United States District Court,
C.D. California.

CHIEN-LU LIN, and Ming-Chin Chou, individuals,
Plaintiffs.
v.
TWINS ENTERPRISE, INC., a corporation, and Does 1 through 10, inclusive,
Defendant.

No. CV 01-07390 MMM (JWJx)

Nov. 12, 2002.

A. Justin Lum, A. Justin Lum Law Offices, South Pasadena, CA, for Plaintiffs.

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CLAIM CONSTRUCTION ORDER

MARGARET M. MORROW**, District Judge.**

This case involves the alleged infringement of United States Patents Nos. 5,832,854 and 5,947,044 issued to plaintiffs Chien-Lu Lin and Ming-Chin Chou. The patents protect a process for protruding embroidery. Pursuant to Markman v. Westview Instruments, Inc., 517 U.S. 370, 373, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996), this order sets forth the court's construction of disputed terms in the patent claims.

I. FACTUAL BACKGROUND

Plaintiffs Chien-Lu Lin and Ming-Chin Chou hold several United States patents protecting a process for protruding embroidery. Two are at issue in this case. FN1

A. The 5,832,854 Patent

The 5,832,854 patent ("the '854 patent"), which protects a protruding embroidery process, was issued on November 10, 1998.FN2

1. Background Of The InventionFN3

The '854 patent protects a process that can be used in the mass production of products with protruding embroidery. One conventional method of creating protruding embroidery is to sew an image or figure using multiple overlapping layers of thread. This can be done with an embroidery machine, which embroiders the desired image as a bottom layer on a cloth or silk background. The background is then attached to the item

to be embroidered, and additional layers of thread are applied until a predetermined thickness is achieved. The result is an image or figure that protrudes from the background. This method of embroidering has several drawbacks. First, the embroidered figure protrudes only slightly, gradually rising from its edge to form a thickness of not more than 2.5 mm at the center of the figure. Moreover, the figure produced is neither smooth nor solid. Additionally, a large quantity of thread is used, which increases the cost of the process and the time required to create a finished product. Because there are so many needle holes in the background, the usable life and strength of the product are reduced.

Protruding embroidery can also be created manually. First, a craftsman cuts a hard plate, such as polyvinyl chloride, in the shape of the desired figure. This plate is then fixed in position on the background as a filler. Sewing manually, the craftsman wraps the filler with thread to create a protruding embroidery figure. This process generally produces a flat protruding figure of even thickness that has steep edges. While a maximum thickness of 4 to 4.5 mm can be achieved, the process nonetheless has certain disadvantages. First, when the figure to be embroidered has a long side edge, it is difficult to encase the edge entirely in thread. It is also difficult to fix small or thin portions of filler in position on the background before beginning the embroidery work. Experienced craftsmen capable of performing precision work must spend substantial time creating the image, and each item produced differs in minor ways from the next. The process is thus not suited to the mass production of identical items such as trademarks, logos or figures found on clothing and baseball caps.

2. Summary Of The InventionFN4

The protruding embroidery process protected by the '854 patent is designed to address these problems, in that it is suitable for the mass production of identical items and permits the embroidery of figures that have tiny elements or sections. The patented process is comprised of the following steps: First, a flat filler is laid and affixed on the embroidering background. The filler must have an even thickness of not more than 4.5 mm, and must be larger in size than the desired figure so that it completely covers the background where the embroidered figure will be placed. Second, perforations are made at intervals in the filler along the contour of the figure to be embroidered. Third, the portion of the filler inside the perforations, together with the background, is wrapped with a plurality of sewing threads along the perforations until the figure is entirely covered by thread. The remainder of the filler surrounding the embroidered figure, is then cut off, and the left over portion is removed.FN5

3. Detailed Description Of The Preferred Embodiment

The detailed description of the preferred embodiment of the invention is virtually identical to the summary description outlined above. The patent states that the preferred method involves use of a numerical control embroidery machine. One of the needles of the machine is unthreaded so that it may serve as the "perforating needle." FN6 The outline or contour of the shape to be embroidered is input into a computer, which then sets the path and number of the needles.FN7

In step (a) of the embroidering process, a cloth or silk background is placed in position on the table of the embroidering machine, and a flat filler of resilient material such as foam rubber plate or polyurethane foam, is laid on the background. The filler can be adhered by tape or sewed to fix it on the background.FN8 The filler and background are perforated in step (b). The interval between perforations should be smaller than the diameter of the perforations themselves. This is necessary so that the threaded needle will puncture the filler between the perforations, and sever the filler along the outline of the embroidery figure. This allows the leftover portion of filler to be easily removed "after embroidering step (c)." FN9

The description notes that, in certain circumstances, it is necessary to provide a flat embroidery lining that extends beyond the protruding embroidery. Where a lining is required, a lining step is completed before steps (a) through (d), which involves sewing a flat embroidery figure on the background in a size larger than the protruding embroidery will be. The filler is then laid on and affixed to the lining embroidery.FN10

Perforating step (b) is described as "essential," because perforation of the filler before performing the embroidering step minimizes thread breaks and needle wear. Additionally, if step (c) is performed immediately after step (a), the unwrapped portion of the filler is not fully detached from the embroidered portion of the filler, and clean removal of the excess filler is not possible. FN11

Finally, the description details a semi-wrapping step, which occurs before embroidery step (c). The semi-wrapping step involves sewing from the side edge of the corner or the edge of the embroidery figure to its center. The stitches of the semi-wrapped embroidery are thus perpendicular to those of the protruding embroidery.FN12

4. Claims Of The InventionFN13

The '854 patent has eleven claims, all of which the parties ask that the court construe. Those claims provide:

"1. A protruding embroidery process, comprising

(a) laying and affixing a flat filler on an embroidering background element, in which said filler has an even thickness and a size larger than the contour size of a desired embroidering figure for covering a figure portion on said embroidering background element where the desired embroidering figure is required to embroider thereon;

(b) perforating said filler to form a plurality of consecutive interval perforations along a contour of said desired embroidering figure;

(c) entirely wrapping up said embroidering background element and an embroidering portion of said filler, which is surrounded by said consecutive interval perforations, with a plurality of sewing threads along said consecutive interval perforations until said embroidering portion, including a predetermined number of side edges thereof, is entirely covered and wrapped up with said sewing threads, so that a leftover portion, which is an outer portion of said filler surrounding said embroidering portion, is fully cut off from said embroidering portion; and

(d) removing said leftover portion of said filler.

2. A protruding embroidery process as recited in claim 1, in which the thickness of said filler is not more than 4.5 mm.

3. A protruding embroidery process as recited in claim 1, in which, between every said two consecutive interval perforations, an interval, smaller than the diameter of each said perforation, is provided.

4. A protruding embroidery process as recited in claim 1, wherein said filler is adhered on said embroidering background element.

5. A protruding embroidery process as recited in claim 1, wherein said filler is sewed to affix on said embroidering background element.

6. A protruding embroidery process as recited in claim 1, before said wrapping step (c), further comprising a semi-wrapping embroidering step of sewing from said side edges of said desired embroidering figure to a central portion thereof.

7. A protruding embroidery process as recited in claim 1, in which said filler is made of resilient material.

8. A protruding embroidery process as recited in claim 1, in which said filler is made of a foam rubber plate.

9. A protruding embroidery process as recited in claim 1, in which said filler is made of polyurethane foam material.

10. A protruding embroidery process, comprising

(a) sewing a flat embroidering on an embroidering background element to form a lining embroidery which has a size larger than the desired embroidering figure;

(b) laying and affixing a flat filler on said lining embroidery sewed on said embroidering background element, in which said filler has an even thickness and a size larger than a contour size of said desired embroidering figure and smaller than said lining embroidery;

(c) perforating said filler to form a plurality of consecutive interval perforations along a contour of said desired embroidering figure;

(d) entirely wrapping up said embroidering background element and an embroidering portion of said filler, which is surrounded by said consecutive interval perforations, with a plurality of sewing threads along said consecutive interval perforations until said whole embroidering portion, including a predetermined number of side edges thereof, is entirely covered and wrapped up with said sewing threads, so that a leftover portion, which is an outer portion of said filler surrounding said embroidering portion, is fully cut off from said embroidering portion; and

(e) removing said leftover portion of said filler.

11. A protruding embroidery process as recited in claim 10, before said wrapping step (d), further comprising a semi-wrapping embroidering step of sewing from said side edges of said desired embroidering figure to a central portion thereof."

B. The 5,947,044 Patent

The 5,947,044 patent ("the '044 patent"), which also protects a protruding embroidery process, was issued on September 7, 1999.FN14 The ' 044 patent was an improvement patent on the ' 854 patent.

1. Background Of The InventionFN15

Because the '044 patent was an improvement patent, the background of the invention set forth therein is

identical to the background found in the '854 patent.

2. Summary Of The InventionFN16

Like its predecessor, the protruding embroidery process protected by the ' 044 patent is designed to address certain of the drawbacks of conventional embroidery techniques. Its methodology permits the mass production of identical items as well as the embroidery of figures that have tiny elements or sections. It has a further benefit, however, in that it can "effectively clear all the remnants along the side edges of the filler and produce a protruding embroidery that is near perfection." FN17

The invention is comprised of the following steps: First, a filler is laid and fixed on an embroidering background. The filler is made of material that shrinks at a predetermined temperature higher than the room temperature. It has an even thickness of not more than 4.5 mm, and must be larger in size than the desired figure so that it completely covers the background where the embroidered figure will be placed. In the second step, the embroidering portion of the filler, together with the background, is wrapped with a plurality of sewing threads until the figure is entirely covered by thread. Third, the remainder of the filler surrounding the embroidered figure, is cut and removed from the embroidering portion. In the final step, a side periphery of the protruding embroidery is heated to a predetermined temperature higher than room temperature to cause leftover filler remnants extending out of the side periphery to shrink into the wrapped sewing threads.FN18

3. Detailed Description Of The Preferred Embodiment

The detailed description of the preferred embodiment of the invention is virtually identical to the summary description outlined above. It notes that the filler is affixed to the background through "adhering or sewing," FN19 and, like the ' 854 patent, states that the preferred embodiment involves use of a numerical control embroidery machine. Unlike the ' 854 patent, all of the needles are threaded, as the patent does not teach a perforation step.FN20

In step (a) of the embroidering process, a cloth or silk background is placed in position on the table of the embroidering machine, and a filler is laid on the background. The filler is made of resilient material that will shrink when heated to a predetermined temperature higher than room temperature and that has a low friction coefficient. The filler can be adhered by tape or sewed with just a few stitches to fix it on the background.FN21

The description notes that, in certain circumstances, it will be necessary to provide a flat embroidery lining that extends beyond the protruding embroidery. Where a lining is required, a lining step is completed before steps (a) through (d) are performed. The lining step involves sewing a flat embroidery figure on the background in a size larger than the protruding embroidery will be. The filler is then laid on and affixed to the lining embroidery.FN22

"Essential features" of the invention are the "use of a low friction material that will shrink when heated" and "heating step (d)." FN23 This is because, when the leftover portion of the filler is torn off from the wrapped, embroidered portion, "some leftover filler remnants will ... remain[ ] between the sewing threads which wrap[ ] the side edges of the filler." FN24 The description states that, even if craftsmen were to cut the remnants finely and carefully, only larger segments could be removed, with generally eighty percent of the tiny remnants remaining. This reduces the quality of the protruding embroidery.FN25 The heat shrinkage process, by contrast, "successfully remove[s] all leftover filler remnants and produce[s] a protruding

embroidery that is near perfection." FN26 In addition to being time efficient, it is also economically competitive.FN27

Finally, the description details a semi-wrapping step, which occurs before embroidery step (b). The semi-wrapping step involves sewing from the side edge of the corner or the edge of the embroidery figure to its center. The stitches of the semi-wrapped embroidery are thus perpendicular to those of the protruding embroidery.FN28

4. Claims Of The InventionFN29

The '044 Patent has twenty-two claims, all of which the parties ask that the court construe. The claims provide:

"1. A protruding embroidery process, comprising the steps of:

(a) laying and affixing a filler on an embroidering background element, in which said filler is made of a material which shrinks under a predetermined temperature higher than a room temperature and has a size larger than a contour size of a desired embroidering figure for covering a figure portion on said embroidering background element where said desired embroidering figure is required to embroider thereon;

(b) entirely wrapping up an embroidering portion of said filler and said embroidering background element with a plurality of sewing threads until said whole embroidering portion, including a predetermined number of side edges thereof, is entirely covered and wrapped up with said sewing threads;

(c) cutting off and removing a leftover portion, which is an outer portion of said filler surrounding said embroidering portion, from said embroidering portion of said filler to form a protruding embroidery on said embroidering background element; and

(d) heating a side periphery of said protruding embroidery to said predetermined temperature higher than said room temperature so as to cause leftover filler remnants extended out of said side periphery of said protruding embroidery shrinking within said wrapped up of the sewing threads.

2. A protruding embroidery process, as recited in claim 1, wherein said filler has a low friction coefficient.

3. A protruding embroidery process, as recited in claim 2, wherein said filler has an even thickness of not more than 4.5 mm.

4. A protruding embroidery process, as recited in claim 2, before step (a) further comprising an additional step of sewing a flat embroidery on said embroidering background element to form a lining embroidery which has a size larger than said protruding embroidery, wherein said filler is laid and affixed on said lining embroidery.

5. A protruding embroidery process, as recited in claim 4, in step (b), further comprising the step of semi-wrapping at least a side edge of said desired embroidery figure by sewing with said sewing threads to form a semi-wrapping embroidery.

6. A protruding embroidery process, as recited in claim 5, wherein said filler has an even thickness of not

more than 4.5 mm.

7. A protruding embroidery process, as recited in claim 5, wherein, in step (a), said filler is adhered by tape on said embroidering background element.

8. A protruding embroidery process, as recited in claim 5, wherein, in step (a), said filler is sewed by a few stitches to affix on said embroidery background element.

9. A protruding embroidery process, as recited in claim 1, in step (b), further comprising the step of semi-wrapping at least a side edge of said desired embroidery figure by sewing with said sewing threads to form a semi-wrapping embroidery.

10. A protruding embroidery process, as recited in claim 2, in step (b), further comprising the step of semi-wrapping at least a side edge of said desired embroidery figure by sewing with said sewing threads to form a semi-wrapping embroidery.

11. A protruding embroidery process, as recited in claim 10, wherein, in step (a), said filler is adhered by tape on said embroidering background element.

12. A protruding embroidery process, as recited in claim 10, wherein, in step (a), said filler is sewed by a few stitches to affix on said embroidery background element.

13. A protruding embroidery process, as recited in claim 1, wherein said filler has an even thickness of not more than 4.5 mm.

14. A protruding embroidery process, as recited in claim 1, before step (a) further comprising an additional step of sewing a flat embroidery on said embroidering background element to form a lining embroidery which has a size larger than said protruding embroidery, wherein said filler is laid and affixed on said lining embroidery.

15. A protruding embroidery process, as recited in claim 14, in step (b), further comprising the step of semi-wrapping at least a side edge of said desired embroidery figure by sewing with said sewing threads to form a semi-wrapping embroidery.

16. A protruding embroidery process, as recited in claim 1, wherein, in step (a), said filler is adhered by tape on said embroidering background element.

17. A protruding embroidery process, as recited in claim 1, wherein, in step (a), said filler is sewed by a few stitches to affix on said embroidery background element.

18. A protruding embroidery process, comprising

(a) an embroidery background element having a figure portion;

(b) a filer made of material having a low friction coefficient and shrinks under a predetermined temperature higher than a room temperature, wherein said filler has a predetermined embroidering figure and is attached on said background element to cover said figure portion of said embroidery background.

(c) a plurality of sewing threads enwrapping around said embroidery figure of said filler and said figure portion of said embroidering background element, wherein said entire including a predetermined number of side edges thereof is entirely covered and wrapped up said sewing threads to form said protruding embroidery.

19. A protruding embroidery, as recited in claim 18, further comprising a lining embroidery, which has a size larger than said protruding embroidery, provided between said filler and said embroidering background element.

20. A protruding embroidery, as recited in claim 19, wherein a semi-wrapping embroidery is provided at a side edge of said filler by sewing from said side edge to an inner portion of said filler with said sewing threads.

21. A protruding embroidery, as recited in claim 18, wherein a semi-wrapping embroidery is provided at a side edge of said filler by sewing from said side edge to an inner portion of said filler with said sewing threads.

22. A protruding embroidery, as recited in claim 18, wherein said filler has an even thickness of not more than 4.5 mm."

II. ANALYSIS

A. Legal Standard For Claim Construction

Patents grant inventors the exclusive right to make and sell their inventions in exchange for full disclosure of the invention. Markman v. Westview Instruments, Inc., 517 U.S. 370, 373, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996). "It has long been understood that a patent must describe the exact scope of an invention and its manufacture to 'secure to [the patentee] all to which he is entitled, [and] to apprize the public of what is still open to them.' " *Id*. (quoting McClain v. Ortmayer, 141 U.S. 419, 424, 12 S.Ct. 76, 35 L.Ed. 800 (1891)). Two parts of the patent fulfill this function-the specification and the claims. *Id*. The specification must describe 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." 35 U.S.C. s. 112. The claims must "particularly point[ ] out and distinctly claim[ ] the subject matter which the applicant regards as his invention." *Id*.

"Victory in an 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*. at 374 (quoting H. Schwartz, PATENT LAW AND PRACTICE 1, 33 (2d ed.1995) and 3 E. Lipscomb, WALKER ON PATENTS, s. 11:2, pp. 288-90 (3d ed.1985)). The Supreme Court's decision in *Markman* clarified that it is the judge, not the jury, who must determine the meaning of the claim terms. *Id*. at 387.

While *Markman* established that judges are to construe the patent claims, it did not specifically address what types of evidence they should consider in doing so. Shortly after *Markman* issued, the Federal Circuit addressed this question in Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576 (Fed.Cir.1996).

Vitronics reiterates the "well-settled" rule "that, in interpreting an asserted claim, the court should look first to the intrinsic evidence of record, i.e., the patent itself, including the claims, the specification and, if in evidence, the prosecution history." *Id*. at 1582. See also Forest Laboratories, Inc. v. Abbott Laboratories, 239

F.3d 1305, 1309 (Fed.Cir.2001) ("In interpreting claims, a court 'should look first to the intrinsic evidence of record, i.e., the patent itself, including the claims, the specification and, if in evidence, the prosecution history,' " quoting *Vitronics*); Biovail Corp. Int'l., v. Andrx Pharmaceuticals, Inc., 239 F.3d 1297, 1300 (Fed.Cir.2001) ("To construe a patent claim, a court first analyzes the intrinsic evidence of record-the claims and written description of the patent itself, and, if in evidence, the prosecution history.... When intrinsic evidence unambiguously describes the scope of a patented invention, reliance on extrinsic evidence is improper"). The *Vitronics* court described such "intrinsic evidence" as "the most significant source of the legally operative meaning of disputed claim language." *Id.;* Gart v. Logitech, Inc., 254 F.3d 1334, 1339-40 (Fed.Cir.2001) ("Interpreting the asserted claims begins with a review of the intrinsic evidence, which consists of the claim language, the written description, and the prosecution history").

Within this general category of "intrinsic evidence," there are also preferences. Initially, a court should look to the words of the claims themselves to define the scope of the patented invention. *Id*. See Thermalloy, Inc. v. Aavid Engineering, Inc., 121 F.3d 691, 693 (Fed.Cir.1997) (while the specification, prosecution history and extrinsic evidence "provide a context to illuminate the meaning of claim terms, ... the focus remains on the meaning of claim language"). The claim terms should be accorded their ordinary and plain meaning unless it is clear from the specification that the inventor intended them to have some other meaning. See Union Carbide Chemicals & Plastics Technology Corp. v. Shell Oil Co., 308 F.3d 1167, 2002 WL 31094845, * 6 (Fed.Cir. Sept.20, 2002) ("The general rule is that the court must presume that the terms in the claims mean what they say and construe them according to their ordinary and accustomed meaning.... This 'heavy presumption' in favor of the claim term's ordinary meaning is overcome, however, if a different meaning is clearly and deliberately set forth in the intrinsic evidence"); Johnson Worldwide Assocs., Inc. v. Zebco Corp., 175 F.3d 985, 989 (Fed.Cir.1999) ("We begin, as with all claim interpretation analyses, with the language of the claims. ... The general rule is, of course, that terms in the claim are to be given their ordinary and accustomed meaning.... General descriptive terms will ordinarily be given their full meaning; modifiers will not be added to broad terms standing alone.... In short, a court must presume that the terms in the claim mean what they say, and, unless otherwise compelled, give full effect to the ordinary and accustomed meaning of claim terms.... In order to overcome this heavy presumption in favor of the ordinary meaning of claim language, it is clear that 'a party wishing to use statements in the written description to confine or otherwise affect a patent's scope must, at the very least, point to a term or terms in the claim with which to draw in those statements,' " quoting Renishaw PLC v. Marposs Societa' per Azioni, 158 F.3d 1243, 1248 (Fed.Cir.1998).

Often, the ordinary meaning of the claim terms can be determined by looking to their dictionary definition. See Optical Disc Corp. v. Del Mar Avionics, 208 F.3d 1324, 1335 (Fed.Cir.2000) ("For such ordinary meaning, we turn to the dictionary definition of the term"). See also Texas Digital Systems, Inc. v. Telegenix, Inc. 308 F.3d 1193, 2002 WL 31307212, * 5 (Fed.Cir. Oct.16, 2002) ("... dictionaries, encyclopedias and treatises are particularly useful resources to assist the court in determining the ordinary and customary meanings of claim terms"); CCS Fitness, Inc. v. Brunswick Corp., 288 F.3d 1359, 1366 (Fed.Cir.2002); ("[O]ur precedents show that dictionary definitions may establish a claim term's ordinary meaning"); Vitronics, supra, 90 F.3d at 1584, n. 6 ("Although ... dictionaries fall within the category of extrinsic evidence, as they do not form a part of an integrated patent document, they are worthy of special note. Judges ... may ... rely on dictionary definitions when construing claim terms, so long as the dictionary definition does not contradict any definition found in or ascertained by a reading of the patent documents"). Technical terms should be accorded the meaning they would be given by experienced persons in the field. Hoechst Celanese Corp. v. BP Chemicals Ltd., 78 F.3d 1575, 1578 (Fed.Cir.1996) ("A technical term used in a patent document is interpreted as having the meaning that it would be given by persons experienced in

the field of the invention, unless it is apparent from the patent and the prosecution history that the inventor used the term with a different meaning").

If the claim language is clear on its face, then the court reviews the balance of the intrinsic evidence to determine whether a deviation from the clear language of the claims is warranted. A deviation may be required where "a patentee [has chosen] to be his own lexicographer and use terms in a manner other than their ordinary meaning." FN30 Interactive Gift Express, Inc. v. Compuserve Inc., 256 F.3d 1323, 1331 (Fed.Cir.2001) (quoting Vitronics, supra, 90 F.3d at 1582). See also Forest Laboratories, supra, 239 F.3d at 1310 ("The words of a claim are generally given their ordinary and accustomed meaning, unless it appears from the specification or the file history that they were used differently by the inventor"); Biovail, supra, 239 F.3d at 1301 (quoting *Vitronics* and stating that the court "review[s] both the specification and the applicable prosecution history to determine whether the patentee defined claim terminology in a manner inconsistent with its ordinary meaning"); Vitronics, supra, 90 F.3d at 1585 (where the specification clearly and unambiguously defines a claim term, that definition is controlling).FN31 A deviation may also be necessary if a patentee has "relinquished [a] potential claim construction in an amendment to the claim or in an argument to overcome or distinguish a reference." *Id*. (quoting Elkay Mfg. Co. v. Ebco Mfg. Co., 192 F.3d 973, 979 (Fed.Cir.1999)).

Where a claim term "does not have an ordinary meaning, and its meaning is not clear from a plain reading of the claim, [the court must] turn to the remaining intrinsic evidence, including the written description, to aid in [its] construction of that term." Telemac Cellular Corp. v. Topp Telecom, Inc., 247 F.3d 1316, 1326 (Fed.Cir.2001). See also Interactive Gift Express, supra, 256 F.3d at 1331 ("If however the claim language is not clear on its face, then our consideration of the rest of the intrinsic evidence is directed to resolving, if possible, the lack of clarity"); Watts v. XL Systems, Inc., 232 F.3d 877, 882 (Fed.Cir.2000) ("One purpose for examining the specification is to determine if the patentee has limited the scope of the claims").

The specification has particular relevance in this regard:

"The specification contains a written description of the invention which must be clear and complete enough to enable those of ordinary skill in the art to make and use it. Thus, the specification 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, supra, 90 F.3d at 1582. See also Teleflex, Inc. v. Ficosa North America Corp., 299 F.3d 1313, 1325 (Fed.Cir.2002) (same); *Bell Atlantic, supra,* 262 F.3d at 1268 ("... the court must examine the intrinsic evidence to determine whether the patentees have given the term an unconventional meaning.... The specification acts as a dictionary 'when it expressly defines terms used in the claims or when it defines terms by implication.' ... 'Thus, the specification 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' ").

In addition to the specification, the prosecution history is "often of critical significance in determining the meaning of the claims." Vitronics, supra, 90 F.3d at 1582. The "prosecution history limits the interpretation of claims so as to exclude any interpretation that was disclaimed during prosecution." CVI/Beta Ventures, Inc. v. Tura LP, 112 F.3d 1146, 1155 (Fed.Cir.1997), cert. denied sub nom. Marchon Eyewear v. Tura LP, 522 U.S. 1109, 118 S.Ct. 1039, 140 L.Ed.2d 105 (1998); Southwall Technologies, Inc. v. Cardinal IG Co., 54 F.3d 1570, 1576 (Fed.Cir.), cert. denied, 516 U.S. 987, 116 S.Ct. 515, 133 L.Ed.2d 424 (1995) (same). See also Renishaw, supra, 158 F.3d at 1249, n. 3. "Although prosecution history can be a useful tool for interpreting claim terms, it cannot be used to limit the scope of a claim unless the applicant took a position

before the PTO that would lead a competitor to believe that the applicant had disavowed coverage of the relevant subject matter." Schwing GMBH v. Putzmeister Aktiengesellschaft, 305 F.3d 1318, 2002 WL 31109922 (Fed.Cir. Sept.24, 2002). Here, the parties agree that no such representations were made.

"It is also appropriate to examine the prior art cited in the prosecution history in order to determine what the claims do not and cannot cover." Vitronics, supra, 90 F.3d at 1583. See also *Amhil Enter., Ltd. v. Wawa, Inc.,* 81 F.3d 1544, 1560 (Fed.Cir.1996) (because a patent claim cannot be construed to encompass the prior art, "[a]n examination of the prosecution history is particularly important where ... the claimed invention is in a crowded art"). Neither party relies on prior art as support for its interpretation of the claims. Thus, in this particular case, the prosecution history of the patents-in-suit has no utility as a construction tool.FN32

B. Patent Claim Terms In Dispute

The parties have identified the claim terms in the '854 and '044 patents that are currently in dispute in their joint claim construction chart and respective claim construction briefs.FN33 Based on the argument presented in the parties' briefs, it appears that several of the disputes reflected on the claim construction chart have been resolved.FN34 Accordingly, the court addresses herein only those claim terms that are discussed in the parties' *Markman* briefs. As to these, the parties' respective interpretations of each term are set forth below, followed by the court's construction.

1. The Order Of The Steps

Defendant argues that the series of steps set forth in the claims of the '854 and '044 patents must be completed sequentially. Plaintiffs counter that the claims do not require that the steps be completed in a particular order, and that such a limitation cannot be read into the claims as a result.

Where a process recites an order, the process must be completed in that order only where the language of the steps themselves implicitly or explicitly require that they be performed in the order written. Interactive Gift Express, supra, 256 F.3d at 1342 ("Unless the steps of a method actually recite an order, the steps are not ordinarily construed to require one. However, such a result can ensue when the method steps implicitly require that they be performed in the order written"); Loral Fairchild Corp. v. Sony Corp., 181 F.3d 1313, 1322 (Fed.Cir.1999) ("... not every process claim is limited to the performance of its steps in the order written"); Mantech Environmental Corp. v. Hudson Environmental Services, Inc., 152 F.3d 1368, 1376 (Fed.Cir.1998) (holding that the steps of a method claim had to be performed in the order delineated in the patent recorded because "the sequential nature of the claim steps is apparent from the plain meaning of the claim language and nothing in the written description suggests otherwise"). The court must therefore analyze whether the patent either expressly or implicitly requires that the steps be performed in a particular order.

a. Claim 1 Of The '854 Patent**-Steps (a) Through (d)**

Claim 1 of the '854 patent claims

"A protruding embroidery process, comprising

(a) laying and affixing a flat filler on an embroidering background element, in which said filler has an even thickness and a size larger than the contour size of a desired embroidering figure for covering a figure portion on said embroidering background element where the desired embroidering figure is required to

embroider thereon;

(b) perforating said filler to form a plurality of consecutive interval perforations along a contour of said desired embroidering figure;

(c) entirely wrapping up said embroidering background element and an embroidering portion of said filler, which is surrounded by said consecutive interval perforations, with a plurality of sewing threads along said consecutive interval perforations until said embroidering portion, including a predetermined number of side edges thereof, is entirely covered and wrapped up with said sewing threads, so that a leftover portion, which is an outer portion of said filler surrounding said embroidering portion, is fully cut off from said embroidering portion; and

(d) removing said leftover portion of said filler."

Plaintiffs assert that nothing in the claim language prevents a party practicing the patent from perforating the filler and background element separately, and thereafter adhering the background element to the filler, or from attaching the filler to the background element as a first step, and perforating both simultaneously. Plaintiffs also contend that the act of sewing the filler in step (c) can act as "a sort of knife" to remove the excess filler as required by step (d). Defendant argues that the specification demonstrates that steps (a), (b) and (c) must be performed sequentially, since it notes three "shortcomings" that will result if step (b) is not performed before step (c). They assert additionally that common sense dictates step (d) be the last step in a sequential process, as, prior to steps (b) and (c), there is no "leftover portion" of filler to remove.

Step (a) of claim 1 provides for the fixing of the filler to the background; step (b) for the perforation of the filler; step (c) for the sewing of thread around the filler and the background, joining the two together; and step (d) for the removal of the leftover filler that is cut off as a result of the perforation and the sewing. The specification elaborates on step (b) as follows:

"The step (b) of the protruding embroidery process ... is an essential step. With the perforating step (b) will result the following shortcomings:

(1) Without perforating a plurality of consecutive interval perforations on the fill *before the embroidering step (c),* the friction between the threads and the filler will be increased due to the thickness and hardness of the filler and the opportunity of thread broken will be increased due to the excessive friction....

(2) When the needles consecutively perforate and rub against the filler, the needles will be easily worn and torn due to the excessive friction between the filler and the needles.

(3) *If process the step (c) just after the step (a),* the unwrapped leftover portion of the filler hasn't be[en] cut off [so] that it still has some parts connected with the wrapped embroidering portion of the filler. Thus, the leftover portion of the filler cannot be simply removed from the embroidery background element." FN35

There is no doubt that the specification indicates steps (a), (b), and (c) are to be performed in sequential order. Plaintiffs maintain, however, that this is a preferred embodiment only, and that nothing in the claim language requires importation of this limitation into the claim.

As respects sequencing, the language of the claim is unambiguous, and should be given its plain and

ordinary meaning. Union Carbide, supra, 308 F.3d 1167, 2002 WL 31094845 at * 6; Johnson Worldwide, supra, 175 F.3d at 989. According the claim terms their ordinary meaning, it is apparent that nothing in the language of the claim requires that step (a) be the first step in the process, or that step (b) follow step (a). As plaintiffs note, step (a) can be completed either before or after step (b). Specifically, nothing in the claim language prevents a manufacturer from perforating the filler and the background element separately (step (b)), and thereafter adhering the filler to the background (step (a)), as opposed to attaching the filler to the background element filler (step (a)), and then perforating both simultaneously (step (b)). FN36 See Katz. v. AT & T Corp., 63 F.Supp.2d 583, 632 (E.D.Pa.2000) ("Interpreting the plain claim language, there is no reason why calls could not be transferred to a live operator or transferred back to the system at any time during a call. Similarly, there is no reason shown in the claim language why a call could not be terminated at any time if the calling number matched negative file data. Thus, the Court concludes that: the claims do not require that the additional steps of Claims 20 and 24 be performed in any particular order").

Defendant is correct that the preferred embodiment set forth in the specification appears to contemplate that steps (a) and (b) will be performed in sequential order, as it discusses placing the background element in position on the table of the embroidery machine, laying the filler on the background element, and attaching it with tape or stitches. Because perforation is performed by an unthreaded needle that is positioned perpendicularly to the table of the embroidery machine, the specification strongly suggests that the perforating step is performed after the filler has been affixed to the background.FN37 The discussion concerns a preferred embodiment only, however, and thus cannot be used to limit the claim. See Texas Digital Systems, supra, 308 F.3d 1193, 2002 WL 31307212 at * 6 ("Consulting the written description and prosecution history as a threshold step in the claim construction process, before any effort is made to discern the ordinary and customary meanings attributed to the words themselves, invites a violation of our precedent counseling against importing limitations into the claims"); Generation II Orthotics Inc. v. Medical Technology Inc., 263 F.3d 1356, 1367 (Fed.Cir.2001) ("The district court should have construed the claim limitation 'controlled' according to its ordinary and accustomed meaning ..., rather than importing a characteristic of a disclosed or preferred embodiment into that term"); *Comark Communications, supra,* 156 F.3d at 1186 (cautioning against the limitation of the claimed invention to preferred or specific embodiments or examples); Transmatic, Inc. v. Gulton Industries, Inc., 53 F.3d 1270, 1277 (Fed.Cir.1995) ("[A] patent claim is not necessarily limited to a preferred embodiment disclosed in the patent"); Loctite Corp. v. Ultraseal Ltd., 781 F.2d 861, 867 (Fed.Cir.1985) ("Generally, particular limitations or embodiments appearing in the specification will not be read into the claims"), overruled on other grounds by Nobelpharma AB v. Implant Innovations, Inc., 141 F.3d 1059 (Fed.Cir.1998); SRI Int'l, Inc. v. Matsushita Elec. Corp., 775 F.2d 1107, 1121, n. 14 (Fed.Cir.1985) (en banc) ("That a specification describes only one embodiment does not require that each claim be limited to that one embodiment"). Since the language of the claim is clear, and since there is nothing in that language that requires step (a) to precede step (b), the court concludes that steps (a) or (b) may be performed in any order. FN38

The court's conclusion with respect to steps (c) and (d), however, is different. The claim language requires that these steps follow steps (a) and (b), and that they be performed sequentially as the third and fourth steps in the process. This is true for multiple reasons. First, the plain language of step (c) requires that it take place after the perforation of the filler (step (b)). Step (c) references "said filler, which is surrounded by said consecutive interval perforations." FN39 It recites that the sewing threads are to be placed "along said consecutive interval perforations." FN40 Thus, the perforations must exist before step (c) commences. See Loral Fairchild Corp., supra, 181 F.3d at 1321 ("By the literal language of the claim, the edges of the implantation barrier regions are aligned with the edges of the insulation layer; hence, the insulation layer must already be in place in order to align the barrier regions with it during ion implantation"); Mantech,

supra, 152 F.3d at 1375 ("Step (b) introduces acetic acid, via the wells provided in step (a), into the groundwater of the contaminated region. Hence, in order to accomplish step (b), the wells of step (a) must already have been provided. Step (c) introduces an aqueous solution of ferrous ion into said groundwater region for mixing with 'said acidified groundwater.' ... In order for the aqueous solution to mix with the acidified groundwater, the acid must have already mixed with the groundwater to form acidified groundwater. Hence step (b) necessarily comes before step (c). Step (d) introduces a treating flow of hydrogen peroxide solution into the groundwater. The hydrogen peroxide solution undergoes a Fenton-like reaction 'in the presence of said acidic conditions and said ferrous ion.' Because the acidic conditions and the ferrous ion must be present before the hydrogen peroxide can undergo the Fenton-like reaction, step (d) must come after both steps (b) and (c)"); Katz, supra, 63 F.Supp.2d at 631 ("The testing step provides for 'testing the selected format,' which suggests that the format must be selected before this step can occur.... Given the clear language and the suggested sequence of the steps provided in the claims, the Court concludes that: the testing step must be performed after the selecting step").

This construction is supported by a review of the specification. The specification describes step (b) as the "essential" step in the process, and states that problems will develop if it is not performed " *before* the embroidering step (c)." FN41 Additionally, the specification notes that if "step (c) [is performed] just following ... step (a)"-i.e., if step (b) does not occur before step (c)-the leftover portion of the filler will not have been cut off and thus will not be able to be removed.FN42 Since a person skilled in the art would look to the specification to determine how "to make and use" the invention (35 U.S.C. s. 112), these statements, which emphasize the importance of performing step (b) before step (c), are significant in determining the appropriate interpretation of the claim.

Moreover, step (c) must logically follow step (a) because the background element and the filler are to be wrapped together by the sewing threads. This cannot happen without laying the filler on the background element, which is a part of step (a). Furthermore, there would be no point in performing step (a) *after* embroidery step (c), as the wrapping of threads around the filler and background element would fix the filler in place on the background such and render any further affixing superfluous. For these reasons, it is logically implicit in the claim language that step (a) must occur before step (c). See Mantech, supra, 152 F.3d at 1375-76 (holding that steps of a method patent had to be performed sequentially because logic dictated such a result: "Step (a) provides the wells. No monitoring or injecting of the groundwater can occur until wells are provided; hence, step (a) must be performed first"); *Altiris, Inc. v. Symantec Corp.,* 106 F.Supp.2d 1274, 1282 (D.Utah 2001) ("... this court must determine whether the claim language or specification directs or logically implies a sequential order of the method steps"); Charles E. Hill & Associates, Inc. v. Compuserve, Inc., 65 F.Supp.2d 924, 950 (S.D.Ind.1999) ("Unless the specific claim language, or some other mandate, requires a certain order of steps in a method claim, the order of the steps need not correspond to the order recited in the method claim.... However, even if the claim language does not dictate the sequence of the steps, the court still must look to see if a particular order is required by the context.... [T]he Court finds that certain steps must naturally precede others for the Hill invention to function as described"), rev'd. on other grounds, 33 Fed.Appx. 527, 2002 WL 535806 (Fed. Cir. Apr 10, 2002).

Therefore, the court finds that both the plain language of the claim both expressly and implicitly requires that step (c) follow steps (a) and (b). Similarly, the court finds that the claim language explicitly requires that step (d) be the final step in the process. Step (d) involves removal of the "leftover portion" of the filler. This "leftover portion" is created during step (c), when the embroidering portion of the filler is entirely wrapped and covered by sewing threads, "so that a leftover portion, which is an outer portion of said filler surrounding said embroidering portion, is fully cut off from said embroidering portion." FN43 Since steps

(a) and (b) must occur before step (c), and the "leftover portion" of filler that is to be removed during step (d) is not created until step (c), it is clear that step (d) must be the last step in the process.

b. Claim 10 Of The '854 Patent**-Steps (a) Through (e)**

Turning to claim 10 of the '854 patent, similar arguments apply. The only substantive difference between claim 1 and claim 10 is that claim 10 has a new step (a), resulting in a fivestep process. This additional step involves "sewing a flat embroidering on an embroidering background element to form a lining embroidery which has a size larger than a desired embroidering figure." FN44 Defendant argues that new step (a) must precede step (b) because "it would make no sense to sew a flat embroidering on the embroidering background element after laying and affixing the filler [on] the embroidering background element." FN45 Plaintiffs' interpretation of the claim supports this construction, as they assert that "the embroidering background element is a lining embroidery and the flat filler is laid and affixed on the lining embroidery." FN46 Most importantly, the plain language of claim 10 requires such a construction. Step (b) of claim 10 requires that a flat filler be laid on and affixed to "said lining embroidery sewed on said embroidering background element." FN47 By definition, therefore, the lining embroidery must have been sewed to the background element before step (b) occurs. See Loral Fairchild Corp., supra, 181 F.3d at 1321; Mantech, supra, 152 F.3d at 1375.

As respects the remaining four steps of claim 10, the analysis is the same as that set forth above regarding claim 1. Specifically, it is not necessary that step (b)-the laying and affixing of the filler on the lining embroidery-precede step (c). Rather, step (b) may take place either before or after perforating step (c) has occurred. Steps (a), (b) and (c) must all be completed before steps (d) and (e) are performed, which must follow as the fourth and fifth steps respectively. In summary, the court finds that step (a) must necessarily be the first step in the process, that steps (b) and (c) may be performed interchangeably as steps two and three, and that steps (d) and (e) must be performed as steps four and five of the process respectively.FN48

c. Claim 1 Of The '044 Patent**-Steps (a) Through (d)**

The parties also dispute the sequencing of steps in the process protected by claim 1 of the '044 patent. Defendant argues that the steps must be completed in the order listed while plaintiffs assert the steps may be completed in any order. The steps outlined in claim 1 of the '044 patent are:

"(a) laying and affixing a filler on an embroidering background element, in which said filler is made of a material which shrinks under a predetermined temperature and has a size larger than a contour size of a desired embroidering figure for covering a figure portion on said embroidering background element where said desired embroidering figure is required to embroider thereon;

(b) entirely wrapping up an embroidering portion of said filler and the said embroidering background element with a plurality of sewing threads until the whole embroidering portion, including a predetermined number of side edges thereof, is entirely covered and wrapped up with said sewing threads.

(c) cutting off and removing a leftover portion, which is an outer portion of said filler surrounding said embroidering portion, from said embroidering portion of said filler to form a protruding embroidery on said embroidering background element; and

(d) heating a side periphery of said protruding embroidery to said predetermined temperature higher than said room temperature so as to cause leftover filler remnants extended out of said side periphery of said

protruding embroidery shrinking within said wrapped up of the sewing threads."

Although similar to claims 1 and 10 of the '854 patent, there are several key differences between the process outlined in claim 1 of the '044 patent and the claims of the '854 patent. The filler must be made of a material that shrinks at a predetermined temperature higher than room temperature. This property is critical to completion of step (d) of the process, in which, after removing the leftover portion of the filler, the side periphery of the protruding embroidery is heated, causing the remaining remnants of the filler extending out from the embroidery pattern to shrink within the sewing threads. The process does not include a perforating step, and the heating step alters the manner in which the removal of filler remnants is achieved in the '854 patent.

As respects the process protected in claim 1, the court concludes that all four steps must be completed in the order in which they are listed in the patent. First, step (a) must precede step (b), since step (b) contemplates that the filler and the embroidering background element will be completely wrapped together with thread. Logically, in order for this to occur, the filler and the background must be attached, so that the threads can sew through and around both at the same time. See Mantech, supra, 152 F.3d at 1375-76; *Altiris, supra,* 106 F.Supp.2d at 1282; Charles E. Hill & Associates, 65 F.Supp.2d at 950. The language of step (b) supports this construction, as it references "said *whole* embroidering portion," which is comprised of the embroidering portion of the filler and the embroidering background element that have been wrapped in thread.FN49 See Loral Fairchild Corp., supra, 181 F.3d at 1321 (looking to the "literal language of the claim" to conclude that the steps of a method patent had to be performed in a particular order); Mantech, supra, 152 F.3d at 1375 (concluding, based on the language of the claims, that the wells provided in step (a) had to precede the remaining steps); Katz, supra, 63 F.Supp.2d at 631 (holding that, because the second step of a claim referenced a "selected format," the selection step had to precede that step).

Similarly, step (b) must logically precede step (c), because there can be no "leftover portion" to cut and remove until wrapping step (b) is finished. FN50 Once again, this is confirmed by the language of the claim, which defines the "leftover portion" of the filler as the "outer portion" surrounding the embroidering portion. This refers to the fact that the embroidering portion of the filler is inside the thread wrap, while the "leftover portion" is outside the wrap. It is also clear that step (d) must follow the three preceding steps, as the filler cannot be shrunk until the filler is firmly attached to the background, the embroidering portion of the filler is secured inside the wrapping, and the leftover portions have been cut off and removed. See *Interactive Gift Express, supra,* 256 F.3d at 142 ("Unless the steps of a method actually recite an order, the steps are not ordinarily construed to require one.... However, such a result can ensue when the method steps implicitly require that they be performed in the order written"); Callicrate v. Wadsworth Manufacturing, Inc., 217 F.Supp.2d 1101 (D.Mont.2002) (same); Sightsound.com Inc. v. N2K, Inc., 185 F.Supp.2d 445, 487-88 (W.D.Pa.2002) (noting that a specific order may be imposed "where such a sequential order is implicit from a review of the claim," and holding that, in the patent being construed, "the steps do have an order imposed by logic in light of the method which is described"). Because a sequential order is implicitly required by the steps of the patented process, the court finds that the steps of process claim 1 of the ' 044 patent must be performed in the order in which they are listed.

d. The "Semi-Wrapping" Step Of The '044 PatentFN51

The parties next dispute whether the "semi-wrapping" step found in dependent claims 5, 9, 10 and 15 of the '044 patent must be performed before the "entire wrapping" step of the process. Each of claims 5, 9, 10 and 15 are dependent, *inter alia,* on claim 1, which describes the wrapping of the embroidering portion of the

filler and the embroidering background element entirely with a plurality of sewing threads. Each of claims 5, 9, 10 and 15 claim a protruding embroidery process "in step (b), further comprising the step of semi-wrapping at least a side edge of said desired embroidery figure by sewing with said sewing threads to form a semi-wrapping embroidery." FN52

The parties do not dispute the definition of "semi-wrapping," which is described in the specification as "sewing from the side edge to an inner portion of the filler with the sewing threads." FN53 It is depicted in Figure 5 of patent. Plaintiffs argue, however, that the semi-wrapping step is part of wrapping step (b), while defendant maintains that any semi-wrapping must necessarily precede step (b).FN54 The claim term "in step (b)" does not clearly address whether the semi-wrapping may take place simultaneously with the wrapping, or whether it must precede the wrapping. "In" means "during the course of." WEBSTER'S NEW WORLD DICTIONARY 708 (2d ed.1968). Because it does not address sequencing with step (b), it does not exclude either of the interpretations for which the parties argue. Accordingly, it is appropriate to look to the specification to determine the meaning of the term. See Interactive Gift Express, supra, 256 F.3d at 1331 ("If however the claim language is not clear on its face, then our consideration of the rest of the intrinsic evidence is directed to resolving, if possible, the lack of clarity"); Telemac Cellular, supra, 247 F.3d at 1326 (where a claim term "does not have an ordinary meaning, and its meaning is not clear from a plain reading of the claim, [the court must] turn to the remaining intrinsic evidence, including the written description, to aid in [its] construction of that term").

Here, the specification clearly recites that the semi-wrapping step occurs *before* the wrapping in step (b). It states: "Referring to F IG. 5, a semi-wrapping embroidering procedure is processed *before* the regular embroidery step (b)." FN55 Moreover, Figure 5, which depicts the semi-wrapping process, demonstrates that it could not take place at the same time as the wrapping step, because the threads are sewn perpendicularly to one another. FN56 See Data General Corp. v. International Business Machines Corp., 93 F.Supp.2d 89, 93 (D.Mass.2000) ("Drawings from the specification may be used in interpreting the scope of a claim"); 5 Donald S. Chisum, Patents s. 18.03[2] [c][iii], p. 18-108 (1998) (citing cases). Thus, the specification provides the information necessary to interpret the phrase "in step (b)" as it appears in dependent claims 5, 9, 10 and 15 of the ' 044 patent. As reflected in the specification and Figure 5, and as logically required, the semi-wrapping process must take place before the embroidering portion of the filler and the embroidering background element are entirely wrapped with sewing threads.

2. The "Needle"

The parties also seek to have the court construe how the perforations contemplated by step (b) of claim 1 of the '854 patent are to be made. Plaintiffs assert the perforations may be made by "any needle," while defendant contends "an unthreaded needle" must be used. Step (b) does not specifically mention use of a needle to make the perforations. Rather, it provides only for the "perforating [of] said filler to form a plurality of consecutive interval perforations along a contour of said desired embroidering figure."

To perforate means "to make a hole or holes through, as by punching or boring, to pierce, or to penetrate." WEBSTER'S DICTIONARY 1056 (2d ed.1968). Perforations can be made using any number of instruments, and the court can interpret "perforating" as used in step (b) of claim 1 without determining whether, if a needle is the implement used to make the perforations, it must be threaded or unthreaded. Arguably, therefore, both parties' proposed constructions unnecessarily read an extraneous limitation into the claim. See Hoganas AB v. Dresser Indus., Inc., 9 F.3d 948, 950 (Fed.Cir.1993) (an extraneous limitation is a limitation added "wholly apart from any need to interpret what the patentee meant by particular words

and phrases in the claim"). See also Renishaw, supra, 158 F.3d at 1249 ("If we need not rely on a limitation to interpret what the patentee meant by a particular term or phrase in a claim, that limitation is 'extraneous' and cannot constrain the claim").

There is another relevant principle of claim construction, however, that bears on the parties' dispute, namely, that a patentee is not generally entitled to claim protection broader than the scope of the patent's disclosure. See Wang Laboratories, Inc. v. America Online, Inc., 197 F.3d 1377, 1383 (Fed.Cir.1999) ("The only embodiment described in the '669 patent specification is the character-based protocol, and the claims were correctly interpreted as limited thereto"). See also Teleflex, supra, 299 F.3d at 1327 (quoting *Wang* and holding that "claim terms take on their ordinary and accustomed meanings unless the patentee demonstrated an intent to deviate from the ordinary and accustomed meaning of a claim term by redefining the term or by characterizing the invention in the intrinsic record using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope"); *Bell Atlantic, supra,* 262 F.3d at 1273 (acknowledging that "it is generally impermissible to limit claim terms by a preferred embodiment or inferences drawn from the description of a preferred embodiment," but concluding that the term "mode" as used in the patent claims was limited to the three modes described in the specification because "the patentees [had] defined the term ... by implication," by "consistent use throughout the '786 patent specification").

"Whether an invention is fairly claimed more broadly than the 'preferred embodiment' in the specification is a question specific to the content of the specification, the context in which the embodiment is described, the prosecution history, and if appropriate the prior art, for claims should be construed, when feasible, to sustain their validity. The usage 'preferred' does not of itself broaden the claims beyond their support in the specification," Wang Laboratories, supra, 197 F.3d at 1383. See also Teleflex, supra, 299 F.3d at 1327 (same).

Here, the specification describes conventional means of creating protruding embroidery, either manually or using an embroidery machine. It states that manual production is not suitable for mass production of items incorporating protruding embroidery, and details various problems with existing machine-produced protruding embroidery. The patent asserts that its "main object" is to set forth a protruding embroidery process that can be used to mass produce items.FN57 The specification details a preferred means of practicing the invention that involves use of an embroidery machine. It states that the perforating step is to be accomplished using "at least a thread-free perforating needle," FN58 and describes use of an embroidering machine with one unthreaded needle that "act[s] as the thread-free perforating needle." FN59 The description details various problems that will result if the perforating step is skipped, and concludes with the statement that "the protruding embroidery process of the present invention can overcome all the shortcomings ... mentioned ... by utilizing a thread-free perforating needle to perforate the filler with a plurality of consecutive interval perforations along the contour of the desired embroidering figure." FN60

Given the main objective of the invention, the overall content of the specification, and the consistent references to use of a "thread-free needle" in the perforating step, the court concludes that plaintiffs cannot claim more broadly than the disclosures in the specification of the '854 patent. FN61 That specification makes clear that a needle is used to perform the perforating step, and that the needle must be threadless. Accordingly, the court concludes that perforating step (b) of claim 1 of the ' 854 patent must be performed with a threadless needle.FN62

3. The "Embroidery Machine"

Plaintiffs also argue that defendant attempts improperly to limit the language of wrapping step (c) of claim 1 of the '854 patent and wrapping step (b) of claim 1 of the '044 patent to require use of an "embroidery machine." Defendant's proposed construction of both claims states that the wrapping step is to be carried out by an "embroidery machine, such as a conventional numerical control ("NC") embroidery machine." FN63 The language of the two claims, however, does not refer to an embroidery machine. It references only the "wrapping of an embroidering portion ... with a plurality of sewing threads." It appears from the specification of each patent, moreover, that use of an embroidery machine is merely a preferred embodiment, as the detailed description states that "the protruding embroidery process is *preferred* to proceed with a numerical control (NC) embroidery machine...." FN64 This limitation cannot be read into the claims, which do not themselves require use of such a machine. *Comark, supra,* 156 F.3d at 1186 (" '[w]hile ... claims are to be interpreted in light of the specification and with a view to ascertaining the invention, it does not follow that limitations from the specification may be read into the claims,' " quoting Sjolund v. Musland, 847 F.2d 1573, 1581 (Fed.Cir.1988)); Laitram Corp. v. NEC Corp., 163 F.3d 1342, 1348 (Fed.Cir.1998) (the "repetition in the written description of a preferred aspect of a claim invention does not limit the scope of an invention that is described in the claims in different and broader terms"). Indeed, elsewhere, the specification refers to an "embroidery unit," suggesting that there may be multiple types of mechanisms used in mass production embroidery. FN65 Accordingly, the court declines to adopt the limitation proposed by defendant with respect to use of a conventional embroidery machine.

4. "Adhered"

The parties next dispute the meaning of the term "adhered" as used in claim 4 of the '854 patent. Claim 4 is dependent on claim 1, and states: "A protruding embroidery process as recited in claim 1 where said filler adhered on said embroidering background element." FN66 Plaintiffs argue that "adhered" means "fully or partially attached," while defendant asserts it means "attached."

Looking first to the language of the claim itself, the court finds that the plain meaning of the word "adhere" is to stick fast. See WEBSTER'S NEW WORLD DICTIONARY 16 (2d ed.1968). See also WEBSTER'S NEW COLLEGIATE DICTIONARY 56 (9th ed.1985) ("adhere: to hold fast or stick by or as if by gluing, suction, grasping, or fusing," quoted in Pandrol USA v. Airboss Railway Products, Inc., 10 Fed.Appx. 837, 2001 WL 294132, * 5, n. 1 (Fed.Cir. Mar.27, 2001) (Unpub.Disp.)).

By its clear meaning, "adhere" can include both full and partial attachments. This is confirmed by the specification, which states: "The filler 10 can be adhered by tape or sewed to fix on the background element." FN67 Taping the filler to the background could easily result in a partial attachment, i.e., only those portions of the filler that are touched by the tape will be held fast to the background. Similarly, a filler that is sewed to the background could be sewed partially at intervals rather than completely.

Neither party addresses whether this constitutes an express definition of the term "adhere," such that it provides the meaning that should be given to "adhere" in claim 4. See Beachcombers v. WildeWood Creative Products, Inc., 31 F.3d 1154, 1158 (Fed.Cir.1994) ("As we have repeatedly said, a patentee can be his own lexicographer provided the patentee's definition, to the extent it differs from the conventional definition, is clearly set forth in the specification"); In re Paulsen, 30 F.3d 1475, 1480 (Fed.Cir.1994) ("Although an inventor is indeed free to define the specific terms used to describe his or her invention, this must be done with reasonable clarity, deliberateness, and precision").

Nor does either party address what specific limitation claim 4 adds to the steps set forth in claim 1. Claim 1

includes a "laying and affixing" step in which the embroidering portion of the filler is "affixed" to the background element. The parties agree that the proper definition of "affix" in claim 1 is "attach." Since both parties also argue that "adhere" means attach-either partially or fully-the two terms seem to concern the same function. Generally, when a limitation in a dependent claim is intended to narrow a step set forth in the independent claim, the word "wherein" is used. See 2 John Gladstone Mills III, Robert C. Highley and Donald C. Reiley III, PATENT LAW FUNDAMENTALS, s. 15.32 (2d ed. 2002) ("Where the dependent claim *narrows* an element of structure stated in the claim on which the dependent claim depends, the further qualification of the element is preceded by the word 'wherein' in lieu of a transitional expression" (emphasis added)). Generally, different words or phrases used in separate claims are presumed to have a different meaning or scope; to the extent the lack of such a difference would render a claim superfluous, the doctrine of claim differentiation requires the court to presume that the difference between claims is significant. Ecolab Inc. v. Paraclipse, Inc., 285 F.3d 1362, 1375 (Fed.Cir.2002) ("Under the doctrine of claim differentiation, 'each claim in a patent is presumptively different in scope' "); Dow Chemical Co. v. United States, 226 F.3d 1334, 1341-42 (Fed.Cir.2000) (stating that the doctrine of claim differentiation "creates a rebuttable presumption that each claim in a patent has a different scope").

Although the doctrine of claim differentiation may at times be controlling, construction of claims is not based solely upon the language of other claims; the doctrine cannot alter a definition that is otherwise clear from the claim language, description, and prosecution history. O.I. Corp. v. Tekmar Co., Inc., 115 F.3d 1576, 1582 (Fed.Cir.1997). Thus, the doctrine of claim differentiation does not preclude a finding that a dependent claim is redundant. See Dow Chemical, supra, 226 F.3d at 1341 ("The doctrine ... cannot broaden the claims beyond their correct scope"); Laitram Corp. v. Rexnord, Inc., 939 F.2d 1533, 1538 (Fed.Cir.1991) (" '[T]he concept of claim differentiation ... states that claims should be presumed to cover different inventions. This means that an interpretation of a claim should be avoided if it would make the claim read like another one. Claim differentiation is a guide, not a rigid rule. If a claim will bear only one interpretation, similarity will have to be tolerated,' " quoting Autogiro Co. of America v. United States, 181 Ct.Cl. 55, 384 F.2d 391, 404 (Ct.Cl.1967)); Moleculon Research Corp. v. CBS, Inc., 793 F.2d 1261, 1269 & n. 4 (Fed.Cir.1986) (affirming the district court's construction of a claim although it rendered a dependent claim redundant); Multiform Desiccants, Inc. v. Medzam, Ltd., 133 F.3d 1473, 1480 (Fed.Cir.1998) ("the doctrine of claim differentiation can not broaden claims beyond their correct scope, determined in light of the specification and the prosecution history and any relevant extrinsic evidence").

Here, the use of "wherein" suggests that a narrowing of claim 1 was intended. The word "affix" in claim 1 is broad, and includes any method of fastening the filler to the background element, e.g., by glue, rubber cement, staples, etc. Since that claim 4 is presumed to have a meaning different than claim 1, so that it is not redundant, the court concludes that the patentees intended to act as their own lexicographers, and that the discussion of "adhere" in the specification defines the term for purposes of claim 4.FN68 Accordingly, the court construes the term "adhere" in claim 4 to mean attaching by tape or sewing to fix the filler on the background element.

5. "Affixed"

The parties also dispute the meaning of the term "affix" in claim 5 of the ' 854 patent. Like claim 4, claim 5 is dependent on claim 1, and states: "A protruding embroidery process as recited in claim 1 wherein said filler is sewed to affix on said embroidering background element." FN69 Plaintiffs argue that as used in the claim, "affix" means "to fully or partially affix or attach." Defendant counters that affix means simply "to affix or attach." "Affix" means to fasten or attach. WEBSTER'S NEW WORLD DICTIONARY 23 (2d

ed.1968). As with "adhere," affixing clearly includes both partial and complete attachment.

The parties' dispute, however, masks the true meaning of claim 5, which narrows claim 1 to a process in which the filler is "sewed to affix" it to the background element. As the court has construed claim 4 as encompassing such a method of attachment, it would appear that claim 5 is redundant. While the court must presume the claim has a different meaning than claim 1 and claim 4, it cannot discern a construction of claim 5 that would eliminate the redundancy. Step (a) of claim 1 covers all methods of "affixing" the filler to the background element. Claim 4 narrows the scope of claim 1, and claims adhering by tape or sewing to fix the filler on the background. Claim 5 can be said to narrow claim 1, as it extends only to affixing by sewing. It is then redundant as respects claim 4, however, which also contemplates sewing the filler to fix it to the background element.

As neither party addresses this issue, the court does not consider it further, and construes claim 5 in accordance with its plain meaning. So construed, the claim is clearly limited to a process in which the filler is sewed to fasten or attach it to the background element. The sewing can affix the filler to the background completely, at all points of contact between the two, or can occur at intervals, creating a partial attachment.

6. The "Foam Rubber Plate"

The parties' next dispute concerns the meaning of the term "foam rubber plate" in claim 8 of the '854 patent.FN70 Plaintiffs contend that "foam rubber plate" means the filler is "a foam rubber material or equivalent material." Defendant maintains that "foam rubber plate" means the filler must be made of "a foam rubber material." The court agrees with defendant. The plain meaning of "foam rubber plate" is a plate made of foam rubber. Foam rubber is a known substance, and nothing in the language of the claim or in the specification suggests that the reference to foam rubber should be extended to include "equivalent materials." FN71 Plaintiffs' proposed construction, in fact, appears to confuse proper construction of the claim with the doctrine of equivalents, an infringement concept. See Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722, 122 S.Ct. 1831, 1833, 152 L.Ed.2d 944 (2002) ("If patents were always interpreted by their literal terms, their value would be greatly diminished. Insubstantial substitutes for certain elements could defeat the patent, and its value to inventors could be destroyed by simple acts of copying. Thus, a patent's scope is not limited to its literal terms, but embraces all equivalents to the claims described"). Here, the language of the claim is clear; what the doctrine of equivalents dictates with respect to infringement is a matter not presently before the court. Accordingly, the court construes "foam rubber plate" to mean a plate made of foam rubber material.

7. Low Friction Coefficient

The parties next dispute the meaning of the term "low friction coefficient" in claims 2 and 18 of the '044 patent. Plaintiffs argue that the term means "low enough for the thread needle to penetrate through." Defendant asserts that "low friction coefficient" does not have a plain or ordinary meaning, and further that plaintiffs' definition runs afoul of the doctrine of claim differentiation. Defendant also maintains that plaintiffs' proposed definition is "not sufficient to enable a person skilled in the relevant art to use the claimed process." FN72

Friction is the resistance to movement of two moving objects or surfaces that touch. WEBSTER'S NEW WORLD DICTIONARY 559 (2d ed.1968).FN73 The coefficient of friction is the ratio of the frictional force (the force that opposes placing a body at rest into motion) to the normal force of the body. See http://scienceworld.wolfram.com/physics/Friction.html. In the context of the ' 044 patent, the coefficient of

friction is the ratio of the resistance exerted by the filler to penetration by the sewing threads and the force of the thread. Claims 2 and 18 provide for a filler with a "low friction coefficient." The term "low" is not defined by reference to any numerical ratio or percentage, and the court finds, in the context of claims 2 and 18, that it has no clear meaning. Moreover, while the specification states that use of a filler made of "low friction material that will shrink when heated" is an "essential feature" of the invention, it provides no particular guidance as to how "low" should be interpreted.

Plaintiffs contend that their proposed construction is supported by a review of the specification of the '854 patent, which is a cited reference in the '044 patent. The '854 specification discusses the fact that the perforating step in the '854 process is necessary to reduce "the friction between the threads and the filler ... due to the thickness and hardness of the filler." Without perforation, this "excessive friction" will lead, the specification states, to broken thread, broken needles, interruption of the embroidery process, and poor quality embroidery.FN74 Typically, a court construing patent claims looks to prior art patents to determine what the patent does not cover. See Autogiro Co., supra, 384 F.2d at 399 ("In its broader use as source material, the prior art cited in the file wrapper gives clues as to what the claims do not cover"). Similarly, it may inform the court's understanding of those skilled in the art would understand the disputed claim terms. See Vitronics, supra, 90 F.3d at 1584 ("In addition, a court in its discretion may admit and rely on prior art proffered by one of the parties, whether or not cited in the specification or the file history. This prior art can often help to demonstrate how a disputed term is used by those skilled in the art"). Here, the ' 854 patent is useful for the latter purpose, and confirms the court's understanding that a person skilled in the art of protruding embroidery would have understood "low friction coefficient" to be a reference to a filler that exerts low resistance to penetration by the sewing threads. Accordingly, the court construes the term in this manner. It notes that its construction differs from plaintiffs' proposal, in that it does not define "low friction coefficient" as meaning simply a friction coefficient that is sufficiently low that thread can penetrate the filler. Rather, the court's construction imports the concept of ease of penetration into the term. FN75

Defendant argues that the court should look to the deposition testimony of Chien-Lu Lin to define "low friction coefficient." Lin stated that the term refers to a filler made of material that the needles of an NC embroidery machine can penetrate easily, and that, on the ying du ji or hardness measuring machine, it has a range of 33 to 70 degrees.FN76 The numerical limitation articulated by Lin is nowhere found in the patent claims, in the specification or in the prosecution history, and the court has no evidence before it that a person skilled in the art who reviewed the patent would understand that "low friction coefficient" had reference to this particular range. Accordingly, the numerical limitation to which Lin testified cannot be read into the claims. See, e.g., Ecolab, Inc. v. Envirochem, Inc., 264 F.3d 1358, 1365-66 (Fed.Cir.2001) ("there is no basis in the intrinsic record on which to infer adding a numerical limitation to the phrase 'substantially uniform' "). Cf. Renishaw, supra, 158 F.3d at 1249 ("... when a claim term is expressed in general descriptive words, we will not ordinarily limit the term to a numerical range that may appear in the written description or in other claims"). Compare Key Pharmaceuticals v. Hercon Laboratories Corp., 161 F.3d 709, 718 (Fed.Cir.1999) (holding that it was proper for the district court to look to FDA standards for pharmaceutical efficacy to determine meaning of "a pharmaceutically effective amount" in a patent claim describing a drug-in-adhesive transdermal patch, where no intrinsic evidence established the numerical range of amounts represented by that phrase, and persons skilled in the art would look to such standards).

Accordingly, the court defines a filler that has a "low friction coefficient" as one that exerts low resistance to penetration by the sewing threads.FN77

8. Miscellaneous Disputed Terms

The parties dispute a variety of other terms found in the patents. Plaintiffs propose that the phrase "consecutive interval perforations," found in step (b) of claim 1 of the '854 patent, be construed as "consecutive interval perforations or spaced apart holes." Defendant asserts the term is clear on its face and does not require construction.FN78 Perforations are holes made by piercing, punching or drilling. See WEBSTER'S NEW WORLD DICTIONARY 1056 (2d ed.1968). "Interval" denotes "a space between two things." Id. at 737. "Consecutive" means "successive." Id. at 302. Thus, the plain meaning of "consecutive interval perforations" is "successive spaced apart holes." Accordingly, the court adopts this construction of the term.

Plaintiffs next propose, in step (c) of claim 1 of the '854 patent, plaintiffs propose that "along said consecutive interval perforations" should be construed to mean that "[t]he edges of the stitching are along the same contour as the perforations of step (b)." Defendant counters that the phrase should be construed to mean that "[t]he edges of the stitching follow the same contour as the perforations of step (b)." FN79

The plain meaning of the word "along" is "on or beside the length of." WEBSTER'S NEW WORLD DICTIONARY 39 (2d ed.1968). The specification teaches that

"the interval between any two of the consecutive interval perforations 11 should be smaller than the diameter of the consecutive interval perforation 11. Thus, when the threaded needle closely perforates the filler 10 along the consecutive interval perforations 11 thereon for wrapping the filler 10 with threads[, the] densely perforating ... threaded needle will properly puncture the intervals between the consecutive interval perforations 11 and thus cut the filler 10 off along the contour of the desired embroidery figure," FN80

This discussion, which indicates that the embroidery thread should pierce the filler between the spaced apart perforations, confirms that "along" should be given its plain meaning, i.e., "on the same contour as the perforations of step (b)."

A similar issue is raised by plaintiffs' proposed construction of step (d) of claim 1 of the '044 patent. Plaintiffs assert that the claim's reference to leftover filler remnants that extend out of the side periphery of the protruding embroidery should be construed as "leftover remnants of the filler." Defendant counters that the phrase means "edges of the filler." The specification is clear that the "leftover filler remnants" are pieces of filler that remain between the sewing threads that wrap the edges of the filler after most of the leftover portion of the filler is cut off from the wrapped embroidery portion in step (c).FN81 The specification explains that these leftover remnants generally cannot be completely removed, and thus impair the quality of the embroidery. It concludes with the statement that "the embroidery process of the present invention can successfully remove all leftover filler remnants and produce a protruding embroidery that is near perfection...." FN82 Based on this discussion in the specification, the court finds that the patentee defined "leftover filler remnants" to mean the pieces of filler that remain between the sewing threads that wrap the edges of the embroidering portion of the filler after step (c). See Interactive Gift Express, supra, 256 F.3d at 1331 (noting that a patentee can chose "to be his own lexicographer and use terms in a manner other than their ordinary meaning); Beachcombers, supra, 31 F.3d at 1158 (the patentee can act as his own lexicographer if he sets forth the definition of a claim term clearly in the specification); In re Paulsen, supra, 30 F.3d at 1480 (the inventor must define terms with reasonable clarity, deliberateness, and precision"). It therefore adopts this construction of the term.

9. Typographical Errors

Plaintiffs ask that the court construe claim 18 of the '044 patent to correct numerous typographical errors therein. Defendant argues that it is inappropriate for the court to make such corrections, as they should have been made by the PTO following a proper application by plaintiffs. The few federal courts that have considered the question have generally corrected typographical errors where they appear to have been inadvertent printing errors rather than an amendment of the claim. See Lemelson v. General Mills, Inc., 968 F.2d 1202, 1203, n. 3 (Fed.Cir.1992) (allowing correction of a typographical error where the error was "an inadvertent error when the patent was printed rather than an amendment to the claim"); EMI Group North America, Inc. v. Cypress Semiconductor Corp., 68 F.Supp.2d 421, 438 (D.Del.1999) (correcting typographical errors where "[b]oth these printing errors are apparent from the file history of the '801 patent. The court agrees that the claims should be corrected as advocated by EMI"). One court, however, has refused to correct typographical errors brought to its attention. In Bausch & Lomb, Inc. v. Moria S.A., No. CIV.A. 99-4247, 2002 WL 563603, * 26 (E.D.Pa. April 16, 2002), the court declined to correct typographical errors found in a patent, citing 35 U.S.C. s. 255. That statute provides:

"Whenever a mistake of a clerical or typographical nature, or of minor character, which was not the fault of the Patent and Trademark Office, appears in a patent and a showing has been made that such mistake occurred in good faith, the Director may, upon payment of the required fee, issue a certificate of correction, if the correction does not involve such changes in the patent as would constitute new matter or would require re-examination. Such patent, together with the certificate, shall have the same effect and operation in law on the trial of actions for causes thereafter arising as if the same had been originally issued in such corrected form." 35 U.S.C. s. 255.

The court in *Moria* declined to correct errors in the patent it was construing, noting that to do so would entail "tak[ing] on th[e] role specifically assigned to the patent office." *Id*. The Federal Circuit's decision in *Lemelson,* however, indicates that it is appropriate for a court to correct obvious typographical errors where the prosecution history indicates that they would not effect an amendment of the claim. Accordingly, to the extent the corrections requested are clearly the request of typographical error, the court concludes that it may make the corrections sought.

Reviewing plaintiffs' requests, the court finds that they seek relatively minor corrections in the language of claim 18, and that the prosecution history of the patent that plaintiffs have submitted demonstrates that the omitted words and/or errors are not amendments but are items that were considered by the patent examiner in issuing the patent. Accordingly, the court grants plaintiffs' request that the errors be corrected.FN83

III. CONCLUSION

As the court has now construed the claims, it sets a telephone status conference for **November 20, 2002** at **5:15 p.m.** to discuss the scheduling of dates for the further prosecution of this action. The parties are directed to submit a joint report addressing scheduling issues on or before **November 15, 2002.**

FN1. Plaintiffs initially claimed that defendant had infringed a third patent, No. 6,164,228. Their *Markman* briefs indicate that claims related to the '228 patent have been abandoned. Accordingly, this order focuses exclusively on the '854 and '044 patents.

FN2. See First Amended Complaint, Ex. 1.

FN3. The information in this section is taken from the "Background of the Present Invention" section of the '854 patent. (See id., col. 1, ll. 1-57.)

FN4. The summary of the invention is found in the '854 patent at col. 1, 1. 60-col. 2, 1. 22.

FN5. See First Amended Complaint, Ex. 1, col. 2, 1. 49-col. 3, 1. 10.

FN6. Id., col. 3, ll. 19-24.

FN7. Id., col. 3, ll. 25-35.

FN8. Id., col. 3, ll. 36-44.

FN9. Id., col. 3, ll. 45-56.

FN10. id., col. 3, ll. 57-64.

FN11. Id., col. 3, l. 65-col. 4, 1. 32.

FN12. Id., col. 4, 1. 61-col. 5, 1. 5.

FN13. The patent claims are found in the '854 patent at col. 5, 1.6-col. 6, 1. 40.

FN14. See First Amended Complaint, Ex. 2.

FN15. The information in this section is taken from the "Background of the Present Invention" section of the '044 patent. (See id., col. 1, 11. 1-57.)

FN16. The summary of the invention is found in the patent at col. 1, 1. 60-col. 2, 1. 42.

FN17. First Amended Complaint, Ex. 2, col. 2, ll. 1-5.

FN18. Id., col 2, ll 8-29.

FN19. Id., col. 3, l.2.

FN20. Id., col. 3, ll. 34-36.

FN21. Id., col. 3, 11. 48-59.

FN22. Id., col. 3, ll. 60-67.

FN23. Id., col. 4, ll. 1-4.

FN24. Id., col. 4, ll. 7-9.

FN25. Id., col. 4, ll. 5-14.

FN26. Id., col. 4, ll. 18-20.

FN27. Id., col. 4, ll. 21-22.

FN28. Id., col. 4, 1.27-34.

FN29. The claims of the '044 patent are found at col. 5, 1. 13-col. 6, 1. 65.

FN30. Where a patentee seeks to depart from the ordinary meaning of a claim term, he must "clearly set forth" or "clearly redefine" the term in the specification so as to put persons reasonably skilled in the art on notice of the intended meaning. Bell Atlantic Network Services, Inc. v. Covad Communications Group, Inc., 262 F.3d 1258, 1268 (Fed.Cir.2001) (quoting Elekta Instrument S.A. v. O.U.R. Scientific International, Inc., 214 F.3d 1302, 1307 (Fed.Cir.2000)). See also Schering Corp. v. Amgen, Inc., 222 F.3d 1347, 1353 (Fed.Cir.2000) (stating that the specification must demonstrate an "express intent to impart a novel meaning" to claim terms); Optical Disc, supra, 208 F.3d at 1334 ("Without evidence in the patent specification of an express intent to impart a novel meaning to a claim term, the term takes on its ordinary meaning"). An explicit statement of redefinition is not required, however. *Bell Atlantic, supra,* 262 F.3d at 1334; SciMed Life Systems, Inc. v. Advanced Cardiovascular Systems, Inc., 242 F.3d 1337, 1344

(Fed.Cir.2001) (a patentee's description of the preferred embodiment "can provide guidance as to the meaning of the claims, thereby dictating the manner in which the claims are to be construed, even if the guidance is not provided in explicit definitional format"). Stated otherwise, the specification may define claim terms "by implication" such that the meaning to be given to the terms is "found in or ascertained by a reading of the patent documents." Vitronics, supra, 90 F.3d at 1582, 1584, n. 6.

FN31. Where the specification does not mandate a limitation, however, no limitation should be read into the claims. See Renishaw, supra, 158 F.3d at 1249; Intervet America, Inc. v. Kee-Vet Laboratories, Inc., 887 F.2d 1050, 1053 (Fed.Cir.1989); E.I. DuPont de Nemours & Co. v. Phillips Petroleum, 849 F.2d 1430, 1433 (Fed.Cir.1988). Cf. Comark Communications, Inc. v. Harris Corp., 156 F.3d 1182, 1186 (Fed.Cir.1998) (recognizing that "there is sometimes a fine line between reading a claim in light of the specification, and reading a limitation into the claim from the specification," and stating that the specification should be reviewed "to ascertain the meaning of a claim term as it is used by the inventor in the context of the entirety of his invention" and not merely to limit a claim). See also Interactive Gift Express, supra, 256 F.3d at 1331 (same).

FN32. Because, in most cases, intrinsic evidence alone "resolves any ambiguity in a disputed claim term," the Federal Circuit has stated that "extrinsic evidence in general, and expert testimony in particular, may be used only to help the court come to the proper understanding of the claims; it may not be used to vary or contradict the claim language." Vitronics, supra, 90 F.3d at 1583. Here, the parties assert that the intrinsic evidence provides adequate evidence regarding the meaning of the claim terms. Hence, with the exception of the inventor's deposition, they have not submitted any extrinsic evidence for the court's consideration. See Spectrum Intern., Inc. v. Sterilite Corp., 164 F.3d 1372, 1378 (Fed.Cir.1998) ("[i]f upon examination of this intrinsic evidence the meaning of the claim language is sufficiently clear, resort to extrinsic evidence, such as treatises and technical references, as well as expert testimony when appropriate, should not be necessary"). The court addresses the relevance of the inventor's testimony below.

FN33. Defendant's Responsive Brief in Support of Defendant's Claim Construction, Ex. B.

FN34. Specifically, plaintiffs have conceded the accuracy of defendant's proposed construction of claim 11 in the '854 patent. They have also conceded that claims 14, 15, 16, 17, 19, 20 and 21 of that patent are dependent claims. As respects the '044 patent, defendant has withdrawn its proposed construction of claims 7, 8, 11, 12, 16 and 17.

FN35. First Amended Complaint, Ex. 1, col. 3, l. 65-col. 4, l. 19 (emphasis added).

FN36. At the *Markman* hearing, defense counsel argued that step (b) cannot precede step (a) because cutting out the design to be embroidered, fixing it to the embroidery background, and stitching it with thread was anticipated by the prior art. (See First Amended Complaint, Ex. 1, col. 1, ll. 30-37.) The court agrees. The court's construction of the '854 patent claims, however, would not permit the embroidery design to be completely severed from a larger piece of filler before being attached to the embroidery background. Rather,

the court concludes that the claims allow one practicing the '854 patent to perforate a piece of filler along the outline of the embroidery design, perforate the background element separately, and then lay the perforated filler on the embroidering background. (See id., col. 4, ll. 33-50 (discussing the problems inherent in cutting the filler to the desired figure and then laying that figure on the background, and stating that the "process of the present invention overcome[s] all the shortcomings mentioned above").) The prior art does not contemplate such a process, and the court thus cannot accept defendant's argument that a construction of the claims that permits step (b) to precede step (a) was anticipated by the prior art.

FN37. See id., col. 3, ll. 36-56.

FN38. Defendant argues that the inventor, Chien-Lu Lin confirmed the sequential nature of the process, including steps (a) and (b), during his deposition. Lin testified that the filler must be affixed to the background as the first step in the process, that the perforating step must be performed next, that the embroidering step is to be performed after the perforating step, and that removal of the filler is the last, finish step. (Deposition of Chien-Lu Lin ("Lin Depo.") at 54:10-55:16.) Inventor testimony of this type is extrinsic evidence to which the court may turn if the language of the claim terms cannot be ascertained from a review of the intrinsic evidence alone. See Bell Atlantic, supra, 262 F.3d at 1268-69 ("Finally, if the meaning of the claim limitation is apparent from the intrinsic evidence alone, it is improper to rely on extrinsic evidence other than that used to ascertain the ordinary meaning of the claim limitation.... However, in the rare circumstance that the court is unable to determine the meaning of the asserted claims after assessing the intrinsic evidence, it may look to additional evidence that is extrinsic to the complete document record to help resolve any lack of clarity.... This additional extrinsic evidence includes such evidence as expert testimony, articles, and inventor testimony"); Zodiac Pool Care, Inc. v. Hoffinger Industries, Inc., 206 F.3d 1408, 1414 (Fed.Cir.2000) ("When construing the meaning of a claim, the court may consider both intrinsic and extrinsic evidence. Intrinsic evidence consists of the claim itself, the specification, and any prosecution history. Extrinsic evidence includes expert testimony, inventor testimony, dictionaries, treatises, and prior art not cited in the prosecution history. The court turns to extrinsic evidence only when the intrinsic evidence is insufficient to establish the clear meaning of the asserted Claim"); Pitney Bowes, Inc. v. Hewlett-Packard Company, 182 F.3d 1298, 1308-09 (Fed.Cir.1999) ("... testimony on the technology is far different from other expert testimony, whether it be of an attorney, a technical expert, or the inventor, on the proper construction of a disputed claim term, relied on by the district court in this case. The latter kind of testimony may only be relied upon if the patent documents, taken as a whole, are insufficient to enable the court to construe disputed claim terms. Such instances will rarely, if ever, occur").

Even where it is appropriate to look to such extrinsic evidence, it "may not be used to vary, contradict, or limit the claim language. See Vitronics, supra, 90 F.3d at 1584, (extrinsic evidence such as inventor testimony cannot be used to vary or contradict the claim language). See also Bell Atlantic, supra, 262 F.3d at 1269 (extrinsic evidence such as inventor testimony "may be used only to assist in the proper understanding of the disputed limitation; it may not be used to vary, contradict, expand, or limit the claim language from how it is defined, even by implication, in the specification or file history"); Dow Chemical Co. v. Sumitomo Chemical Co., Ltd., 257 F.3d 1364, 1373 (Fed.Cir.2001) (same); Markman v. Westview Instruments, Inc., 52 F.3d 967, 985-86 (Fed.Cir.1995) (en banc) (holding that inventor testimony as to "[t]he subjective intent of the inventor when he used a particular term is of little or no probative weight in determining the scope of a claim (except as documented in the prosecution history)"), aff'd., 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996); Bell & Howell Document Management v. Altek Systems, 132 F.3d

701, 706 (Fed.Cir.1997) ("The testimony of an inventor and his attorney concerning claim construction is thus entitled to little or no consideration. The testimony of an inventor is often a self-serving, after-the-fact attempt to state what should have been part of his or her patent application ..."); Roton Barrier, Inc. v. Stanley Works, 79 F.3d 1112, 1126 (Fed.Cir.1996) ("We have previously stated that an inventor's after-the-fact testimony is of little weight compared to the clear import of the patent disclosure itself" (internal quotations omitted)). Here, the language of the patent claims is clear, and there is no need to resort to extrinsic evidence. The court thus declines to vary the plain meaning of claim terms based on the testimony of the inventor.

FN39. *Id*. col. 5, ll. 19-21.

FN40. *Id*., col. 5, ll. 21-22.

FN41. See *id*., col. 4, ll. 1-13 (emphasis added).

FN42. *Id*., col. 4, ll. 14-19.

FN43. See *id*., col. 5, 11. 25-28.

FN44. *Id*., col. 6, ll. 13-15.

FN45. See Defendant Twins Enterprise, Inc.'s Responsive Brief in Support of Defendant's Claim Construction for Markman Hearing ("Def.'s Brief") at 10:11-43.

FN46. Plaintiffs Chien-Lu Lin and Ming-Chin Chou's Opening Brief in Support of Plaintiffs' Claim Construction for Markman Hearing ("Pls.' Brief") at13:14-15.

FN47. First Amended Complaint, Ex. 1, col. 6, ll. 16-17.

FN48. Defendant argues that plaintiffs are estopped from arguing that the steps may be completed other than in the order in which they are written, since plaintiffs' original claim construction chart, served on defendant on May 17, 2002, did not assert such a position. The claim construction chart was not signed under oath, was not filed with the court and was ultimately superseded by the joint claim construction chart. It thus cannot be given effect as a binding judicial admission. See, e.g., American Title Ins. Co. v. Lacelaw Corp., 861 F.2d 224, 226-27 (9th Cir.1988) ("A statement in a complaint, answer or pretrial order is a judicial admission, as is a failure in an answer to deny an allegation.... This court has never decided whether statements of fact contained in briefs or other memoranda constitute judicial admissions. ... The Tenth Circuit holds that briefs are not pleadings or part of the record, and statements in briefs may be considered admissions in the court's discretion.... We agree and hold that statements of fact contained in a brief may be

considered admissions of the party in the discretion of the district court"); United States v. McKeon, 738 F.2d 26, 31 (2d Cir.1984) ("A pleading prepared by an attorney is an admission by one presumptively authorized to speak for his principal.... When a pleading is amended or withdrawn, the superseded portion ceases to be a conclusive judicial admission; but it still remains as a statement once seriously made by an authorized agent, and as such it is competent evidence of the facts stated, though controvertible, like any other extra-judicial admission made by a party or his agent ..."). The chart, which was the work of plaintiffs' attorney, may be a party admission against interest (see Trull v. Volkswagen of America, 187 F.3d 88, 99 (1st Cir.1999) (holding that a diagram of an accident scene proffered by a party in prior litigation and the statement of its attorney that the accident was a "side-to-front impact" were admissions against interest that could be admitted against it in a subsequent case); United States v. McKeon, 738 F.2d 26, 31 (2d Cir.1984) ("The law is quite clear that [superseded] pleadings constitute the admissions of a party-opponent and are admissible in the case in which they were originally filed as well as in any subsequent litigation involving that party"); Allendale Mut. Ins. Co. v. Bull Data Systems, Inc., No. 91 C 6103, 1994 WL 687579, * 1 (N.D.Ill.Dec.7, 1994) ("... a party opponent may offer prior inconsistent pleadings, whether from the same case or other cases, as substantive evidence or for impeachment purposes.... In such instances, the court classifies the pleadings as evidentiary admissions-relevant but not conclusive"). It is a form of extrinsic evidence the court cannot consider, however, if it finds, based on the intrinsic evidence presented, that the meaning of the claims is clear. Because the court finds that the claim terms are unambiguous and clear, it does not consider plaintiffs' admissions in their original claim construction chart.

FN49. See First Amended Complaint, Ex. 2, col. 5, ll. 26-27 (emphasis added).

FN50. The parties dispute the stage at which the "cutting off" in step (c) takes place. Plaintiffs appear to argue that the cutting off may be accomplished by the needle during the stitching process, so that all that remains is to remove the detached portion of the filler. Defendant contends that the cutting off is a step separate from the stitching. The court agrees with defendant. Claim 1 of the '044 patent clearly claims "cutting off and removing" as a distinct step in the process from wrapping with sewing threads. The words "cutting off" cannot be read out of this step, such that it comprises only removal of the leftover portion of the filler that has already been "cut off" in step (b). Construing step (c) to include the "cutting off" as well as removal of the excess filler is supported by the specification. Discussing a preferred embodiment, the specification notes that "the leftover portion 103 of the filler 10 is torn off from the wrapped embroidery portion 101 of the filler 10 *after step (c)*." (See id., col. 4, ll. 5-7 (emphasis added).)

FN51. While the joint claim construction chart reflects a similar dispute regarding claims 6 and 11 of the '854 patent, the court concludes, based on plaintiffs' *Markman* brief, that they concede the semi-wrapping step set forth in these dependent claims must precede the wrapping step of the process protected. This is evident from the language of the claims. Claim 6 of the '854 patent is dependent on claim 1, which recites the wrapping up of the embroidering portion of the filler and the embroidering background element as step (c). Claim 11 is dependent on claim 10, which recites the wrapping up of the embroidering portion of the filler and the embroidering background element as step (d). In each instance, the language of the dependent claim makes clear that the semi-wrapping step is to occur before the wrapping step. Claim 6 states: "A protruding embroidery process as recited in claim 1, *before said wrapping step (c),* further comprising a semi-wrapping embroidering step of sewing from said side edges of said desired embroidering figure to a central portion thereof." (Id., col. 6, 11. 1-5 (emphasis added)).

Similarly, claim 11, which is dependent on claim 10, states:
"A protruding embroidery process as recited in claim 10, *before said wrapping step (d),* further comprising a semi-wrapping embroidering step of sewing from said side edges of said desired embroidering figure to a central portion thereof." s. Id., col. 6, 11. 36-40 (emphasis added)).

FN52. See id., col. 5, ll. 52-56; col. 5, 1. 66-col. 6, 1. 3; col. 6, ll. 4-8; col. 6, ll. 24-28.

FN53. See id., col. 5, ll. 2-5. See also id., col. 4, ll. 29-32 ("Such semi-wrapping embroidery 50 is processed by sewing from the side edge of the corner or the edge of the desired embroidery figure to an inner portion of the filler 10. Thus, the path of the semi-wrapped embroidery is perpendicular[ ] to the path of the regular protruding embroidery in step (b)").

FN54. Plaintiffs contend that the semi-wrapping step takes place "in step (b)" rather than "before step (b)." They thus appear to concede that the semi-wrapping cannot take place *after* the wrapping has completely encased the embroidery portion of the filler and the embroidering background element. The court assumes from their proposed construction on the joint claim construction chart that plaintiffs assert the semi-wrapping and wrapping can occur simultaneously, and that it is not necessary for one to precede the other.

FN55. Id., col. 4, ll. 25-27 (emphasis added).

FN56. Additionally, the detailed description expressly so provides. See id., col. 4, ll. 30-32.

FN57. See id., Ex. 1, col. 1, ll. 60-63.

FN58. Id., col. 2, l. 63.

FN59. Id., col. 3, ll. 19-20.

FN60. Id., col. 4, ll. 45-49.

FN61. Defendant also argues that plaintiffs agreed the needle used to perforate should be an "unthreaded" needle in their initial claim construction chart. For the reasons discussed in note 47, *supra,* the court declines to consider any admissions contained in plaintiff's original claim construction chart.

FN62. If the needle were threaded while making the perforations required by step (b), one of the benefits of the perforating step would be lost, i.e., there would be increased friction between the thread and the filler that would result in a greater number of instances of broken thread. This too lends support to the interpretation the court adopts.

FN63. See Joint Claim Construction Chart at 6, 21.

FN64. See First Amended Complaint, Ex. 1, col. 3, ll. 12-14; Ex. 2, col. 3, ll. 26-28.

FN65. Id., Ex. 1, col. 4, ll. 33-44 (stating that a skilled embroidery craftsman is "generally required to operate fifteen to twenty embroidery units at the same time for mass production," such that fixing small portions of the filler on the embroidery background can consume inordinate amounts of time"); Ex. 2, col. 4, 11. 36-48 (same).

FN66. See id., Ex. 1, col. 5, ll. 37-39.

FN67. Id., col. 3, ll. 43-44.

FN68. For the reasons set forth above in note 47, the court declines to consider any variation between plaintiffs' present construction of the term and the position set forth in their original claim construction chart. The court also finds unpersuasive defendant's argument that plaintiffs are attempting to rewrite the patent to change "adhere" to "partially adhere," as the plain meaning of the word includes both partial and complete attachment.

FN69. First Amended Complaint, Ex. 1, col. 5, 11. 40-42.

FN70. Claim 8 states: "A protruding embroidery process as recited in claim 1, in which said filler is made of a foam rubber plate."

FN71. This interpretation is reinforced by the parties' joint construction of claim 9. This claim limits claim 1 to processes in which the filler used is made of polyurethane foam material. The parties agree that "polyurethane foam material" means "polyurethane foam material." Their definition does not extend to "equivalent materials."

FN72. Joint Claim Construction Chart at 24.

FN73. See also http://physic s.about.com/library/dict/bldeffriction.htm ("The resistance to motion which is called into play when it is attempted to slide one surface over another with which it is in contact").

FN74. See First Amended Complaint, Ex. 1, col. 4, ll. 1-13.

FN75. For this reason, the court need not address defendant's argument that plaintiffs' construction undermines claim 2's validity. Claim 2 is dependent on claim 1, and adds the limitation "wherein said filler has a low friction coefficient." If the term "low friction coefficient" is defined as plaintiffs propose, defendant asserts it will add no limitation, as the thread must be able to penetrate the filler in order to perform the steps of claim 1. By adopting the construction of the term recited in text, the court avoids this problem, as claim 1 extends broadly to any filler that can be penetrated by thread, even with attendant thread and needle breakage, while claim 2 adds the limitation of a filler whose friction coefficient is sufficiently low that it can be easily penetrated by needle and thread.

FN76. Lin Depo. at 57:2-63:23.

FN77. The court expresses no opinion as to whether, so defined, the term is invalid for indefiniteness under 35 U.S.C. s. 112.

FN78. Joint Claim Construction Chart at 5; Def.'s Brief at 6, n. 6.

FN79. Joint Claim Construction Chart at 6.

FN80. First Amended Complaint, Ex. 1, col. 3, ll. 45-54.

FN81. Id., Ex. 2, col. 4, ll. 7-9.

FN82. Id., col. 4, ll. 9-20.

FN83. The court makes the following corrections to the language of claim 18 in the '044 patent:
1. It changes the word "embroidery," which appears before "background element" at col. 6, 1. 36, to "embroidering";

2. It inserts the word "embroidering" before the phrase "background element" at col. 6, 1. 42;

3. It changes the word "embroidery," which appears before "background" at col. 6, 1. 43, to "embroidering";

4. It inserts the word "element" after the word "background" at col. 6, 1.43;

5. It inserts the word "filler" after the word "entire" and before the word "including" at col. 6, 1. 47.