

**UNITED STATES DISTRICT COURT FOR THE
SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION**

BAKER HUGHES, A GE COMPANY,
LLC AND BAKER HUGHES OILFIELD
OPERATIONS, LLC,

Plaintiffs,

v.

ULTERRA DRILLING TECHNOLOGIES,
L.P.,

Defendant.

Civil Action No. 4:18-cv-00339

**DISCLOSURE OF ASSERTED CLAIMS AND PRELIMINARY INFRINGEMENT
CONTENTIONS**

Plaintiff Baker Hughes, a GE company, LLC (“BHGE”) and Baker Hughes Oilfield Operations, LLC (“BHOO”) (collectively, “Baker Hughes”), serve this Disclosure of Asserted Claims and Preliminary Infringement Contentions under P.R. 3-1.

I. P.R. 3-1. Disclosure of Asserted Claims and Preliminary Infringement Contentions

(A) Claims Infringed by Ulterra

U.S. Patent No.	Claims Infringed
6,298,930	1, 2, 3, 9, 10, 15, 16, 17, 18, 19, 25, 26, 31, 32, 52, 53, 58
6,460,631	1, 2, 3, 4, 12-19, 64, 65, 66, 68, 69
6,779,613	1, 2, 3, 4, 5, 6, 12, 13, 26, 27, 32, 33, 34, 35, 55
6,935,441	16, 17, 19, 20, 21, 23, 24
7,096,978	1, 2, 3, 4, 5, 7-9
6,575,256	1, 9
7,763,355	18, 19, 20, 23, 24, 25, 26, 30

Baker Hughes reserves the right to assert additional claims following discovery on the accused drill bits and methods.

(B) Ulterra's Infringing Drill Bits and Infringing Methods

The accused instrumentalities are Ulterra drill bits, methods for drilling with the infringing drill bits, and methods for designing such drill bits. According to publically available information from Ulterra, the accused drill bits are identified by a code beginning with "U" followed by codes for the number of blades, the cutter size, and the bit body material. For example, U616S designates a PDC drill bit with 6 blades, 16mm cutters, and a steel body. The infringing PDC drill bits can also be configured in different styles, which Ulterra identifies as "U-Technology." The infringing styles known to Baker Hughes at this time are identified as CounterForce, FastBack, OneShot, SplitBlade and Heavy-Oil Grade according to publically available information.

According to publically available information, Ulterra's infringing drill bits are customized or designed by Ulterra with the following features: Load Limiters, Casing Drill Out, Double Row Cutters, Extended Gauge, Fixed Ports, In-Gauge PDC, Short Gauge, and Up Drill Cutters. Inclusion or exclusion of these features would not affect the grounds for infringement set forth in these Preliminary Infringement Contentions unless specifically noted.

Ulterra's infringing drill bits, when used to engage a formation to drill a well, would infringe the claimed methods for drilling as set forth in the attached claim charts, and would constitute acts of induced and/or contributory on the part of Ulterra even if Ulterra did not directly perform all steps of the claimed methods. Further, Ulterra infringes the claimed methods for designing the infringing drill bits. According to Ulterra's website, Ulterra designs at least 4 new drill bits every week.

Baker Hughes infringement contentions are explained with regard to exemplary infringing drill bit Model U513M. Baker Hughes is unable to identify every infringing drill bit provided by Ulterra at this time by specific part or model number because this information, to Baker Hughes' knowledge, is not publically available. However, Baker Hughes contends that at least the following drill bits infringe, and/or, when used or designed would infringe the claimed methods, for the same reasons discussed with respect to the exemplary U513M bit:

- U513M (part no. U02556)
- U613M (part no. U02644)
- U516S (part no. U2509)
- U511S
- U616S
- U516M
- MS1666 (part no. U01398)
- U616S
- U616M (8.5")

(C) Infringement Charts

Claim Charts A – G and Exhibits A – G, attached, identify specifically where each element of each asserted claim is found within the accused drill bits or accused methods.

(D) Type of Infringement

Each accused drill bit infringes each asserted claims literally and/or under the doctrine of equivalents. Similarly, each of the methods of designing drill bits or methods or using the drill bits infringe each of the asserted claims literally and/or under the doctrine of equivalents.

(E) Priority

Each of the '930, '631, '613, '441, and '978 patents claims a priority date of August 26, 1999, which is the original filing date of Application No. 09/383,228, which issued as the '930 patent.

The '256 patent claims priority to Provisional Application No. 60/175,457, filed January 11, 2000.

The '355 patent claims priority to Provisional Application No. 60/897,457, filed January 25, 2007.

(F) Baker Hughes' Use of the Patents

Baker Hughes uses the patents in at least drill bits corresponding to Part Nos. 194X25041 and 190X26576.

P.R. 3-2 Document Production

Baker Hughes will produce the following documents:

(1) Disclosures of the Invention Before Patent Application

Baker Hughes is aware of no such documents at this time.

(2) Conception, Reduction to Practice, Design, and Development of Each Claimed Invention

Baker Hughes will produce documents reflecting the conception, reduction to practice, design, and development of each claimed invention after an appropriate Protective Order is entered in this action.

(3) File Histories

Baker Hughes will produce documents BH000097 – BH003704 related to the file histories in this case.

(4) Licenses

Baker Hughes will produce documents BH000001 – BH000096, related to licenses for the patents-in-suit after an appropriate Protective Order is entered in this action.

Date: July 13, 2018

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CERTIFICATE OF SERVICE

I certify that the foregoing was served by e-mail at the e-mail addresses listed below on
July 13, 2018.

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Claim Chart A: U.S. 6,298,930

Claim	Accused Instrumentality
<p>1. A drill bit for subterranean drilling, comprising:</p>	<p>Infringing Ulterra PDC drill bits are identified by a code beginning with “U” followed by codes for the number of blades, the cutter size, and the bit body material. For example, U616S designates a PDC drill bit with 6 blades, 16mm cutters, and a steel body. The infringing PDC drill bits can also be configured in different styles, which Ulterra identifies as “U-Technology.” The infringing styles known to Baker Hughes at this time are identified as CounterForce, FastBack, OneShot, SplitBlade and Heavy-Oil Grade according to publically available information.</p> <p>According to publically available information, Ulterra’s infringing drill bits may be customized with the following features: Load Limiters, Casing Drill Out, Double Row Cutters, Extended Gauge, Fixed Ports, In-Gauge PDC, Short Gauge, and Up Drill Cutters. Inclusion or exclusion of these features would not affect the grounds for infringement set forth in these Preliminary Infringement Contentions unless specifically noted.</p> <p>Baker Hughes’ infringement contentions are explained with regard to exemplary infringing drill bit Model U513M. Baker Hughes is unable to identify every infringing drill bit provided by Ulterra at this time by specific part or model number because this information, to Baker Hughes’ knowledge, is not publically available. However, Baker Hughes contends that at least the following drill bits infringe for the same reasons discussed with respect to the exemplary U513M bit:</p> <ul style="list-style-type: none">• U513M (part no. U02556)• U613M (part no. U02644)• U516S (part no. U2509)• U511S

Claim	Accused Instrumentality
	<ul style="list-style-type: none"> • U616S • U516M • MS1666 (part no. U01398) • U616S • U616M (8.5")
a bit body [1.1] including a leading end [1.2] for contacting a formation during drilling and a trailing end [1.3] having structure associated therewith for connecting the drill bit to a drill string;	Ulterra's exemplary U513 PDC drill bit has a bit body with a longitudinal centerline, a leading end with a face for contacting the formation and a trailing end with a structure to connect the bit body to the drill string as claimed. <i>See</i> Ex. A1.
at least one superabrasive cutter [1.4a-e] secured to the bit body over the leading end at a radius [R] from a centerline [CL] of the bit body; and exterior structure [1.5a-e] on the leading end disposed substantially at the radius and exhibiting sufficient surface area, when in contact with the formation, to control penetration of the at least one superabrasive cutter into the formation under weight on bit by distributing the weight on bit so as to maintain a unit load on the formation below a compressive strength thereof.	Ulterra's drill bit model U513 (P/N U02556) meets this limitation as shown in Ex. A2 and A3. The bit has a plurality of superabrasive cutters, exemplified generally by cutters 1.4a-e, which are arranged substantially at radius R from the centerline (running perpendicularly into the figure at the center of the bit). The bit also has exterior structures, exemplified by exterior structures 1.5a-e.
2. The drill bit of claim 1, wherein the at least one superabrasive cutter comprises a plurality of superabrasive cutters [1.4a-e], each of the plurality of superabrasive cutters positioned at a radius [R] from the centerline, and the exterior structure on the leading end comprises a plurality of bearing segments having bearing surfaces and protruding from the bit body, each bearing segment of the plurality disposed substantially at the radius of one of the plurality of superabrasive cutters, wherein a combination of bearing surfaces of bearing segments of the plurality exhibits the sufficient surface area.	Ulterra's drill bit model U513 (P/N U02556) meets this limitation as shown in Ex. A2 and A3. The bit has a plurality of superabrasive cutters, exemplified generally by cutters 1.4a-e, which are arranged at radius R from the centerline (running perpendicularly into the figure at the center of the bit). The bit also has exterior structures, exemplified by exterior structures 1.5a-e. These structures comprise bearing surfaces at the face-end of the structures that engage the formation and provide surface area to control penetration of the cutters.
3. The drill bit of claim 2, wherein at least some of the bearing segments of the plurality	Ulterra's drill bit model U513 (P/N U02556) meets this limitation as shown in Ex. A2. At

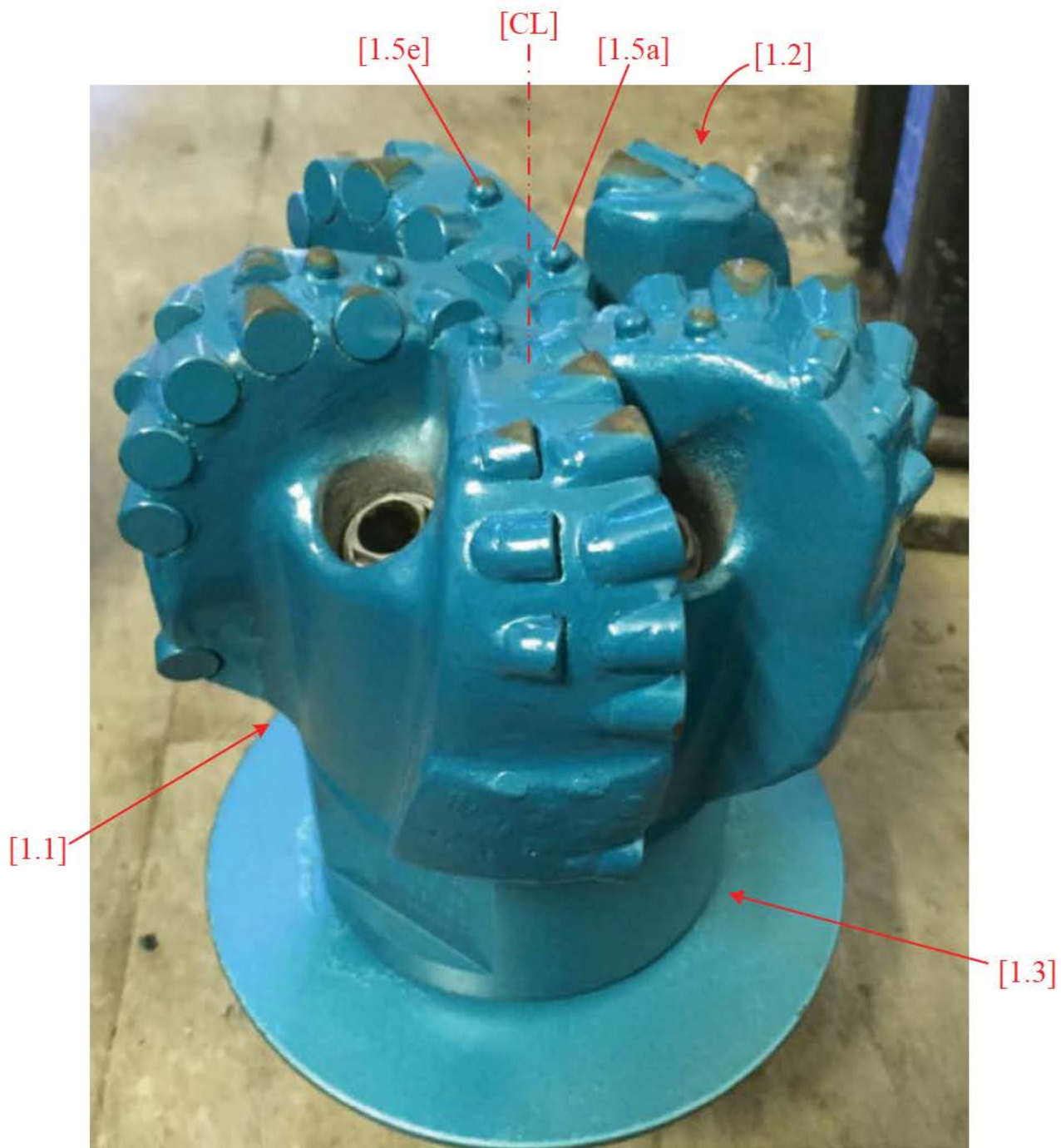
Claim	Accused Instrumentality
are each leading, as taken in a direction of bit rotation, one superabrasive cutter of the plurality of superabrasive cutters.	least bearing segment 1.5a leads cutter 1.4c in the direction of bit rotation.
9. The drill bit of claim 3, wherein each superabrasive cutter led by a bearing segment is carried on a preformed structure having that bearing segment formed thereon.	Ulterra's drill bit model U513 (P/N U02556) meets this limitation as shown in Ex. A2. The preformed structure, created from matrix material, carries at least bearing segment 1.5a and cutter 1.4c.
10. The drill bit of claim 2, wherein the bearing surfaces of at least some of the bearing segments of the plurality protrude from the bit body to at least two different heights.	Ulterra's drill bit model U513 (P/N U02556) meets this limitation as shown in Ex. A1. For example, at least bearing segment 1.5a is at a different height from the face of the bit than bearing segment 1.5e.
15. The drill bit of claim 2, wherein at least some portions of the bearing surfaces of at least some of the bearing segments of the plurality are provided with wear-resistant structures.	Ulterra's drill bit model U513 (P/N U02556) meets this limitation as shown in Ex. A2. In addition, Ulterra's "Product Portfolio" offers "Load Limiters" and explains that "TCI inserts reduce depth of cut and minimize torque variations." <i>See</i> http://ulterra.com/wp-content/uploads/2016/09/Ulterra-drill-Bit-Portfolio-online.pdf at p. 8.
16. The drill bit of claim 15, wherein the wear-resistant structures are selected from the group comprising tungsten carbide inserts, polycrystalline diamond compacts, thermally stable polycrystalline diamond compacts, natural diamonds, diamond grit, diamond film, and cubic boron nitride compacts.	<i>See</i> claim 15.
17. A drill bit for subterranean drilling, comprising:	<i>See</i> identification of accused drill bits in claim 1.
a bit body [1.1] including a leading end [1.2] for contacting a formation during drilling and a trailing end [1.3] having structure associated therewith for connecting the drill bit to a drill string;	Ulterra's exemplary U513 PDC Drill bit has a bit body with a longitudinal centerline, a leading end with a face for contacting the formation and a trailing end with a structure to connect the bit body to the drill string as claimed. <i>See</i> Ex. A1.
at least one superabrasive cutter [1.4a-e] secured to the bit body over the leading end at	Ulterra's drill bit model U513 (P/N U02556) meets this limitation as shown in Ex. A2 and

Claim	Accused Instrumentality
<p>a radius [R] from a centerline [CL] of the bit body; and at least one feature [1.5a-e] on the leading end disposed substantially at the radius and sized and configured so as to limit a depth of cut of the at least one superabrasive cutter into the formation through distribution of an axial load applied to the drill bit during drilling over a surface area sufficient to avoid failure of the formation.</p>	<p>A3. The bit has a plurality of superabrasive cutters, exemplified generally by cutters 1.4a-e, which are arranged substantially at radius R from the centerline (running perpendicularly into the figure at the center of the bit). The bit also has features on the leading end disposed substantially at the radius, exemplified by exterior structures 1.5a-e, that are sized and configured to limit a depth of cut of the superabrasive cutters by distributing the axial load applied to the drill bit without failure of the formation.</p>
<p>18. The drill bit of claim 17, wherein the at least one superabrasive cutter comprises a plurality of superabrasive cutters, each of the plurality of superabrasive cutters positioned at a radius from the centerline, and the at least one feature on the leading end comprises a plurality of bearing segments having bearing surfaces and protruding from the bit body, each bearing segment of the plurality disposed substantially at the radius of one of the plurality of superabrasive cutters, wherein a combination of bearing surfaces of bearing segments of the plurality is sized and configured to provide the sufficient surface area.</p>	<p>Ulterra's drill bit model U513 (P/N U02556) meets this limitation as shown in Ex. A2 and A3. The bit has a plurality of superabrasive cutters, exemplified generally by cutters 1.4a-e, which are arranged at radius R from the centerline (running perpendicularly into the figure at the center of the bit). The bit also has the claimed features, exemplified by features 1.5a-e. These comprise bearing surfaces at the face-end of the structures that engage the formation and provide surface area to control penetration of the cutters.</p>
<p>19. The drill bit of claim 18, wherein at least some of the bearing segments of the plurality are each leading, as taken in a direction of bit rotation, one superabrasive cutter of the plurality of superabrasive cutters.</p>	<p>Ulterra's drill bit model U513 (P/N U02556) meets this limitation as shown in Ex. A2. At least bearing segment 1.5a leads cutter 1.4c in the direction of bit rotation.</p>
<p>25. The drill bit of claim 19, wherein each superabrasive cutter led by a bearing segment is carried on a preformed structure having that segment formed thereon.</p>	<p>Ulterra's drill bit model U513 (P/N U02556) meets this limitation as shown in Ex. A2. The preformed structure, created from matrix material, carries at least bearing segments 1.5a and cutter 1.4c.</p>
<p>26. The drill bit of claim 18, wherein the bearing surfaces of at least some of the bearing segments of the plurality protrude from the bit</p>	<p>Ulterra's drill bit model U513 (P/N U02556) meets this limitation as shown in Ex. A2. For example, at least bearing segment 1.5d is at a different height from the face of the bit than</p>

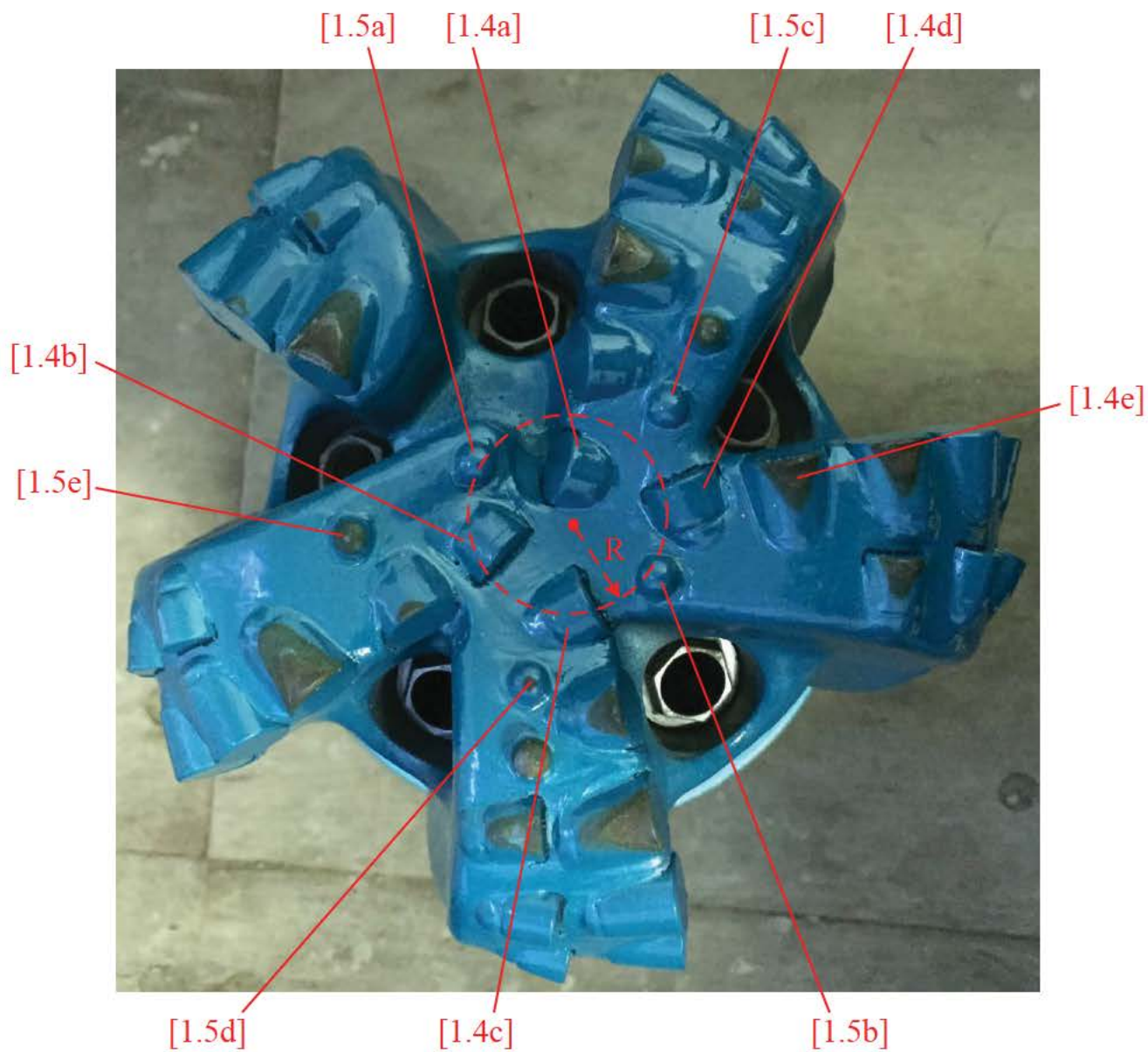
Claim	Accused Instrumentality
body to at least two different heights.	bearing segment 1.5b.
31. The drill bit of claim 18, wherein at least some portions of the bearing surfaces of at least some of the bearing segments of the plurality are provided with wear-resistant structures.	Ulterra's drill bit model U513 (P/N U02556) meets this limitation as shown in Ex. A2. In addition, Ulterra's "Product Portfolio" offers "Load Limiters" and explains that "TCI inserts reduce depth of cut and minimize torque variations." <i>See</i> http://ulterra.com/wp-content/uploads/2016/09/Ulterra-crill-Bit-Portfolio-online.pdf at p. 8.
32. The drill bit of claim 31, wherein the wear-resistant structures are selected from the group comprising tungsten carbide inserts, polycrystalline diamond compacts, thermally stable polycrystalline diamond compacts, natural diamonds, diamond grit, diamond film, and cubic boron nitride compacts.	<i>See</i> claim 31.
52. A method of drilling a subterranean formation, comprising:	Ulterra's line of PDC drill bits are instrumentalities that are used to drill a subterranean formation.
engaging the formation with at least one cutter of a drill bit to a selected depth of cut; and	When used, Ulterra's PDC drill bits engage the formation with at least one cutter of a drill bit with a selected depth of cut. <i>See, e.g.</i> , cutters 1.4a-e.
maintaining the selected depth of cut during application of a weight on bit in excess of that required for the at least one cutter to penetrate the formation to the selected depth of cut by providing a bearing area on the drill bit to distribute the excess weight on bit sufficient to achieve a unit load by the bearing area on the formation less than a compressive strength of the formation.	When used, Ulterra's PDC drill bits maintain the selected depth of cut when weight on bit in excess of that required for the at least one cutter to penetrate the formation to the selected depth of cut by providing a bearing area with bearing segments 1.5a-e that achieve a unit load by the bearing area on the formation less than a compressive strength of the formation.
53. A method of drilling a subterranean formation, comprising:	Ulterra's line of PDC drill bits are instrumentalities that are used to drill a subterranean formation.
engaging the subterranean formation with at least one cutter of a drill bit to a selected depth of cut; and	When used, Ulterra's PDC drill bits engage the formation with at least one cutter of a drill bit with a selected depth of cut. <i>See, e.g.</i> , cutters

Claim	Accused Instrumentality
	1.4a-e.
<p>maintaining the selected depth of cut during application of a weight on bit in excess of that required for the at least one cutter to penetrate the subterranean formation to the selected depth of cut by providing a bearing area on the bit sufficient to support the drill bit on the subterranean formation without failure thereof.</p>	<p>When used, Ulterra's PDC drill bits maintain the selected depth of cut when weight on bit in excess of that required for the at least one cutter to penetrate the formation to the selected depth of cut by providing a bearing area with bearing segments 1.5a-e that are sufficient to support the drill bit on the subterranean formation without failure of the formation.</p>
<p>58. A method of drilling a subterranean formation, comprising:</p> <p>applying a first selected weight to cause at least one cutter of a drill bit to engage a first formation to a first selected depth of cut;</p> <p>precluding subsequent penetration of the at least one cutter into the first formation in excess of the first selected depth of cut during application of at least the first selected weight;</p> <p>applying a second selected weight different from the first selected weight to cause the at least one cutter of the drill bit to engage a second formation to a second selected depth of cut different from the first selected depth of cut; and</p> <p>precluding subsequent penetration of the at least one cutter into the second formation in excess of the second selected depth of cut during application of at least the second selected weight.</p>	<p>When used in multiple formations and provided with bearing surfaces of different heights, Ulterra's PDC drill bits meet these limitations in substantially the same manner as described with respect to claims 52 and 53 as the weight on bit is changed between the formations.</p>

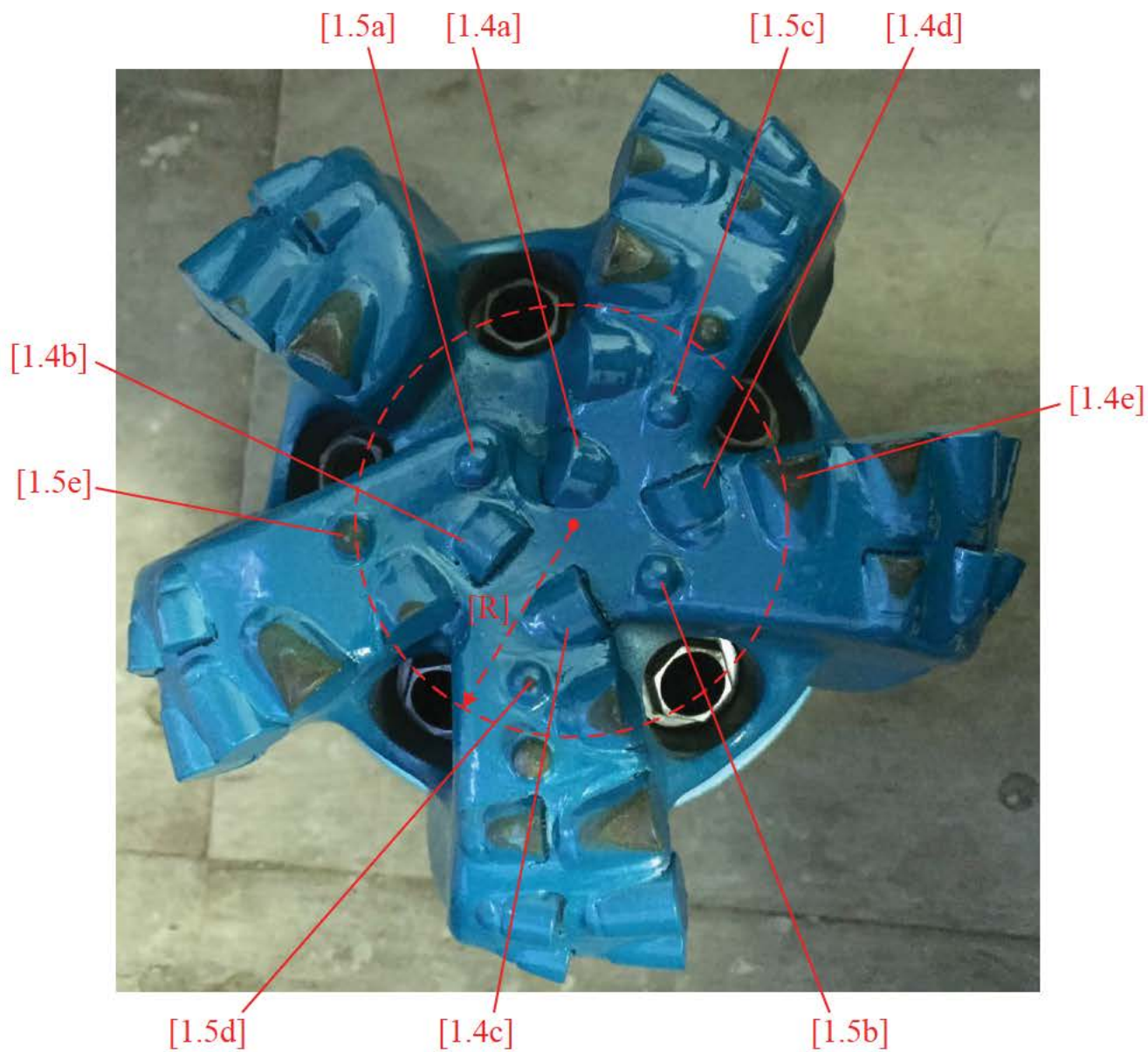
U.S. 6,298,930 – Exhibit A1



U.S. 6,298,930 – Exhibit A2



U.S. 6,298,930 – Exhibit A3



Claim Chart B: U.S. 6,460,631

Claim	Accused Instrumentality
<p>1. A drill bit for subterranean drilling, comprising:</p>	<p>Infringing Ulterra PDC Drill bits are identified by a code beginning with “U” followed by codes for the number of blades, the cutter size, and the bit body material. For example, U616S designates a PDC drill bit with 6 blades, 16mm cutters, and a steel body. The infringing PDC drill bits can also be configured in different styles, which Ulterra identifies as “U-Technology.” The infringing styles known to Baker Hughes at this time are identified as CounterForce, FastBack, OneShot, SplitBlade and Heavy-Oil Grade according to publically available information.</p> <p>According to publically available information, Ulterra’s infringing drill bits may be customized with the following features: Load Limiters, Casing Drill Out, Double Row Cutters, Extended Gauge, Fixed Ports, In-Gauge PDC, Short Gauge, and Up Drill Cutters. Inclusion or exclusion of these features would not affect the grounds for infringement set forth in these Preliminary Infringement Contentions unless specifically noted.</p> <p>Baker Hughes infringement contentions are explained with regard to exemplary infringing drill bit Model U513M. Baker Hughes is unable to identify every infringing drill bit provided by Ulterra at this time by specific part or model number because this information, to Baker Hughes’ knowledge, is not publically available. However, Baker Hughes contend that at least the following drill bits infringe for the same reasons discussed with respect to the exemplary U513M bit:</p> <ul style="list-style-type: none">• U513M (part no. U02556)• U613M (part no. U02644)• U516S (part no. U2509)

Claim	Accused Instrumentality
	<ul style="list-style-type: none"> • U511S • U616S • U516M • MS1666 (part no. U01398) • U616S • U616M (8.5”).
<p>a bit body [1.1] including a longitudinal centerline [CL], a leading end [1.2] having a face [1.3] for contacting a formation having a maximum compressive strength during drilling, and a trailing end [1.4] having a structure associated therewith for connecting the bit body to a drill string, the face of the leading end configured to include a total bearing surface of a size sufficient to substantially support the bit body upon the bit body being forced against the formation at a maximum weight-on-bit resulting in a unit load on the formation not exceeding the maximum compressive strength of the formation; and</p> <p>at least one superabrasive cutter [1.5] for engaging the formation during drilling secured to a selected portion of the face of the leading end of the bit body, the at least one superabrasive cutter exhibiting a limited amount of cutter exposure perpendicular to the selected portion of the face of the leading end to which the at least one superabrasive cutter is secured to, in combination with the total bearing surface of the bit body, limit a maximum depth-of-cut of the at least one superabrasive cutter into the formation having the maximum compressive strength during drilling.</p>	<p>The infringing drill bits have the elements as shown in Ex. B1.</p>
<p>2. The drill bit of claim 1, wherein the at least one superabrasive cutter comprises a plurality of superabrasive cutters and the face of the leading end comprises a plurality of blade</p>	<p>As seen in Ex. B1, the infringing drill bits have blade structures (five blade structures shown) that carry at least one of the plurality of superabrasive cutters and the blade structures</p>

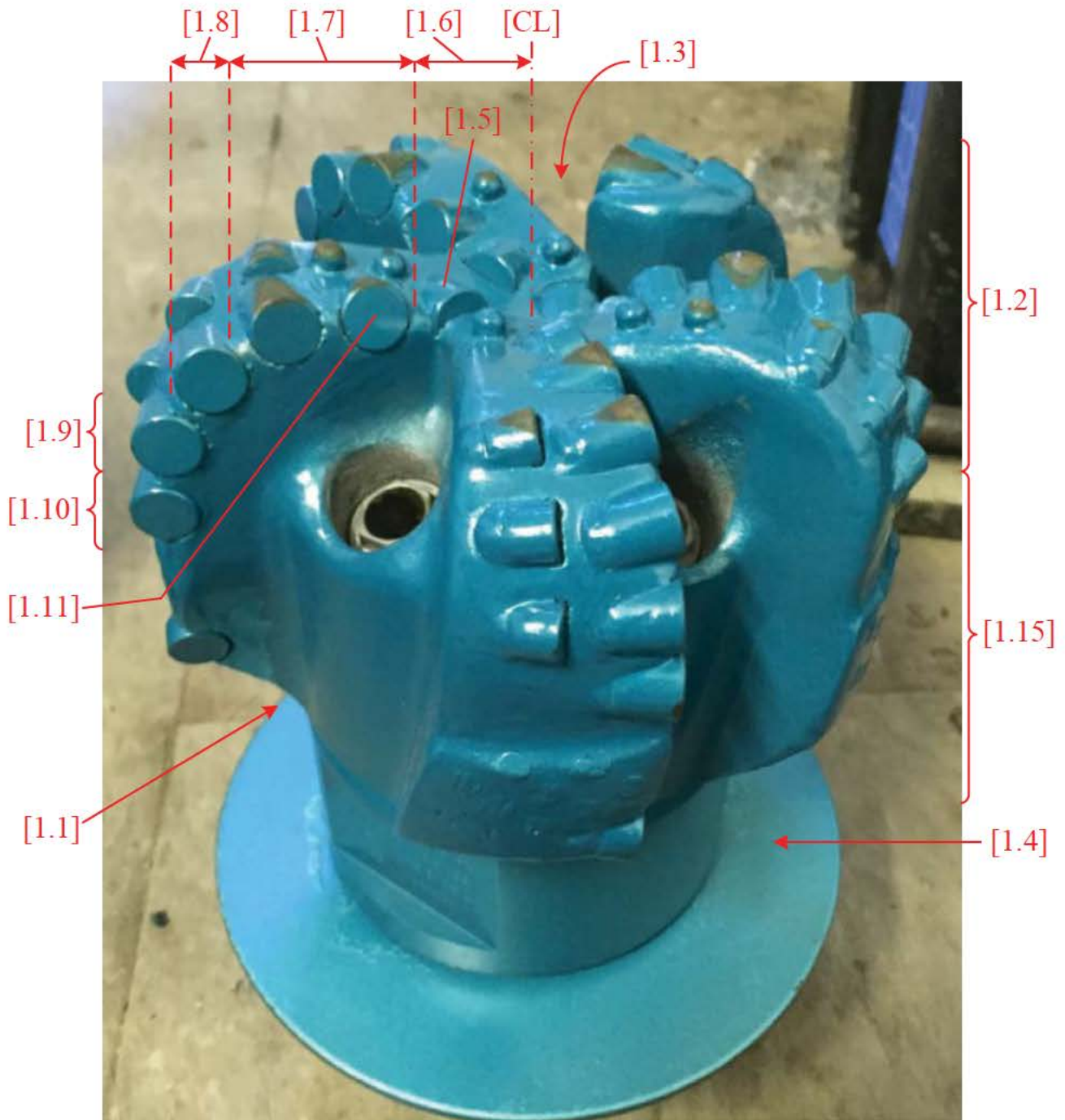
Claim	Accused Instrumentality
structures protruding from the bit body, at least some of the plurality of blade structures carrying at least one of the plurality of superabrasive cutters and the blade structures exhibiting in total a combined bearing surface area of sufficient size to maintain the unit load on the formation not exceeding the maximum compressive strength thereof.	exhibit in total a combined bearing surface area of sufficient size to maintain the unit load on the formation not exceeding the maximum compressive strength thereof.
3. The drill bit of claim 2, wherein the at least some of the plurality of blade structures each extend from a respective point generally proximate the longitudinal centerline of the bit body generally radially outward toward a gage of the bit body and longitudinally toward the trailing end of the bit body.	At least some of the blade structures on the infringing drill bits extend from a respective point generally proximate the longitudinal centerline of the bit body generally radially outward toward a gage of the bit body and longitudinally toward the trailing end of the bit body. <i>See Ex. B1.</i>
4. The drill bit of claim 3, wherein the at least some of the plurality of blade structures each carry several of the plurality of superabrasive cutters and exhibit at least one bearing surface, and wherein each of the plurality of blade structures generally encompasses each of the several of the plurality of superabrasive cutters carried thereon with a limited portion of each of the several superabrasive cutters exposed by a preselected extent perpendicular from the respective at least one bearing surface proximate each of the several superabrasive cutters so as to control a respective depth-of-cut for each of the several superabrasive cutters.	At least some of the blade structures on the infringing drill bits carry several superabrasive cutters and exhibit at least one bearing surface, and each of the blade structures generally encompasses each of the several superabrasive cutters carried thereon with a limited portion of each of the several superabrasive cutters exposed by a preselected extent perpendicular from the respective at least one bearing surface proximate each of the several superabrasive cutters so as to control a respective depth-of-cut for each of the several superabrasive cutters.
12. The drill bit of claim 4, wherein the face of the leading end of the bit body comprises a cone [1.6], nose [1.7], flank [1.8], shoulder [1.9], and gage region [1.10].	<i>See</i> claimed regions of bit identified in Ex. B1.
13. The drill bit of claim 12, wherein at least one of the plurality of superabrasive cutters is positioned in the cone region and exhibits a lesser amount of cutter exposure than at least one other of the plurality of superabrasive cutters [1.11] positioned in the nose region.	The cutters in the cone region exhibit less cutter exposure than the cutters in the nose region. <i>See Ex. B1.</i>

Claim	Accused Instrumentality
14. The drill bit of claim 13, wherein the at least one other superabrasive cutter positioned in the nose region exhibits a greater amount of cutter exposure than the at least one superabrasive cutter positioned in the cone region.	The cutters in the cone region exhibit less cutter exposure than the cutters in the nose region. <i>See Ex. B1.</i>
15. The drill bit of claim 14, wherein at least one of the plurality of superabrasive cutters is positioned in the flank region and exhibits a lesser amount of cutter exposure than the at least one superabrasive cutter positioned in the cone region.	The cutters in the cone region exhibit less cutter exposure than the cutters in the nose flank region. <i>See Ex. B1.</i>
16. The drill bit of claim 15, wherein at least one of the plurality of superabrasive cutters is positioned in the shoulder region and exhibits a lesser amount of cutter exposure than the at least one superabrasive cutter positioned in the flank region.	<i>See Ex. B1</i>
17. The drill bit of claim 16, wherein the cutter exposure of the at least one superabrasive cutter in the nose region does not exceed approximately 0.2 inch.	<i>See Ex. B1</i>
18. The drill bit of claim 16, wherein the cutter exposure of the at least one superabrasive cutter in the nose region does not exceed approximately 0.16 inch.	<i>See Ex. B1</i>
19. The drill bit of claim 18, wherein the cutter exposure of the at least one superabrasive cutter in the cone region does not exceed approximately 0.13 inch, the cutter exposure of the at least one superabrasive cutter in the flank region does not exceed approximately 0.1 inch, and the cutter exposure of the at least one superabrasive cutter in the shoulder region does not exceed approximately 0.07 inch.	<i>See Ex. B1</i>
64. A rotary drag bit for drilling subterranean formations comprising: a bit body [64.1] having a longitudinal axis	The accused drill bits have the elements as shown in Ex. B2.

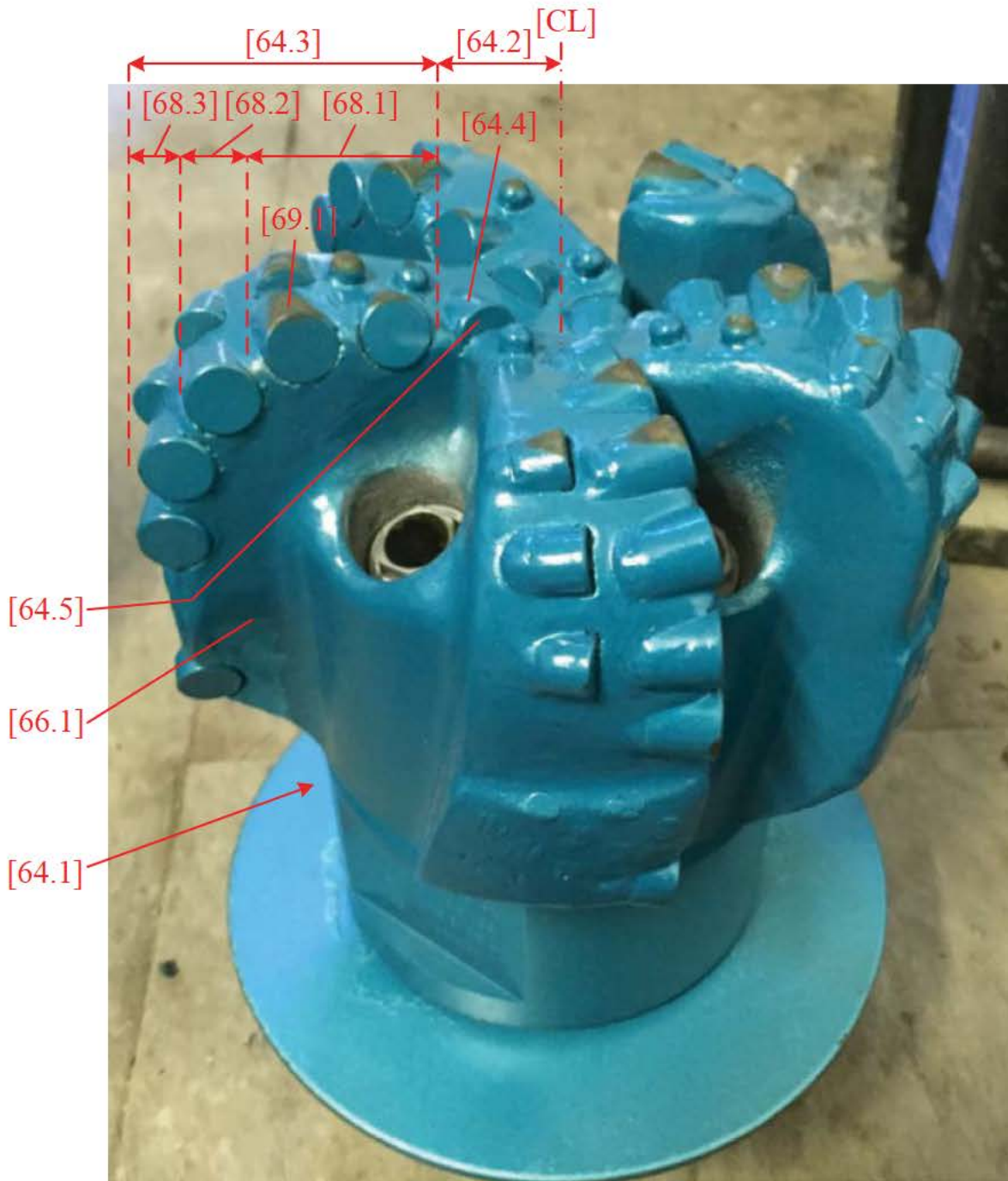
Claim	Accused Instrumentality
<p>[CL] and extending radially outward therefrom to a gage, the bit body further comprising at least a first region [64.2] and a second region [64.3] over a face to be oriented toward at least one subterranean formation during drilling; and</p> <p>a plurality of cutters secured on the bit body in the first and second regions, at least one of the plurality of cutters [64.4] having a superabrasive cutting face [64.5] having a preselected geometry and being positioned substantially transverse to a direction of cutter movement during drilling, and wherein the at least one cutter exhibits a limited amount of cutter exposure perpendicular to a portion of the formation-facing surface to which the at least one cutter is secured to control a maximum depth-of-cut of the at least one cutter into the formation during drilling.</p>	
<p>65. The rotary drag bit of claim 64, wherein the first region comprises an area closer to the longitudinal axis of the bit body than the second region and the at least one cutter is located in the first region.</p>	<p>The accused drill bits have the elements as shown in Ex. B2.</p>
<p>66. The rotary drag bit of claim 65, wherein the first region is a cone region on the face of the bit body and the at least one cutter secured to the formation-facing surface is located on a blade structure [66.1].</p>	<p>The accused drill bits have the elements as shown in Ex. B2.</p>
<p>68. The rotary drag bit of claim 64, wherein the first region comprises a cone region and the second region comprises at least one of the group consisting of a nose region [68.1], a shoulder region [68.3], and a flank region [68.2].</p>	<p>The accused drill bits have the elements as shown in Ex. B2.</p>
<p>69. The rotary drag bit of claim 68, wherein at least one cutter of the plurality secured on the bit body in the first region exhibits a limited amount of cutter exposure that is less than a limited amount of cutter exposure of at least</p>	<p>The accused drill bits have the elements as shown in Ex. B2.</p>

Claim	Accused Instrumentality
one cutter [69.1] of the plurality secured in the second region.	

U.S. 6,460,631 – Exhibit B1



U.S. 6,460,631 – Exhibit B2



Claim Chart C: U.S. 6,779,613

Claim	Accused Instrumentality
<p>1. A drill bit for subterranean drilling, comprising:</p>	<p>The accused instrumentalities are Ulterra PDC Drill bits, methods for drilling with these drill bits, and methods for designing such drill bits. According to publically available information from Ulterra, the accused drill bits are identified by a code beginning with “U” followed by codes for the number of blades, the cutter size, and the bit body material. For example, U616S designates a PDC drill bit with 6 blades, 16mm cutters, and a steel body. The infringing PDC drill bits can also be configured in different styles, which Ulterra identifies as “U-Technology.” The infringing styles known to Baker Hughes at this time are identified as CounterForce, FastBack, OneShot, SplitBlade and Heavy-Oil Grade according to publically available information.</p> <p>According to publically available information, Ulterra’s infringing drill bits may be customized with the following features: Load Limiters, Casing Drill Out, Double Row Cutters, Extended Gauge, Fixed Ports, In-Gauge PDC, Short Gauge, and Up Drill Cutters. Inclusion or exclusion of these features would not affect the grounds for infringement set forth in these Preliminary Infringement Contentions unless specifically noted.</p> <p>Baker Hughes infringement contentions are explained with regard to exemplary infringing drill bit Model U513M. Baker Hughes is unable to identify every infringing drill bit provided by Ulterra at this time by specific part or model number because this information, to Baker Hughes’ knowledge, is not publically available. However, Baker Hughes contend that at least the following drill bits infringe for the same reasons discussed with respect to the exemplary U513M bit:</p>

Claim	Accused Instrumentality
	<ul style="list-style-type: none"> • U513M (part no. U02556) • U613M (part no. U02644) • U516S (part no. U2509) • U511S • U616S • U516M • MS1666 (part no. U01398) • U616S • U616M (8.5")
<p>a bit body [1.1] including a longitudinal centerline [CL], a leading end [1.2] having a face [1.3] for contacting a formation having a maximum compressive strength during drilling, and a trailing end [1.4] having a structure associated therewith for connecting the bit body to a drill string, the face of the leading end configured to include a total bearing surface [1.5] of a size sufficient to substantially support the bit body upon the bit body being forced against the formation at a maximum weight-on-bit resulting in a unit load on the formation not exceeding the maximum compressive strength of the formation; and</p>	<p>The Ulterra PDC drill bits have the claimed bit body 1.1 with a longitudinal centerline CL (shown extending into the image in Ex. C) and a leading end 1.2 with face 1.3. The accused drill bits also have a trailing end 1.4 (not visible) with a threaded structure for connecting the bit body to a drill string. The face includes a total bearing surface (the portion of the face located within the region 1.5 indicated in the image) that is sized to substantially support the bit body as claimed.</p>
<p>at least one superabrasive cutter [1.6] for engaging the formation during drilling secured to a selected portion of the face of the leading end of the bit body, the at least one superabrasive cutter exhibiting a limited amount of cutter exposure perpendicular to the selected portion of the face of the leading end to which the at least one superabrasive cutter is secured to, in combination with the total bearing surface of the bit body, limit a maximum depth-of-cut of the at least one superabrasive cutter into the formation having the maximum compressive strength during drilling.</p>	<p>The accused drill bits have at least one superabrasive cutter 1.6 that exhibits a limited amount of cutter exposure as claimed in combination with the total bearing surface of the bit body to limit a maximum depth-of-cut into the formation during drilling.</p>
<p>2. The drill bit of claim 1, wherein the at least</p>	<p>The accused drill bits comprise the claimed</p>

Claim	Accused Instrumentality
<p>one superabrasive cutter comprises a plurality of superabrasive cutters [1.6], [1.7], [1.8] and [1.9], and the face of the leading end comprises a plurality of blade structures [1.10], [1.11], [1.12], [1.13], and [1.14], protruding from the bit body, at least some of the plurality of blade structures carrying at least one of the plurality of superabrasive cutters and the blade structures exhibiting in total a combined bearing surface area of sufficient size to maintain the unit load on the formation not exceeding the maximum compressive strength thereof.</p>	<p>superabrasive cutters 1.6, 1.7, 1.8, 1.9, as shown in the attached image. These cutters are located on blades structures 1.10-1.14.</p>
<p>3. The drill bit of claim 2, wherein the at least some of the plurality of blade structures each extend from a respective point generally proximate the longitudinal centerline of the bit body generally radially outward toward a gage [1.15] of the bit body and longitudinally toward the trailing end of the bit body.</p>	<p>The blades on the accused drill bits extend to a gage 1.15 on the bit body and extend longitudinally toward the trailing end of the bit body.</p>
<p>4. The drill bit of claim 3, wherein the at least some of the plurality of blade structures each carry several of the plurality of superabrasive cutters and exhibit at least one bearing surface, and wherein each of the plurality of blade structures generally encompasses each of the several of the plurality of superabrasive cutters carried thereon with a limited portion of each of the several superabrasive cutters exposed by a preselected extent perpendicular from the respective at least one bearing surface proximate each of the several superabrasive cutters so as to control a respective depth-of-cut for each of the several superabrasive cutters.</p>	<p>At least some of the blade structures on the infringing drill bits carry several superabrasive cutters and exhibit at least one bearing surface, and each of the blade structures generally encompasses each of the several superabrasive cutters carried thereon with a limited portion of each of the several superabrasive cutters exposed by a preselected extent perpendicular from the respective at least one bearing surface proximate each of the several superabrasive cutters so as to control a respective depth-of-cut for each of the several superabrasive cutters.</p>
<p>5. The drill bit of claim 4, wherein at least a portion of the at least one bearing surface of at least one of the plurality of blade structures includes a wear-resistant exterior.</p>	<p>The accused drill bits are provided with a wear-resistant exterior, for example, a tungsten carbide material. <i>See</i> http://ulterra.com/wp-content/uploads/2016/09/Ulterra-erill-Bit-Portfolio-online.pdf at p. 8.</p>
<p>6. The drill bit of claim 5, wherein the wear-</p>	<p>The wear-resistant exterior of the accused drill</p>

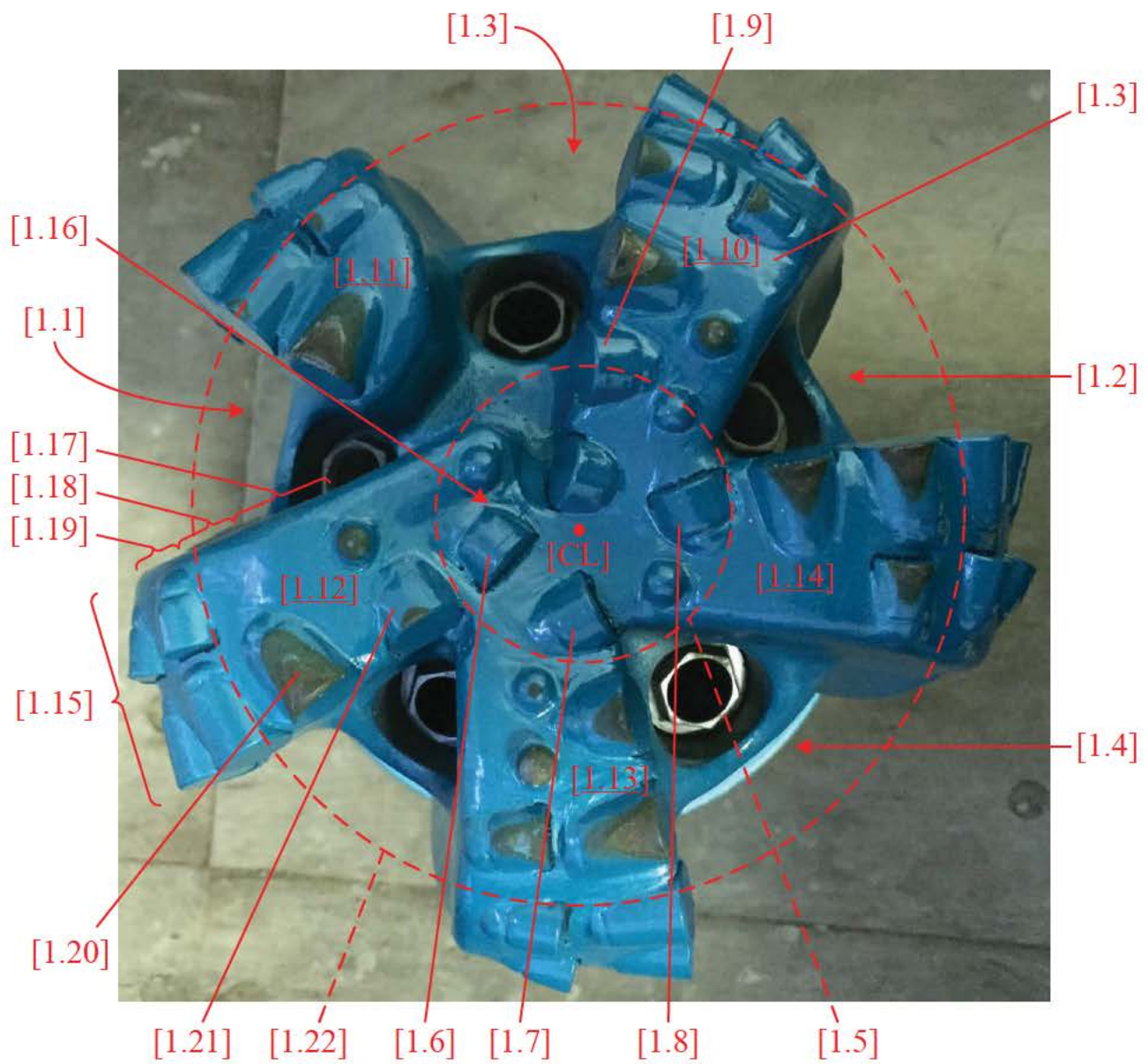
Claim	Accused Instrumentality
<p>resistant exterior comprises at least one of the group consisting of carbide, tungsten carbide, synthetic diamond, natural diamond, polycrystalline diamond, thermally stable polycrystalline diamond, cubic boron nitride, and hard facing material.</p>	<p>bits comprise at least one of carbide, tungsten carbide, synthetic diamond, natural diamond, polycrystalline diamond, thermally stable polycrystalline diamond, cubic boron nitride, and hard facing material. <i>See</i> http://ulterra.com/wp-content/uploads/2016/09/Ulterra-erill-Bit-Portfolio-online.pdf at p. 8.</p>
<p>12. The drill bit of claim 4, wherein the face of the leading end of the bit body comprises a cone [1.16], nose [1.17], flank [1.18], shoulder [1.19], and gage [1.15] region.</p>	<p>The accused drill bits comprise a cone region, nose region, flank region, shoulder region, and gage region as shown in Ex. C.</p>
<p>13. The drill bit of claim 12, wherein at least one of the plurality of superabrasive cutters is positioned in the cone region and exhibits a lesser amount of cutter exposure than at least one other of the plurality of superabrasive cutters positioned in the nose region.</p>	<p>In the accused drill bits, cutter 1.6 is in the cone region and exhibits a lesser amount of cutter exposure than cutters 1.20 and 1.21, which are in the nose region.</p>
<p>26. A method of drilling a subterranean formation without generating an excessive amount of torque-on-bit, comprising:</p>	<p>Ulterra PDC Drill bits are identified by a code beginning with “U” followed by codes for the number of blades, the cutter size, and the bit body material. For example, U616S designates a PDC drill bit with 6 blades, 16mm cutters, and a steel body. The infringing PDC drill bits can also be configured in different styles, which Ulterra identifies as “U-Technology.” The infringing styles known to Baker Hughes at this time are identified as CounterForce, FastBack, OneShot, SplitBlade and Heavy-Oil Grade according to publically available information.</p> <p>According to publically available information, Ulterra’s infringing drill bits may be customized with the following features: Load Limiters, Casing Drill Out, Double Row Cutters, Extended Gauge, Fixed Ports, In-Gauge PDC, Short Gauge, and Up Drill Cutters. Inclusion or exclusion of these features would not affect the grounds for infringement set forth in these Preliminary Infringement Contentions unless specifically</p>

Claim	Accused Instrumentality
	<p>noted.</p> <p>Baker Hughes infringement contentions are explained with regard to exemplary infringing drill bit Model U513M. Baker Hughes is unable to identify every infringing drill bit provided by Ulterra at this time by specific part or model number because this information, to Baker Hughes' knowledge, is not publically available. However, Baker Hughes contend that at least the following drill bits infringe for the same reasons discussed with respect to the exemplary U513M bit:</p> <ul style="list-style-type: none"> • U513M (part no. U02556) • U613M (part no. U02644) • U516S (part no. U2509) • U511S • U616S • U516M • MS1666 (part no. U01398) • U616S • U616M (8.5")
engaging the formation, the formation having a compressive strength, with at least one cutter [1.6] of a drill bit within a selected depth-of-cut range;	A user would engage the formation with the drill bit from a drilling rigs as conventional in the industry. The accused drill bits have at least one cutter.
applying a weight-on-bit within a range of weight-on-bit in excess of that required for the at least one cutter to penetrate the formation and above which results in a bearing surface [1.5] contacting the formation, wherein an area of the bearing surface contacting the formation remains substantially constant over the range of excess weight-on-bit; and	A user applies weight on bit ("WOB") to penetrate the formation as conventional in the industry. The WOB would be sufficient, at one end of the range, to cause the cutter to penetrate the formation. The cutter would cut into the formation until the bearing surface contacted the formation. The area of the bearing surface would be substantially constant once it engages with the formation.
transferring the excess weight-on-bit through a bearing surface to the formation at a stress less than substantially the compressive strength of	As a user continues to apply WOB to the bit in excess of the amount required to cause the cutter to cut into the formation, the additional

Claim	Accused Instrumentality
the formation.	WOB would be transferred to the bearing surface provided on the drill bit.
27. The method of claim 26, wherein transferring the excess weight-on-bit through a bearing surface to the formation comprises transferring the excess weight-on-bit to at least one formation-facing bearing surface on the drill bit generally surrounding at least a portion of the at least one cutter.	At least one bearing surface, e.g., 1.5, generally surrounds at least the trailing portion of cutter 1.6 when the bit is used to drill into the formation and transfers the excess WOB to the formation.
32. The method of claim 27, wherein transferring the excess weight-on-bit to at least one formation-facing bearing surface on the drill bit generally surrounding at least a portion of the at least one cutter comprises transferring the excess weight-on-bit to a hard facing material affixed to a selected portion of the respective at least one formation-facing bearing surface proximate at least one cutter.	The bearing surfaces in the accused drill bits are comprised of a hard facing material.
33. The method of claim 32, wherein transferring the excess weight-on-bit to a hard facing material comprises transferring the excess weight-on-bit to a hard facing material affixed to a steel-bodied bit.	The accused bits designated "S" in Ulterra's product code nomenclature are steel-bodied bits.
34. The method of claim 33, wherein transferring the excess weight-on-bit to a hard facing material affixed to a steel-bodied bit comprises transferring the excess weight-on-bit to a hard facing material affixed to a steel-bodied bit within at least a cone region of the steel-bodied bit.	The hard facing material on, for example, bearing surface 1.5, is in the cone region of the bit.
35. The method of claim 26, further comprising: applying an additional weight-on-bit in excess of the excess weight-on-bit required for the bearing surface to contact the formation and above which results in the bearing surface and another bearing surface contacting the formation; and transferring the additional excess weight-on-bit	As WOB in excess of the WOB required to cause the cutter to cut into the formation is applied, bearing surface 1.5 will first engage the formation and transfer WOB to the formation. As a user continues to apply WOB to the accused bits, bearing surface 1.21 will engage and transfer WOB to the formation until such time as the user increase WOB beyond the compressive strength of the formation.

Claim	Accused Instrumentality
<p>through the another bearing surface to the formation at a stress less than substantially the compressive strength of the formation.</p>	
<p>55. A method of designing a drill bit for drilling subterranean formations, the drill bit under design including a plurality of superabrasive cutters disposed about the formation-engaging leading end of the drill bit, the method comprising:</p> <p>selecting a maximum depth-of-cut for the at least some of the plurality of superabrasive cutters;</p>	<p>Ulterra designs drill bits that include a plurality of superabrasive cutters. These cutters, as discussed in connection with claims asserted above, are disposed about the formation-engaging leading end of the drill bit. Ulterra selects the maximum depth-of-cut for the at least some of the plurality of superabrasive cutters and the cutter profile arrangement to which the at least some of the plurality of superabrasive cutters are to be radially and longitudinally positioned on the leading end of the drill bit.</p>
<p>selecting a cutter profile arrangement to which the at least some of the plurality of superabrasive cutters are to be radially and longitudinally positioned on the leading end of the drill bit;</p> <p>selecting an individual extent of cutter exposure to which the at least some of the plurality of superabrasive cutters are to be exposed generally perpendicular from at least one respective formation-facing bearing surface at least partially surrounding the at least some of the plurality of superabrasive cutters so as to ensure that the selected maximum depth-of-cut for the at least some of the plurality of superabrasive cutters is not exceeded; and</p>	<p>Ulterra selects the individual extent of cutter exposure to which the at least some of the plurality of superabrasive cutters are to be exposed that are at least partially surrounded to ensure that the selected maximum depth-of-cut is not exceeded.</p>
<p>including within the design of the drill bit a sufficient total amount of formation-facing bearing surface area to axially support the drill bit should the drill bit be subjected to a weight-on-bit exceeding a weight-on-bit which would cause the at least some of the plurality of superabrasive cutters to engage a subterranean formation at the selected maximum depth-of-cut.</p>	<p>Ulterra also includes in its design a sufficient total amount of formation-facing bearing surface to support the drill bit under the claimed WOB.</p>

U.S. 6,779,613 – Exhibit C1



Claim Chart D: U.S. 6,935,441

Claim	Accused Instrumentality
<p>16. A method of drilling a subterranean formation without generating an excessive amount of torque-on-bit, comprising:</p>	<p>Infringing Ulterra PDC drill bits are identified by a code beginning with “U” followed by codes for the number of blades, the cutter size, and the bit body material. For example, U616S designates a PDC drill bit with 6 blades, 16mm cutters, and a steel body. The infringing PDC drill bits can also be configured in different styles, which Ulterra identifies as “U-Technology.” The infringing styles known to Baker Hughes at this time are identified as CounterForce, FastBack, OneShot, SplitBlade and Heavy-Oil Grade according to publically available information.</p> <p>According to publically available information, Ulterra’s infringing drill bits may be customized with the following features: Load Limiters, Casing Drill Out, Double Row Cutters, Extended Gauge, Fixed Ports, In-Gauge PDC, Short Gauge, and Up Drill Cutters. Inclusion or exclusion of these features would not affect the grounds for infringement set forth in these Preliminary Infringement Contentions unless specifically noted.</p> <p>Baker Hughes infringement contentions are explained with regard to exemplary infringing drill bit Model U513M. Baker Hughes is unable to identify every infringing drill bit provided by Ulterra at this time by specific part or model number because this information, to Baker Hughes’ knowledge, is not publically available. However, Baker Hughes contend that at least the following drill bits infringe for the same reasons discussed with respect to the exemplary U513M bit:</p> <ul style="list-style-type: none">• U513M (part no. U02556)• U613M (part no. U02644)• U516S (part no. U2509)

Claim	Accused Instrumentality
	<ul style="list-style-type: none"> • U511S • U616S • U516M • MS1666 (part no. U01398) • U616S • U616M (8.5")
engaging the subterranean formation with at least one cutter [16.4a-e] of a drill bit within a selected depth-of-cut range;	The infringing drill bits would engage a subterranean formation with at least one cutter 16.4a-e within a selected depth-of-cut range when drilling a subterranean formation. <i>See</i> Ex. D1 and D2.
applying a weight-on-bit within a range of weight-on-bit in excess of that required for the at least one cutter to penetrate the subterranean formation and above which results in a bearing surface [16.5a-e] contacting the subterranean formation;	A user of the infringing drill bits would apply a WOB within a range of WOBs in which the lowest WOB of the range would cause at least one cutter 16.4a-e to penetrate the subterranean formation to the point that a bearing surface 16.5a-e contacts the subterranean formation.
transferring the excess weight-on-bit from the drill bit through the bearing surface to the subterranean formation without substantial indentation of the bearing surface into the subterranean formation; and	As more WOB is applied, the infringing bits would transfer the excess WOB from the drill bits through the bearing surface to the subterranean formation without substantial indentation of the bearing surface 16.5a-e into the subterranean formation. The amount of WOB that would cause the bearing surface 16.5a-e to substantially indent the subterranean formation would represent the upper end of the claimed range.
wherein an area of the bearing surface contacting the subterranean formation remains substantially constant over the range of excess weight-on-bit.	The excess WOB would not substantially change the area of the bearing surface 16.5a-e contacting the subterranean formation over the claimed range.
17. The method of claim 16, wherein transferring the excess weight-on-bit from a body [16.1] of the drill bit through the bearing surface [16.5a-e] to the subterranean formation comprises transferring the excess weight-on-bit to at least one formation-facing bearing surface	The infringing drill bits, when WOB is applied, transfer the excess weight-on-bit to a formation-facing bearing surface on the drill bit generally surrounding at least a portion of the at least one cutter.

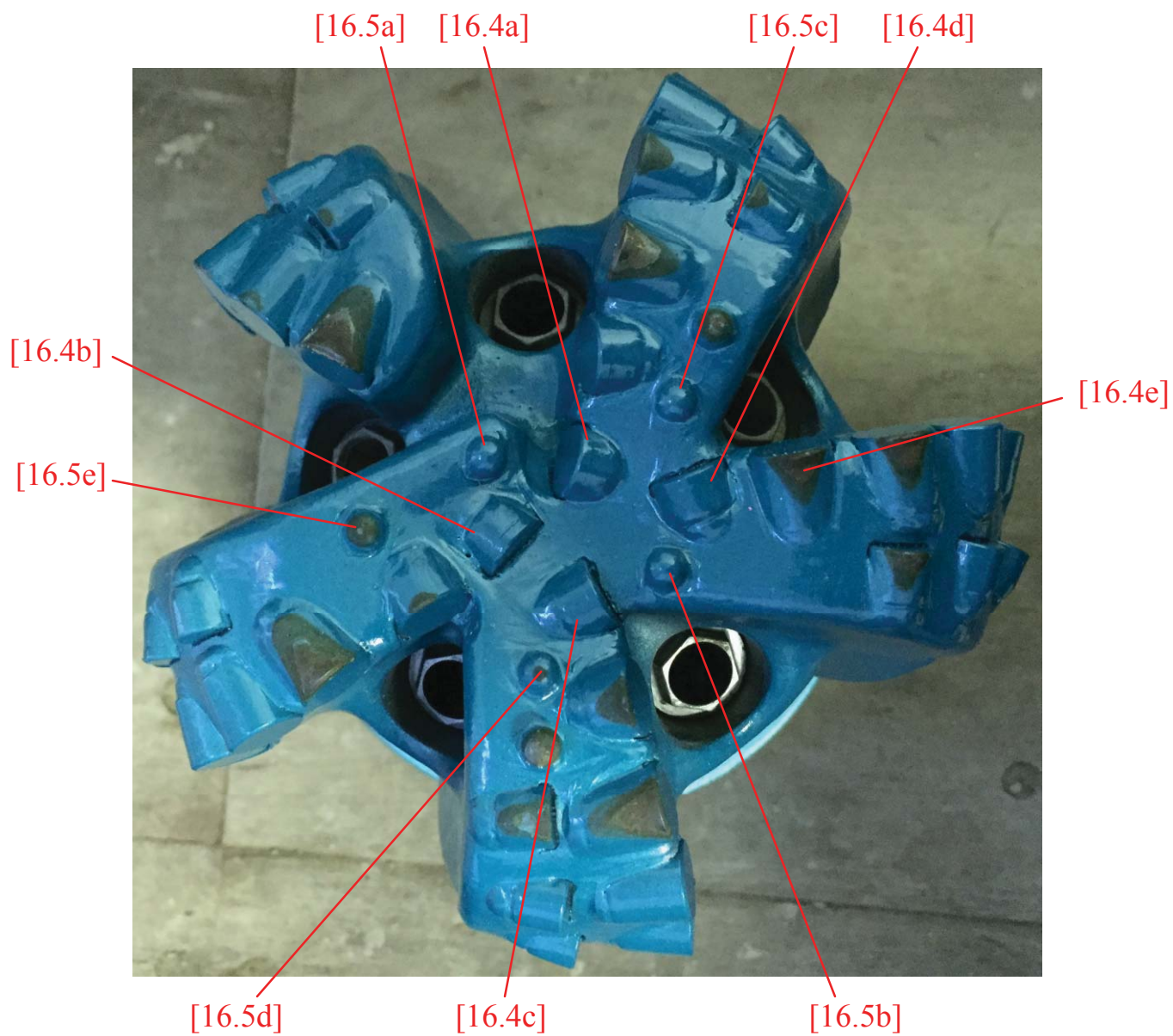
Claim	Accused Instrumentality
on the drill bit generally surrounding at least a portion of the at least one cutter [16.4a-e].	
19. The method of claim 17, wherein transferring the excess weight-on-bit to the at least one formation-facing bearing surface on the drill bit generally surrounding the at least a portion of the at least one cutter comprises transferring the excess weight-on-bit to a hard facing material affixed to a selected portion of the at least one formation-facing bearing surface proximate the at least one cutter.	The infringing drill bits have a hard facing material affixed to a selected portion of the at least one formation-facing bearing surface proximate the at least one cutter to which the excess WOB is transferred. <i>See</i> http://ulterra.com/wp-content/uploads/2016/09/Ulterra-drill-Bit-Portfolio-online.pdf at p. 8.
20. The method of claim 16, further comprising: applying an additional weight-on-bit in excess of the excess weight-on-bit required for the bearing surface [16.5a-e] to contact the subterranean formation and above which results in the bearing surface [16.5a-e] and another bearing surface [16.5a-e] contacting the subterranean formation; and transferring the additional excess weight-on-bit from a body [16.1] of the drill bit through the another bearing surface to the subterranean formation without substantial indentation of the another bearing surface thereinto.	The infringing drill bits are provided with additional bearing surfaces so that applying additional WOB in excess of the excess WOB required for the bearing surface 16.5a-e to contact the subterranean formation results in the bearing surface of another bearing surface contacting the subterranean formation. This transfers the additional excess weight-on-bit from the bit body to the subterranean formation without substantial indentation of the other bearing surface into it.
21. A method of designing a drill bit for drilling a subterranean formation, the drill bit under design including a plurality of superabrasive cutters [16.4a-e] disposed about a formation-engaging leading end [16.2] of the drill bit, the method comprising:	<i>See</i> identification of accused drill bits in claim 16.
selecting a maximum depth-of-cut [21.1] for at least some of the plurality of superabrasive cutters;	The infringing drill bits have a maximum depth-of-cut 21.1 for at least some of the plurality of superabrasive cutters.
selecting a cutter profile arrangement [21.2] to which the at least some of the plurality of superabrasive cutters are to be radially and longitudinally positioned on the formation-engaging leading end of the drill bit; and	The infringing drill bits have profile arrangement 21.2 to which the at least some of the plurality of superabrasive cutters are to be radially and longitudinally positioned on the formation-engaging leading end of the drill bit.

Claim	Accused Instrumentality
<p>configuring within the design of the drill bit a sufficient total amount of formation-facing bearing surface area [16.5a-e] structured for axially [CL] supporting the drill bit without substantially indenting the subterranean formation should the drill bit be subjected to a weight-on-bit exceeding a weight-on-bit which would cause the formation-facing bearing surface area to contact the subterranean formation, wherein the formation-facing bearing surface area is sized and configured to remain substantially constant over a range of excess weight-on-bit.</p>	<p>The infringing drill bits are configured with a sufficient total amount of formation-facing bearing surface area 16.5a-e structured for axially supporting the drill bit without substantially indenting the subterranean formation should the drill bit be subjected to a WOB exceeding a WOB which would cause the formation-facing bearing surface area to contact the subterranean formation. The formation-facing bearing surface area 16.5a-e of the infringing drill bits is sized and configured to remain substantially constant over a range of excess WOB.</p>
<p>23. The method of claim 21, wherein configuring within the design of the drill bit a sufficient total amount of the formation-facing bearing surface area comprises selecting an amount of hard facing to be disposed on at least a portion of the formation-facing bearing surface at least partially surrounding the at least some of the plurality of superabrasive cutters.</p>	<p>The infringing drill bits have a selected amount of hard facing disposed on at least a portion of the formation-facing bearing surface at least partially surrounding the at least some of the plurality of superabrasive cutters. <i>See</i> http://ulterra.com/wp-content/uploads/2016/09/Ulterra-erill-Bit-Portfolio-online.pdf at p. 8.</p>
<p>24. The method of claim 21, further comprising: including within the design of the drill bit another formation-facing bearing surface area [16.5a-e] structured for axially supporting the drill bit without substantially indenting the subterranean formation therewith should the drill bit be subjected to an additional excess weight-on-bit exceeding an excess weight-on-bit.</p>	<p>The infringing drill bits have another formation-facing bearing surface area 16.5a-e structured for axially supporting the drill bit without substantially indenting the subterranean formation as claimed.</p>

U.S. 6,935,441 – Exhibit D1



U.S. 6,935,441 – Exhibit D2



Claim Chart E: U.S. 7,096,978

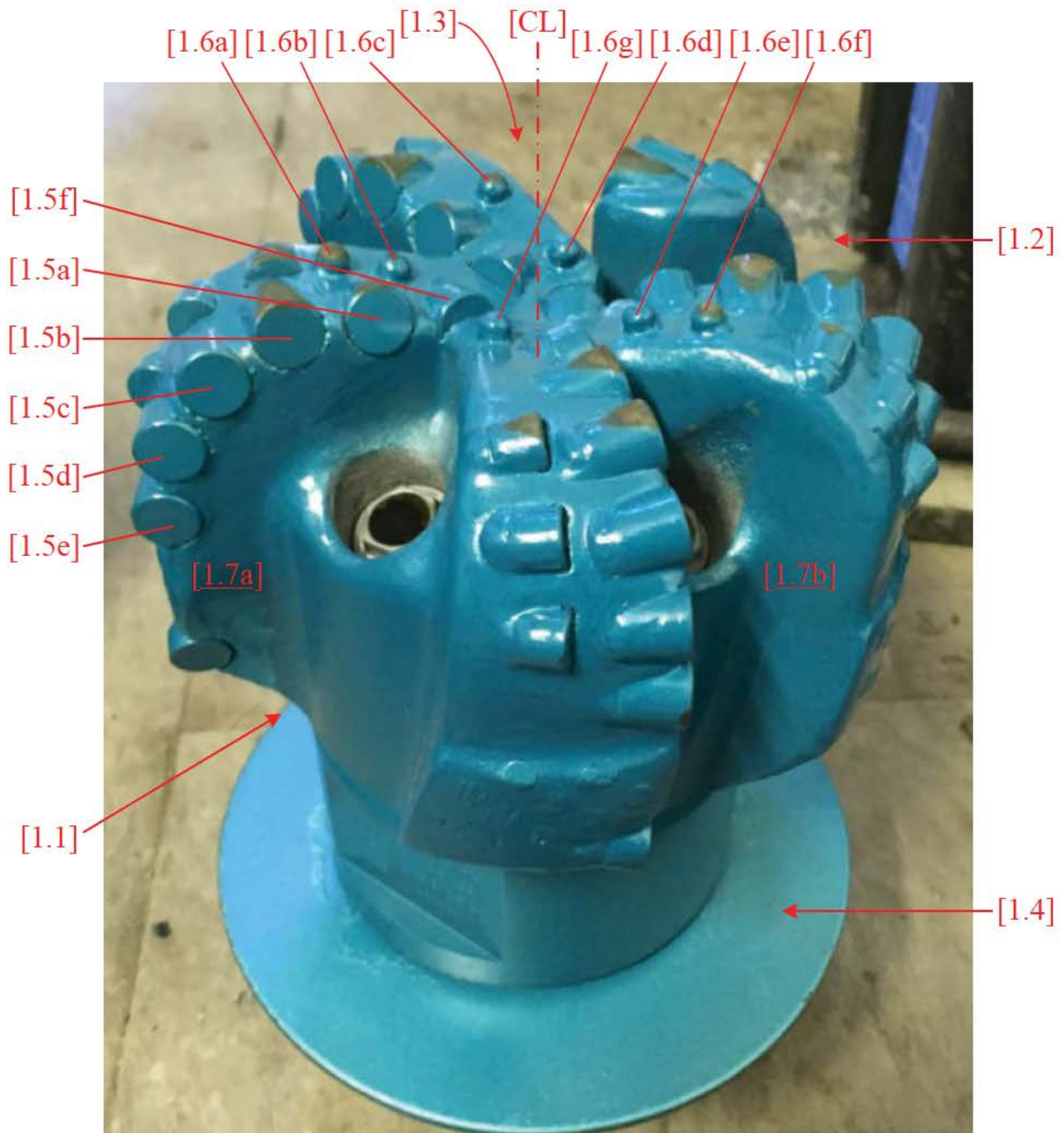
Claims	Accused Instrumentality
<p>1. A drill bit for subterranean drilling, comprising:</p>	<p>Infringing Ulterra PDC drill bits are identified by a code beginning with “U” followed by codes for the number of blades, the cutter size, and the bit body material. For example, U616S designates a PDC drill bit with 6 blades, 16mm cutters, and a steel body. The infringing PDC drill bits can also be configured in different styles, which Ulterra identifies as “U-Technology.” The infringing styles known to Baker Hughes at this time are identified as CounterForce, FastBack, OneShot, SplitBlade and Heavy-Oil Grade according to publically available information.</p> <p>According to publically available information, Ulterra’s infringing drill bits may be customized with the following features: Load Limiters, Casing Drill Out, Double Row Cutters, Extended Gauge, Fixed Ports, In-Gauge PDC, Short Gauge, and Up Drill Cutters. Inclusion or exclusion of these features would not affect the grounds for infringement set forth in these Preliminary Infringement Contentions unless specifically noted.</p> <p>Baker Hughes infringement contentions are explained with regard to exemplary infringing drill bit Model U513M. Baker Hughes is unable to identify every infringing drill bit provided by Ulterra at this time by specific part or model number because this information, to Baker Hughes’ knowledge, is not publically available. However, Baker Hughes contend that at least the following drill bits infringe for the same reasons discussed with respect to the exemplary U513M bit:</p> <ul style="list-style-type: none">• U513M (part no. U02556)• U613M (part no. U02644)• U516S (part no. U2509)

	<ul style="list-style-type: none"> • U511S • U616S • U516M • MS1666 (part no. U01398) • U616S • U616M (8.5")
<p>a bit body [1.1] including a leading end [1.2] having a face [1.3] for contacting a formation having a compressive strength during drilling, and a trailing end [1.4] having a structure associated therewith for connecting the bit body to a drill string,</p> <p>the face of the leading end including one or more bearing surfaces [1.6a-g] sized and configured, in combination, to transfer a range of weight-on-bit from the bit body through the bearing surface to the formation, wherein the range of weight-on-bit comprises any weight-on-bit which results in the one or more bearing surfaces contacting the formation at a stress of less than substantially the compressive strength of the formation;</p>	<p>The Ulterra PDC drill bits include the claimed elements as set forth in Ex. E. The elements marked are exemplary, and it should be understood that the bit includes, for example, additional cutters that are substantially identical to cutters 1.5a-e, with only cutters 1.5a-e marked for clarity.</p>
<p>wherein a total area of contact [1.6a-g] with the formation of the one or more bearing surfaces is configured and located to be substantially constant within the range of weight-on-bit; and</p>	<p><i>See Ex. E</i></p>
<p>at least one superabrasive cutter [1.5a] for engaging the formation during drilling secured to a selected portion of the face of the leading end of the bit body, the at least one superabrasive cutter exhibiting an exposure limited by the contact of the one or more bearing surfaces with the formation.</p>	<p><i>See Ex. E</i></p>
<p>2. The drill bit of claim 1, wherein the at least one superabrasive cutter comprises a plurality of superabrasive cutters [1.5a-e], the one or more bearing surfaces comprises a plurality of bearing surfaces and the face of the leading end comprises a plurality of blade structures [1.7a-b] protruding from the bit body, at least</p>	<p>The Ulterra PDC drill bits contain a plurality of superabrasive cutters, such as cutters 1.5a-e. These cutters are located on blade structures, such as 1.7a and 1.7b, shown in Ex. E.</p>

some of the plurality of blade structures carrying at least one of the plurality of superabrasive cutters and at least one of the plurality of bearing surfaces, the plurality of bearing surfaces exhibiting in total a combined bearing surface area of sufficient size to substantially maintain the stress on the formation not exceeding the compressive strength thereof.	
3. The drill bit of claim 2, wherein the at least some of the plurality of blade structures each extend from a respective point generally proximate a longitudinal centerline of the bit body generally radially outward toward a gage of the bit body and longitudinally toward the trailing end of the bit body.	Blades 1.7a and 1.7b extend radially outward toward a gage of the bit body from the longitudinal center of the bit as shown in Ex. E.
4. The drill bit of claim 2, wherein a maximum weight-on-bit of the range of weight-on-bit equals the combined bearing surface area multiplied by the compressive strength of the formation.	The Ulterra drill bits have the claimed combined bearing surface area
5. The drill bit of claim 3, wherein the at least some of the plurality of blade structures each carry several of the plurality of superabrasive cutters and at least one bearing surface proximate thereto, and wherein each of the plurality of blade structures generally encompasses each of the several of the plurality of superabrasive cutters carried thereon with a limited portion of each of the several superabrasive cutters exposed by a preselected extent perpendicular from the respective at least one bearing surface proximate the several superabrasive cutters so as to control a respective depth-of-cut for each of the several superabrasive cutters.	The Ulterra drill bits met this limitation. For example, the superabrasive cutter 1.5a has a bearing surface 1.6a proximate that is carried on a bit blade and provides a limited portion of the cutter for exposure to the formation. <i>See</i> Ex. E.
7. The drill bit of claim 5, wherein the face of the leading end of the bit body comprises cone, nose, flank, shoulder, and gage regions.	The Ulterra drill bits met this limitation as explained with respect to Ex. B for U.S. 6,460,631.
8. The drill bit of claim 7, wherein superabrasive cutters of the plurality are located in each of the cone, nose, flank, shoulder and	In the Ulterra PDC drill bits, superabrasive cutter 1.5f in the cone region has less exposure than cutters 1.5b located in at least the nose

gage regions, and an exposure of superabrasive cutters located in the cone region of the leading end of the bit body less than an exposure of cutters located at least in the nose region of the leading end.	region of the leading end.
9. The drill bit of claim 7, wherein the one or more bearing surfaces reside at least in the cone region of the leading end.	At least bearing surface 1.6g resides in the cone region of the leading end.

U.S. 7,096,978 – Exhibit E1



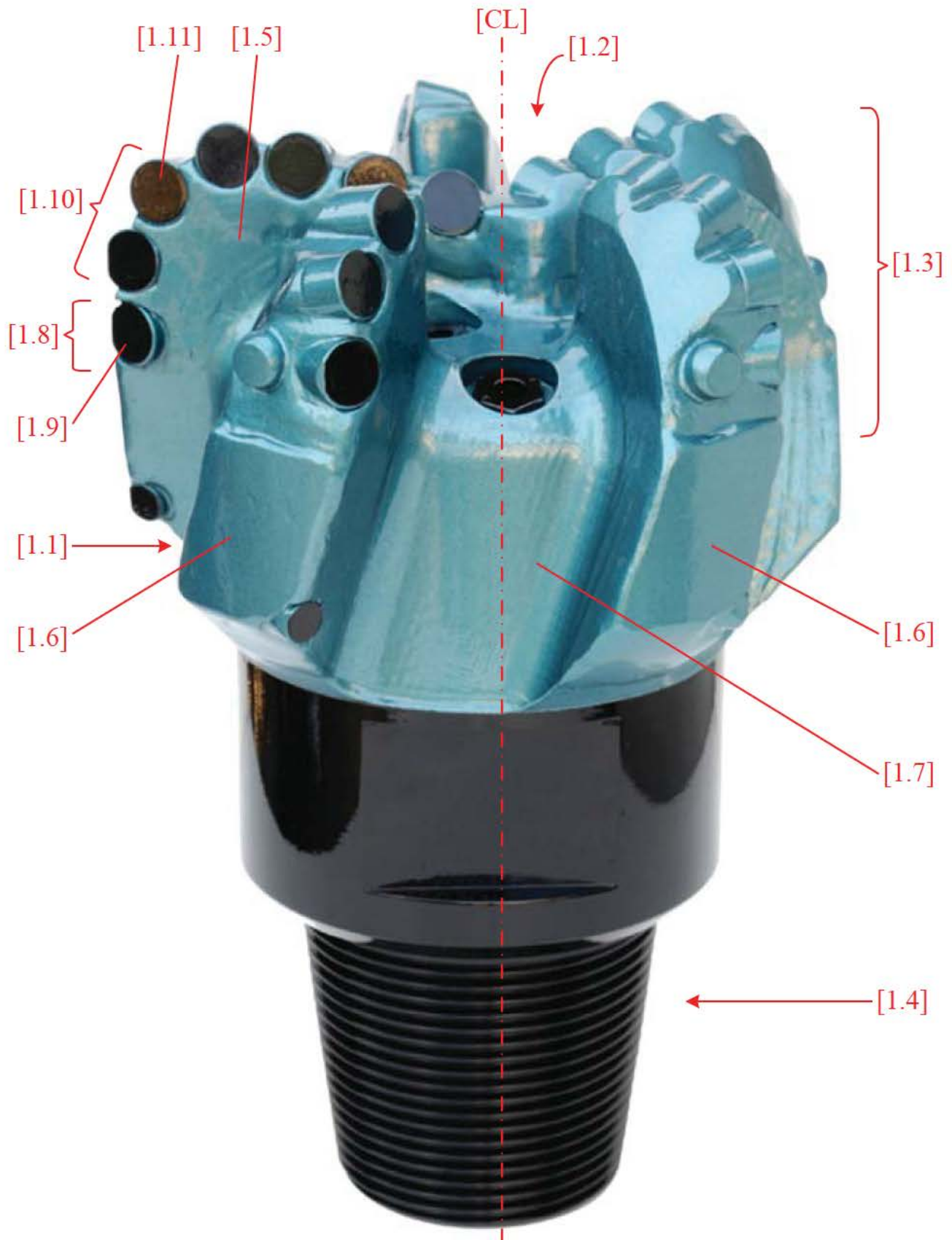
Claim Chart F: U.S. 6,575,256

Claims	Accused Instrumentality
<p>1. A rotary drag bit for drilling a subterranean formation, comprising:</p>	<p>Infringing Ulterra PDC Drill bits are identified by a code beginning with “U” followed by codes for the number of blades, the cutter size, and the bit body material. For example, U616S designates a PDC drill bit with 6 blades, 16mm cutters, and a steel body. The infringing PDC drill bits can also be configured in different styles, which Ulterra identifies as “U-Technology.” The infringing styles known to Baker Hughes at this time are identified as CounterForce, FastBack, OneShot, SplitBlade and Heavy-Oil Grade according to publically available information.</p> <p>According to publically available information, Ulterra’s infringing drill bits may be customized with the following features: Load Limiters, Casing Drill Out, Double Row Cutters, Extended Gauge, Fixed Ports, In-Gauge PDC, Short Gauge, and Up Drill Cutters. Inclusion or exclusion of these features would not affect the grounds for infringement set forth in these Preliminary Infringement Contentions unless specifically noted.</p> <p>Baker Hughes infringement contentions are explained with regard to exemplary infringing drill bit Model U513M. Baker Hughes is unable to identify every infringing drill bit provided by Ulterra at this time by specific part or model number because this information, to Baker Hughes’ knowledge, is not publically available. However, Baker Hughes contend that at least the following drill bits infringe for the same reasons discussed with respect to the exemplary U513M bit:</p> <ul style="list-style-type: none">• U513M (part no. U02556)• U613M (part no. U02644)• U516S (part no. U2509)

Claims	Accused Instrumentality
	<ul style="list-style-type: none"> • U511S • U616S • U516M • MS1666 (part no. U01398) • U616S • U616M (8.5")
<p>a bit body [1.1] having a longitudinal axis [CL] and including a face [1.2] at a leading end [1.3] thereof and structure for connecting the rotary drag bit to a drill string at a trailing end thereof [1.4];</p>	<p>The infringing Ulterra PDC drill bits have the claimed elements as shown in Ex. F. The trailing end would include pipe threads for connecting the bit to a drill string.</p>
<p>a plurality of generally radially extending blades [1.5] over the bit face, each blade carrying at least one superabrasive cutting structure thereon;</p>	<p>The infringing Ulterra PDC drill bits have the claimed elements as shown in Ex. F. The exemplary bit has five blades, such as blade 1.5. Each blade has multiple cutting structures, which are not each individually numbered, but cutters 1.9 and 1.11 are exemplary.</p>
<p>a plurality of gage pads [1.6] circumferentially spaced about the bit body, defining junk slots [1.7] therebetween and including radially outer bearing surfaces substantially parallel to the longitudinal axis, at least one of the plurality of gage pads including a longitudinally extended gage region [1.8] toward the leading end and proximate the bit face and carrying at least one superabrasive cutting structure [1.9] thereon having an exposure less than an exposure of at least a majority of the superabrasive cutting structures carried by the blades; and</p>	<p>The infringing Ulterra PDC drill bits have the claimed elements as shown in Ex. F. The exemplary bit has five gage pads 1.6, and it should be understood that gage pad 1.6 is exemplary of gage pads that would be similarly located on each of blades 1.5.</p>
<p>a shoulder region [1.10] proximate a leading end of each of the plurality of gage pads and carrying at least one superabrasive cutting structure [1.11] thereon having an exposure less than the exposure of at least the majority of the superabrasive cutting structures outside the shoulder region carried by the blades.</p>	<p>The infringing Ulterra PDC drill bits have the claimed elements as shown in Ex. F. The exemplary bit has a shoulder region 1.10, and it should be understood that shoulder region 1.10 is exemplary of shoulder regions that would be similarly located on each of blades 1.5. The shoulder region 1.10 carries a superabrasive cutting structure 1.11.</p>

Claims	Accused Instrumentality
<p>9. The rotary drag bit of claim 1, wherein at least one superabrasive cutting structure carried by the longitudinally extending gage region has an exposure less than any superabrasive cutting structure carried by the shoulder region.</p>	<p>The infringing Ulterra PDC drill bits have the claimed elements as shown in Ex. F. Cutting structure 1.9 has an exposure less than any cutting structure carried by the shoulder region 1.10.</p>

U.S. 6,575,256 – Exhibit F1



Claim Chart G: U.S. 7,762,355

Claim	Accused Instrumentality
18. A rotary drag bit, comprising:	<p>Infringing Ulterra PDC Drill bits are identified by a code beginning with “U” followed by codes for the number of blades, the cutter size, and the bit body material. For example, U616S designates a PDC drill bit with 6 blades, 16mm cutters, and a steel body. The infringing PDC drill bits can also be configured in different styles, which Ulterra identifies as “U-Technology.” The infringing styles known to Baker Hughes at this time are identified as CounterForce, FastBack, OneShot, SplitBlade and Heavy-Oil Grade according to publically available information.</p> <p>According to publically available information, Ulterra’s infringing drill bits may be customized with the following features: Load Limiters, Casing Drill Out, Double Row Cutters, Extended Gauge, Fixed Ports, In-Gauge PDC, Short Gauge, and Up Drill Cutters. Inclusion or exclusion of these features would not affect the grounds for infringement set forth in these Preliminary Infringement Contentions unless specifically noted.</p> <p>Baker Hughes infringement contentions are explained with regard to exemplary infringing drill bit Model U513M. Baker Hughes is unable to identify every infringing drill bit provided by Ulterra at this time by specific part or model number because this information, to Baker Hughes’ knowledge, is not publically available. However, Baker Hughes contend that at least the following drill bits infringe for the same reasons discussed with respect to the exemplary U513M bit:</p> <ul style="list-style-type: none">• U513M (part no. U02556)• U613M (part no. U02644)• U516S (part no. U2509)

Claim	Accused Instrumentality
	<ul style="list-style-type: none"> • U511S • U616S • U516M • MS1666 (part no. U01398) • U616S • U616M (8.5")
a bit body [18.1] with a face [18.2] and an axis [CL]; at least one blade [18.3] extending radially and longitudinally over the face; and	Ulterra's exemplary U513 PDC drill bit has at least one blade 18.3 that extends radially and longitudinally over the face 18.2. <i>See</i> Ex. G1.
a primary cutter row [18.4] comprising at least one primary cutter [18.5a-b], the at least one primary cutter including a cutting surface [18.6a-b] protruding at least partially from the at least one blade, located to traverse a cutting path upon rotation of the bit body about the axis, and configured to engage a formation upon movement along the cutting path; and	As shown in Ex. G1, the infringing drill bits have a primary cutter row 18.4 with at least one primary cutter 18.5a-b that includes a cutting surface 18.6a-b protruding at least partially from the at least one blade 1.3, is located to traverse a cutting path upon rotation of the bit body about the axis, and configured to engage a formation upon movement along the cutting path.
a backup cutter row [18.7] comprising a plurality of backup cutters comprising a first backup cutter [18.8a] rotationally following the at least one primary cutter, and a second backup cutter [18.8b] oriented differently than the first backup cutter, the first backup cutter and the second backup cutter including a cutting surface [18.9a, 18.9b] protruding at least partially from the at least one blade, configured to conditionally engage a formation upon movement along the cutting path; and wherein the second backup cutter has at least one of: a different backrake angle than the first backup cutter; and a different siderake angle than the first backup cutter.	As shown in Ex. G2, backup cutter row 18.7 comprises a plurality of backup cutters including a first backup cutter 18.8a rotationally following the at least one primary cutter, and a second backup cutter 18.8b oriented differently than the first backup cutter, the first backup cutter and the second backup cutter including a cutting surface 18.9a, 18.9b protruding at least partially from the at least one blade, configured to conditionally engage a formation upon movement along the cutting path, where the second backup cutter has at least one of a different backrake angle and a different siderake angle from the first backup cutter.
19. The rotary drag bit of claim 18, wherein the second backup cutter has a different backrake angle than the first backup cutter.	As shown in Ex. G2, Ulterra's second backup cutter 18.8b has a different backrake angle from the first backup cutter 18.8a.
20. The rotary drag bit of claim 18, wherein the	Ulterra's second backup cutter 18.8b has a

Claim	Accused Instrumentality
second backup cutter has a different backrake angle and siderake angle than the first backup cutter.	different backrake angle and siderake angle from the first backup cutter 18.8a.
23. The rotary drag bit of claim 15, wherein the second backup cutter is underexposed to a lesser extent than the first backup cutter.	As shown in Ex. G2, Ulterra's second backup cutter 18.8b is underexposed to a lesser extent than the first backup cutter 18.8a.
24. A rotary drag bit, comprising:	<i>See identified drill bits in claim 18.</i>
a bit body [18.1] with a face [18.2] and an axis [CL]; at least one blade [18.3] extending radially and longitudinally over the face;	The infringing Ulterra PDC drill bits have the claimed elements as shown in Ex. G1. At least one blade 18.3 extends radially and longitudinally over the face 18.2.
a primary cutter row [18.4] comprising a first primary cutter [18.5a] and a second primary cutter [18.5b], each primary cutter including a cutting surface [18.6a, 18.6b] protruding at least partially from the at least one blade, located to traverse a cutting path upon rotation of the bit body about the axis, and configured to engage a formation upon movement along the cutting path;	As shown in Ex. G1, the infringing Ulterra PDC drill bits have a primary cutter row 18.4 having at least first and second primary cutters 18.5a-b that include cutting surfaces 18.6a-b protruding at least partially from the at least one blade, are located to traverse a cutting path upon rotation of the bit body about the axis, and configured to engage a formation upon movement along the cutting path.
a first backup cutter [18.8a] rotationally following the first primary cutter, the first backup cutter including a cutting surface [18.9a] protruding at least partially from the at least one blade, configured to conditionally engage a formation upon movement along the cutting path; and a second backup cutter [18.8b] rotationally following the second primary cutter and oriented differently than the first backup cutter, the second backup cutter including a cutting surface [18.9b] protruding at least partially from the at least one blade, configured to conditionally engage a formation upon movement along the cutting path; and wherein the second backup cutter has at least one of: a different backrake angle than the first backup cutter; and a different siderake angle than the first backup	As shown in Ex. G2, a first backup cutter 18.8a rotationally follows the at least one primary cutter and includes a cutting surface 18.9a, and a second backup cutter 18.8b that is oriented differently from the first backup cutter and includes a cutting surface 18.9b protruding at least partially from the at least one blade, and configured to conditionally engage a formation upon movement along the cutting path, where the second backup cutter has at least one of a different backrake angle and a different siderake angle from the first backup cutter.

Claim	Accused Instrumentality
cutter.	
25. The rotary drag bit of claim 24, wherein the second backup cutter is underexposed to a lesser extent than the first backup cutter.	As shown in Ex. G2, Ulterra's second backup cutter 18.8b is underexposed to a lesser extent than the first backup cutter 18.8a.
26. A rotary drag bit, comprising:	<i>See identified infringing drill bits in claim 18.</i>
a bit body [18.1] with a face [18.2] and an axis [CL]; at least one blade [18.3] extending radially and longitudinally over the face;	The infringing Ulterra PDC drill bits have the claimed elements as shown in Ex. G1. At least one blade 18.3 extends radially and longitudinally over the face 18.2.
a plurality of primary cutters [18.5a-b], each primary cutter of the plurality of primary cutters including a cutting surface [18.6a-b] protruding at least partially from the at least one blade, located to traverse a cutting path upon rotation of the bit body about the axis, and configured to engage a formation upon movement along the cutting path;	As shown in Ex. G1, the infringing Ulterra PDC drill bits have a plurality of primary cutters 18.5a-b, each including a cutting surface 18.6a-b protrudes at least partially from the at least one blade, located to traverse a cutting path upon rotation of the bit body about the axis, and configured to engage a formation upon movement along the cutting path.
a first backup cutter [18.8a] rotationally following a primary cutter of the plurality of primary cutters, the first backup cutter including a first siderake angle, a first backrake angle, and a cutting surface [18.9a] protruding at least partially from the at least one blade, configured to conditionally engage a formation upon movement along the cutting path; and a second backup cutter [18.8b] rotationally following another primary cutter of the plurality of primary cutters, the second backup cutter including a different second siderake angle than the first siderake angle, a different second backrake angle than the first backrake angle, and a cutting surface [18.9b] protruding at least partially from the at least one blade, configured to conditionally engage a formation upon movement along the cutting path.	As shown in Ex. G2, a first backup cutter 18.8a rotationally follows a primary cutter and includes a first siderake angle, a first backrake angle, and a cutting surface 18.9a protruding at least partially from the at least one blade, the first backup cutter configured to conditionally engage a formation upon movement along the cutting path. A second backup cutter 18.8b rotationally follows another primary cutter and includes a different second siderake angle from the first siderake angle, a different second backrake angle from the first backrake angle, and a cutting surface 18.9b protruding at least partially from the at least one blade, the second backup cutter configured to conditionally engage a formation upon movement along the cutting path.
30. A method of designing a rotary drag bit, comprising:	<i>See identified infringing drill bits in claim 18.</i>

Claim	Accused Instrumentality
<p>configuring a bit body [18.1] having a face [18.2], an axis [CL], at least one blade [18.3] extending radially and longitudinally over the face, and a plurality of primary cutters cutter [18.5a-b], each primary cutter of the plurality of primary cutters including a cutting surface [18.6a-b] protruding at least partially from the at least one blade, located to traverse a cutting path upon rotation of the bit body about the axis, and configured to engage a formation upon movement along the cutting path;</p>	<p>The infringing Ulterra PDC drill bits are configured to have a bit body 18.1 having a face 18.2, an axis CL, and at least one blade 18.3 extending radially and longitudinally over the face, as shown in Ex. G1.</p> <p>The infringing Ulterra PDC drill bits are also configured to have a plurality of primary cutters 18.5a-b, each primary cutter including a cutting surface 18.6a-b protruding at least partially from the at least one blade, located to traverse a cutting path upon rotation of the bit body about the axis, and configured to engage a formation upon movement along the cutting path.</p>
<p>configuring a first backup cutter [18.8a], rotationally trailing a primary cutter of the plurality of primary cutters, the first backup cutter including a first siderake angle, a first backrake angle, and a cutting surface [18.9a] protruding at least partially from the at least one blade, configured to conditionally engage a formation upon movement along the cutting path; and</p>	<p>As shown in Ex. G2, infringing Ulterra PDC drill bits are configured to have a first backup cutter 18.8a rotationally trailing a primary cutter of the plurality of primary cutters, the first backup cutter including a first siderake angle, a first backrake angle, and a cutting surface protruding at least partially from the at least one blade, and configured to conditionally engage a formation upon movement along the cutting path.</p>
<p>configuring a second backup cutter [18.8b] rotationally following another primary cutter of the plurality of primary cutters, the second backup cutter including a different second siderake angle than the first siderake angle, a different second backrake angle than the first backrake angle, and a cutting surface [18.9b] protruding at least partially from the at least one blade, configured to conditionally engage a formation upon movement along the cutting path.</p>	<p>Infringing Ulterra PDC drill bits are also configured to a second backup cutter 18.8b rotationally following another primary cutter of the plurality of primary cutters, the second backup cutter including a different second siderake angle than the first siderake angle, a different second backrake angle than the first backrake angle, and a cutting surface 18.9b protruding at least partially from the at least one blade, and configured to conditionally engage a formation.</p>

U.S. 7,762,355 – Exhibit G1



