. Slick Slide’s recreational slide system practices this limitation. EX2039. The coefficient of friction between the mesh layer of Slick Slide’s ride vehicle and the non-wet, lubricated slide surface of Slick

Slide's slides is 0.047-0.090 based on testing performed under ASTM D1894 and demonstrates that the Slick Slide's slides have a coefficient of friction within the claimed range. EX2039.

55. As shown above, Slick Slide's commercial recreational slide system corresponds in all material respects to the invention claimed in claim 1 of the '854 patent. This correspondence demonstrates that claim 1 is coextensive with Slick Slide's recreational slide system.

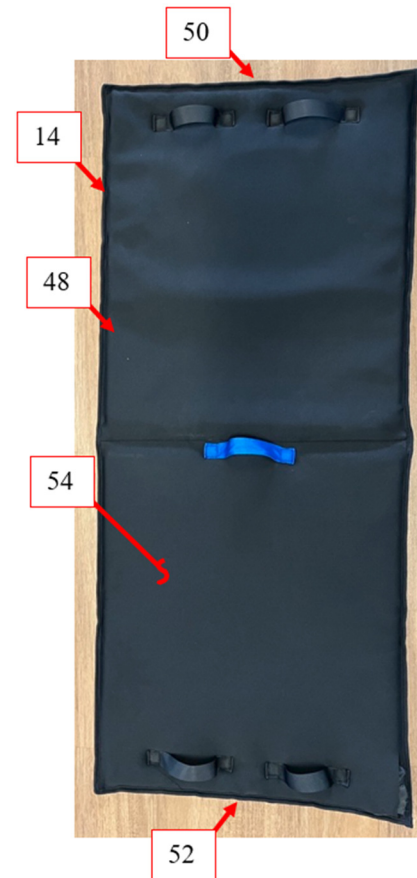
2. Independent Claim 22

a. The Preamble [22pre]

56. The preamble [22pre] of claim 22 requires "A ride vehicle configured to support a rider down a non-wet lubricated recreational slide." EX1001. Slick Slide's recreational slide system practices this limitation. *See supra* VI.A.a.i.

b. Limitation [22a-i]

57. Limitation [22a-i] requires “an elongate body that extends between a first end and an opposite second end.” EX1001.Slick Slide’s ride vehicle practices this limitation. Slick Slide’s ride vehicle 14 is depicted to the right. As shown, the ride vehicle 14 includes an elongate body 48 that extends between a first end 50 and an opposite second end 52.



c. Limitations [22a-ii]-[22a-iv]

58. Limitation [22a-ii] requires “the body including a central core positioned between”; limitation [22a-iii] requires “a top surface of the ride vehicle”; and limitation [22a-iv] requires “a woven mesh layer that forms a bottom surface of the ride vehicle that is configured to contact the non-wet lubricated recreational slide.” EX1001.Slick Slide’s ride vehicle practices each of limitations [22a-ii]-[22a-iv]. The construction of Slick Slide’s ride vehicle 14 is depicted to the right. As shown, the body 48 of Slick Slide’s ride vehicle 14 includes a central core 60 in the form of a flexible foam pad positioned between a fabric layer that forms the top surface 54 of the ride

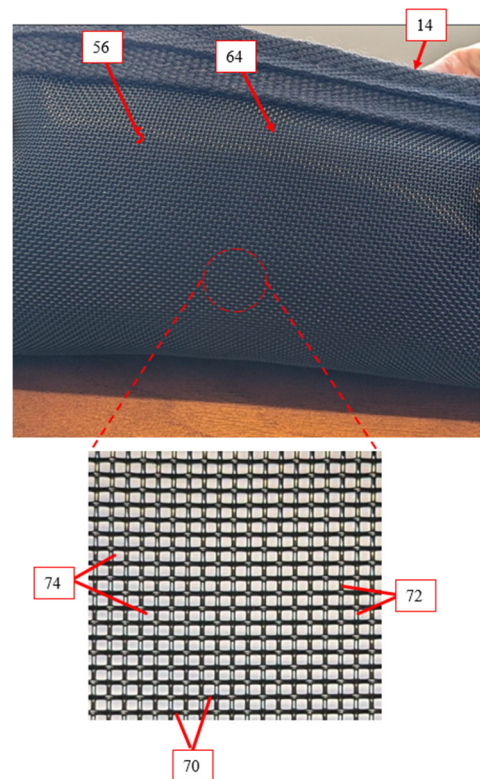


vehicle 14 and a woven mesh layer 64 that forms a bottom surface 56 of the ride vehicle 14. The woven mesh layer 56 is on the underside of the ride vehicle and thus is configured to (and does) contact the non-wet lubricated recreational slide 12 during use.

d. Limitation [22b]

59. Limitation [22b] requires “wherein the mesh layer includes a plurality of interstitial openings that define an open area of the mesh layer, wherein the open area of the mesh layer is within a range of between about 35% to about 50%.”

EX1001. Slick Slide’s ride vehicle practices this limitation. The images to the right depict the woven mesh layer 64 that forms a bottom surface 56 of Slick Slide’s ride vehicle 14, including a close-up image of the woven mesh layer 64 of Slick Slide’s ride vehicle 14. As shown, the woven mesh layer 64 layer of Slick Slide’s ride vehicle 14 includes a plurality of interstitial openings 74 between warp threads 70 and weft threads 72 that define an open area of the woven mesh layer 64. Image analysis and measurement show open area of the mesh layer 64 is 43%, and within the claimed range. Open area was determined using methodology consistent with industry practice; see EX2018; EX2016; EX2040.



60. As shown above, Slick Slide’s commercial ride vehicle corresponds in all material respects to the invention claimed in claim 22 of the ‘854 patent. This correspondence demonstrates that claim 22 is coextensive with Slick Slide’s commercial ride vehicle. Because claim 22 of the ‘854 patent is coextensive with Slick Slide’s commercial ride vehicle, I understand that there is a presumption of a nexus between the secondary consideration evidence and the merits of the claimed invention.

3. Independent Claim 25

a. The Preamble [25pre]

61. The preamble [25pre] of claim 25 requires “A ride vehicle configured to support a rider down a non-wet lubricated recreational slide.” EX1001.Slick Slide’s recreational slide system practices this limitation. *See supra* VI.A.a.i.

b. Limitation [25a-i]

62. Limitation [25a-i] requires “an elongate body that extends between a first end and an opposite second end.” EX1001.Slick Slide’s ride vehicle practices this limitation. *See supra* VI.A.a.i.

c. Limitations [25a-ii]-[25a-iv]

63. Limitation [25a-ii] requires “the body including a central core positioned between”; limitation [25a-iii] requires “a top surface of the ride vehicle”; and limitation [25a-iv] requires “a woven mesh layer that forms a bottom surface of the ride vehicle that is configured to contact the non-wet lubricated recreational slide.”

Slick Slide's ride vehicle practices each of limitations [25a-ii]-[25a-iv]. *See supra* VI.A.a.i.

d. Limitation [25b]

64. Limitation [25b] requires “wherein the mesh layer includes a plurality of weft threads each having a thread diameter within a range of between 0.1 mm to 0.6 mm and a plurality of warp threads each having a thread diameter within a range of between about 0.1 mm to about 0.6 mm.” EX1001.Slick Slide's ride vehicle

practices this limitation. The images to the right depict the woven mesh layer 64 that forms a bottom surface 56 of Slick Slide's ride vehicle 14, including a close-up image of the woven mesh layer 64 of Slick Slide's ride vehicle 14.

As shown, The woven mesh layer 64 of Slick Slide's ride vehicle 14 includes a plurality of

warp threads 70 and weft threads 72. Image

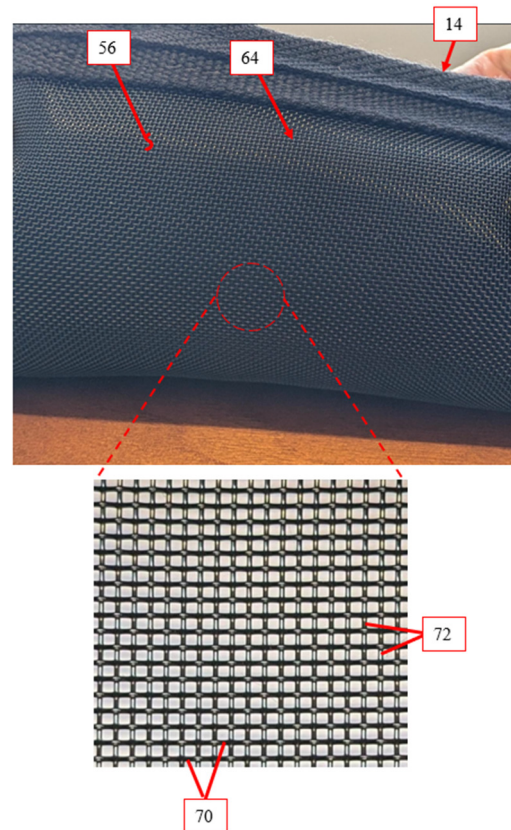
analysis and measurement show Each warp

thread has a diameter of approximately 0.3 mm

and each weft thread has a diameter of approximately 0.3 mm, and within the

claimed range. Thread diameter was determined using methodology consistent with

industry practice; see EX2018; EX2016; EX2041.



65. As shown above, Slick Slide's commercial ride vehicle corresponds in all material respects to the invention claimed in claim 25 of the '854 patent. This correspondence demonstrates that claim 25 is coextensive with Slick Slide's commercial ride vehicle.

IV. CONCLUSION

66. I currently hold the opinions set expressed in this declaration. But my analysis may continue, and I may acquire additional information and/or attain supplemental insights that may result in added observations.

Respectfully submitted,

Date: Sept. 12, 2025



TABLE OF CLAIMS

Claim 1	
[1pre]	A recreational slide system, comprising:
[1a-i]	a slide
[1a-ii]	including a slide body with a non-wet lubricated slide surface that extends between a top entrance of the slide and a bottom exit of the slide; and
[1b-i]	a ride vehicle configured to support a rider down the slide,
[1b-ii]	the ride vehicle including a top surface configured to contact the rider
[1b-iii]	and a mesh layer that forms a bottom surface configured to contact the slide surface;
[1c]	wherein a coefficient of friction between the mesh layer of the ride vehicle and the non-wet lubricated slide surface is within a range of between about 0.03 to about 0.2.
Claim 2	
[2]	The recreational slide system of claim 1, wherein the coefficient of friction is kinetic coefficient of friction.
Claim 3	
[3]	The recreational slide system of claim 1, wherein the slide surface includes a dry lubricant material.
Claim 4	
[4]	The recreational slide system of claim 3, wherein the dry lubricant material comprises a dry lubricant coating over the slide surface.
Claim 5	

[5]	The recreational slide system of claim 4, wherein the dry lubricant coating includes a thickness that is within a range of between about 1 micron to about 5 micron.
Claim 6	
[6]	The recreational slide system of claim 4, wherein the slide body includes a base wall and a pair of sidewalls and the dry lubricant coating covers a sliding surface of the base wall.
Claim 7	
[7]	The recreational slide system of claim 6, wherein the dry lubricant coating covers at least a portion of the pair of sidewalls.
Claim 8	
[8]	The recreational slide system of claim 3, wherein the dry lubricant material includes a resin, a lubricant, a thermal conductor, and a hardener.
Claim 9	
[9]	The recreational slide system of claim 8, wherein the dry lubricant material applied to the slide surface comprises: 20% to 30% by weight of the resin; 30% to 50% by weight of the lubricant; 1% to 5% by weight of the thermal conductor; and 20% to 30% by weight of the hardener.
Claim 10	
[0]	The recreational slide system of claim 9, wherein the resin comprises a silicon-based epoxy resin.
Claim 11	
[1]	The recreational slide system of claim 9, wherein the lubricant comprises polytetrafluoroethylene.
Claim 12	

[12]	The recreational slide system of claim 9, wherein the thermal conductor comprises copper.
Claim 13	
[13]	The recreational slide system of claim 9, wherein the hardener comprises an anhydride-based or an amine-based catalyst.
Claim 14	
[14]	The recreational slide system of claim 1, wherein the mesh layer of the ride vehicle comprises a weave of threads formed of monofilament synthetic fibers.
Claim 15	
[15]	The recreational slide system of claim 14, wherein the monofilament synthetic fibers comprise a polyamide monofilament structure.
Claim 16	
[16]	The recreational slide system of claim 14, wherein the weave of threads comprises a plurality of weft threads each having a thread diameter within a range of between 0.1 mm to 0.6 mm and a plurality of warp threads each having a thread diameter within a range of between about 0.1 mm to about 0.6 mm.
Claim 17	
[17]	The recreational slide system of claim 14, wherein the mesh layer includes a plurality of interstitial openings that define an open area of the mesh layer, wherein the open area of the mesh layer is within a range of between about 35% to about 50%.
Claim 22	
[22pre]	A ride vehicle configured to support a rider down a non-wet lubricated recreational slide, the ride vehicle comprising:
[22a-i]	an elongate body that extends between a first end and an opposite second end,

[22a-ii]	the body including a central core positioned between
[22a-iii]	a top surface of the ride vehicle
[22a-iv]	and a woven mesh layer that forms a bottom surface of the ride vehicle that is configured to contact the non-wet lubricated recreational slide;
[22b]	wherein the mesh layer includes a plurality of interstitial openings that define an open area of the mesh layer, wherein the open area of the mesh layer is within a range of between about 35% to about 50%.
Claim 23	
[23]	The ride vehicle of claim 22, wherein the woven mesh layer comprises a weave of threads formed of monofilament synthetic fibers.
Claim 24	
[24]	The ride vehicle of claim 22, wherein the monofilament synthetic fibers comprise a polyamide monofilament structure.
Claim 25	
[25pre]	A ride vehicle configured to support a rider down a non-wet lubricated recreational slide, the ride vehicle comprising:
[25a-i]	an elongate body that extends between a first end and an opposite second end,
[25a-ii]	the body including a central core positioned between
[25a-iii]	a top surface of the ride vehicle
[22a-iv]	and a woven mesh layer that forms a bottom surface of the ride vehicle that is configured to contact the non-wet lubricated recreational slide;
[25b]	wherein the mesh layer includes a plurality of weft threads each having a thread diameter within a range of between 0.1 mm to 0.6

	mm and a plurality of warp threads each having a thread diameter within a range of between about 0.1 mm to about 0.6 mm.
Claim 26	
[26]	The ride vehicle of claim 22, wherein the central core is surrounded by a fabric liner that is positioned between the central core and the fabric layer and the woven mesh layer.
Claim 27	
[27pre]	A recreational slide system, comprising:
[27a]	the ride vehicle of claim 22; and
[27b]	a slide including a slide body with a non-wet lubricated slide surface that extends between a top entrance of the slide and a bottom exit of the slide;
[27c]	wherein a coefficient of friction between the mesh layer of the ride vehicle and the non-wet lubricated slide surface is within a range of between about 0.03 to about 0.2.
Claim 28	
[28]	The recreational slide system of claim 27, wherein the coefficient of friction is kinetic coefficient of friction.