11cv1911g-ord(MarkmanRulings).wpd

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF OHIO
EASTERN DIVISION

A.R. ARENA PRODUCTS, INC. ,	:	
	:	**Case No. 5:11-CV-1911**
Plaintiff	:	
	:	
v.	:	
	:	**SPECIAL MASTER COHEN**
GRAYLING INDUSTRIES, INC.,	:	
	:	
Defendant	:	**REPORT AND RECOMMENDED**
	:	**RULING**

In an Order dated July 26, 2012 (dkt. no. 99), the Honorable John R. Adams directed the undersigned to "conduct a *Markman* hearing and submit a written report recommending constructions for the disputed claim terms" contained in the patents at issue in this case. Order at 2 (referring to *Markman v. Westview Instruments*, 517 U.S. 370 (1996)). The Special Master conducted the *Markman* hearing on October 11, 2012, and now files this Report.

A table of contents for the Report is shown on the following page. For ease of reference, the Report begins with two charts, which summarize the Special Master's claim construction recommendations.[1] The reasons for these recommendations are set out in the balance of the Report.

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[1] As explained in the body of this Report, at one time the parties disputed the meaning of many claim terms, but eventually came to agreement on the construction of all claim terms except three. Those three disputed terms, and the Special Master's recommended constructions, are listed in the first chart.

The second chart lists the terms for which the parties ultimately agreed on a construction. The parties further agree that any claim term not listed in either of these two charts needs no construction and should simply be given its "plain and ordinary meaning."

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U. S. Patent No. 6,234,351 ("the '351 Patent")	
Claim Number & Term	**Construction**
10 – "of substantially identical perimetral extent"	"having identical or substantially identical outside-edge dimensions"
22 – "substantially identical to each other in dimension"	"identical or substantially identical to each other in dimension"
29 – "substantially identical dimension"	"identical or substantially identical dimension"
U.S. Patent No. 6,427,873 ("the '873 Patent")	
Claim Number & Term	**Construction**
10– "of substantially identical perimetral extent"	"having identical or substantially identical outside-edge dimensions"
22 – "substantially identical to each other in dimension"	"identical or substantially identical to each other in dimension"
29 – "substantially identical dimension"	"identical or substantially identical dimension"
U. S. Patent No. 6,467,652 ("the '652 Patent")	
1 – "sump"	"flexible sump, the bottom of which includes the lowest point that the bag surface contacts the material, and at least some portion of the side of which includes a bag ply that has been elevated above the lowest point that the bag surface contacts the material"
1 – "where the material is discharged from the bag"	"where the material is discharged from the bag, without squeezing the material from the discharge zone and without squeezing the material out of the bag"
6 – "sump"	"flexible sump, the bottom of which includes the lowest point that the bag surface contacts the material, and at least some portion of the side of which includes a bag ply that has been elevated above the lowest point that the bag surface contacts the material"
6 – "for discharge from the bag"	"for discharge from the bag, without squeezing the material from the discharge zone and without squeezing the material out of the bag"
11 – "where the material is discharged from the bag"	"where the material is discharged from the bag, without squeezing the material from the discharge zone and without squeezing the material out of the bag"

CHART TWO – CONSTRUCTIONS AGREED UPON BY THE PARTIES	
U. S. Patent No. 6,234,351 ("the '351 Patent")	
Claim Number & Term	**Construction**
10 – "viscous contents"	"flow-resistant fluid contents"
10 – "to increase a depth of the bulk material remaining in the bag"	"to increase a depth of the bulk material remaining in the bag, the increase in depth characterized by keeping the level of bulk material above the drain until at least very near the end of evacuation"
16 – "urge the bulk material toward an exit port of the bag"	"urge the bulk material toward the exit port of the bag by raising the level of the bag contents, but does not squeeze the material out of the exit port"
22 – "urge the bulk material toward an exit port of the bag"	"urge the bulk material toward an exit port of the bag by raising the level of the bag contents, but does not squeeze the material out of the exit port"
28 – "viscous contents"	"flow-resistant fluid contents"
29 – "viscous contents"	"flow-resistant fluid contents"
29 – "urging viscous contents of the bag toward the drainage port"	"urging flow-resistant fluid contents of the bag toward the drainage port by raising the level of the bag contents, without squeezing the flow-resistant fluid contents out of the drainage port"
U.S. Patent No. 6,427,873 ("the '873 Patent")	
Claim Number & Term	**Construction**
10 – "viscous contents"	"flow-resistant fluid contents"
10 – "to increase a depth of the bulk material remaining in the bag"	"to increase a depth of the bulk material remaining in the bag, the increase in depth characterized by keeping the level of bulk material above the drain until at least very near the end of evacuation"
16 – "urge the bulk material toward the drain region of the bag"	"urge the bulk material toward the drain region of the bag by raising the level of the bag contents, but does not squeeze the material out of the drain region"

CHART TWO – CONSTRUCTIONS AGREED UPON BY THE PARTIES	
22 – "urge the bulk material toward an exit region of the bag"	"urge the bulk material toward an exit region of the bag by raising the level of the bag contents, but does not squeeze the material out of the exit region"
29 – "viscous contents"	"flow-resistant fluid contents"
29 – "urging viscous contents of the bag toward the outflow region"	"urging flow-resistant fluid contents of the bag toward the outflow region by raising the level of the bag contents, without squeezing the flow-resistant fluid contents out of the outflow region"
39 – "semi-flowable bulk material"	"flow-resistant fluid bulk material"
39 – "urging bulk material toward the output"	"urging bulk material toward the output, without squeezing the bulk material out of the output"
48 – "semi-fluid material"	"flow-resistant fluid material"
58 – "semi-fluid contents"	"flow resistant fluid contents"
58 – "displaces the contents toward the drain region"	"displaces the contents toward the drain region by raising the level of the bag contents, but does not squeeze the contents out of the drain region"

I. Background of the Case.

A. Procedural Background.

In its first amended complaint (docket no. 19), plaintiff A. R. Arena Products, Inc. ("Arena") states claims against defendant Grayling Industries, Inc. ("Grayling") for infringement of three of Arena's patents. The parties refer to these patents as the '351 patent, the '873 patent, and the '652 patent.[2] Arena's patents all teach invention of a multi-ply plastic bulk material shipper bag. Arena claims Grayling infringes the three patents by selling its "Guardian Pressure Dispense Liner" products.

Pursuant to the Local Patent Rules, the parties exchanged initial infringement contentions and then filed: (a) simultaneous opening claim construction briefs (docket nos. 61 & 62); (b) simultaneous response briefs (docket nos. 77 & 78); and (c) a joint claim construction brief (docket no. 85). Especially in the beginning, these exchanges were acrimonious.[3] Eventually, however, as the parties continued to respond to each other's arguments, the number of disputed patent terms decreased. For example, Arena's opening claim construction brief addresses 52 different patent terms about which the parties disagreed,[4] but just before the *Markman* hearing the parties stipulated that only four patent terms were at issue.[5] During the *Markman* hearing, the parties further agreed

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[2] The patents at issue are No. 6,234,351 ("the '351 patent"); No. 6,427,873 ("the '873 patent"); and No. 6,467,652 ("the '652 patent"). Arena's three patents are all related, in that the latter two patents ('873 and '652) are continuations-in-part of the former patent ('351).

[3] *See, e.g.* docket no. 60 (*Special Master's First Report*, addressing parties' accusations that the other did not comply with the Local Patent Rules); docket no. 96 (Order addressing subsequent motion for sanctions by reason of misconduct in claim construction proceedings).

[4] *See* docket no. 62 at 11-24.

[5] *See Markman* hearing tr. at 5-6 (listing the terms in dispute).

on the construction of one of these four terms, leaving three for construction by the Court.[6]

After the *Markman* hearing, pursuant to directions from the undersigned, the parties filed an amended joint claim construction chart (docket no. 119) setting out their final positions. Chart Two above, which lists constructions agreed upon by the parties, is essentially copied from the parties' amended joint claim construction chart. Chart One above shows the Special Master's conclusions regarding constructions of patent claim terms disputed by the parties. The balance of this Report explains how the undersigned reached these conclusions.

B. Background of the Invention.

Arena's three patents are all directed at bulk material shipper bags. Bulk material shipper bags normally sit inside large (e.g., 315-gallon) plastic containers or totes, which are used to transport liquids, gels, pastes, or powders. The shipper bag acts as a liner, preventing the bulk material from contacting the inside of the tote and making it easier to empty the tote when it arrives at its destination. The invention is directed especially at helping empty a shipper bag of contents that are flow-resistant (such as mayonnaise, drywall paste, or hair gel) or viscous (such as oil, honey, syrup, or ink).

In its '351 patent, Arena begins its explanation of its invention by describing the primary problem the invention solves. Arena states:

> In the bulk material shipping industry, where plastic bags in totes, such as plastic totes, are used to ship quantities of liquids, pastes, granular materials, powders, and other flowable and semi-flowable bulk materials, substantial quantities of the bulk material can be left in the bag when the bag has been nearly completely evacuated. This is true even where pumps are connected to the drain ports of the bags, and is especially true of more flow-resistant bulk materials, such as drywall

[6] *See Markman* hearing tr. at 55 (parties agreeing on construction of the term "equator")

> paste and mayonnaise. This problem with bulk material shipper bags is created when the bag is evacuated and collapses, which leaves folds of bag material in the tote. When the excess folds are on the bottom near the drain, they can be sucked against the drain port, stalling the pump.

'351 patent, col. 1, lines 18-31. Arena notes that "prior inventors have tried several approaches" to solve this problem and reduce the amount of bulk material left inside a shipper bag. *Id.* at line 33. These approaches include: (1) "inclin[ing] the bottom of the bag toward the drain port by tilting part or all of the base of the shipping container or even tilting the entire shipping container, plastic tote and all;" and (2) "us[ing] a special structure in the bag or in the rigid container to squeeze the residual contents out of the bag," such as using battens to stiffen the bag near the drain port, and "add[ing] a special chamber to the bag that can be filled with pressurized air to squeeze the contents from the primary chamber." *Id.* at lines 35-37 & 45-52. The principal disadvantages with these approaches are that they are relatively expensive and require human intervention.

Arena's invention is a less expensive option that requires much less human oversight. Arena's patents teach construction of a two-ply plastic shipper bag, where air can be pumped between segmented areas of the two plies; by seaming together the two plies in certain ways and then inflating the bladder(s) the plies create, the contents inside the bag can be pushed toward an integrated outlet or discharge port, and folds of the bag material do not get sucked into the outlet as the bag is emptied. This leads to a more thorough evacuation of the contents from the shipper bag. Arena describes the mechanics of its invention as follows:

> In one embodiment, I add an air input port and conduit to the lower half of a [shipper] bag and opposite the drain port. The input port allows inflation of an interply region between two lower plies of the pillow bag using low pressure air. The air input conduit is preferably connected to a source of pressurized air at the outset of evacuation. The interply region inflates as the bulk material is removed from the bag through the drain port. As the interply region inflates, the inner ply or

> plies rise near the air input port so that the part beneath the bag contents in that area effectively lifts the fluid and becomes an advancing wall. Unlike prior arrangements, however, the advancing wall doesn't squeeze the bag contents out the drain port. Rather, the advancing wall simply inclines the bottom of the bag a little at a time and raises the level of the bag contents so that the drain port is always completely covered by bulk material. Because the level of the contents is kept above the drain port until very near the end of evacuation, folds of material that collect as the bag collapses float or ride on the surface of the bulk material and do not block the drain port. Additionally, the inner ply is kept taut at all times by the air pressure, pulling the bag material away from the drain port and further preventing or at least significantly delaying drain port blockage.

Id. at col. 2, line 65 - col. 3, line 20.

Notably, inflation of the bladder(s) to lift the inner ply of the shipper bag is achieved "using low pressure air." *Id.* at col. 3, line 2. This is in contrast to the prior invention of "add[ing] a special chamber to the bag that can be filled with pressurized air to squeeze the contents from the primary chamber," which "requires relatively high pressure." *Id.* at col. 1, lines 50-52 & 59. Thus, Arena is careful to note that inflation of the bladder(s) "doesn't squeeze the bag contents out the drain port;" rather, inflation of the bladder causes the inner ply to "rise near the air input port so that the [ply] . . . effectively lifts the fluid and becomes an advancing wall," which "simply inclines the bottom of the bag a little at a time and raises the level of the bag contents so that the drain port is always completely covered by bulk material." *Id.* at col. 3, lines 9-14. In other words, the bulk material contained in the shipper bag described in Arena's patents is normally evacuated using gravity or suction, and the principal function of the shipper bag's internal bladder is to keep the bag from covering up the drain port near the end of evacuation; the bulk material is *not* squeezed out of the shipper bag by virtue of the plumping of the internal bladder.

On the following page are five drawings of the invention, copied from the '351 patent and simplified, showing the shipper bag in various stages as its bulk contents are removed through the drain port. Figure 26 shows the shipper bag when it is full, and figure 30 shows the shipper bag when it is virtually empty. The area marked "5" is where the bulk material (such as syrup) is held within the shipper bag; the area marked "6" is the shipper bag's bladder, which is inflated with air as the bag is emptied; and the red arrows show the movement of the "advancing wall" of the inner ply, as the bulk material is emptied from the shipper bag. A key to the five drawings is shown on the bottom right side of the page.

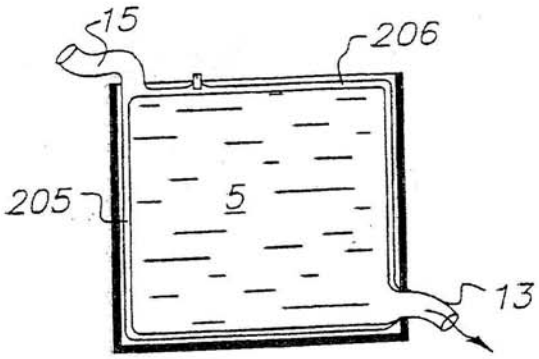


FIG. 26

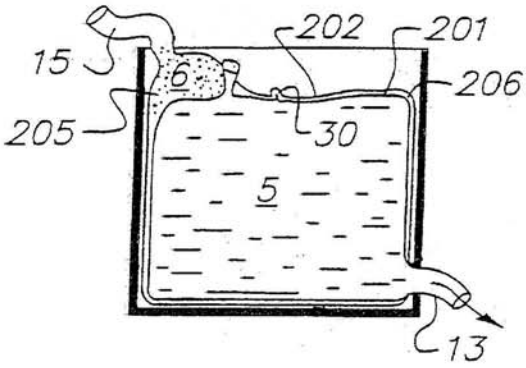


FIG. 27

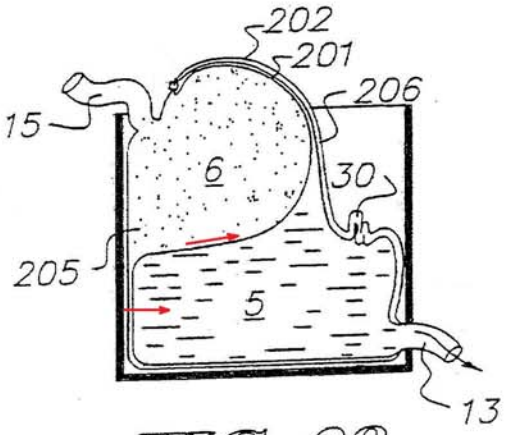


FIG. 28

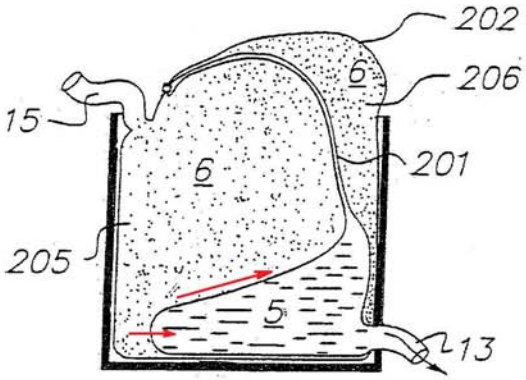


FIG. 29

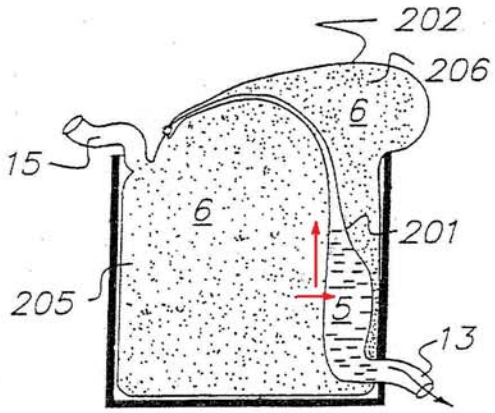


FIG. 30

5	= bulk material contained in bag
15	= air input
205	= interply (bladder) region
206	= interply (bladder) region
13	= drain
6	= air blown between plies of bag
30	= folds of bag as it empties
202	= outer (external) ply of bag
201	= inner (internal) ply of bag

red arrows = movement of inner ply

Three additional drawings are shown on the following page, these copied from the '652 patent and simplified. Whereas the drawings on the previous page show a drain port at the bottom of the shipper bag, the drawings on the next page depict a shipper bag that is emptied using a "dip tube" inserted through the top of the bag. As the dip tube sucks the contents out of the shipper bag, the inner plies of the bag move toward the dip tube, pushed by air pressure inside of the shipper bag's bladder. The object marked "30" is the dip tube; the area marked "40" is where the bulk material (such as mayonnaise) is held within the shipper bag; and the area marked "88" is the shipper bag's bladder, which is inflated with air as the bag is emptied. A key to the three drawings is shown on the bottom right side of the page.

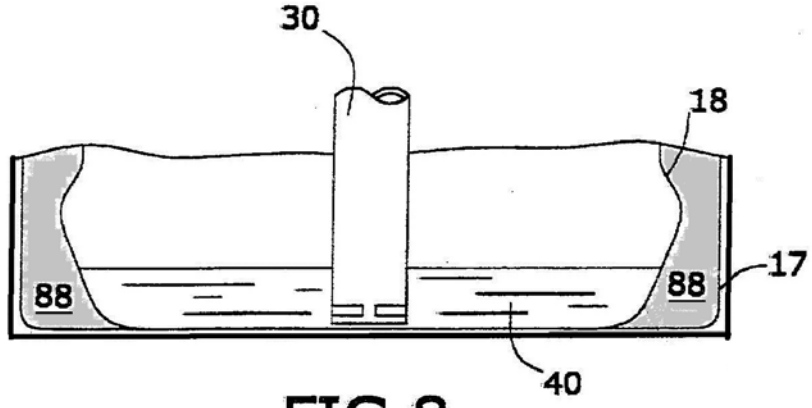


FIG.8

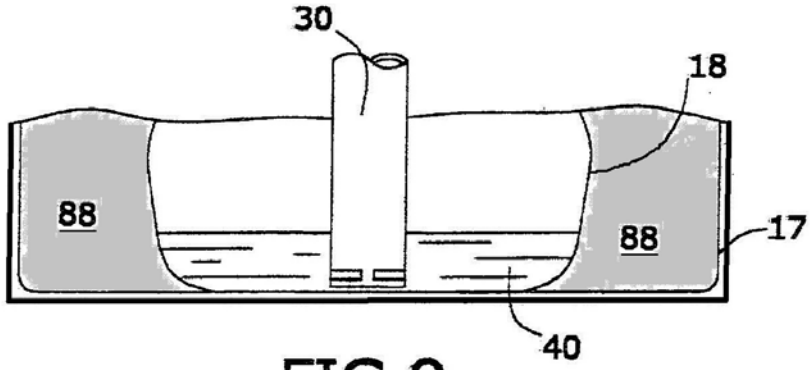


FIG.9

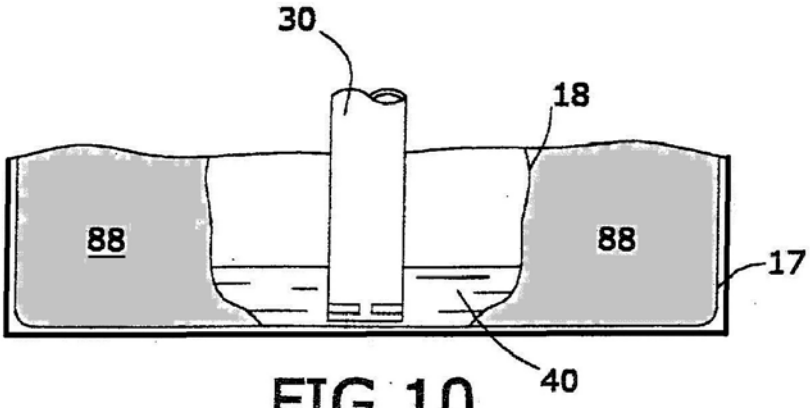


FIG.10

30 = dip tube
17 = outer (external) ply of bag
18 = inner (internal) ply of bag
40 = bulk material contained in bag
88 = interply (bladder) region

C. Patent Claim Language.

(NOTE – this section of the Report is included primarily for ease of reference. The reader may safely skip this section and instead refer back to it only if necessary.)

In its Infringement Contentions, Arena asserts Grayling is infringing the following claims of Arena's three patents:

'351 Patent: Claims 10, 11, 16, 17, 18, 19, 21, 22, 23, 25, 27, 28, 29, 30, 31, 32;

'873 Patent: Claims 10, 11, 16, 17, 18, 21, 22, 23, 25, 27, 28, 29, 30, 31, 32, 39, 42, 46, 47, 48, 49, 50, 52, 56, 57, 58, 59, 60; and

'652 Patent: Claims 1, 4, 6, 7, 10, 11, 14.

The parties have not asked the Court to construe all of these claims. Indeed, the parties agree the Court need not construe the terms used in *most* of these claims – the terms should simply be given their plain and ordinary meaning. Regarding other claims, the parties agree the Court should construe certain terms, and the parties also agree on what that construction should be. Finally, there are a number of claims containing terms regarding which the parties disagree on the necessity of construction, or what any construction should be. Set forth below is the compete language for those claims that: (1) contain terms the parties agree must be construed and agree on construction (shown underlined), or (2) contain terms regarding which the parties disagree over construction (shown in **bold**).

1. The '351 Patent.

10. An arrangement enhancing output of viscous contents of a bag including:

> an air input port formed on a multiple-ply bag, the multiple-ply bag including a plurality of plies of **substantially identical perimetral extent**, at least one edge of

each ply being joined to at least one respective edge of another ply, the air input port being connectable to a source of pressurized air;

an interply region between two plies of the plurality of plies of the bag with which the air input port is in fluid communication so that the interply region can fill with pressurized air from a source of pressurized air when a source of pressurized air is connected to the air input port;

a drain extending from an interior of the bag to an exterior of the bag allowing contents of the bag to be emptied when present;

a portion of the bag acting as a bottom of the bag; and

an inner of the two plies having a bottom part at least partially overlying the bottom of the bag and being arranged so that an increasing portion of the bottom part of the inner ply can become a wall part of the inner ply substantially non-parallel to a the [sic] bottom of the bag to increase a depth of the bulk material remaining in the bag.

16. A method of using the bag of claim **10** including the steps of:

connecting a first end of an air input conduit to the air input port of the bag after the bag has been filled with bulk material;

connecting a second end of the air input port to the source of the pressurized air so that pressurized air can travel through the air input conduit to the interply region; and

allowing pressurized air to enter into fluid communication with the interply region via the air input conduit and the air input port so that a bottom portion of the inner ply can urge the bulk material toward an exit port of the bag.

22. A method of enhancing evacuation of a multiple-ply, bulk material-filled bag including a plurality of plies **substantially identical to each other in dimension**, at least one edge of each ply being joined to a respective edge of at least one other ply, the method including the steps of:

connecting a region between two plies of the bag to a source of pressurized air, one of the two plies being an inner ply and another of the two plies being an outer ply; and

inflating the region between the two plies with pressurized air from the source of pressurized air, the region extending under the bulk material, the pressurized air causing the inner ply of the two plies to urge the bulk material toward an exit port of the bag.

28. A method of using the arrangement of claim **10** including the steps of:

Filling the bag with viscous contents;

connecting the air input port to a source of pressurized air; and

opening the drain to allow the viscous contents to exit the bag, a portion of the inner of the two plies farthest from the drain port and highest relative to the bottom of the bag plumping in response to pressurized air from the source of pressurized air, the plumping portion of the inner ply thereby pulling the bottom part of the inner ply and causing it to increase its slope so that the increasing portion of the bottom part of the inner ply becomes the wall part.

29. A method of enhancing drainage of viscous contents of a multiple-ply bag, the bag including at least two plies all of **substantially identical dimension**, the method including the steps of:

pulling an inner ply of two plies of the bag;

changing part of the inner ply from being part of the bottom of the bag to being a movable wall a portion of which is substantially perpendicular to the bottom of the bag;

moving the movable wall toward a drainage port of the bag; and

urging viscous contents of the bag toward the drainage port.

2. The ‘873 Patent.

10. An arrangement enhancing output of viscous contents of a bag including:

an air input port formed on a multiple-ply bag, the multiple-ply bag including a

plurality of plies of **substantially identical perimetral extent**, at least one edge of each ply being joined to at least one respective edge of another ply, the air input port being connectable to a source of pressurized air;

an interply region between two plies of the plurality of plies of the bag with which the air input port is in fluid communication so that the interply region can fill with pressurized air from the source of pressurized air when the source of pressurized air is connected to the air input port;

a portion of the bag acting as a bottom of the bag;

a drain region of the bag located proximate to the bottom of the bag; and

an inner of the two plies having a bottom part at least partially overlying the bottom of the bag and being arranged so that an increasing portion of the bottom part of the inner ply can become a wall part of the inner ply substantially non-parallel to a the [sic] bottom of the bag to increase a depth of the bulk material remaining in the bag in the drain region.

16. A method of using the bag of claim **10** including the steps of:

connecting a first end of an air input conduit to the air input port of the bag after the bag has been filled with bulk material;

connecting a second end of the air input port to the source of pressurized air so that pressurized air can travel through the air input conduit to the interply region; and

allowing pressurized air to enter into fluid communication with the interply region via the air input conduit and the air input port so that a bottom portion of the inner ply can urge the bulk material toward the drain region of the bag.

22. A method of enhancing evacuation of a multiple-ply, bulk material-filled bag including a plurality of plies **substantially identical to each other in dimension**, at least one edge of each ply being joined to a respective edge of at least one other ply, the method including the steps of:

connecting a region between two plies of the bag to a source of pressurized air, one of the two plies being an inner ply and another of the two plies being an outer ply;

and

inflating the region between the two plies with pressurized air from the source of pressurized air, the region extending under bulk material, the pressurized air causing the inner ply of the two plies to urge the bulk material toward an exit region of the bag.

29. A method of enhancing outflow of viscous contents of a multiple-ply bag, the bag including at least two plies all of **substantially identical dimension**, the method including the steps of:

pulling an inner ply of two plies of the bag;

changing part of the inner ply from being part of the bottom of the bag to being a movable wall a portion of which is substantially perpendicular to the bottom of the bag;

moving the movable wall toward an outflow region of the bag; and

urging viscous contents of the bag toward the outflow region.

39. A system for evacuating semi-flowable bulk material from a multi-ply bag arranged within a shipping container, the system comprising:

an air input passageway extending to an interply region of the bag that extends under liquid contained within bottom plies of the bag supported on a bottom of the container;

the interply region of the bag being configured to contain pressurized air accumulating initially in regions remote from an output for the bag and to exclude the pressurized air from substantial upper regions of the bag; and

the bag being configured and located within the container so that pressurized air within the interply region counteracts liquid pressure within the bag to raise a ply of the bag against the bulk material in regions remote from the output, thereby urging bulk material toward the output and increasing bulk material depth so that folds of material collecting from bag collapse ride on the surface of the bulk material, the surface of the bulk material being maintained at a level above the output by the

raised ply of the bag in the interply region, thereby preventing blockage of the output by the folds of material.

48. A combination of a shipping container and a multi-ply bag arranged within the container for holding a semi-fluid material within the multi-plies of the bag for shipment with the container, the combination comprising:

an air inlet arranged in communication with an interply region of the bag extending below an equator of the bag and underneath the material contained within the bag;

seams of the bag being configured to contain within the interply region low pressure air pumped into the interply region and to substantially exclude the low pressure air from a top region of the bag; and

the interply region being arranged to be balloonable in regions remote from a drain region of the bag so that air pressure ballooning the interply region of the bag counteracts material pressure applied in a bottom region of the bag to displace the material toward the drain region.

58. In a bulk material shipping container lined with a bag having a drain region from which semi-fluid contents can be withdrawn from the bag, a method of keeping the drain region flooded with contents being withdrawn, for more completely emptying the bag, the method comprising:

applying low pressure air to an interply region of the bag extending below an equator seam of the bag and below the contents within the bag; and

prearranging the bag within the container to provide ballooning room away from the drain region so that as a contents level within the bag lowers, air pressure balloons the interply region of the bag away from the drain region and displaces the contents toward the drain region and keeps the drain region flooded with the contents until the bag is nearly empty.

3. The '652 Patent.

1. A system of enhancing discharge of pumpable material from a material discharge zone disposed at the bottom of a disposable plastic bag arranged within a supporting container so that a bottom of the bag contacts a bottom of the container and underlies material contained in the bag, the system comprising:

a. at least a portion of the bag being formed of multiple plies secured together in a configuration that confines inflating air within an inflatable region between the secured together plies;

b. the ply securing configuration being arranged to dispose the inflatable region outside the discharge zone at the bottom of the bag;

c. an air delivery system arranged to urge air into the inflatable region when the bag is disposed in a container and at least partly filled with the material; and

d. the ply securing configuration being arranged so that the air plumps the inflatable region of the bag and, as weight of the material remaining in the bag permits, raises above the bottom of the container a ply of the bag contacting the material whereupon gravity makes the material flow downward along a slope of the raised ply into the **sump** in the discharge zone **where the material is discharged from the bag**.

6. A disposable, multi-ply plastic bag structured to facilitate outflow of material from a discharge zone of the bag disposed at a bottom of the bag when the bag is arranged within a supporting container, the bag comprising:

a. at least a portion of the bag being formed of multiple plies secured to each other so as to contain air in an air containment region;

b. the air containment region being arranged to extend at least partly over the bottom of the bag;

c. an air passageway arranged to conduct inflating air into the air containment region;

d. plies of the bag forming the air containment region being arranged in the

discharge zone at the bottom of the bag to limit inflation of the air containment region from air delivered through the air passageway to a region spaced from the discharge zone; and

e. the air containment region of the bag being configured so that inflation of the air containment region as the material is flowed from the bag causes a bag surface contacting the material to elevate above the discharge zone in regions of the bag spaced from the discharge zone to shape the bag surface into a **sump** located in the discharge zone so that gravity urges the material down a slope of the elevated bag surface and into the **sump** at the discharge zone **for discharge from the bag**.

11. A method of discharging pumpable material from a disposable multi-ply plastic bag supported within a shipping container, the method comprising:

a. pre-forming a continuous seam sealing together plies of the bag between which air can be contained;

b. pre-locating the continuous seam so that an interply air containment region within the seam extends over a bottom region of the bag supported by the container and extending under the material contained within the bag;

c. holding together plies of the bag forming the air containment region in a discharge zone disposed at the bottom of the bag;

d. urging air into the air containment region when a major portion of the material has been discharged from the bag to inflate the air containment region of the bag outside the discharge zone where the plies of the bag are held together; and

e. using inflation of the air containment region to cause a ply of the bag contacting the material within the bag to elevate above the discharge zone so that gravity urges the material downward along the elevated ply of the bag toward the discharge zone **where the material is discharged from the bag**.

II. Legal Standards.

A patent document contains "two distinct elements." *Markman v. Westview Instruments*, 517 U.S. 370, 373 (1996). The first is "a **specification** describing the invention 'in such full, clear, concise, and exact terms as to enable any person skilled in the art . . . to make and use the same." *Id.* (quoting 35 U.S.C. § 112) (emphasis added). The patent language quoted in Section I.B of this Report ("Background of the Invention"), as well as the drawings shown in that Section, come from the specification of Arena's patents.

The second element is that "a patent includes one or more '**claims**,' which 'particularly poin[t] out and distinctly clai[m] the subject matter which the applicant regards as his invention.'" *Id.* (quoting 35 U.S.C. § 112) (emphasis added). "A claim covers and secures a process, a machine, a manufacture, a composition of matter, or a design," and "define[s] the scope of a patent grant." *Id.* (citing E. Lipscomb, *Walker on Patents* (3rd ed. 1985)). "Victory in [a patent] infringement suit requires a finding that the patent claim 'covers the alleged infringer's product or process,' which in turn necessitates a determination of 'what the words in the claim mean.'" *Id.* (quoting H. Schwartz, Patent Law and Practice 80 (2nd ed. 1995)). The patent language quoted in Section I.C of this Report ("Patent Claim Language") come from the claims recited in the three patents in suit.

In *Markman*, the Supreme Court held that construing "what the words in the claim mean" is a matter for the Court to decide, not the jury. When construing a claim, the Court determines "the meaning and scope of the patent claims asserted to be infringed." *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995), *affirmed*, 517 U.S. 370, 372 (1996). Claims must be construed from the vantage point of a person of ordinary skill in the art at the time of the invention. *Id.* at 986. If a claim term does not possess any latent ambiguities, is not overly technical, or is not relevant to the resolution of a disputed issue in the case, the claim term need not,

and should not, be included in the claim construction process. *Hakim v. Cannon Avent Group, PLC*, 479 F.3d 1313, 1318-19 (Fed. Cir. 2007); *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008). "Words of a claim are generally given their ordinary and customary meaning, which is the meaning a term would have to a person of ordinary skill in the art after reviewing the intrinsic record at the time of the invention." *O2 Micro*, 521 F.3d at 1360; *see Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) ("the ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application"); *Northern Telecom Ltd. v. Samsung Electronics*, 215 F.3d. 1281, 1287 (Fed. Cir. 2000) ("Claim language is given its ordinary and accustomed meaning except where a different meaning is clearly set forth in the specification or where the accustomed meaning would deprive the claim of clarity.").

"The person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." *Phillips*, 415 F.3d at 1313. Accordingly, when construing claim terms, the Court looks to "those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean." *Innova/Pure Water, Inc. v. Safari Water Filtration Systems, Inc.*, 381 F.3d 1111, 1116 (Fed. Cir. 2004). Those sources include "[1] the words of the claims themselves, [2] the remainder of the specification, [3] the prosecution history, and [4] extrinsic evidence concerning relevant scientific principles, [5] the meaning of technical terms, and [6] the state of the art." *Id.* Short observations about some of these sources are set out below.

Regarding the words of the claims themselves, "[o]ther claims of the patent in question, both asserted and unasserted, can . . . be valuable sources of enlightenment as to the meaning of a claim

term. Because claim terms are normally used consistently throughout the patent, the usage of a term in one claim can often illuminate the meaning of the same term in other claims." *Phillips*, 415 F.3d at 1314 (citations omitted). "Differences among claims can also be a useful guide in understanding the meaning of particular claim terms." *Id.*

Regarding the specification, it "is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576 , 1582 (Fed. Cir. 1996); *see Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1360 (Fed. Cir. 2004) ("In most cases, the best source for discerning the proper context of claim terms is the patent specification wherein the patent applicant describes the invention").

The prosecution history "consists of the complete record of the proceedings before the PTO [Patent and Trademark Office] and includes the prior art cited during the examination of the patent." *Phillips*, 415 F.3d at 1317. Like the specification, the prosecution history provides evidence of how the PTO and the inventor understood the patent. The prosecution history "can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be." *Id.*

The patent and the prosecution history qualify as "intrinsic evidence" relevant to claim construction. Compared with extrinsic evidence, intrinsic evidence is more significant in determining the legally operative meaning of claim language. *Id.* Extrinsic evidence "consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." *Markman*, 52 F.3d at 980. The Federal Circuit has "viewed extrinsic evidence in general as less reliable than the patent and its prosecution history in

determining how to read claim terms" – while it may be useful to the Court, "it is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence." *Phillips*, 415 F.3d at 1318, 1319. Reliance on extrinsic evidence is discouraged where the public record – that is, the claims themselves, the specification, and the file history – unambiguously defines the scope of the claims. *Vitronics*, 90 F.3d at 1583. Courts are not prohibited, though, from examining extrinsic evidence, even when the patent document is itself clear. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1308 (Fed. Cir. 1999).

The meaning of technical terms may be found in technical dictionaries or treatises, which are a form of extrinsic evidence. These resources may provide to a court a better understanding of the underlying technology and the way in which a person skilled in the art might use the claim terms. *Id.* at 1318; *Vitronics*, 90 F.3d at 1584 n.6. "Because dictionaries, and especially technical dictionaries, endeavor to collect the accepted meanings of terms used in various fields of science and technology, those resources have been properly recognized as among the many tools that can assist the court in determining the meaning of particular terminology to those of skill in the art of the invention." *Phillips*, 415 F.3d at 1318. But a court must be careful in relying upon general or technical dictionaries or treatises, which generally remain less reliable than intrinsic evidence and "'cannot overcome art-specific evidence of the meaning' of a claim term." *Id.* at 1322.

Finally, a court "is free to devise its own construction of claim terms rather than adopt a construction proposed by either of the parties." *Patent Case Management Judicial Guide* §5.1.4.4 at 5-29 (2nd ed. 2012). A principal purpose of claim construction "to give meaning to claim language when the jury might otherwise misunderstand a claim term." *Id.* §5.1.4.3 at 5-29. "A description of what a component does may add clarity and understanding to the meaning and scope of the claim." *Funai Elec. Co., Ltd. v. Daewoo Electronics Corp.*, 616 F.3d 1357, 1366 (Fed. Cir. 2010).

Ultimately, "[t]he criterion is whether the explanation aids the court and the jury in understanding the term as it is used in the claimed invention." *Id.*

III. Analysis.

The parties dispute the meaning of various terms contained in the three patents. The Special Master now supplies a construction for each of these disputed terms.

A. "Substantially Identical"

The '351 patent and the '873 patent each contain three claims that use the phrase "substantially identical," followed by a reference to size. Specifically, Claim 10 in each patent describes a "multiple-ply bag including a plurality of plies of **substantially identical perimetral extent**, at least one edge of each ply being joined to at least one respective edge of another ply." (Emphasis added.) Claim 22 in each patent describes "a multiple-ply, bulk material-filled bag including a plurality of plies **substantially identical to each other in dimension**, at least one edge of each ply being joined to a respective edge of at least one other ply." (Emphasis added.) And claim 29 in each patent describes a "bag including at least two plies all of **substantially identical dimension**." (Emphasis added.) On page 11 of this Report, the drawings copied from the '351 patent show two plies of "substantially identical" size, labeled 201 and 202.

Arena contends the three phrases at issue require no special construction by the Court – that is, each phrase should simply be given its plain and ordinary meaning. Grayling contends the phrases should all be construed to mean "exactly the same size and shape when laid flat." *See* Amended Joint Claim Construction Statement, Exh. A at 1 (docket no. 120). The Special Master concludes the phrases do require construction, but Grayling's proposed construction is not accurate. For the reasons that follow, the Special Master recommends the Court: (a) construe the phrase "substantially identical" to mean "identical or substantially identical;" and (b) construe the phrase "perimetral extent" to mean "outside-edge dimensions." The other words contained in these three

phrases should be given their ordinary and customary meanings, as understood by a person of ordinary skill in the art.

To begin, the Special Master easily concludes Grayling's proposal – "exactly the same size and shape when laid flat" – is not well-taken for the simple reason that Grayling asserts the Court should completely ignore the word "substantial." As Grayling stated during the *Markman* hearing, the Court should simply read out the word "substantially" as "meaningless," so that, for example, "substantially identical to each other in dimension" should be construed to mean "identical to each other in dimension." *Markman* hearing tr. at 76. But the Federal Circuit Court of Appeals has made clear that claim language must be "interpreted with an eye toward giving effect to all terms in the claim." *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 950 (Fed. Cir. 2006). Accordingly, the Federal Circuit has repeatedly refused to adopt a claim construction that "would render a claim limitation meaningless" or "render claim language superfluous." *Becton, Dickinson and Co. v. Tyco Healthcare Group, LP*, 616 F.3d 1249, 1257 (Fed. Cir. 2010) (citing cases). To construe the phrase "substantially identical" to mean "identical" or "exactly the same," as Grayling proposes, runs afoul of this rule.

Grayling also asserts that, when used in a patent, the term "substantially" is usually defined explicitly to mean within a certain, defined range – such as, "plus or minus one inch" – and that, because the three Arena patents do not define "substantially" as being within a certain range, the term is ambiguous and should be defined to mean "exactly." *Markman* hearing tr. at 75-76. Once again, however, the Federal Circuit Court of Appeals has rejected this contention. In *Playtex Products, Inc. v. Procter & Gamble Co.*, 400 F.3d 901 (Fed. Cir. 2005), the court concluded that "the term 'substantial,' a term of degree, should not be interpreted as having a strict numerical limitation" if the inventor, himself, did not so define the term. *Id.* at 907. Instead, the court noted,

"[t]he term 'substantial' is a meaningful modifier implying 'approximate,' rather than 'perfect.'" *Id.* (quoting *Liquid Dynamics Corp. v. Vaughan Co., Inc*., 355 F.3d 1361, 1368 (Fed. Cir. 2004)). Accordingly, the phrase "substantially identical" cannot be properly construed to mean "exactly identical" or "identical" or "exactly the same."

To the contrary, given that the word "substantial" implies "approximate," the term "substantially identical" means "*exactly* identical **OR** *almost* identical." The point of Arena's claim language describing plies that are "substantially identical to each other in dimension" is that the size of the plastic plies that are joined together must be very close to the same, but not necessarily *perfectly* the same.

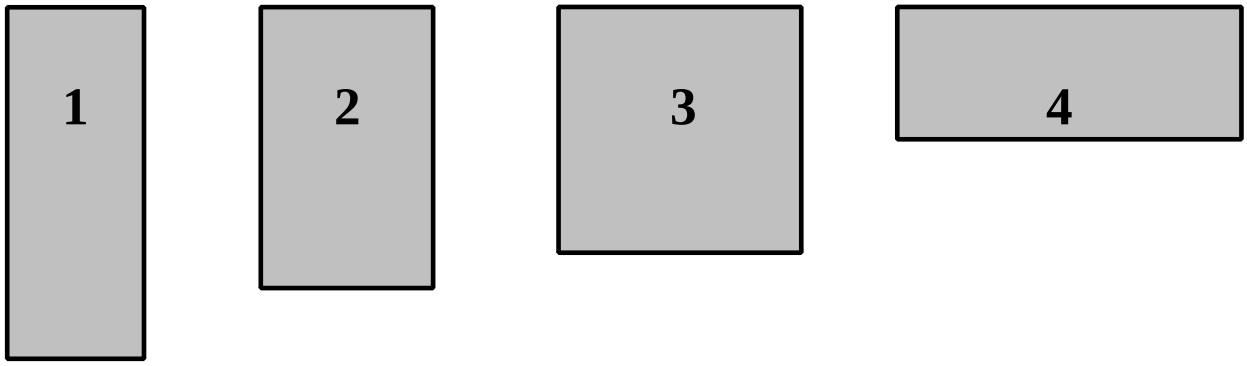
This point is best conveyed by construing the term "substantially identical" to mean "identical or substantially identical." This construction makes clear that the dimensions of the plies of the shipper bag may, in fact, be perfectly identical, but may also be less-than-perfectly identical. The Federal Circuit Court of Appeals, itself, has used this precise language to convey this exact meaning. In *Application of Best*, 562 F.2d 1252 (Fed. Cir. 1977), the Federal Circuit explained that, when "the claimed and prior art products are *identical or substantially identical*, or are produced by *identical or substantially identical* processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product." *Id.* at 1255 (emphasis added). The italicized language makes clear that "identical" and "substantially identical" do not mean the same thing; rather, the terms together describe something that is the same *or* almost the same. This is what Arena describes in its claim language, as revealed by all of the intrinsic evidence.

Having concluded that "substantially identical" should be construed to mean "identical or substantially identical," this leaves the question of whether to adopt the remainder of Grayling's

proposal – that is, whether to construe the three phrases at issue to mean "identical or substantially identical in size and shape when laid flat." The Special Master concludes Grayling's proposed language is an inaccurate and even incorrect construction of Arena's claim language.

In support for its assertion that reference must be made to the size and shape of the plies when laid flat, Grayling focuses on the term "perimetral extent," contained in claim 10 of the '351 and '873 patents, and asserts it is ambiguous.[7] The perimeter of an object, of course, is its outside border or outer boundary. Grayling argues it is unclear, however, whether the "extent" of an object's perimeter refers to: (a) only the measure in *length* of an object's perimeter, (b) only the measure of an object's *area*, or (c) both. For example, compare the four objects shown on the following page.

[7] *See Markman* hearing tr. at 80 (counsel for Grayling stating "I don't know, and nobody knows, I believe, what 'perimetral extent' means").



Object	Object's Size	Object's Perimeter Length	Object's Area
Object One	4 feet x 10 feet	28 feet	40 square feet
Object Two	5 feet x 8 feet	26 feet	40 square feet
Object Three	7 feet x 7 feet	28 feet	49 square feet
Object Four	10 feet x 4 feet	28 feet	40 square feet

Objects One and Two have the same areas but different perimeters; Objects One and Three have the same perimeters but different areas; Objects One and Four have the same areas and perimeters. Grayling asks: which pair of objects have the same "perimetral extent"?

Grayling asserts the answer to this question is revealed by the patent specification. Under "Description of the Invention," the patent describes how to form the shipper bag "by taking four layers of plastic and bonding their edges together to form seams. The four layers can be made from two rectangular layers cut in half . . . and stacked." '351 patent at col. 6 line 67 - col 7 line 4 (references to figures deleted). This description makes clear the "plastic layers" have the same perimeter *and* area. Similarly, when describing "a variation of the first embodiment," the patent describes "form[ing] the pillow bag from two layers of material cut into rectangles and fold[ing] the layers in half to form four rectangular plies. * * * After folding the layers, I bond the non-fold edges

of the plies together to form seams." '351 patent at col. 7 lines 33 - 41 (references to figures deleted). Again, this description makes clear the layers of material all have the same perimeter *and* area – that is, they are the same size and shape.

When construing claim language, however, the Court must be mindful of the rule that "[t]he patentee is entitled to the full scope of his claims, and [a court must] not limit him to his preferred embodiment or import a limitation from the specification into the claims." *Kara Tech. Inc. v. Stamps.com Inc*., 582 F.3d 1341, 1348 (Fed. Cir. 2009). Thus, Arena's patent is not limited to shipper bags formed with *rectangular* plies merely because the specification describes that method – the plies could be rectangular, circular, trapezoidal, or any other shape. Further, the fact that the plies must have approximately the same "perimetral extent" does not necessarily mean the plies must be able to lay flat at all. Indeed, examination of claim terms used in other patents makes clear that a person skilled in the art would recognize that two objects can not only be three-dimensional, but also mostly *dissimilar* in size and shape, and still have the same perimetral extent. Thus, Grayling's references to the area and perimeter of flat objects is ultimately largely inapposite.

An easy example is the common two-piece plastic food container, such as those made by Tupperware.® These containers consist of a tub and a lid. After putting food into the tub, a user marries the outside edge of the lid to the top edge the of tub, and pinches them together. One skilled in the art would describe the tub and its lid as having the same "perimetral extent" – essentially meaning they measure the same along their marrying outside edges. This is the case even though the tub and lid are clearly not the same size and shape, and cannot be "laid flat."

Examples of this use of the term "perimetral extent" may be found in many and disparate

patented inventions, including: (1) folding cardboard boxes,[8] (3) powder-dispensing carpet cleaners,[9] (3) interlocking structural blocks used to construct retaining walls,[10] (4) packages used to mail perfume samples,[11] (5) collapsible support frames for a litter-box,[12] (6) chain saw bars,[13] (7) compact disc jewel cases,[14] and (8) collapsible plastic easels.[15] Each of these patents describe two objects that join or fit together along at least a part of their edges, but the two objects are usually *not* the same size and shape. While Arena's shipper bag invention may be formed by joining the edges of plies

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[8] *See* patent no. 8,117,722 at col. 4, lines 21-23 ("This transverse extension can have a length at least equal to the transverse perimetral extent of the container in assembled condition") (references to figures omitted).

[9] *See* patent no. 5,101,532 at col. 17, lines 6-8 (the "[d]isplaceable seal has an outer perimetral extent which matches the inner perimetral extent of [the] column") (references to figures omitted).

[10] *See* patent no. 8,321,759 at col. 3, lines 7-9 ("It is a further feature of this invention that the projection portion of the connector has a perimetral extent less than the perimetral extent of the base portion.").

[11] *See* patent no. 4,998,621 at col. 3, lines 27-30 ("Preferably this represents a major portion of the perimetral extent of the envelope so that the minor portion of the perimetral extent of the envelope is the free and unsupported part.").

[12] *See* patent no. 4,638,967 at col. 2, lines 60-65 ("The receptacle opens upwardly and has a perimetral extent throughout its front, rear, and side panels being substantially equal to the perimetral extent throughout the front, rear and side frame portions of the support frame so that the receptacle is disposable within the support frame.").

[13] *See* patent no. 4,259,783 at col. 13, lines 19-22 (claiming "a segmented bar . . . in which [the] nose section includes a pair of plates of like perimetral extent arranged in overlying spaced apart registrations").

[14] *See* patent no. 4,702,369 at col. 8, lines 25-30 ("Presented on the undersurface of [the] lower wall portion of [the] lower cover member substantially throughout the perimetral extent is a downwardly depending ledge-like formation corresponding to [the] upstanding ledge-like formation extending throughout the entire perimetral extent of the upper cover member").

[15] *See* patent no. 4,338,527 at col. 5, lines 38-44 (certain folds "separate panel portions from side panel portions, with the uppermost edge of [the] central panel portion constituting a fold axis of perimetral extent greater than the perimetral extent of [the] lowermost edge") (references to figures omitted).

that are approximately or exactly "the same size and shape when laid flat," the patent does not require this to be so, and a construction of the term 'perimetral extent" that would limit the invention in this way would unfairly restrict the scope of the patents.[16]

In sum, any construction of the term "plies of substantially identical perimetral extent" must: (a) permit the plies to have a different size and shape, yet also (b) require the *outside edges* of those plies to be about the same size, so they can be joined together. Thus, the Special Master concludes a person skilled in the art would understand the phrase "plies of substantially identical perimetral extent," as used in the context of the '351 and '873 patents, means "plies having identical or substantially identical outside-edge dimensions." The Special Master recommends the Court construe this claim term accordingly.

[16] That two objects with the same "perimetral extent" do not necessarily have the same "dimensions" – as is the case with the Tupperware® tub and lid – is also revealed by the language used in another patent owned by Arena. Patent no. 6,120,181, which is also directed at bulk material shipper bags, claims a "pillow bag . . . wherein the layers are individual pieces of material [of] *substantially identical dimension and perimetral extent* and the bottom edges are joined" (col. 7, line 55 - col. 8, line 1) (emphasis added). That the material is described as substantially identical in *both* "dimension and perimetral extent" shows these terms mean different things.

B. "Sump"

The '652 patent contains two claims that use the term "sump." Specifically, Claim 1 describes a "disposable plastic bag . . . [including a] ply securing configuration being arranged so that the [pressurized] air plumps the inflatable region of the bag and . . . raises above the bottom of the container a ply of the bag . . . whereupon gravity makes the material flow downward along a slope of the raised ply into the **sump** in the discharge zone." (Emphasis added). Similarly, Claim 6 describes a "multi-ply plastic bag . . . [including an] air containment region . . . configured so that inflation of the air containment region . . . causes a bag surface . . . to elevate above the discharge zone . . . to shape the bag surface into a **sump** located in the discharge zone so that gravity urges the material down a slope of the elevated bag surface and into the **sump** at the discharge zone for discharge from the bag." (Emphasis added).

Arena contends the term "sump" should be construed to mean "an area within the bag where material collects to be discharged." Grayling contends the term should be construed to mean "a pit or reservoir serving as a drain or receptacle for liquids." *See* Amended Joint Claim Construction Statement, Exh. A at 2 (docket no. 120). The Special Master concludes neither of these proposed constructions fully remove ambiguity and fully define the meaning of the term "sump," as it is used in the context of the '652 patent. The Special Master recommends the Court construe the term "sump" to mean "flexible sump, the bottom of which includes the lowest point that the bag surface contacts the material, and at least some portion of the side of which includes a bag ply that has been elevated above the lowest point that the bag surface contacts the material."

The Special Master's reasoning is as follows. Merriam-Webster's online dictionary defines

"sump" as "a pit or reservoir serving as a drain or receptacle for liquids."[17] This is the construction Grayling proposes. Arena asserts two primary objections to Grayling's proposal. First, Arena notes that claim language must be construed from the vantage point of a person of ordinary skill in the art *at the time of the invention*, and objects that the dictionary definition quoted by Grayling is from 2012 – not 2002, when the '652 patent issued. This objection is not well-taken, as neither the term "sump" nor this definition are new; for example, essentially the same definition appears in dictionaries that are decades old.[18]

Arena's second objection, however, is well-taken. Arena notes that nowhere in the patent specification is the term "sump" characterized as a pit or reservoir or drain or receptacle; to the contrary, the specification uses the term "drain" to refer to a distinct and different portion of the shipper bag entirely. *See, e.g.*, '652 patent, col. 7, lines 9-12 ("This plumping effect forms the bottom of a fitted bag into a central *sump* where a dip tube or *drain* can be located for full discharge of the bag contents.") (emphasis added). Thus, use of the word "drain" to construe the term "sump" would be confusing. Further, the "sump" referred to in the '652 patent is clearly not limited to being a receptacle for "liquids," as that term is commonly understood. *See* '652 patent, col. 1, lines 36-39 ("The full discharge of shipped material becomes especially problematic with highly viscous materials such as mayonnaise or dry wall paste, and with powdered or granular materials that are barely flowable or pumpable."). Put simply, Grayling's proposed construction does not derive from,

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[17] *See* http://www.merriam-webster.com/dictionary/sump.

[18] *See Webster's New Twentieth Century Dictionary Unabridged* at p.1825 (2nd ed. 1978) ("a pit or well in which liquids collect"); *Webster's New World Dictionary Second College Edition* at p.1426 (1980) ("a pit for draining, collecting, or storing liquids; cistern, reservoir, cesspool, etc.").

The Special Master does note, however, that Arena is correct in characterizing dictionaries as extrinsic evidence and, although often "useful," therefore less reliable than intrinsic evidence. *Phillips*, 415 F.3d at 1818.

nor jibe completely with, all of the language in the patent specification; it must be rejected as insufficiently precise.

The same general criticism, however, also adheres to Arena's proposed construction. Arena proposes that "sump" be construed to mean "an area within the bag where material collects to be discharged." The normal understanding of the term "sump," however, is not that it is an "area," which is two-dimensional; rather, a "sump" is commonly understood to be a pit, drain, reservoir, or receptacle, which is a three-dimensional space. Further, even if Arena's proposed construction is amended to "a *space* within the bag where material collects to be discharged," the meaning and contours of the term "space" remain imprecise. The "space within the bag where material collects to be discharged" that is described in the '652 patent has some critical characteristics, which any construction of the term "sump" must include.

Specifically, unlike most sumps, which are fixed in shape and relative location, the sump described in the '652 patent is flexible in shape and location. For example, other dictionary definitions of sump include: (1) in mining, "the lowest part of a mine shaft into which water drains;"[19] and (2) in mechanical engineering, "a receptacle, such as the lower part of the crankcase of an internal-combustion engine, into which liquids, esp. lubricants, can drain to form a reservoir."[20] These definitions suggest a sump is an object that does not normally change in shape or location.[21] In contrast, the sump described in the '652 patent is specifically *designed* to change in shape and location. In several places, the patent specification describes the formation and flexible nature of

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[19] http://www.merriam-webster.com/dictionary/sump.

[20] http://www.thefreedictionary.com/sump.

[21] That there several dictionary definitions of the term "sump" serves as an additional reason to reject Grayling's proposed construction. Grayling offers no support for why the Court should adopt the dictionary definition Grayling chose, instead of another one.

the "sump":

- "a multi ply region arranged to be inflated as the bag empties in such a way as to **form a sump at the bag bottom** for discharge of pumpable material from the sump." '652 patent abstract (emphasis added).

- "Plumping the bag effectively raises above the bottom of the container a ply of the bag contacting the material to **form the bag into a sump shape** at the discharge zone." '652 patent, col. 2, lines 2-5 (emphasis added).

- (Describing a preferred embodiment in Figure 2) "When the bottom region of [the] bag is inflated, its bottom can plump inward from the corners of container, but its plies remain unplumped in the region of [the] seam. This **forms a sump shape** that tends to flow undischarged material from the container corners inward toward the discharge region where [the two] seam lines cross each other. '652 patent, col. 5, lines 15-21 (references to figures deleted) (emphasis added).

- Another way of insuring that bag plumping **forms the desired sump shape in [the] bag bottom** is schematically shown in FIG. 3 as involving a dip tube disposed in a discharge region of [the] bag to hold bag plies together in the discharge region so that separation of bag plies from plumping is limited to bag bottom regions around [the] dip tube. * * * A dip tube is preferably held down with sufficient force to ensure that the bottom of [the] dip tube remains at **the bottom of the sump shape formed when plumping gives the bag walls sloping contact** with the material being discharged. * * * Also, it is possible for plumping to raise the sump above the bottom of the container, providing that the sump remains the lowest point that a bag surface contacts the material being discharged and the dip tube remains in the sump. '652 patent, col. 5, lines 34-55 (references to figures deleted) (emphasis added).

In other words, the sump described in the '652 patent: (1) is created and formed as the inter-ply bladder(s) of the bag are inflated and a part of the bag floor rises; (2) changes in shape as inflation continues; and (3) may change location, even lifting above the bottom of the shipping container. The construction of the term "sump," as used in the '652 patent, must describe these characteristics, which are not usually associated with the term, even by one skilled in the art. Neither Grayling's nor Arena's proposed constructions include these invention-specific characteristics.

Accordingly, the Special Master recommends the Court construe the term "sump" to mean "flexible sump, the bottom of which includes the lowest point that the bag surface contacts the

material, and at least some portion of the side of which includes a bag ply that has been elevated above the lowest point that the bag surface contacts the material." Nearly all of this language is taken directly from the '652 patent specification and the description therein of the term "sump;" further, the term "flexible" acknowledges that the sump's shape and location may change as bulk material is removed from the shipper bag. Although this construction is lengthy, it serves as necessary "explanation [to] aid[] the court and the jury in understanding the term as it is used in the claimed invention." *Funai*, 616 F.3d at 1366.

C. "Discharge from the Bag"

The '652 patent contains three claims that use the term "discharge from the bag." Specifically, Claim 1 describes how, due to inflation of the shipper bag bladder, "gravity makes the material flow downward along a slope of the raised ply into the sump in the discharge zone **where the material is discharged from the bag**." (Emphasis added). Using almost identical language, Claim 11 describes how, due to inflation of the shipper bag bladder, "gravity urges the material downward along the elevated ply of the bag toward the discharge zone **where the material is discharged from the bag**. (Emphasis added). And Claim 6 also describes how "gravity urges the material down a slope of the elevated bag surface and into the sump at the discharge zone **for discharge from the bag**." (Emphasis added).

The parties' contentions regarding the proper construction for these terms have only a minor difference. Arena contends the phrase "discharged from the bag" should be construed to mean "discharged from the bag, without squeezing the material from the discharge zone and out of the bag." Grayling contends the phrase should be construed to mean "discharged from the bag, without squeezing the material from the discharge zone and *without squeezing the material* out of the bag"

– that is, Grayling essentially agrees with Arena's construction, but asserts the construction should also include the italicized clause. *See* Amended Joint Claim Construction Statement, Exh. A at 1 (docket no. 120). The Special Master concludes Grayling's construction is more accurate and appropriate.

The '652 patent is a continuation-in-part of the '351 patent and explicitly incorporates by reference the disclosures of the ''351 patent. *See* '652 patent, col. 1, lines 5-13. The '351 patent makes very clear that Arena's invention is different from earlier shipper bags (prior art) because it does not squeeze the bulk material out of the bag. For example, when discussing the background of the invention, Arena's patent notes that some existing shipper bags "use a special structure in the bag or in the rigid container to squeeze the residual contents out of the bag." *See* '351 patent, col. 1, lines 45-47. These structures include "a special chamber [in] the bag that can be filled with pressurized air to squeeze the contents from the primary chamber," or "piston arrangements, rollers, and other external squeezing arrangements." *See* '351 patent, col. 1, lines 50-52 and 64-65. Arena's patent then makes special note, when summarizing the invention, that, "unlike prior arrangements, . . . the advancing wall [of the inflating bladder] *doesn't squeeze the bag contents out [of] the drain port*." *See* '351 patent, col. 3, lines 9-10.

Ultimately, the air that is pumped into the bladder of Arena's patented shipper bag works to raise an inner ply of the bag, thereby allowing gravity to pull the bulk material down the slope of the elevated ply – the air does *not* work to push on the inner ply with enough force to actively squeeze the material out of the bag. With Arena's invention, some force *other* than squeezing – such

as a vacuum pump or a siphon or gravity – works to move the bulk material out of the bag.[22]

Grayling asserts its proposed construction makes clear that the bulk material in the patented shipper bag is not squeezed at any point as part of the evacuation process – it is not squeezed from the discharge zone *or* out of the bag. Arena does not contend Grayling's construction is incorrect, so much as that Grayling's construction is unnecessarily wordy – Arena sees no need for using the phrase "without squeezing the material" twice.

The Special Master notes, however, that the '652 patent distinguishes between material in the "discharge zone" and material leaving through a drain port as it moves outside of the bag. *See* '652 patent, col. 3, lines 40-45 ("The invention solves these problems by providing a way of urging material in the bottom of [the] bag toward a discharge zone from which it can be pumped or drained so as to substantially empty [the] bag of its contents.") (references to figures deleted). Thus, it is appropriate to make clear that material is not squeezed from either the discharge zone or the bag. Further, Arena and Grayling have agreed on the construction of other patent terms that make clear the bulk material is also not squeezed out of other structures. *See, e.g.,* Chart Two, '351 patent, claims 16, 22 (agreeing on the construction "urge the bulk material toward an exit port of the bag by raising the level of the bag contents, *but does not squeeze the material out of the exit port*") (emphasis added); Chart Two, '873 patent, claim 16 (agreeing on the construction "urge the bulk material toward the drain region of the bag by raising the level of the bag contents, *but does not squeeze the material out of the drain region*") (emphasis added); Chart Two, '873 patent, claim 39 (agreeing on the construction "urging bulk material toward the output, *without squeezing the bulk*

[22] Notably, the '351 patent does not state the bulk material is not squeezed – it states the bulk material is not squeezed *out of the bag*. The low pressure air used to inflate the bladder in the bag may cause a small degree of squeezing upon the bulk material but, because it is flow-resistant, the bulk material is not squeezed *out of the bag*; rather, gravity, suction, siphon, or some other additional force is required for evacuation.

material out of the output") (emphasis added).

While Grayling's proposed construction offers only a very small increment of extra precision compared to Arena's, Grayling's language does more clearly highlight the aspect of the invention that Arena states is its distinguishing feature – air pressure is used to facilitate evacuation of bulk material from the bag, but the material is not *squeezed* out. Because Grayling's proposed construction makes it more clear than Arena's proposed construction that this squeezing out of the bag does not occur, the Special Master adopts Grayling's proposal.

IV. Conclusion

The Special Master recommends the Court adopt the constructions listed in Chart One, at page 3 of this Report, for the disputed claim terms in the three patents at issue. The Special Master further recommends the Court adopt the constructions listed in Chart Two, at pages 4-5 of this Report, for the claim terms in the three patents regarding which the parties agree.

"[A]ny party may file an objection to an order, finding, report, or recommendation by the Special Master within 14 calendar days of the date it was electronically filed; failure to meet this deadline results in permanent waiver of any objection to the Special Master's orders, findings, reports, or recommendations." Order at 5 (docket no. 37).

RESPECTFULLY SUBMITTED,

/s/ David R. Cohen
David R. Cohen
Special Master

DATED: December 3, 2012