

UNITED STATES DISTRICT COURT
FOR THE
DISTRICT OF VERMONT

SYNVENTIVE MOLDING SOLUTIONS, INC., :
 :
Plaintiff, :
 :
v. : Case No. 2:08-cv-136
 :
HUSKY INJECTION MOLDING SYSTEMS, INC., :
 :
Defendant. :

OPINION and ORDER: Claim Construction

In the course of litigating this patent infringement action, Plaintiff Synventive Molding Solutions, Inc. ("Synventive") and Defendant Husky Injection Molding Systems, Inc. ("Husky") seek the Court's construction of several claim terms in U.S. Patent No. 5,894,025 (filed Apr. 13, 1999) ("'025 Patent"); U.S. Patent No. 6,419,870 (filed Jul. 16, 2002) ("'870 Patent"); and U.S. Patent No. 6,599,116 (filed Jul. 29, 2003) ("'116 Patent"). Having examined the evidence submitted by the parties, the Court concludes that the claim terms may be construed on the paper record of the intrinsic evidence, without the necessity for expert testimony or oral argument at a *Markman* hearing. *Cf. Inpro II Licensing, S.A.R.L. v. T-Mobile USA, Inc.*, 450 F.3d 1350, 1357 (Fed. Cir. 2006) (district court has broad discretion in determining scope of *Markman* hearing); *Lava Trading, Inc. v. Sonic Trading Mgmt., LLC*, 445 F.3d 1348, 1353 (Fed. Cir. 2006) (district court has discretion to issue *Markman* ruling without written opinion).

Background

The patents in suit (collectively "the Lee patents") are directed to an improved "valve pin actuator," a device used in injection molding systems to control a valve pin, which is used to open and close the flow of molten plastic into a cavity in a mold in which the plastic part is formed. Typically a molding machine has several injection nozzles connected to a heated manifold. A valve pin extends from the gate of the mold through the injection nozzle, through a bore in the manifold, and is connected to an actuator which is attached to a clamp plate. An actuator includes a piston in a cylinder, which is hydraulically or pneumatically driven.

The invention of the Lee patents describes an actuator that can be partially disassembled without removing the valve pin, allowing the cylinder and piston to remain with the clamp plate while the valve pin assembly and the valve pin remain with the manifold. This feature is designed to simplify disassembly and reassembly of the apparatus, which reduces lost production time. Another aspect of the invention is to provide for a clearance between the actuator piston and the actuator cap. This clearance allows for relative thermal expansion between the hot manifold and the cold clamp plate without putting a significant side load force on the valve pin. Allowing for such movement is designed to reduce valve pin breakage and facilitate reassembly of the

actuator.

In a preferred embodiment of the invention, disassembly and reassembly from the manifold is accomplished by removing a ring and associated snap ring. The cylinder and piston along with the hydraulic fluid lines are retained within the clamp plate, while the valve pin assembly remains with the manifold. There is thus no need to drain the hydraulic fluid, and no need to remove the valve pin from the manifold. '025 Patent col.6 l.51-63.

Another feature of a preferred embodiment of the invention is a "self-alignment between the actuator assembly and the valve pin assembly." '025 Patent col.6 l.66-67. The valve pin assembly allows some limited side-to-side motion through the interaction of the ring, actuator cap and an annular flange extending inward from the piston. When the valve pin assembly, and the manifold to which it is mounted, move, the flange and piston can move side to side within the clearance that is formed between the actuator cap and the flange. '025 Patent col.7 l.1-11.

Another feature of a preferred embodiment of the invention is the ease with which the valve pin may be adjusted. In order to position the valve pin to seat at a precise location in the mold gate, the actuator cap, which is threaded onto the pin head of the valve pin, can be rotated to raise or lower the valve pin with respect to the manifold and the gate. '025 Patent col.7

1.27-34.

Synventive originally asserted that Husky's device infringed seventeen claims of the Lee patents; the claims at issue have now been reduced to six: claim 12 of the '025 Patent, claims 2 and 3 of the '870 Patent, and claims 2, 3 and 12 of the '116 Patent. The parties were unable to agree on some twenty-eight terms or phrases in these six claims, and have submitted them for the Court's construction. See *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970-71 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996) (Interpretation and construction of patent claims is a matter of law for the court to determine.).

Claim Construction Principles

The principles of claim construction are well established. "[T]he claims of a patent define the invention to which the patentee is entitled the right to exclude." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed Cir. 2004)). "[T]he words of a claim 'are generally given their ordinary and customary meaning.'" *Id.* (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). "[T]he 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." *Id.* at 1313.

When the meaning of a claim term is not readily apparent, courts look to "sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean. Those sources include the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art." *Innova*, 381 F.3d at 1116. Extrinsic evidence, however, "including expert and inventor testimony, dictionaries, and learned treatises," *Phillips*, 415 F.3d at 1317, generally is "'less significant than the intrinsic record in determining the legally operative meaning of claim language.'" *Id.* (quoting *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 862 (Fed. Cir. 2004)). "When the intrinsic evidence is unambiguous, it is improper . . . to rely on extrinsic evidence." *Bell & Howell Document Mgmt. Prods. Co. v. Altek Sys.*, 132 F.3d 701, 706 (Fed. Cir. 1997).

Although "claims 'must be read in view of the specification,'" *Phillips*, 415 F.3d at 1315 (quoting *Markman*, 52 F.3d at 979), which "'is the single best guide to the meaning of a disputed term,'" *id.* (quoting *Vitronics*, 90 F.3d at 1582), "a court may not read a limitation into a claim from the specification." *Innova*, 381 F.3d at 1117; see also *Phillips*, 415

F.3d at 1323 (discussing the sometimes difficult distinction "between using the specification to interpret the meaning of a claim and importing limitations from the specification into the claim.").

"Limitations stated in dependent claims are not to be read into the independent claim from which they depend," a principle known as claim differentiation. *Curtiss-Wright Flow Control Corp. v. Velan, Inc.*, 438 F.3d 1374, 1380 (Fed. Cir. 2006) (quoting *Nazomi Commc'ns, Inc. v. Arm Holdings, PLC*, 403 F.3d 1364, 1370 (Fed. Cir. 2005)). Outside the context of independent and independent claims, "claim differentiation is a guide, not a rigid rule." *Id.* at 1381 (quoting *Laitram Corp. v. Rexnord, Inc.*, 939 F.2d 1533, 1538 (Fed. Cir. 1991)). As a guideline, the principle of claim differentiation would avoid "a claim construction that would render additional, or different language in another independent claim superfluous . . . [or] 'broaden claims beyond their correct scope.'" *Id.* (quoting *Fantasy Sports Props., Inc. v. Sportsline.com, Inc.*, 287 F.3d 1108, 1115-16 (Fed. Cir. 2002)).

Given that the "legal function of giving meaning to claim terms always takes place in the context of a specific accused infringing device," *Wilson Sporting Goods Co. v. Hillerich & Bradsby Co.*, 442 F.3d 1322, 1326 (Fed Cir. 2006), additional information about the accused product may necessitate revision of

certain disputed claim terms if their meaning in context remains ambiguous.

Discussion

Many of the disputed claim terms are recited in claim 12 of the '025 Patent, which is reproduced below with the disputed claim terms in bold.¹

12. A **valve pin actuator** for use in an injection molding system adapted for mounting between a plastic distribution **manifold** and an overlying **clamping plate**, the **valve pin actuator coupled to a valve pin adapted to extend through an injection nozzle** and positioned to seat and unseat at a mold gate, said **valve pin actuator** comprising:
 - a cylinder mounted to the **clamping plate**;
 - a **piston** slidably mounted in the cylinder;
 - a **valve pin assembly carried by the piston** and for holding a **top end of the valve pin**; and
 - a circuit **coupled to said piston** to control sliding movement thereof and in turn translation of said **valve pin** between the seated and unseated positions;
 said **valve pin assembly** including:
 - a **first part** removably secured to the **piston** so as to translate therewith, the first part

¹ Some of the disputed terms appear in claim 12 only in the preamble, but occur in the body of one or more of the other claims at issue. The parties do not dispute that the same terms should receive the same construction in each of the claims; therefore the Court construes terms that appear in the preamble of claim 12 of the '025 patent and also in the body of another claim at issue in this suit. *Cf. Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999) ("[I]f the preamble is 'necessary to give life, meaning, and vitality' to the claim then the claim preamble should be construed as if in the balance of the claim." (quoting *Kropa v. Robie*, 187 F.2d 150, 152 (C.C.P.A. 1951))). Where the body of the claim refers again to a preamble term, any necessarily limiting language in the preamble will have the effect of a limitation. *See Bell Commc'ns Research, Inc. v. Vitalink Commc'ns Corp.*, 55 F.3d 615, 621 (Fed. Cir. 1995).

including an **actuator cap**;
and a **second part** for receiving said valve pin and
secured to said **manifold**, the second part
including an **actuator support** and **means for**
securing the actuator support to the top of
the manifold;

wherein the **valve pin** includes a **pin head** secured to
the **actuator cap**.

'025 Patent col.8 l.33-56.

1. Valve pin actuator

Synventive proposes that the term be construed as

drive and alignment mechanism for translating the valve
pin back and forth through the manifold and nozzle
bores to seat and unseat the distal tip end of the
valve pin at the mold gate and includes a valve pin
assembly for maintaining the valve pin in alignment
with a drive piston; the piston of the actuator is
couplable to and decouplable from an actuator cap that
is secured to the top end of the valve pin.

Husky proposes that the terms be construed as "drive mechanism
for moving the valve pin and comprises four parts: a cylinder, a
piston, a valve pin assembly, and a power circuit."

According to Synventive's definition, the valve pin actuator
is not only a drive mechanism but an alignment mechanism, with
the valve pin assembly component of the actuator performing the
alignment function. The Lee Patent specifications state that an
object of the invention is an improved valve pin actuator that
provides a clearance that "allows for relative expansion between
the hot runner manifold and the top clamp plate in any direction,
without putting a significant side load force on the valve pin.

'025 Patent col.2 l.24-29. The detailed description of the

invention states that an "advantage of the actuator of the present invention is the manner in which there is essentially a self-alignment between the actuator assembly and the valve pin assembly; . . . the valve pin is supported in such a manner that would allow some limited side-to-side motion in any direction thereof as the hot runner manifold undergoes certain expansion." '025 Patent col.6 l.64-col.7 l.4. Thus, the specification describes an embodiment of the valve pin actuator in which the valve pin assembly performs an alignment function.

Reading the Lee Patents as a whole, however, this feature described in the specification cannot be read into the claims at issue in this suit. Other claims of the Lee Patents specifically claim a valve pin assembly with an alignment feature that is not claimed in the claims at issue. See, e.g., '025 Patent claims 10, 11, as they depend from claim 1. The valve pin actuator as set forth in claim 1 of the '870 Patent and claim 1 of the '116 Patent and their dependent claims does not claim an alignment feature. Were the alignment feature necessarily part of the construction of "valve pin actuator," then dependent claims 10 and 11 of the '025 Patent would be vulnerable to a validity challenge. See 35 U.S.C. § 112 ¶ 4 (a claim in dependent form shall specify a further limitation of the subject matter claimed); *Curtis-Wright Flow Control*, 438 F.3d at 1380 ("[R]eading an additional limitation from a dependent claim into

an independent claim would not only make that additional limitation superfluous, it might render the dependent claim invalid.").

Under the principles of claim differentiation, the fact that the claims at issue do not specify an alignment function where other claims do suggests that the valve pin actuator is not limited to a construction that includes an alignment feature. Moreover, it appears that it is more precisely the valve pin assembly, a component of the valve pin actuator, that accomplishes the alignment. The term is construed as "drive mechanism for moving the valve pin back and forth through the manifold and nozzle bores that comprises a cylinder, a piston, a valve pin assembly and a power circuit."

2. Manifold

Synventive proposes "also referred to as a hot runner or plastic distribution manifold, is a part for distributing hot molten plastic having a plastic feed bore through which the valve pin extends and is translationally driven and is coupled to the feed bore of the injection nozzle." Husky proposes "device for distributing molten plastic to the injection nozzle."

According to the description of the related art in the '025 Patent, in hot runner systems used in injection molding a manifold distributes molten plastic to an injection nozzle or nozzles. A valve pin is typically located in the center of the

bore of the nozzle, extends through a bore in the manifold, and is connected to an actuator located above the manifold and attached to a top clamp plate. '025 Patent col.1 1.13-33. Although Husky's construction would omit any reference to the feed bore, to one of ordinary skill in the art reviewing the patent, a manifold has a feed bore through which a valve pin extends. The term is construed as "also referred to as a hot runner or plastic distribution manifold, a part for distributing molten plastic that has a feed bore through which a valve pin extends."

3. Clamping plate/Clamp plate.

Synventive had proposed "also referred to as a top or clamping plate, is disposed above the manifold and is couplable to and decouplable from the mold; the clamp plate provides a clamping pressure that holds the manifold and mold together during the high pressure injection molding operation." Husky proposes "plate used to retain the manifold with the cavity block portion of the mold."

Husky objected that the clamp plate provides no pressure, but transfers pressure, and the pressure does not hold the manifold and mold together. Synventive has withdrawn the disputed language, and the parties' constructions do not materially differ. The term is construed as "also referred to as a top clamping plate, lies above the manifold and is coupled to

and uncoupled from the cavity block part of the mold."

4. Valve pin.

Synventive proposes

shaft located in and translationally drivable through the central bore of the injection nozzle and the plastic feed bore of the manifold; the valve pin has a distal tip end that slidably moves between seated and unseated positions at the mold gate (entrance to the mold); the valve pin has a pin head that retains the valve pin at its top end (opposite the distal tip end) to an actuator cap.

Husky proposes "shaft and a pin head that function as a part of a valve."

According to the description of the related art in the '025 Patent, valve pins are used to open and close the gate to a cavity in the mold in which the molded part is formed. '025 Patent col.1 l.13-15. The valve pin is typically located in the center of the bore of the hot runner nozzle. '025 Patent col.1 l.24-25. The tip of the valve pin extends to the gate of the mold, and from its tip the valve pin extends through the hot runner nozzle, through a bore in the manifold, and is connected to an actuator. '025 Patent col.1 l.28-32.

Husky's construction would omit any reference to the context of the invention, improvements in valve pin actuators used in injection molding systems. A person of ordinary skill in the art, reading the patents as a whole, would understand that "valve pin," as used in the claims, refers to a device used to open and close a mold gate in an injection molding system.

Although both parties include reference to the pin head in their proposed constructions of "valve pin," they also seek construction of the term separately. Claim 12 of the '025 Patent includes the limitation that the valve pin includes a pin head, but the term is not so limited in claims 2, 3 and 12 of the '116 Patent, or claims 2 and 3 of the '870 Patent. The patent drawings and the specification identify a pin head as a separate part. See '025 Patent fig. 9. The Court concludes that according to the patents a valve pin may but need not include a pin head.

The term is construed as "shaft connected to a valve pin actuator that extends through a feed bore in the manifold and the center of the bore of a hot runner nozzle to the gate of the mold; used to open and close the gate to a cavity in the mold in which the molded part is formed."

5. Injection nozzle

Synventive proposes "part for feeding molten plastic to the mold gate (entrance to the mold cavity); the nozzle has a central feed bore coupled to a feed bore in the manifold through both of which a valve pin extends and is translationally driven." Husky proposes "part for feeding molten plastic to the entrance of the mold cavity."

The parties agree that an injection nozzle is a part for feeding molten plastic to the entrance to the mold cavity; Husky

opposes the addition of terms it contends improperly reads in limitations not found in the claim. Reading the claim in light of the specification, however, an injection nozzle is coupled or connected to a manifold, and a valve pin extends through bores in both parts. See '025 Patent col.1 1.24-32. The term is construed as "a part for feeding molten plastic to the entrance to a mold cavity that is connected to a manifold, through the bores of both of which a valve pin extends."

6. Valve pin adapted to extend through an injection nozzle

The phrase, found in the preamble of claim 12 of the '025 Patent, is not in need of construction. That the valve pin in the claimed invention extends through an injection nozzle is part of the construction of the claim term "valve pin." Synventive would construe the term as meaning that "the valve pin is not secured to the nozzle." Nothing in the claim language or the specification requires that in addition to extending through the injection nozzle, the valve pin must also be not secured to the injection nozzle. That the embodiment of the invention depicts a valve pin that apparently is not secured to the injection nozzle, and that the summary of the invention states unequivocally that the valve pin is secured to the manifold does not translate to a conclusion that the preamble language "extend through" means "extend through and not secured to an injection nozzle."

7. Piston

Synventive proposes "a drive mechanism having a flange defining a radial clearance for self-alignment of the actuator cap with the piston." Husky proposes "a drive mechanism." The parties agree that a piston is a drive mechanism, but Synventive claims that the piston of the claim language must be read in light of the specification to include an annular flange that extends inward from the piston and creates a clearance that enables limited lateral motion as the hot runner manifold expands. See '025 Patent col.7 l.1-4; figs. 3-6.

One of the objects of the invention is "to provide an improved valve pin actuator that provides for a clearance between the actuator piston and actuator cap." '025 Patent col.2 l.24-26. The '025 Patent also describes one of the benefits of the invention as

essentially a self-alignment between the actuator assembly and the valve pin assembly . . . ; the valve pin assembly is supported in such a manner that would allow some limited side-to-side motion in any direction thereof as the hot runner manifold undergoes certain expansion This is facilitated by the interaction of the ring, actuator cap and the annular flange extending inwardly of the piston. When the manifold, and valve pin assembly mounted thereto, moves, the flange and piston can move side to side within the clearance that is formed between the actuator cap and the flange.

'025 Patent col.6 l.64-col.7 l.11.

Claim 12 does not specifically recite a requirement that the piston include an annular flange, however. Other claims in the

'025 patent do recite the requirement that the piston have an annular flange: for example claim 5 and claim 7 as they depend from claim 1. According to the principles of claim differentiation a piston as used in the '025 patent need not therefore include an annular flange; otherwise the language in dependent claims 5 and 7 would be superfluous, and claim 5 might well be invalid. The term is construed as "a drive mechanism that moves the valve pin."

8. Valve pin assembly

Synventive proposes

an assembly that includes a first part for holding a top end of a valve pin and removably coupling the valve pin to an actuator piston, and a second part secured to the manifold for receiving the valve pin such that the valve pin, when decoupled from the piston, remains extended through an injection nozzle and secured to the manifold when a top clamping plate and actuator cylinder and piston are removed from the mold, without requiring removal of the valve pin from the manifold. A valve pin assembly provides alignment between the valve pin and piston. A valve pin assembly provides radial clearance between the actuator cap and piston to prevent any substantial side load force being exerted on the valve pin.

Husky proposes "group of parts that includes a first part and a second part."

According to the '025 Patent claims, a valve pin assembly is part of the valve pin actuator, and consists of two parts, one part removably secured to the piston and one part secured to the manifold. See, e.g., '025 Patent, claims 1, 12, 20. The part secured to the piston holds a top end of the valve pin, and the

part secured to the manifold receives the valve pin. *Id*; see also '025 Patent col.5 l.35-42 (describing a preferred embodiment of the invention). Husky's definition is devoid of context and does not assist a meaningful construction of the term.

The key disagreement between the competing constructions is Synventive's contention that the valve pin assembly provides alignment and radial clearance. As mentioned in the construction of "valve pin actuator," certain claims not at issue assert the alignment and radial clearance functions performed by the interaction of certain components of the valve pin assembly, specifically the ring, actuator cap and annular flange in the illustrated preferred embodiment. See '025 Patent col.7 l.1-17. Whereas the actuator cap is recited in three of the asserted claims, and the ring is an additional limitation recited in two of the asserted claims, the annular flange is not recited in any of the asserted claims. No other structure is apparently recited in the asserted claims that functions to provide alignment or radial clearance or interacts with the actuator cap and/or the ring to provide those functions. Reading the patents as a whole, taking care not to render language in other claims superfluous, a valve pin assembly may but is not required to provide alignment between the valve pin and the piston, and radial clearance between the actuator cap and the piston.

The term is construed as "part of the valve pin actuator

that secures the valve pin to the actuator and includes a first part for holding a top end of a valve pin that is removably secured to the piston, and a second part for receiving the valve pin that is secured to the manifold."

9. Valve pin assembly carried by the piston

To the extent that this phrase needs construction, it is construed as "valve pin assembly that is held or supported by the piston while the piston moves."

10. Top end of the valve pin

The parties do not significantly disagree over the construction of this term. The term is construed as "the end of the valve pin at the top of the pin, opposite the distal tip end which seats and unseats at the mold gate."

11. First part/Second part

Synventive proposes that a first part is "part of the valve pin assembly for holding a top end of a valve pin and removably coupling the valve pin to the actuator piston." Husky proposes "part carried by the piston, including an actuator cap."

Synventive proposes that a second part is

a part of the valve pin assembly that is secured to the manifold for receiving the valve pin such that the valve pin, when decoupled from the piston, remains extended through an injection nozzle and secured to the manifold when a top clamping plate and/or actuator cylinder and piston are removed from the mold, without requiring removal of the valve pin from the manifold.

Husky proposes "part carried by the piston, including an actuator

support."

The terms are construed consistently with the construction of valve pin assembly. A first part is "a part of the valve pin assembly for holding a top end of a valve pin that is removably secured to the piston." A second part is "a part of the valve pin assembly for receiving the valve pin that is secured to the manifold."

12. Actuator cap

Synventive proposes

part of the valve pin assembly that: a) is secured to a top end of a valve pin for alignment with a piston; (b) removably couples the valve pin to the piston such that the pin and the actuator cap are not in contact with the piston upon decoupling; and (c) remains secured to the manifold together with the valve pin when the clamp plate is removed from the mold.

Husky proposes "uppermost part of the valve pin assembly, that provides for adjusting, i.e., raising or lowering, of the valve pin."

An actuator cap is described in the specification of the '025 Patent as a part of the valve pin assembly that receives the pin head and is removably coupled to the piston. See '025 Patent col.5 l.35-46; see also '025 Patent claim 12. Although in the preferred embodiment the actuator cap may rotate to raise or lower the valve pin, see '025 Patent col.7 l.27-37, and claim 4 of the '116 Patent describes an internally threaded actuator cap that enables the adjustment, there is no requirement that the

actuator cap enable raising or lowering of the valve pin in the asserted claims.

Likewise, although the preferred embodiment employs an actuator cap attached to a pin head which receives the top of the valve pin, and claim 12 of the '025 Patent recites a pin head secured to the actuator cap, other claims of the Lee Patents do not recite a pin head as attaching the valve pin to the actuator cap. Compare '116 Patent claim 2 with '116 Patent claim 4. The term is construed as "part of the valve pin assembly to which a top end of a valve pin or a pin head is attached and which is removably coupled to the piston."

13. Actuator support

Synventive proposes

part of the valve pin assembly that receives the valve pin and is secured to the manifold so as to secure the valve pin to the manifold in alignment with the piston when the valve pin is decoupled from the piston; as a result, the valve pin remains extended through the injection nozzle, secured to the manifold and aligned with the piston when the top clamping plate and actuator cylinder and piston are removed from the mold, without requiring removal of the valve pin from the manifold.

Husky proposes "structure that limits axial movement of the actuator cap toward the manifold."

An actuator support is described in the specification of the '025 Patent as a part of the valve pin assembly that is mounted to the hot runner manifold. See '025 Patent col.5 l.47-49. According to claim 12 of the '025 Patent, the second part of the

valve pin assembly is for receiving the valve pin and is secured to the manifold, and includes an actuator support and means for securing the actuator support to the top of the manifold.

Actuator support is construed as "part of the valve pin assembly for receiving the valve pin that is secured to the hot runner manifold."

14. Means for securing the actuator support to the top of the manifold

Synventive proposes "a mechanism that secures the actuator support to the top of the manifold." Husky proposes "the function recited in the limitation is securing the actuator support to the top of the manifold. The corresponding structures for securing the actuator support to the top of the manifold are a base flange (65) on the actuator support and mounting screws(67).

This claim element is a "means-plus-function" limitation. Such a claim is "construed to cover the corresponding structure, material, or acts described in the specification or equivalents thereof." 35 U.S.C. § 112 ¶ 6. The '025 Patent specification lists structure corresponding to means for securing the actuator support to the top of the manifold at column 5 lines 47-50: "The actuator support **64** has a base flange **65** that is used to mount the actuator support directly to the hot runner manifold **16**. For providing this mounting, there are provided mounting screws **67**."

The term is construed as a base flange **65** on the actuator support and mounting screws **67**, or their equivalents.

15. Pin head

Synventive proposes "a top end of the valve pin that is secured to the actuator." Husky proposes "structure for receiving an end of the valve pin at the top of the shaft, that cooperates with the actuator cap for adjusting, i.e., raising or lowering, of the valve pin."

Claim 12 of the '025 Patent recites a valve pin as including a pin head secured to the actuator cap. '025 Patent col.8 l.55-56. Claim 13 of the '025 Patent recites structure for securing the top of the valve pin to the pin head. *Id.* col.8 l.57-59. The preferred embodiment describes a pin head with a central hole for receiving the top of the valve pin. *Id.* col.6 l.6-7. Construing the patent claims as a whole, the pin head may be part of the valve pin as in Claim 12, but may be a separate part that is secured to the valve pin as in Claim 13 and the preferred embodiment. There is no requirement in the asserted claims that the pin head cooperate with the actuator cap for adjusting the valve pin, although the preferred embodiment includes that feature.

The term is construed as "a top end of the valve pin or a part that holds a top end of the valve pin that is secured to the actuator cap."

Several disputed claim terms are recited in claim 1 of the '116 Patent, from which claims 2 and 3 depend. Claim 1 is reproduced below with the disputed claim terms in bold.

What is claimed is:

1. An injection molding system comprising:
a **mold**;
a **clamp plate coupled** to the **mold**;
a **manifold** having at least one **injection nozzle coupled** thereto, the **manifold** being seated between the **mold** and **clamp plate**;
a **valve pin actuator** mounted in a recess in the **clamp plate** so that the **valve pin actuator** is accessible from above the **clamp plate**, the **valve pin actuator** including a **piston** slidably and sealingly mounted therein; and
a **valve pin removably coupled** to the **piston** so that movement of the **piston** causes axial movement of the **valve pin**, the **valve pin extending from the clamp plate into the manifold**, wherein the **valve pin** can be **decoupled** from the **piston** while the **clamp plate** and the **valve pin actuator** are **coupled** to the **mold** and while the **piston** remains sealingly mounted within the **valve pin actuator**, so that when the **valve pin** is **decoupled** from the **piston**, the **clamp plate** and the **valve pin actuator**, including the **piston**, can be removed from the **mold** while the **valve pin remains extended into the manifold**.

'116 Patent col.7 l.47-col.8 l.3. The disputed terms not yet construed are "mold," "coupled," "removably coupled to," "valve pin extending from the clamp plate into the manifold," and "valve pin remains extended into the manifold."

16. Mold

It is not clear whether the parties continue to dispute the construction of this term. See Synventive's Reply 35 (providing no alternative construction of the term) (Doc. 227); Husky's Mem. 47 (stating Synventive's proposed construction) (Doc. 216); Synventive's Confidential Claim Construction 1 (stating its

proposed construction somewhat differently) (Doc. 205, Ex. A).

The term is construed as "part or parts that define a cavity that determines the contour of the molded part being produced."

17. Coupled to/Removably coupled to/Decoupled

Synventive proposes

"coupled" means the ring holds the valve pin to the piston while allowing side-to-side (radial) motion between the valve pin and the piston. When the valve pin is "decoupled" from the piston, it is not retained by the piston. "Removably coupled" means the valve pin can be decoupled from the piston without requiring removal of the valve pin from the manifold and with the valve pin assembly remaining secured to the manifold in alignment with the piston.

Husky proposes "'coupled' means 'secured;' 'decoupled' means 'unsecured;' 'decoupling' means 'unsecuring;' 'removably coupled' and 'being removably coupled to' means 'can be unsecured from;' 'removably coupling' means 'can secure and unsecure.'"

These terms are not used in the patent claims in any specialized fashion. The ordinary meaning of "coupled" as "fastened" or "secured" adequately conveys the meaning where these terms are used throughout the patent claims. Thus "coupled to" means "fastened to" or "secured to;" "removably coupled to" means "removably fastened to" or "removably secured to;" "decoupled" means "unfastened" or "unsecured."

18. Valve pin extending from the clamp plate into the manifold/
Valve pin remains extended into the manifold/
Valve pin adapted to extend from the clamp plate and into
the manifold ('116 Patent claim 9)

Synventive proposes

the valve pin extending from the clamp plate is secured to the manifold which maintains the valve pin assembly in alignment with the piston on decoupling from the piston; "extended into the manifold" means the valve pin, when decoupled from the piston, is secured to the manifold while maintaining the valve pin assembly in alignment with the piston; and "valve pin adapted to extend from the clamp plate into the manifold" means a valve pin extending from the clamp plate is secured to the manifold which maintains the valve pin assembly in alignment with the piston on decoupling of the valve pin from the piston.

Husky proposes "valve pin continues from the clamp plate through a bore in the manifold; valve pin continues through a bore in the manifold; valve pin is capable of continuing from the clamp plate through a bore in the manifold."

"Valve pin," "clamp plate" and "manifold" have been construed. Contrary to Synventive's argument, the specification does not require the valve pin itself to be secured to the manifold, nor does the plain meaning of "extend into" mean that the valve pin must be secured to the manifold. According to the patent specification, the actuator support is mounted or secured to the manifold. In the illustrated preferred embodiment a threaded bushing nut engages with the manifold and holds a valve pin bushing in position. The valve pin bushing then provides a guide for the valve pin as it enters the manifold. '116 Patent

col.6 1.19-30. Thus, although the invention may involve securing the valve pin itself to the manifold, it does not require it, and in fact the preferred embodiment uses the actuator support, the bushing nut and the valve pin bushing to hold the valve pin in place with respect to the manifold. Further, claim 2 of the '870 Patent adds the specific limitation that the valve pin is mounted to the manifold. Where the inventors specified precisely in claim 2 of the '870 Patent that the valve pin be mounted to the manifold, and it is undisputed that the claim terms should be uniformly construed in all three patents, there is no basis to import a limitation from the specification to embellish the ordinary meaning of "extend" in the asserted claims.

Contrary to Husky's argument, it is not necessary to the construction of the term here to import the further limitation "through a bore in the manifold." That a valve pin typically passes through a bore in the manifold at some point does not necessarily mean that it can only extend from the clamp plate through a bore in the manifold. The terms are therefore construed in accordance with the ordinary meaning of "extend," as "reaches" or "continues."

Additional disputed claim terms are recited in claim 3 of the '116 Patent, reproduced below with the disputed claim terms in bold.

The injection molding system of claim 2, further comprising a **ring** for **removably coupling** the **actuator cap** to the **piston**, wherein **when the ring is removed, the actuator cap and the valve pin are decoupled from the piston** and the **clamp plate and valve pin actuator**, including the **piston**, can be removed from the **mold** while the **valve pin remains extended into the manifold** and the **actuator cap remains mounted to the manifold**.

'116 Patent col.8 l.8-15. The disputed terms not yet construed are "ring," "when the ring is removed, the actuator cap and the valve pin are decoupled from the piston," and "actuator cap remains mounted to the manifold."

19. Ring

Synventive proposes

part of the valve pin assembly that couples the valve pin to the piston while facilitating side-to-side (radial) movement between the valve pin assembly and piston; the ring also enables decoupling of the valve pin assembly from the piston such that the valve pin assembly remains aligned with the piston and secured to the manifold when the ring is decoupled.

Husky proposes "circular band."

The patent and its specification provide no indication that the word is used in any manner inconsistent with the ordinary meaning of the word. There is no express definition of "ring" set out in the specification, nor is any alternative definition implied. See, e.g., *Phillips*, 415 F.3d at 1320-21 ("[T]he specification 'acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication.'" (quoting *Vitronics*, 90 F.3d at 1582)). That the ring is an integral part of the innovative valve pin assembly

that secures it to the piston does not alter its ordinary meaning. The term is construed as "circular band."

20. When the ring is removed, the actuator cap and the valve pin are decoupled from the piston

With "ring," "actuator cap," "valve pin," "decoupled," and "piston" construed, the phrase does not need further construction.

21. Actuator cap remains mounted to the manifold

"Actuator cap" and "manifold" have been construed. The ordinary meaning of "mounted to" in this context, is "securely attached or fastened to." See *Asyst Techs., Inc. v. Emtrak, Inc.*, 402 F.3d 1188, 1193-94 (Fed. Cir. 2005). The term is construed as "actuator cap remains securely attached to the manifold."

22. Actuator cylinder ('116 Patent claim 9)

The parties agree that an actuator cylinder is a cylinder that is part of an actuator. The remainder of Synventive's proposed construction adds an explanation of the actuator itself, which has been separately construed. The term is construed as "a cylinder that is part of a valve pin actuator."

23. Valve pin adapted to remain stationary when being decoupled from the piston ('116 Patent claim 12)

"Valve pin," "decoupled," and "piston" have been construed. The parties have not pointed to anything in the intrinsic evidence that would suggest that the ordinary meaning of the

words "adapted" and "stationary" have been altered. Accordingly, the term is construed as "valve pin modified to remain fixed or immobile when being decoupled from the piston."

24. Valve pin is coupled to the piston via a ring, and step (A) includes decoupling the ring ('870 Patent claim 3)

With "valve pin," "coupled," "piston," "ring," and "decoupl[ing]" construed, this phrase needs no further construction.

25. Valve pin remains stationary and mounted to the manifold ('870 Patent claim 2)

"Valve pin" and "manifold" have been construed. The parties have not pointed to anything in the intrinsic evidence that would suggest that the ordinary meaning of the words "stationary" and "mounted to" have been altered. Accordingly, the term is construed as "valve pin remains fixed or immobile and securely attached or fastened to the manifold."

Dated at Burlington, Vermont this 13th day of August, 2009.

/s/ William K. Sessions III
William K. Sessions III
Chief Judge