with the claim language?

MR. PRATT: Objection to form.

BY THE WITNESS:

A. They would have to specifically match -- some of those flat knit edges would specifically have to match certain locations within the -- within the claim.

Q. Yeah. Okay.

MR. STOCKWELL: Let's take a break. I don't think I have a whole lot more, but I wanted to go through some notes.

MR. PRATT: Okay.

THE VIDEOGRAPHER: Going off the record. Time now is 11:12 a.m.

(A short break was had.)

THE VIDEOGRAPHER: We're back on the record. Time now is 11:26 a.m.

BY MR. STOCKWELL:

Q. Mr. Tonkel, you had mentioned earlier that you had been overseas for manufacturing trips about a hundred times?

A. In total, yes, probably, give or take.

Q. When you started your career in footwear, were footwear articles manufactured in the United

DECLARATION OF SABIT ADANUR

I. Background and Qualifications

1. My professional background and qualifications are set forth in my Curriculum Vitae, a copy of which is attached. I provide a summary of my background and qualifications below.

2. I have extensive experience in knitting and knitted fabrics. My family had a knitting business in Istanbul, Turkey, where we had circular knitting machines; we also had a hand operated flat knitting machine to make knitted goods. I worked in that business during summer vacations before I came to the U.S.

3. I have a B.S. in Mechanical Engineering, an M.S. in Textile Engineering and Science, and a Ph.D. in Fiber and Polymer Science. During my M.S. and Ph.D. studies at North Carolina State University, I took several courses and lab sessions in fabric formation including knitting.

4. I have been teaching knitting technology and structure of knitted fabrics since I joined Auburn University in 1992. I have taught the following courses which include knitting technology and knitted fabric structures:

- PFEN 2270 Introduction to Engineered Fibrous Materials
- PFEN 3300 Fibrous Product Testing and Instrumentation
- PFEN 4300 Engineered Fibrous Structures
- PFEN 6250 Advanced Engineering Fibrous Structures
- PFEN 7210 Fabric Formation and Properties

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- TE 225 Fabric Design and Manufacturing
- TE 460 Mechanics of Textile Manufacturing Processes and Systems
- TXTN 3450 Technical Textiles

5. Some of these courses involved laboratory sessions in which we used both circular and flat warp and weft knitting machines to teach the students. For example, in the Fall 2013 semester, I am teaching PFEN 2270 which includes a chapter in knitting technology and knitted fabrics.

6. One of my Ph.D. students did his dissertation on a patented hybrid weaving/knitting machine to produce woven/knitted fabrics. We published the following articles as a result of that work:

- Adanur, S., and Onal, L., "Analysis of a Novel 3D Hybrid Woven/Knitted Fabric Structure, Part II: Mechanical Model to Predict Modulus and Extension", Textile Research Journal, 74(10), 865-871, October 2004.
- Onal, L., and Adanur, S., "Analysis of a Novel 3D Hybrid Woven/Knitted Fabric Structure, Part I: Geometric Model and Verification", Textile Research Journal, 74(9), 827-832, September 2004.

7. We made the following presentations about this project:

- Onal, L., and Adanur, S., "A Novel 3D Structure, 3D Hybrid Woven/Knitted Fabric", Proceedings of The Fiber Society 2003 Spring Symposium, "Advanced Flexible Materials and Structures: Engineering with Fibers", June 30-July 2, 2003, Loughborough, England.
- Adanur, S., and Onal, L., "Design Characterization of a Novel 3D Hybrid Knitted/Woven Fibrous Structure for Composites", Proceedings of the 2003 NSF Design, Service and Manufacturing Grantees and Research Conference, January 6-9, 2003, Birmingham, AL.

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- Adanur, S., Gumusel., L. and Bas, H., "A Novel 3D Woven-Knit Hybrid Fabric for Composites", Techtextil North America Symposium, April 1-3, 2008, Atlanta, GA.

8. My book entitled "Wellington Sears Handbook of Industrial Textiles" (Technomic/CRC Press, 1995) includes a chapter on knitting technology and knitted fabrics. I am currently in the process of updating this handbook.

9. I have attended many ATME-I (American Textile Machinery Exhibition-International) textile machinery shows in the USA, ITMA machinery shows (International Textile Machinery Association) in Europe (Milan, Paris, Birmingham, Munich), and TechTextil show in China. In these shows, I kept myself up to date with the latest developments in textile machinery and fabrics, including knitting machinery and knitted fabrics. As a result, I have a large collection of knitting machine brochures and knitted fabric samples, which I use in my classes.

10. Between 2008-2011, I was retained as an expert witness by a textile company in a case involving knitted fabric structures. Earlier, I did consulting work for Eaton Corp., Milwaukee in woven and knit reinforcements for composites. I also did consulting work for Hoechst Celanese, Spartanburg, SC in developing a warp knitted structure using elastomeric monofilament fiber.

11. I am being compensated at my normal consulting rate of $220 per hour for my time spent in preparing this declaration. I am being separately

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15. In addition to the materials I have referenced, I discussed with Dr. Edward Frederick the standard of a person of ordinary skill in the art at the time the '011 patent was filed, the proposed constructions of certain claim terms discussed in my declaration, as well as the motivation that such a person would have to modify flat knit textiles that are formed as part of a larger structure to include "knit to shape" flat knit textiles.

III. Person of Ordinary Skill in the Art

16. It is my opinion that the person of ordinary skill in the art at the time of the invention for the '011 patent would have at least several years' experience with all aspects of shoemaking from the conceptual stage through design, development, commercialization, and manufacturing, including basic knowledge of the functional requirements of footwear and a comprehensive understanding of the range of material choices, as well as construction techniques and processes used to create the various types of a shoe and to assemble them in a proper manner. For example, such a person would have the skills and capabilities to identify knitting machines, knitted fabric structures and their major properties. I have assumed that the time of invention is around the filing date of the '011 patent, March 2004.

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17. I have an understanding of the capabilities of the skilled person in this field, which I have confirmed through my discussion with Dr. Frederick, and my comments and opinions are provided from the perspective of such a person.

IV. Principles of Claim Construction, Anticipation, and Obviousness

18. I have been informed that in an *inter partes* review, claim terms are given their broadest reasonable interpretation that is consistent with the patent specification in which they appear. I also understand that limitations from the specification are not to be read into the claims.

19. I understand that a patent claim is invalid as anticipated under 35 U.S.C. § 102 if every element of a claim is found expressly, implicitly, or inherently in a reference.

20. I also understand that a patent claim may not be obtained though the invention is not identically disclosed or described in a reference, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious under 35 U.S.C. § 103(a) at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

21. I understand that there should be some articulated reasoning with some rational underpinning as to why the prior art references render the patent

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the industry understanding that tricot and milanese warp-knit fabrics are knit in flat form. (Ex. 2011, p. 6.)

33. Warp Knit Fabrics Technologies, a reference book written in 2007 and which is contemporaneous with the '011 patent, states that "[i]n the industry, some people refer to weft knitting machines as flat machines and warp knit machines as circular machines, but in reality there are flat and circular warp as well as weft knit machines." (Ex. 1018, p. 9.)

34. U.S. Patent No. 6,984,596, which is also contemporaneous with the '011 patent, includes a similar definition of "flat knit" (i.e., "a knitted fabric made on a flatbed-knitting frame as distinguished from tubular fabric made on a circular frame") to describe a warp knit construction produced on a conventional flat knitting machine. (Ex. 1022, 2:57-3:7.)

VI. Proposed Constructions of "Flat Knit Textile Element" and "Flat Knit Edges"

35. Substitute claim 47 recites an article of footwear that comprises "an upper incorporating a flat knit textile element." Although the '011 patent describes flat knitting as a sub-type of weft knitting, the specification does not define "flat knit," "flat knit textile," or "flat knitting," or otherwise state that flat knitting is exclusively a sub-type of weft knitting. (Ex. 1015, pp. 34-36.)

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36. Because it is well-known in the knitting industry that other types of knit structures (such as tricot and milanese) may be knit in flat form (whether by a flat knitting machine or by hand), when the term "flat knit textile element" is given its broadest reasonable interpretation that is consistent with the '011 patent specification, the term "flat knit textile element" means "a knitted textile that is knit in flat form." This proposed construction is consistent with the plain and ordinary meaning, and also does not introduce any particular method of production into the claim since the claim itself does not recite that the flat knit textile element be produced in any specific way.

37. In summary, I have prepared Table 2, which shows the types of knitted materials that a skilled person at the time the '011 patent was filed would understand to be included within the term "weft knitted textile element" under its broadest reasonable interpretation that is consistent with the '011 patent specification (as indicated with vertical lines), and shows the types of knitted materials that a skilled person would understand to be included within the term "flat knit textile element" under its broadest reasonable interpretation that is consistent with the '011 patent specification (as indicated with horizontal lines). The checkered pattern indicates types of knitted materials that a skilled person would understand to be included within both terms under the broadest reasonable interpretation that is consistent with the '011 patent specification.

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Table 2 Comparison of claim term constructions

		Arrangement of Needles in the Knitting Machine	
		In one line (flat)	In a circle (circular)
Direction of thread	Lengthwise in the fabric (warp)		
	Diagonal in the fabric (milanese)		
	Crosswise in the fabric (weft)		

- Vertical lines illustrate materials encompassed by broadest reasonable interpretation of "weft knitted textile element."
- Horizontal lines illustrate materials encompassed by broadest reasonable interpretation of "flat knit textile element."
- Checkered pattern illustrate materials encompassed by broadest reasonable interpretation of both terms.

38. Substitute claim 47 also recites that the flat knit textile element has "flat knit edges." The '011 patent does not define "flat knit edges." (Tonkel Dep. Tr., Ex. 1015, p. 95.) As described above, when "flat knit" is given its broadest reasonable interpretation that is consistent with the '011 patent specification, "flat knit" means "knit in flat form." Therefore, "flat knit edges," when given its broadest reasonable interpretation that is consistent with the '011 patent specification, means "edges of a knitted textile that are knit in flat form." This proposed construction is also consistent with the plain and ordinary meaning, and also does not introduce any particular method of production of the edge into the

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claim since the claim itself does not recite that the flat knit edge be produced in any specific way.

VII. Conclusion

39. In signing this declaration, I recognize that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross examination in the case and that cross examination will take place within the United States. If cross examination is required of me, I will appear for cross examination within the United States during the time allotted for cross examination.

40. I reserve the right to supplement my opinions in the future to respond to any arguments raised by the owner of the '011 patent and to take into account new information as it becomes available to me.

41. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

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SABIT ADANUR
Professor
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Phone: (334) 844-5497, Fax: (334) 844-4068
e-mail: adanusa@eng.auburn.edu, http://www.eng.auburn.edu/~adanusa

1. EDUCATION

June 1989	Ph.D. in Fiber and Polymer Science North Carolina State University, Raleigh, North Carolina.
Dec. 1985	M.S. in Textile Engineering and Science North Carolina State University, Raleigh, North Carolina.
July 1982	B.S. in Mechanical Engineering Istanbul Technical University, Istanbul, Turkey.

PROFESSIONAL EXPERIENCE

Oct. '00 – Present	Professor Auburn University, Polymer and Fiber Engineering Department, Auburn, Alabama.
Oct. '96 – Sept. '00	Associate Professor Auburn University, Textile Engineering Department, Auburn, Alabama.
Sep. '92 - Sep. '96	Assistant Professor Auburn University, Textile Engineering Department, Auburn, Alabama.
Nov. '89-Aug '92	Product and Process Development Manager Asten Forming Fabrics, Inc., Appleton, Wisconsin.
July '89-Oct. '89	Process Development Engineer Asten Forming Fabrics, Inc., Appleton, Wisconsin.
Aug. '83-Jun. '89	Research/Teaching Assistant North Carolina State University, Raleigh, North Carolina.

Litigation Support Experience

1) I gave a deposition in a case involved Asten Forming Fabrics and their competitor regarding a patent infringement case regarding a forming fabric design, Opelika, AL, mid 1990s.

2) I was retained by Sulzer Textile as an expert in a lawsuit with Picanol in a patent infringement case involving air-jet weaving machine operations, 2000-2001. There was a jury trial of more than a week in September 2001 in Tyler, Texas.

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3) I was retained as an expert by Southern Mills against Polartec in a patent infringement case regarding fire resistant fleece knit fabric and garment, Atlanta, GA, 2008.

Professional Development Activities

- Attended the Biggio Seminar "Engaging Students in Active Learning", 14 February 2013, Biggio Center, Auburn University.
- Attended the tutorial "Canvas Orientation", Sept. 20, 2011, Auburn University.
- Attended the workshop "Introduction to Performance Tasks", by [Cla]ssroom Academy, 15-16 August, 2011, Auburn, AL.
- Completed the Alabama Ethics Law Training, March 31, 2011.
- Developing Online Courses (July 14, 2010)
- Teaching with Powerpoint 2007 (July 13, 2010)
- Attended the Biggio Seminar, "Writing to Learn and Learning to Write", by Alyson Whyte, 13 Nov. 2008
- Attended the Biggio Seminar,"Nurturing the Expectancy Effect", March 11, 2008.

2. ASSIGNED DUTIES FOR THE PAST FIVE YEARS (average)

Quarter	Teaching (%)	Research (%)	Extension/Service (%)
Summers	0	92	8
Academic	63	32	5

3. HONORS AND AWARDS

- Our Poster entitled "Activated carbon fiber filter media for proton exchange membrane fuel cell cathode" by Liu, W. and Adanur, S., won the best poster award at the Fiber Society Meeting in Shanghai, China, June 2009.
- My graduate student Mr. Erdem Selver was chosen as one of the ten Outstanding Master's Students at Auburn University for 2008-2009 by the AU Graduate Council.
- Outstanding Faculty Award, Department of Polymer and Fiber Engineering, 2008-2009
- Best poster presentation for the NSF Research Experience for Undergraduates (REU) Program in Micron/Nano-Structured Materials, Therapeutics and Devices. Title: Addition of Nanoparticles to Electrospun Nanofibers. Authors: Roxanne Guarin, Wei Liu and Sabit Adanur. Auburn REU Fellows Research Poster Session, July 31, 2008. There were 10 undergraduate students from different parts of the US in this program who spent their summers in Auburn.
- Outstanding Faculty Award, Department of Polymer and Fiber Engineering, 2007-2008
- Outstanding Teacher Award, Department of Textile Engineering, 2002-2003.
- Outstanding Teacher Award, Department of Textile Engineering, 2001-2002.
- Auburn Alumni Professor Award (1999 – 2004).
- Outstanding Teacher Award, Department of Textile Engineering, 2000-2001.
- AU College of Engineering Birdsong Merit Teaching Award 2000
- Outstanding Teacher Award, Department of Textile Engineering, 1999-2000.
- Auburn Alumni Engineering Council Senior Faculty Research Award, 1999.
- My graduate student Mr. Baohua Xu is awarded the academic excellence award for international students (June 1998).

- Nominated two years in a row (1997 and 1998) as a potential participant in the National Academy of Engineering (NAE)'s Third and Fourth Annual Symposiums on Frontiers of Engineering, Irvine, CA.
- 1995 NSF Faculty Early Career Development (CAREER) Award, National Science Foundation, $ 210,000.00, duration: 4 years (Sept. 1, 96-Aug. 31, 2000).
- Nominated by Dr. William V. Muse two years in a row (1994 and 1995) to represent Auburn University in highly prestigious National Science Foundation, Presidential Faculty Fellows Award competition (only two candidates can be nominated by an institution).
- 1991 George Goldfinger Award. "This award is presented to the graduate of the North Carolina State University, College of Textiles, Fiber and Polymer Science Program who was judged to have submitted the most outstanding Ph.D. thesis over the past two years".

4. SCHOLARLY CONTRIBUTIONS

4. A. TEACHING

4.A.1 Courses Taught for the Past Five Years

ENGR 1110	Introduction to Engineering
FBEN 2250	Fabric Design and Engineering
PFEN 2270	Introduction to Engineered Fibrous Materials
PFEN 3200	Polymer Processing
PFEN 3300	Fibrous Product Testing and Instrumentation
TXTN 3450	Technical Textiles
PFEN 4300	Engineered Fibrous Structures
PFEN 4820	Senior Design
PFEN 5100	Fabrics for Papermaking
PFEN 6100	Fabrics for Papermaking
PFEN 6106	Fabrics for Papermaking (outreach)
PFEN 6250	Advanced Eng. Fibrous Str.
PFEN 7960	Adv. Polymer Processing lab
PFEN 7970	Advanced Polymer Processing
PFEN 7990	Research and Thesis
PFEN 7210	Fabric Formation and Properties
PFEN 7960	Special Problems in Polymers and Fibers
PFEN 7970	Special Topics
PFEN 7980	Graduate Project
PFEN 7990	Research and Thesis
PFEN 8200	Adv Textl Struct Desi & Develop
ITAS 8990	Research and Dissertation

4.A.2 Graduate Students Whose Work Has Been Completed

Students for Whom The Candidate Served as Major Professor

Student	Degree	Chair	Department	Graduation Date	Current Employer
Meeks, S. B.	MS	Dr. Adanur	PFEN	May 2012	Interviewing
Zheng, H.	MS	Dr. Adanur	PFEN	Dec. 2010	Graduate Student
Gocek, I.	PhD	Dr. Adanur	PFEN	May 2010	Istanbul Technical Univ.
Keskin, R.	PhD	Dr. Adanur	PFEN	May 2010	Pamukkale University

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Liu, W.	PhD	Dr. Adanur	PFEN	May 2010	A company in IL
Selver, E.	MS	Dr. Adanur	PFEN	May 2010	PhD Student/England
Liu, W.	MPFEN	Dr. Adanur	PFEN	May 2009	AU PhD student
Isikel, L.	MS	Dr. Adanur	PFEN	May 2007	A company in Turkey
Irsale, Swagat J.	PhD	Dr. Adanur	PFEN	Dec. 2005	Nexus Software Sol,Inc., MN
Ascioglu, Birgul	PhD	Dr. Adanur	PFEN	Aug. 2005	Valeo, Inc., Bursa, Turkey
Irsale, Swagat J.	MS	Dr. Adanur	Textile Eng.	Dec. 2003	Nexus Software Sol, Inc., PA.
Hughes, Kevin	MTE	Adanur/Tippur	Textile Eng.	May 2005	GKN Aerospace
Vakalapudi, Sathendra	MS	Dr. Adanur	Textile Eng.	Aug. 2003	Detroit (software co.)
Onal, Levent	PhD	Dr. Adanur	Textile Eng.	May 2002	Erciyes University
Turel, Tacibaht	MS	Dr. Adanur	Textile Eng.	Aug. 2002	PhD, Consumer Aff.
Tascan, Mevlut	MS	Dr. Adanur	Textile Eng.	May 01	PhD, Clemson Univ.
Orak, Hakan	MS	Adanur/Tippur	Textile Eng.	May 01	PhD, Clemson Univ.
Kayathi, K. K.	MS	Dr. Adanur	Textile Eng.	January 01	India
Xu, BaoHua	MS	Dr. Adanur	Textile Eng.	Aug. 99	PhD Student, TE
Arumugam, Yuvaraj	MS	Dr. Adanur	Textile Eng.	July 98	Goodyear Tire Co.
Qi, Jing	MS	Dr. Adanur	Textile Eng.	May 98	Grad Student in EE
Tewari. Ashutosh	MS	Dr. Adanur	Textile Eng.	Dec. 97	California Co.
Hou, Zhenwei	MS	Dr. Adanur	Textile Eng.	Dec. 97	PhD Candidate
Gongalareddy, Sreekanth	MS	Dr. Adanur	Textile Eng.	Dec. 96	Telecom., Atlanta
Mallick, Sumita B.	MS	Dr. Adanur	Textile Eng.	Aug. 96	PhD (Boston Univ.)
Zhai, Honglian	MS	Dr. Adanur	Textile Eng.	Aug. 96	TCOM, Maryland
Yuksekkaya, M. Emin	MS	Dr. Adanur	Textile Eng.	June 96	Prof., Usak U., Turkey
Tsao, Yen P.	MS	Dr. Adanur	Textile Eng.	Dec. 95	Taiwan
Tam, Chi-Wen	MS	Dr. Adanur	Textile Eng.	March. 95	Taiwan
Sartain, Stephen L.	MS	Dr. Adanur	Textile Eng.	Dec. 94	Own automotive business

Others:

Inan, Gunes	PhD	Dr. Adanur	Textile Eng.	Aug. 04-Dec. 04
Kilinc, F. Selcen	PhD	Dr. Adanur	Textile Eng.	Aug. 00 – Dec. 01
Unsal, Evren	PhD	Dr. Adanur	Textile Eng.	Aug. 00-Feb. 01
Xu, BaoHua	PhD	Dr. Adanur	Textile Eng.	June 99 – Dec. 99
Zhenwei Hou	PhD	Dr. Adanur	Textile Eng.	Jan. 99 – Sept. 99
Mallick, Sumita B.	PhD	Dr. Adanur	Civil Eng.	Aug. 96 – Aug. 98
Nalamati, R. Kumar	MS	Dr. Adanur	Mech. Eng.	Sept. 95- April 96

Students for Whom The Candidate Served as Committee Member

Student	Degree	Chair	Department	Graduation Date	Current Employer
Blackwell, C.	MPFEN	Dr. Thomas	PFEN	Dec. 2012	CSP
Liu, Yang	MS	Dr. Zhang	PFEN	Fall 2011	PhD student at AU
Quinones ,Vladimir	PhD	Dr. Thomas	PFEN	Spring 2011	Post-doc at AU
Luna, Eric	PhD	Dr. Tatarchuk	Chemical Eng.	Summer 2009	Syngenta Crop P., NC
Anthony, Rebecca	MPFEN	Dr. Thomas	PFEN	Spring 2009	Unknown

Hasan Kocer	M.S.	Dr. Broughton	PFEN	Fall 2007	PhD student ITAS
Ray, Rebecca	M.S.	Dr. Thomas	PFEN	Fall 2006	Unknown
Ma, Erjian	PhD	Dr. Jang	Materials Eng.	Spring 01	Unknown
McCarthy, P. J.	MCE	Dr. Elton	Civil Eng.	Spring 96	Denver, CO
Xiao, Liming	PhD	Dr. Yang	Materials Eng.	Spring 98	Postdoc, AU EE
Hunt, Rich	MS	Dr. Nelms	Electrical Eng.	June 97	Unknown
Kirkpatrick, C. T.	MS	Dr. Jang	Materials Eng.	Spring 97	California Company
Kotha, S.	MS	Dr. Gowayed	Textile Eng.	Spring 97	India
Xi, Xiaomei	PhD	Dr. Yang	Materials Eng.	Aug. 96	California Company
Zhang, Qiang	PhD	Dr. Beale	Mechanical Eng.	Jan. 96	A Comp. in Maryland
Vickers, Daniel	MS	Dr. Beale	Mechanical Eng.	March 95	FMP/Rauma

Students for Whom the Candidate Served as Outside Reader

Student	Degree	Chair	Department	Defense Date
Donath, Gregory W.	PhD	Dr. Duke	Chemical Eng.	Nov. 10, 2008
Ajitsaria, Jyoti K.	PhD	Dr. Choe	Mech. Eng.	Aug. 29, 2008
Butts, Daniel Alan	PhD	Dr. Gale	Materials Eng.	May 9, 2005
ElBashir, Nimir	PhD	Dr. C. Roberts	Chemical Eng.	Nov 15. 2004
Gopalakrishnan, M.	PhD	Dr. ElHalwagi	Chemical Eng.	May 21, 2002
Noureldin, M.	PhD	Dr. ElHalwagi	Chemical Eng.	Oct.12, 00
Patil, A. R.	PhD	Dr. Crocker	Mechanical Eng.	Sept. 11, 00
Park, Y.	PhD	Dr. Roberts	Chemical Eng.	July 20, 00
Shelley, M. D.	PhD	Dr. El-Halwagi	Chemical Eng.	Apr. 20, 00
Abdo, Z. A. M.	PhD	Dr. Gale	Materials Eng.	Dec. 3, 99
Garrison, W.	PhD	Dr. El-Halwagi	Chemical Eng.	May 8, 97
Yim, J. H.	PhD	Dr. Jang	Materials Eng.	Apr. 25, 97
Hamad, A. A.	PhD	Dr. El-Halwagi	Chemical Eng.	Apr. 21, 97
Mallick, R. B.	PhD	Dr. Brown	Civil Eng.	Apr. 8, 97
Zhao, Li-Ren	PhD	Dr. Jang	Materials Eng.	Feb. 26, 96
Haque, Anwarul	PhD	Dr. Raju	Mechanical Eng.	Oct. 10, 95
Yim, Jong H.	PhD	Dr. Jang	Materials Eng.	April 25, 95

4.A.3 Graduate Students on Whose Committee the Candidate is Presently Serving

Students for Whom the Candidate is Serving as Major Professor

Student	Degree	Chair	Department	Date Started
Shen, Yang	M.S.	Dr. Adanur	PFEN	Fall 2012
Cermik, Ozdes	Ph.D.	Marghitu/Adanur	ME	Fall 2010

Students for Whom the Candidate is Serving as Committee Member

Student	Degree	Chair	Department	Date Started

Smith, James	MS	Dr. Zhang	PFEN	May 2012
Wang, Xialong	MS	Dr. Zhang	PFEN	Fall 2011
White, Charles J.	PhD	Dr. Byrne	CHEN	Spring 2012
Cermik, Ozdes	MS	Dr. Marghitu	ME	Fall 2010
Poyraz, Selcuk	PhD	Dr. Zhang	PFEN	Fall 2008
Liu, Yang	MS	Dr. Zhang	PFEN	Fall 2010
Liu, Zhen	PhD	Dr. Zhang	PFEN	Spring 2009
Chandler, Mark	MS	Dr. Thomas	Textile Eng.	Fall 2001
Zhou, Fangfang	PhD	Dr. Jang	Materials Eng.	Winter 2000

Visiting Scholars/Students Supported

Name	Origin	Duration
Ms. Roxanne Guarin	Undergraduate student from Univ. of Mass-Amherst	May 21, 2008- July 31, 2008
Ms. Stacy Yee	Undergraduate student from Univ. of Michigan	May 21, 2007- July 27, 2007
Ms. Christina Yacoob	Undergraduate student from SUNY Buffalo	May 29, 2006-Aug. 4, 2006
Dr. Levent Gumusel	Turkey	Jan. – Feb. 2005, Jan. 2006
Dr. Hasan Bas	Turkey	Jan. – Feb. 2005, Jan. 2006
Ms. Abibe Maimaiti	China	Sept. 2001-Sept. 2002
Dr. Gulay Ozcan	Turkey	January 01 – February 01
Dr. Tianyi Liao	China	Aug. 96 - March 99.
Dr. Sule Altun	Turkey	July 99-Sept. 99

4.A.4 Courses and Curricula Developed

New Undergraduate Courses Developed:

Dr. Adanur has developed the following courses which did not exist before.

1. PFEN 3200 Polymer Processing
2. ENGR 1110 Introduction to Polymer and Fiber Engineering
3. PFEN 3300 Fibrous Product Testing and Instrumentation
4. PFEN 4300 Engineered Fibrous Structures
5. PFEN 5100/6100 Fabrics for Papermaking
6. TXTN 3450 Technical Textiles
7. TE 225 Fabric Design and Manufacturing
8. TE 460 Mechanics of Textile Manufacturing Processes and Systems

New Graduate Courses Developed:

1. PFEN 7210 Fabric Formation and Properties
2. PFEN 6250 Advanced Engineering Fibrous Structures
3. PFEN 8200 Advanced Textile Structure Design and Development

4.A.5 Grants Received Related to Teaching (Total $ 241,864.00; see also 4.B.8)

1. Adanur, S., Graduate Outreach Program (GOP) Grant, $135.00, Spring 2009.

2. Two injection molding machines were donated to polymer processing lab by ThermoFisher Scientific of Auburn, May 2007, $9,000.00.

3. Travel fund for the ITMA 2003, Birmingham, England.
Funding Agent: Highland Takata Industries
Amount: $ 3,428.92
Duration: Oct. 21-30, 2003.

4. Developing a Course Based on Equipment Design for Introduction to Engineering
Funding Agent: AU College of Engineering
Amount: $ 24,050
PI: P. Jones (leader), C. A. Flood, S. Adanur
Duration: June 1, 1999-May 31, 2000

5. Title: Travel fund for IFAI Expo 1999, San Diego, CA.
Funding Agent: Highland Takata Industries
Amount: $ 4,000.00
PI: W. Walsh, S. Adanur, R. Broughton, Y. ElMogahzy
Duration: Oct. 28-30, 1999.

6. Title: Travel fund for Messe Frankfurt Industrial Textiles Fair, Frankfurt, Germany
Funding Agent: Highland Takata Industries
Amount: $ 4,000.00
PI: S. Adanur (50%), W. Walsh (50%)
Duration: May 11-18, 1998

7. Title: Textile Structural Composites Laboratory
Funding Agent: National Science Foundation, Instrumentation and Laboratory Improvement (ILI)
Amount: $ 87,185.00
PI: S. Adanur (95 %), Co-PIs: W. Walsh, R. Walker, B. Jang
Duration: Sept. 1, 94- Aug. 31, 96
This NSF grant is specifically for undergraduate curriculum development purposes.

8. Title: Wellington Sears Handbook of Industrial Textiles
Funding Agent: Wellington Sears Company, Valley, Alabama.
Amount: $ 60.000.00
PI: Sabit Adanur
Duration: Oct. 1, 93 - March 15, 95.

9. Title : Discretionary Teaching Grant-in-Aid
Funding Agent: Auburn University
Amount: $ 200.00

PI: Sabit Adanur
Duration: Nov. 1, 92 - Apr. 30, 93.

10. Two shuttle looms and a warper were donated to weaving lab by West Point Stevens Company, AL, 1992/1993, $ 50,000.00.

4.A.6 Publications Pertaining to Teaching

Textbooks/Book Chapters

1. Chapter 8 – "Structure and Mechanics of Coated Fabrics", book chapter in "Structure and Mechanics of Fibre Assemblies", edited by Peter Schwartz - Woodhead Publishing Limited and CRC Press LLC, 2008.
2. "Fabrics for Papermaking", first draft of the chapter prepared and submitted for the book, "Technology and Woven Fabrics" edited by Dr. Mansour H. Mohamed, Woodhead Publishing, Ltd.
3. Adanur, S., Wellington Sears Handbook of Industrial Textiles, Technomic Publishing Co., Inc., Lancaster, PA, 1995. Library of Congress Catalog Card No. 95-61229, ISBN No. 1-56676-340-1, 850 pages (519 figures and 140 tables).
4. Adanur, S., Paper Machine Clothing, Technomic Publishing Co., Inc., Lancaster, PA, 1997. Library of Congress Catalog Card No. 97-60981, ISBN No. 1-56676-544-7, 405 pages (338 figures, 55 tables).
5. Adanur, S., Handbook of Weaving, Technomic Publishing Co., Inc., 2001. Library of Congress Catalog Card No. 00-107625, ISBN No. 1-58716-013-7. 446 pages (539 Figures, 52 Tables).

Lecture Notes (Bound)

1. TE 425 Technical Textiles, Lecture Notes, Auburn University, 191 pages.
2. TE 460 Mechanics of Textile Manufacturing Processes and Systems, Lecture Notes, Auburn University, 154 pages.

4.A.7 Other Contributions to Teaching

- Accreditation Board for Engineering and Technology (ABET) Accreditation of Textile Engineering program in 1998 and Fiber Engineering program in 2004 (ABET Coordinator)
- Semester Transition (was responsible for the quarter to semester transition for the curriculums in the Department of Textile Engineering).
- Expansion of Master's Program (actively participated in expanding the Masters program in the Department. There were not adequate graduate level courses that covered certain aspects of the Master of Science program in Textile Engineering. Developed four new graduate level courses for this purpose).
- Establishment of Ph.D. Program (was a member of the Textile Engineering Department Committee to establish a joint Ph.D. program with the Consumer Affairs Department).

Establishment of High Performance Materials Laboratory

Dr. Adanur has established an industrial textiles/composites laboratory in the Department. The lab is equipped with state of the art equipment and is being used for teaching. Besides teaching, the laboratory provides an excellent opportunity for undergraduate and graduate students in their projects and independent studies. The lab will strengthen the University's interaction with industry. A new Instron was purchased and installed in the lab. Dr. Adanur received funding from National Science Foundation for a computerized braiding machine which has been installed in the lab. He

has purchased and installed a new compression molding machine and Dynatup impact testing machines with the NSF EPSCoR funding. The value of these machines is around $ 600,000.00.

4.B RESEARCH / CREATIVE WORK

4.B.1 Books/Book Chapters (See 4.A.6)

1. Chapter 8 – "Structure and Mechanics of Coated Fabrics", book chapter in "Structure and Mechanics of Fibre Assemblies", edited by Peter Schwartz - Woodhead Publishing Limited and CRC Press LLC, 2008.
2. "Fabrics for Papermaking", first draft of the chapter prepared and submitted for the book, "Technology and Woven Fabrics" edited by Dr. Mansour H. Mohamed, Woodhead Publishing, Ltd.
3. Adanur, S., Wellington Sears Handbook of Industrial Textiles, Technomic Publishing Co., Inc., Lancaster, PA, 1995. Library of Congress Catalog Card No. 95-61229, ISBN No. 1-56676-340-1, 850 pages (519 figures and 140 tables).
4. Adanur, S., Paper Machine Clothing, Technomic Publishing Co., Inc., Lancaster, PA, 1997. Library of Congress Catalog Card No. 97-60981, ISBN No. 1-56676-544-7, 405 pages (338 figures, 55 tables).
5. Adanur, S., Handbook of Weaving, Technomic Publishing Co., Inc., 2001. Library of Congress Catalog Card No. 00-107625, ISBN No. 1-58716-013-7. 446 pages (539 Figures, 52 Tables).

4.B.2 Article-length Publications

Refereed Journal Articles (*: student)

1. Adanur, S., and Liu, W., "Desulfurization Properties of Modified Activated Carbon Fibers and Activated Carbon Fiber Paper", submitted to the Journal of Industrial Textiles, 28 Feb. 2013, 14 pages; accepted: August 5, 2013; Galley proofs were sent August 22,2013.
2. Liu, W*., and Adanur, S., Desulfurization Properties of Activated Carbon Fibers, submitted to the Journal of Engineered Fibers and Fabrics, 21 Feb. 2013, 6 pages. Accepted: March 12, 2013.
3. Adanur, S., and Zheng, H*., "Synthesis and Characterization of Sulfonated Polyimide Based Membranes for Proton Exchange Membrane Fuel Cells", Journal of Fuel Cell Science and Technology, Aug. 2013, Vol. 10, 041001, pp. 1-5.
4. Liu, W*., Yee, S*., and Adanur, S., "Properties of Electrospun PVA/nanoclay Composites", Journal of the Textile Institute, 2013, http://www.tandfonline.com/doi/abs/10.1080/00405000.2013.819156
5. Adanur, S., and Vakalapudi, J. S*., "Woven Fabric Design and Analysis in 3D Virtual Reality, Part 1: Computer Aided Design and Modeling of Interlaced Structures", Journal of the Textile Institute, **DOI:** 10.1080/00405000.2012.753698, published January 10, 2013.
6. Gocek, I*., and Adanur, S., "Effect of Processing Parameters on Polypropylene Film Properties", International Journal of Modern Engineering Research (IJMER), Vol. 2, Issue 5, Sep.-Oct. 2012, pp. 3056-3060.
7. Gocek, I*., and Adanur, S., "Effect of Nanoclay Amount and Compatibilizer Presence on Thermal, Morphological and Mechanical Behaviour of Nanoclay Reinforced Composite Polypropylene Cast Film", Materials Testing, 54 (2012) 5, pp. 318-329 (German/English).
8. Adanur, S., and Vakalapudi, J. S., "Woven Fabric Design and Analysis in 3D Virtual Reality, Part 2: Predicting Fabric Properties with the Model", Journal of the Textile Institute (DOI:10.1080/00405000.2012.745236, published 3 December 2012).

9. Adanur, S., and Selver, E., "Nanoclay/Polypropylene Composite Monofilament Processing and Properties using Twin and Single Screw Extruders", International Journal of Polymeric Materials (published 5/17/2012: http://www.tandfonline.com/doi/abs/10.1080/00914037.2011.641696).
10. Keskin, R*., and Adanur, S., "Improving Toughness of Polypropylene with Thermoplastic Elastomers in Injection Molding", Polymer-Plastics Technology and Engineering, 50:20-28, 2011 (January 2011).
11. Selver, E*., and Adanur, S., "Processing and Property Relationship of Nanoclay Reinforced Polypropylene Monofilaments, Journal of Industrial Textiles", Vol. 40, No. 2, Oct. 2010, pp. 123-137.
12. Isikel, L*., Gocek, I*., and Adanur, S., "Design and Characterization of Nonwoven Fabrics for Gas Diffusion Layer in Polymer Electrolyte Membrane Fuel Cell", The Journal of the Textile Institute, Vol. 101, No. 11, Nov. 2010, pp. 1006-1014.
13. Yacoob, C*., Liu, W.*, and Adanur, S., "Properties and Flammability of Electrospun PVA and PVA/Laponite® Membranes", Journal of the Industrial Textiles, Vol. 40, No. 1., July 2010, pp. 33-48.
14. Liu, W*., and Adanur, S., "Properties of Electrospun Polyacrylonitrile Membranes and Chemically-Activated Carbon Nanofibers", Textile Research Journal, Vol. 80(2), pp. 124-134, Jan. 2010.
15. Ascioglu, B*., Adanur, S., Gumusel, L., and Bas, H., "Transverse Direction Thermal Conductivity Modeling of Nano-micro Fiber Reinforced Composites", Textile Research Journal, Vol. 79 (12), 2009, pp. 1059-1066.
16. Yuksekkaya, M. E*., and Adanur, S., "Analysis of Polymeric Braided Tubular Structures Intended for Medical Applications", Textile Research Journal, 2009; Vol. 79, No. 2, pp. 99-109.
17. Yuksekkaya, M.E.*, Thomas, H., and Adanur, S., "Influence of the Fabric Properties on Fabric Stiffness for the Industrial Textiles", Tekstil and Konfeksiyon (English), April 2008, pp. 263-267.
18. Adanur, S., and Qi, J*., "Property Analysis of Denim Fabrics Made on Air-Jet Weaving Machine, Part 2: Effects of Tension on Fabric Properties", Textile Research Journal, Vol. 78(1), Jan. 2008, pp. 10-20.
19. Adanur, S., and Qi, J*., "Property Analysis of Denim Fabrics Made on Air-Jet Weaving Machine, Part 1: Experimental System and Tension Measurements", Textile Research Journal, Vol. 78(1), Jan. 2008, pp. 3-9.
20. Adanur, S., and Ascioglu, B.*, "Nanocomposite Fiber Based Web and Membrane Formation and Characterization", Journal of Industrial Textiles, Vol. 36, No. 4, April 2007, pp. 311-327.
21. Elton, D. J., Hayes, D. W.*, and Adanur, S., "Bubblepoint Testing of Geotextiles: Apparatus and Operation", American Society for Testing Materials (ASTM) Geotechnical Testing Journal, Vol. 30, No. 1, Jan. 2007.
22. Onal, L.*, and Adanur, S., "Modeling of Elastic, Thermal and Strength/Failure Analysis of 2D Woven Composites – A Review", Applied Mechanics Reviews (AMR), Vol. 60, Issue 1, pp. 37-49, Jan. 2007.
23. Irsale, S.*, and Adanur, S., "Design and Characterization of Polymeric Stents, Journal of Industrial Textiles, Vol. 35, No. 3, January 2006, pp. 189-199.
24. Onal, L.*, and Adanur, S., "Optimization of Compression Molding Process in Laminated Woven Composites", Journal of Reinforced Plastics and Composites", Vol. 24, No. 7, 2005, pp. 775-780.
25. Adanur, S., and Onal, L.*, "Analysis of a Novel 3D Hybrid Woven/Knitted Fabric Structure, Part II: Mechanical Model to Predict Modulus and Extension", Textile Research Journal, 74(10), 865-871, October 2004.
26. Onal, L.*, and Adanur, S.,, "Analysis of a Novel 3D Hybrid Woven/Knitted Fabric Structure, Part I: Geometric Model and Verification", Textile Research Journal, 74(9), 827-832, September 2004.
27. Adanur, S., and Turel, T.*, "Effects of Air and Yarn Characteristics in Air-Jet Filling Insertion, Part II:Yarn Velocity Measurements with a Profiled Reed", Textile Research Journal, 74(8), 657-661, August 2004.

28. Adanur, S., "Dynamic Analysis of Air-Jet Filling Insertion: Effect of Timing on Air and Yarn Velocity", Developments in Theoretical and Applied Mechanics, Eds. H. Mahfuz and M. V. Hosur, Vol. XXII, 2004, pp. 202-207.
29. Turel, T.*, Bakhtiyarov, S., and Adanur, S., "Effects of Air and Yarn Characteristics in Air-Jet Filling Insertion, Part I: Air Velocity and Air Pressure Measurements", Textile Research Journal, 74(7), 592-597, July 2004.
30. Adanur, S., Mcclain, A., and Xu, B.*, "A Novel Approach to Fast Net-Shape Manufacturing of Braided Epoxy Composites", Journal of Elastomers and Plastics, Vol. 35, No. 3, July 2003.
31. Adanur, S., and Arumugham, Y.*, "Characteristics of Ultraviolet Cured Glass/Epoxy Composites, Part 2: Results and Discussion", Journal of Industrial Textiles, Vol. 32, No. 2, October 2002, pp. 107-118.
32. Adanur, S., and Arumugham, Y.*, "Characteristics of Ultraviolet Cured Glass/Epoxy Textile Composites, Part 1: Experimental Procedures and Testing", Journal of Industrial Textiles, Vol. 32, No. 2, October 2002, pp. 93-106.
33. Onal, L.*, and Adanur, S., "Effect of Stacking Sequence on the Mechanical Properties of Glass/Carbon Hybrid Composites Before and After Impact", Journal of Industrial Textiles, Vol. 31, No. 4, April 2002, pp. 255-271.
34. Adanur, S., and Onal, L.*, "Factors Affecting the Mechanical Properties of Laminated Glass/Graphite-Epoxy Hybrid Composites", Journal of Industrial Textiles, Vol. 30, No. 3, January 2002.
35. Elton, D. J., Mohamed, T.*, and Adanur, S., "BubblePoint and AOS Testing of Geotextiles", Proceedings of the Geosynthetics Conference, 2001, Portland, Oregon, Feb. 12-14, 2001.
36. Yang*, B. (30%), Kozey, V. (30%), Adanur, S. (20%), and Kumar, S. (20%), "Bending, Compression and Shear Behavior of Woven Glass Fiber-Epoxy Composites", Composites: Part B: Engineering, 31 (2000), pp. 715-721.
37. Liao, T. (50%), and Adanur, S. (50%), "3D Structural Simulation of Tubular Braided Fabrics for Net-Shape Composites", Textile Research Journal, 70(4), pp. 297-303, April 2000.
38. Vickers, A. D. (30%), Beale, D. G. (40%), Wang, Y. T. (15%), and Adanur, S. (15%), "Analysis of Yarn-to-Surface Friction Via Data Acquisition and Digital Imaging Techniques", Textile Research Journal, 70(1), 36-43, January 2000.
39. Adanur, S. (50%), and Liao, T. (50%), "Fiber Arrangement Characteristics and Their Effects on Nonwoven Tensile Behavior", Textile Research Journal, 69(11), 816-824, Nov. 1999.
40. Bakhtiyarov, S. (50%), and Adanur, S. (50%), "Airflow over Wavy Yarn in Air-jet Filling Insertion", Mathematical & Computational Applications, Vol. 4, No. 1, pp. 1-7, 1999.
41. Adanur, S. (50%), and Bakhtiyarov, S. (50%), "Numerical Study of Collision Efficiency of Dust Particles", Mathematical & Computational Applications, Vol. 4, No. 1, pp. 297-303, 1999.
42. Liao, T. (50%), and Adanur, S. (50%), "Computerized Failure Analysis of Nonwoven Fabrics Based on Fiber Failure Criterion", Textile Research Journal, 69(7), 489-496, July 1999.
43. Zhang, Q. (30%), Beale, D. (50%) , Broughton, R. M. (10%), and Adanur, S. (10%), "Analysis of Circular Braiding Process, Part 2: Mechanics Analysis of the Circular Braiding Process and Experiment", ASME Journal of Manufacturing Science and Engineering, August 1999, Vol. 121, pp. 351-359.
44. Adanur, S. (50%), and Liao, T. (50%), "3D Modeling of Textile Composite Preforms", Composites, Part B: Engineering, 29B (1998), pp. 787-793.
45. Liao, T. (50%), and Adanur, S., (50%)"A Novel Approach to Three Dimensional Modeling of Interlaced Fabric Structures", Textile Research Journal, 68(11), November 1998, pp. 841-847.

46. Adanur, S. (60%), Hou, Z. (20%), and Broughton, R. M. (20%), "Recovery and Reuse of Waste PVC Coated Fabrics, Part 2: Analysis of the Components Separated from PVC Coated PET Fabrics", Journal of Coated Fabrics, Vol. 28, October 1998.
47. Adanur, S. (60%), Hou, Z. (20%), and Broughton, R. M. (20%), "Recovery and Reuse of Waste PVC Coated Fabrics, Part 1: Experimental Procedures and Separation of Fabric Components", Journal of Coated Fabrics, Vol. 28, July 1998, pp. 37-55.
48. Adanur, S. (50%), and Liao, T. (50%), "Computer Simulation of Mechanical Properties of Nonwoven Geotextiles in Soil-Fabric Interaction", Textile Research Journal, 68(3), March 1998, pp. 155-162.
49. Adanur, S. (80%), and Tewari, A.* (20%), "An Overview of Military Textiles", Indian Journal of Fibre & Textile Research (IJFTR), 22(4), December 1997, pp. 348-352.
50. Wang, S*. (50%), Adanur, S. (30%). and Jang, B. Z. (20%), " Mechanical and Thermo-Mechanical Failure Mechanism Analysis of Fiber/Filler Reinforced Phenolic Matrix Composites", Composites Part B, 28B, (1997), pp. 215-231.
51. Liao, T. (50%), Adanur, S. (40%), and Drean, J. (10%),"Predicting the Mechanical Properties of Nonwoven Geotextiles with the Finite Element Method", Textile Research Journal, Vol. 67, No. 10, October 1997, pp. 753-760.
52. Zhang*, Q.(25%), Beale, D. (30%), Adanur, S. (30%), Broughton, R. M. (10%), Walker, R. P. (5%), "Structural Analysis of Two Dimensional Braided Fabric", Journal of the Textile Institute, Vol. 88, Part 1, No. 1, 1997, pp. 41-52.
53. Adanur, S. (80%), and Tam, C. A* (20%)., "On-machine Interlocking of 3D Laminate Structures for Composites", Composites, Part B: Engineering, 28B, 1997, pp. 497-506.
54. Basu Mallick, S.* (50%), Elton (25%), D. J., and Adanur, S. (25%), "An Experimental Characterization of Soil-Woven Geotextile Interface in Large Box Pullout Tests", Geosynthetics, March 1997, pp. 927-940.
55. Adanur, S., (70%) and Bakhtiyarov, S., (30%), "Analysis of Air Flow in Single Nozzle Air-Jet Filling Insertion: Corrugated Channel Model", Textile Research Journal, 66(6), June 1996, pp. 401-406.
56. Mallick, S. B.* (30%), Zhai, H.* (30%), Adanur, S. (25%), and Elton, D. J. (15%), "Pullout and Direct Shear Testing of Geosynthetic Reinforcement: A State of the Art Report", Transportation Research Record, No. 1534, Soils, Geology and Foundations, Transportation Research Board, National Research Council, National Academy Press, Washington, DC, 1996, pp. 80-90.
57. Zhai, H.* (30%), Basu Mallick, S.* (30%), Elton, D. (10%), and Adanur, S. (30%), "Performance Evaluation of Nonwoven Geotextiles in Soil-Fabric Interaction", Textile Research Journal, Vol. 66, No. 4, April 1996, pp. 269-276.
58. Adanur, S. (80%), and Allen*, B. (20%), "First Results on the Effects of ISO 9000 in the United States Textile Industry", Benchmarking for Quality Management and Technology, Vol. 2, No. 3, 1995, pp. 41-52.
59. Adanur, S. (70%), Tsao*, Y. P. (20%), and Tam*, C. W. (10%), "Improving Fracture Resistance of Laminar Textile Composites by Third Direction Reinforcement", Composites Engineering, Vol. 5, No. 9, 1995, pp. 1149-1158.
60. Adanur, S., "Effects of Fabric Structural Parameters on Fabric Modulus", Melliand Textilberichte, Vol. 76, No. 6, June 1995 (German/English), pp. E 106-108 (396-399).
61. Adanur, S., "Effects of Forming Fabric Structural Parameters on Sheet Properties", TAPPI Journal, Vol. 77, No. 10, October 1994, pp. 187-195. .

62. Adanur, S. (60 %), Walker, R. P. (10 %), Broughton, R. M. (10%), and Beale, D. (20%), "Weaving Technology - What Next?", Melliand Textilberichte, English/German, Vol. 75, No. 4, April 1994, pp. E 69-70 (267-272).
63. Adanur, S. (95 %), and Mohamed, M. H. (5 %), "Analysis of Yarn Motion in Single-nozzle Air-Jet Filling Insertion, Part II: Experimental Validation of the Theoretical Models and Statistical Analysis", Journal of the Textile Institute, Vol. 83, No. 1, 1992, pp. 56-68.
64. Adanur, S. (95 %), and Mohamed, M. H. (5 %), "Analysis of Yarn Motion in Single-nozzle Air-Jet Filling Insertion, Part I: Theoretical Models for Yarn Motion", Journal of the Textile Institute, Vol. 83, No. 1, 1992, pp. 45-55.
65. Adanur, S. (95 %), and Mohamed, M. H. (5 %), "Analysis of Yarn Tension in Air-Jet Filling Insertion", Textile Research Journal, Vol. 61, No. 5, May 1991, pp. 259-266.
66. Adanur, S. (95 %), and Mohamed, M.H. (5 %), "Analysis of Air Flow in Air-Jet Filling Insertion", Textile Research Journal, Vol. 61, No. 5, May 1991, pp. 253-258.
67. Adanur, S. (90 %), and Mohamed, M. H. (10 %), "Weft Insertion on Air-Jet Looms: Velocity Measurement and Influence of Yarn Structure, Part II: Effects of System Parameters and Yarn Structure", Journal of the Textile Institute, Vol. 79, No. 2, 1988, pp. 316-329.
68. Adanur, S. (90 %), and Mohamed, M. H. (10 %), "Weft Insertion on Air-Jet Looms: Velocity Measurement and Influence of Yarn Structure, Part I: Experimental System and Computer Interface", Journal of the Textile Institute, Vol. 79, No. 2, 1988, pp. 297-315.
69. Salama, M. (50 %), Adanur, S. (40 %), and Mohamed, M. H. (10 %), "Mechanics of a Single Nozzle Air-Jet Filling Insertion System, Part III: Yarn Insertion Through Tubes", Textile Research Journal, Vol. 57, No.1, January 1987, pp. 44-54.

Refereed Journal Articles Accepted

1. Broughton, R. M. (25%), Bakhtiyarov, S. I. (25%), Brady, P. (25%), and Adanur, S. (25%), "Design Considerations of Nonwoven Fabrics for Air Filtration", Textile Research Journal (accepted, needs modification), 18 pages.

Refereed Journal Articles Submitted

1. Liu, W., and Adanur, S., Mechanism Analysis and Model Development of Sulfur Dioxide Removal with KMnO4 Modified Activated Carbon Fibers – Part II Adsorption in the Presence of Water, submitted to Carbon, 30 August 2013, 11 pages.

2. Liu, W., and Adanur, S., Mechanism Analysis and Model Development of Sulfur Dioxide Removal with KMnO4 Modified Activated Carbon Fibers – Part I Adsorption in the Absence of Water, submitted to Carbon, 29 August 2013, 23 pages.

3. Shen, Y., Meir, A. J., Cao, Y., and Adanur, S., "Finite Element Analysis of Monofilament Woven Fabrics under Uniaxial Tension", submitted to the Journal of the Textile Institute, 19 August 2013, 14 pages.

4. Adanur, S., Gumusel, L., Bas, H., and Aglan, H., "Improvement of 3D Composite Preform Manufacturing", submitted to Reinforced Plastics and Composites, June 16, 2010.
5. Gocek, I., and Adanur, S., "Effect of Processing Parameters on Polypropylene Film Properties", submitted to Textile Research Journal, 3 Nov. 2009, 28 pages.

6. Guarin, R., Liu, W., and Adanur, S., "Mechanical and thermal characterization of electrospun polyacrylonitrile/montmorillonite nanocomposites", submitted to Polymer Engineering & Science, 25 June 2009.
7. Yee, S., Liu, W., and Adanur, S., "Properties of Electrospun PVA/nanoclay Composites", submitted to Journal of Engineered Fibers and Fabrics (JEFF), Feb. 11, 2009, 11 pages.

Refereed Journal Articles under Preparation

1. Irsale, S., and Adanur, S., "Blood Flow Characterization of Polymeric Textile Stents", submitted to the Journal of Industrial Textiles, 1 August 2006, 17 pages (reviewer comments have been received).
2. Adanur, S., and Irsale, S., "Modeling Polymeric Textile Stents: Predicting Young's Modulus and Compression Force", submitted to the Journal of Industrial Textiles, 1 August 2006, 23 pages (reviewer comments have been received).
3. Adanur, S. , "Impact Absorbing Characteristics of Fabrics as Vehicle Covers Against Hail Storms", submitted to Textile Research Journal, 24 pages. Will include more experimental results to support the theory developed in the paper.

Invited Feature Articles

1. Interviewed by Turkish daily Hurriyet during the Fiber Society Conference in Bursa, Turkey (May 2010) which was published on-line entitled "Tekstil Nanoteknoloji ile gelisecek: Textiles will be improved with nanotechnology", : http://www.hurriyet.com.tr./teknoloji/14712535.asp (accessed 6/16/2010).
2. Adanur, S., "American Textile Machinery Exhibition-International (ATME-I) 2004 Review", Tekstil Teknoloji-International Textile Technology Magazine (Turkish/English), October 2004, pp. 68-71.
3. Adanur, S., "Weaving: What Next?", Weaver's Digest, No. 2, September 2003.
4. Adanur, S., "Beyond 2000: Weaving Prep., Weaving Speeds Up", America's Textile Industries (ATI), pp. 62-68, May 2000.
5. Adanur, S. (50%), and Xu, B. (50%), "Characteristics of Microwave-Cured Braided Glass/Epoxy Composites", Composites in Manufacturing, Published by the Composites Manufacturing Association of the Society of Manufacturing Engineers, Third Quarter 1998, Vol. 14, No. 3.
6. Adanur, S., "Fabric That Moves", Industrial Fabric Products Review, IFAI, April 1997, pp. 46-49.

Conference Proceedings

1. *Adanur, S.,* and Liu, W, "Desulfurization Properties of Activated Carbon Fibers in Dry Conditions", Proceedings of the International Istanbul Textile Congress 2013, New Materials, May 30-31, 2013, Istanbul, Turkey.
2. Adanur, S., "A Novel Braided Structure to Increase Compression and Torsion Resistance of Composites", Proceedings of the 5th International R&D Project Brokerage Event, Bursa, Turkey, 4-5 April, 2013.
3. Adanur, S., "Prevention of PEM Fuel Cell Poisoning via Adsorption using Activated Carbon Fiber Based Cathode Filters", Proceedings of the 5th International R&D Project Brokerage Event, Bursa, Turkey, 4-5 April, 2013.
4. Adanur, S., "Health and Safety Effects of Nanoparticles Embedded in Textile Materials", Proceedings of the 5th International R&D Project Brokerage Event, Bursa, Turkey, 4-5 April, 2013.
5. Selver, E., and Adanur, S., Properties of Nanoclay Added Composite Polypropylene Monofilaments Using Twin and Single Screw Extruders, Fiber Society International Symposium on New Frontiers in Fiber Materials Science, Oct. 11-13, 2011, Charleston, SC.

6. Adanur, S., A Novel Filling Insertion System for Weaving, The 3rd International R&D Project Brokerage Event, Bursa, Turkey, Feb. 10-11, 2011.
7. Adanur, S., Conceptual Design and Characterization of 3D Interlaced Fibrous Structures, The 3rd International R&D Project Brokerage Event, Bursa, Turkey, Feb. 10-11, 2011.
8. Zheng, H., and Adanur, S., "Synthesis and Characterization of Sulfonated Polyimide Based Membrane for Proton Exchange Membrane Fuel Cell Applications", Alabama Composites Conference, Aug. 24-26, 2010, Birmingham, AL (presented as poster as well).
9. Liu, W., and Adanur, S., "Activated Carbon Fiber Filter Media in Proton Exchange Membrane Fuel Cells for Automotives", Techtextil North America Symposium, May 18-20, 2010, Georgia World Congress Center, Atlanta, GA.
10. Adanur, S., and Selver, E., "Processing and Properties of nanoclay reinforced polypropylene monofilaments", The 4th International Technical Textiles Congress Proceedings, 16-18 May, 2010, Istanbul, Turkey.
11. Liu, W., and Adanur, S., "Application of Activated Carbon Fibers in Fuel Cell Cathode Filter Media", The Fiber Society 2009 Spring Conference: International Conference on Fibrous Materials 2009, Shanghai, China, May 27-29, 2009.
12. Adanur, S., "Nanotechnologies are Coming Your Way", Industrial Fabrics Association International (IFAI) Expo '08, October 21-23, 2008, Charlotte, NC.
13. Adanur, S., and Irsale, S., "Textile Stent Prototyping and Modeling", Proceedings of the IFAI Expo 2006 Medical Textiles Symposium, Atlanta, Oct. 31, 2006.
14. Adanur, S., Isikel, L., and Abdelhady, F., "Coated and Laminated Fabrics for Fuel Cells", Proceedings of the TechTextil Symposium North America, March 28-30, 2006, Atlanta, GA.
15. Ascioglu, B., and Adanur, S., "Heat Transfer Behavior of Particle Reinforced Nanofibers", Developments in Theoretical and Applied Mechanics, Eds. H. Mahfuz and M. V. Hosur, Proceedings of the SECTAM XXII, 22nd Southeastern Conference on Theoretical and Applied Mechanics, August 15-17, 2004, Tuskegee, AL.
16. Irsale, S., and Adanur, S., "Compression Force Modeling of Braided Textile Stents", Developments in Theoretical and Applied Mechanics, Eds. H. Mahfuz and M. V. Hosur, Proceedings of the SECTAM XXII, 22nd Southeastern Conference on Theoretical and Applied Mechanics, August 15-17, 2004, Tuskegee, AL.
17. Adanur, S., and Ascioglu, B., "Processing Characterization of PVA Nanofibers in Electrospinning", Proceedings of the ICCE-11, 11th Annual International Conference on Composites/Nano Engineering, Ed. D. Hui, August 8-14, 2004, Hilton Head, SC.
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3. Adanur, S., "Forming Fabrics in Papermaking", Textile and Technique, Turkish/English, August 1994, pp. 115-118.
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2. *Adanur, S.,* and Liu, W, "Desulfurization Properties of Activated Carbon Fibers in Dry Conditions", International Istanbul Textile Congress 2013, New Materials, May 30-31, 2013, Istanbul, Turkey.
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4. *Adanur, S.*, and Broughton, R., "Recovery and Reuse of Waste PVC Coated PET Fabrics", The 4rd International R&D Project Brokerage Event, Bursa, Turkey, Feb. 2-3, 2012 (presented as poster as well).
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6. Selver, E., and *Adanur, S.*, Properties of Nanoclay Added Composite Polypropylene Monofilaments Using Twin and Single Screw Extruders, Fiber Society International Symposium on New Frontiers in Fiber Materials Science, Oct. 11-13, 2011, Charleston, SC.
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9. Zheng, H., and *Adanur, S.*, "Synthesis and Characterization of Sulfonated Polyimide Based Membrane for Proton Exchange Membrane Fuel Cell Applications", Alabama Composites Conference, Aug. 24-26, 2010, Birmingham, AL (presented as poster as well).
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30. *Adanur, S.,* "Wide World of Industrial Textiles", presentation given to the teachers of the Istanbul Textile Vocational School, June 22, 2006, Istanbul, Turkey.
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82. *Adanur, S.*, and Sreekanthreddy, G., "Compression Behavior of 3D Reinforced Glass/Epoxy Laminar Composite Profiles", ICAPC-97, International Conference on Advanced Polymer Composites, Materials, Processing and Applications, Beijing University of Aeronautics and Astronautics, Beijing, China, June 3-5, 1997.
83. *Adanur, S.*, "Geotextiles: Design and Applications in Alabama", Presentation to Alabama Congressional Delegation , May 9, 1997.
84. Basu Mallick, S., Elton, D. J., and *Adanur, S.*, "An Experimental Characterization of Soil-Woven Geotextile Interface in Large Box Pullout Tests", Geosynthetics '97, March 10-13, 1997, Long Beach, CA.
85. Yuksekkaya, M., *Thomas, H.,* Adanur, S., Chaikof, E., "Polymeric Braided Stents for Medical Applications", 1996 ASME International Mechanical Engineering Congress and Exposition, Nov. 17-22, 1996, Atlanta, GA.
86. *Ghosh, T.*, and Adanur, S., Design and Characterization of Geotextiles for High Performance Applications, Nonwovens Cooperative Research Center, Semi-Annual Meeting, Year 5, Nov. 20, 1996, Raleigh, NC.
87. *Adanur, S.*, Mallick, S., and Zhai, H., "Analysis of Geotextile-Soil Interaction in Pull-Out Tests", IS Kyushu '96, International Symposium on Earth Reinforcement, November 12-14, 1996, Fukuoka, Japan.
88. Warren, A., El-Halwagi, M. and *Adanur, S.*, "Design of a New Process for Converting Textile Solid Waste into Transportation Fuel", *TIEES-96,* The First Trabzon International Energy and Environment Symposium, July 29-31, 1996, Karadeniz Technical University, Trabzon, Turkey.
89. *Adanur, S.*, and Gongalareddy, S., "Compressive Properties of Stitched Woven Fiberglass Fabric Reinforced Composite Sections for Civil Engineering Applications", ICCE/3, Third International Conference on Composites Engineering, July 21-26, 1996, New Orleans, LA.

90. *Adanur, S.*, Design and Characterization of Geotextiles for High Performance Applications, Nonwovens Cooperative Research Center, 5th Annual Meeting, May 29, 1996, Raleigh, NC.
91. *Adanur, S.*, "Manufacturing of Industrial Textiles: Requirements and Opportunities", Sulzer-Ruti Technical Fabric Symposium, February 21-23, 1996, Spartanburg, SC.
92. *Adanur, S.*, "State of the Art in Technical Textiles", Discover EXPO '95, Industrial Fabric and Equipment Exposition, Industrial Fabrics Association International, Charlotte, NC, Oct. 12-14, 1995.
93. Wang, S., *Adanur, S.* and Jang, B. Z., "Thermo-Mechanical Behavior of Fiber/Filler Reinforced Phenolic Matrix Composites", 2nd International Conference on Composites Engineering (ICCE/2), August 21-24, 1995, New Orleans, LA.
94. *Adanur, S.,* and Tam, C. A., "On-machine Stitching of 3-D Laminate Structures for Composites", 2nd International Conference on Composites Engineering (ICCE/2), August 21-24, 1995, New Orleans, LA.
95. Wang, S., *Adanur, S.* and Jang, B. Z., "Mechanical Behavior of Fiber/Filler Reinforced Phenolic Matrix Composites", Proceedings of the 2nd International Conference on Composites Engineering (ICCE/2), August 21-24, 1995, New Orleans, LA.
96. *Adanur, S.,* Mallick, S. B., and Zhai, H., "Design and Characterization of Geotextiles for High Performance Applications", Hi-Tech Textiles Exhibition and Conference, July 24-26, 1995, Greenville, SC.
97. *Broughton, R. M.,* Bakhtiyarov, S. I., Brady, P., and Adanur, S., "Initial Design of Nonwoven Fabrics for Air Filtration", Hi-Tech Textiles Exhibition and Conference, July 24-26, 1995, Greenville, SC.
98. *Adanur, S.*, and Tsao, Y. P., "Stitch Bonded Textile Structural Composites", The 26th International Technical Conference, SAMPE, October 24-27, 94, Atlanta, GA.
99. *Adanur, S.*, Tsao, Y. P., and Tam, C. W., "Improving Fracture Resistance in Laminar Textile Composites", First International Conference on Composites Engineering, August 28-31, 1994, New Orleans, LA.
100. *Adanur, S.*, "Design and Structure of Fabrics for Papermaking", Third International Hi-Tech Textiles Exhibition & Conference, June 21-22, 1994, Greenville, SC.
101. *Adanur, S.*, and Walker, B., "Yarn Preparation for Weaving in the Future (Yarn Preparation for the Second Loom)", 33rd Annual Textile Slashing Short Course, September 22, 1993, Auburn University, AL.
102. *Adanur, S.*, "Paper Machine Clothing", Istanbul Technical University, Textile Engineering Department, August 4, 1993.
103. *Adanur, S.*, "Effects of Forming Fabric Design on Paper Properties", 2nd International Hi-Tech Textiles Conference, July 21, 1993, Greenville, SC.
104. ElMogahzy, Y., Gowayed, Y. and Adanur, S., "Mechanical Characterization of Geotextiles/Soil Interaction", The Fiber Society Spring Meeting, May 1993, Raleigh, NC.
105. *Adanur, S.*, "Design and Applications of Forming Fabrics in Papermaking", North Carolina State University, College of Textiles, Fiber, Polymer and Textile Seminar Program, March 17, 1993, Raleigh, NC.

Graduate Student Presentations:

1. Isikel, L., "Comparative Evaluation of GDL Media for PEMFCs", Auburn University Annual Graduate Student Research Paper Competition, 9 March 2006, Foy Union, AU.
2. Ascioglu, B., "Heat Transfer Modeling in Nanofiber Reinforced Composite", Auburn University Annual Graduate Student Research Paper Competition, 10 March 2005, Foy Union, AU.
3. Irsale, S., "Textile Prosthesis for Vascular Applications", NTC Paper presentation, 10 January 2005, Spidle Hall, AU.

4. Ascioglu, B., "Heat Transfer Modeling in Nanofiber Reinforced Composite", NTC Paper presentation, 10 January 2005, Spidle Hall, AU.

4.B.4 Poster Sessions Presented

1. Shen, Y., and Adanur, S., "Finite Element Analysis of Monofilament Woven Fabrics under Uniaxial Tension", 2nd Annual Graduate Engineering Research Show Case, Auburn University, Oct. 24, 2013.
2. Adanur, S., "A Novel Braided Structure to Increase Compression and Torsion Resistance of Composites", The 5th International R&D Project Brokerage Event, Bursa, Turkey, 4-5 April, 2013.
3. Adanur, S., "Prevention of PEM Fuel Cell Poisoning via Adsorption using Activated Carbon Fiber Based Cathode Filters", The 5th International R&D Project Brokerage Event, Bursa, Turkey, 4-5 April, 2013.
4. Adanur, S., "Health and Safety Effects of Nanoparticles Embedded in Textile Materials", The 5th International R&D Project Brokerage Event, Bursa, Turkey, 4-5 April, 2013.
5. Adanur, S., and Broughton, R., "Recovery and Reuse of Waste PVC Coated PET Fabrics", The 4rd International R&D Project Brokerage Event, Bursa, Turkey, Feb. 2-3, 2012.
6. Adanur, S., "PVA Nanofiber Based Membrane for Proton Exchange Membrane Fuel Cells", The 4rd International R&D Project Brokerage Event, Bursa, Turkey, Feb. 2-3, 2012.
7. *Adanur, S.*, A Novel Filling Insertion System for Weaving, The 3rd International R&D Project Brokerage Event, Bursa, Turkey, Feb. 10-11, 2011.
8. *Adanur, S.*, Conceptual Design and Characterization of 3D Interlaced Fibrous Structures, The 3rd International R&D Project Brokerage Event, Bursa, Turkey, Feb. 10-11, 2011.
9. Liu, W., and Adanur, S., "Activated carbon fiber filter media for proton exchange membrane fuel cell cathode", The Fiber Society 2009 Spring Conference: International Conference on Fibrous Materials 2009, Shanghai, China, May 27-29, 2009 (chosen as one of the 4 best posters).
10. Liu, W., and Adanur, S., "Activated carbon fiber filter media for proton exchange membrane fuel cell cathode Fiber Society Meeting, Shanghai, China, June 2009. Won the best poster award.
11. Adanur, S., and Irsale, "Development of Drug Eluting Textile Stents", NTC Forum, June 3, 2008, Greenville, S.C.
12. Lee, S., Liu, W., and Adanur, S., "Nonwoven Fibrous Structures from Electrospun Nanofibers", NSF Research Experience for Undergraduates REU Program in Micro/Nano-Structured Materials, Therapeutics and Devices Poster Session, AU Saugahatchee Club, July 26, 2007.
13. Liu, W., and Adanur, S., "Characterization of PVA and PAN Electrospun Nonwoven Fibers", Auburn University 17th Annual GSC Research Forum, 7 March 2007, Foy Union, AU.
14. Isikel, L., Adanur, S., Tatarchuk, B., Isikel, L., (Auburn University), Warner, S., Fan, Q., and Narvekar, V., "Coated and Laminated Fabrics for Fuel Cells", NTC Forum, Feb. 25-27, 2007, Hilton Head, S.C.
15. Thomas, H., Riggs, L., Elton, D., and Adanur, S., "Reinforcement Fabrics with Electronic Antenna Capabilities", NTC Forum, Feb. 25-27, 2007, Hilton Head, S.C.
16. Yacoob, S., Isikel, L., and Adanur, S., "Nonwoven Fabric Manufacturing and Testing Using Electrospinning", NSF Research Experience for Undergraduates (REU) Program, Moores Mill Club, Auburn, 4 August 2006.
17. Adanur, S., Isikel, L., and Abdelhady, F., "Coated and Laminated Fabrics for Fuel Cells", TechTextil Symposium North America, March 28-30, 2006, Atlanta, GA.
18. Adanur, S., Choe, B., Fan, Q., and Warner, S., "Coated and Laminated Fabrics for Fuel Cells", National Textile Center 14th Annual Forum, February 19-21, 2006, Hilton Head, SC.
19. Adanur, S., Swagat, I., Warner, S., and Chaikof, E., "Textile Prostheses for Vascular Applications", National Textile Center 14th Annual Forum, February 19-21, 2006, Hilton Head, SC.

20. Adanur, S., Choe, B., Fan, Q., and Warner, S., "Coated and Laminated Fabrics for Fuel Cells", National Textile Center 13th Annual Forum, March 20-22, 2005, Raleigh, NC.
21. Adanur, S., Swagat, I., Warner, S., and Chaikof, E., "Textile Prostheses for Vascular Applications", National Textile Center 13th Annual Forum, March 20-22, 2005, Raleigh, NC.
22. Adanur, S., Ascioglu, B, Prabir, K. P., Warner, S. B. et al, "Nano Engineered Fire Resistant Composite Fibers", National Textile Center 13th Annual Forum, March 20-22, 2005, Raleigh, NC.
23. Irsale, S., and Adanur, S., "Exploring Textile Stents: Prototyping and Modeling", AU Annual Graduate Student Research Forum, March 10, 2005, Auburn, AL.
24. Adanur, S., and Irsale, S., "Textile Prosthesis for Vascular Applications", Presentation and Poster Session, TechTextil Symposium North America, Atlanta, GA, March 30-April 1, 2004.
25. Adanur, S., Ascioglu, B, Prabir, K. P., Warner, S. B. et al, "Nano Engineered Fire Resistant Composite Fibers", National Textile Center Annual Forum, February 15-17, 2004, Hilton Head, SC.
26. Adanur, S., Swagat, I., Warner, S., and Chaikof, E., "Textile Prostheses for Vascular Applications", National Textile Center Annual Forum, February 15-17, 2004, Hilton Head, SC.
27. Ascioglu, B., and Adanur, S., "Nano Engineered Fire Resistant Composite Fibers", Auburn University Annual Research Forum, Auburn, AL, 20 March 2003. This poster won the 2nd place in Engineering.
28. Adanur, S., Ascioglu, B, Prabir, K. P., Warner, S. B. et al, "Nano Engineered Fire Resistant Composite Fibers", National Textile Center Annual Forum, February 16-18, 2003, Hilton Head, SC.
29. Adanur, S., and Sathendra, V., "Fabric Design and Analysis System in 3D Virtual Reality", National Textile Center Annual Forum, February 16-18, 2003, Hilton Head, SC.
30. Adanur S., and Onal, L., "Design and Characterization of a Novel 3D Hybrid Knitted/Woven Fibrous Structure for Composites", 2003 NSF Design, Service and Manufacturing Grantees and Research Conference, January 6-9, 2003, Birmingham, AL.
31. Turel, T., Adanur, S., Bakhtiyarov, S., Ahmed, A., and Beale, D., "Filling Yarn Insertion in Air-Jet Weaving", National Textile Center Annual Forum, February 10-12, 2002, Charlotte, NC.
32. Sathendra, V., and Adanur, S., "Fabric Design and Analysis System in 3D Virtual Reality", National Textile Center Annual Forum, February 10-12, 2002, Charlotte, NC.
33. Adanur, S., and Onal, L., "Factors Affecting the Mechanical Properties of Laminated Glass/Graphite-Epoxy Hybrid Composites", 2002 NSF Design, Service and Manufacturing Grantees and Research Conference, January 7-10, 2002, San Juan, Puerto Rico.
34. Tascan, M., and Adanur, S., "Filling Yarn Insertion in Air-Jet Weaving", 11th Research Forum, Auburn University, March 19, 2001.
35. Onal, L., and Adanur, S., "Impact Properties of Textile Composites", 11th Research Forum, Auburn University, March 19, 2001.
36. Kilinc, F. S., and Adanur, S., "3D Fabric Design and Analysis", 11th Research Forum, Auburn University, March 19, 2001.
37. Tascan, M., Adanur, S., Bakhtiyarov, S., Ahmed, A., and Beale, D., "Filling Yarn Insertion in Air-Jet Weaving", National Textile Center Annual Forum, February 11-13, 2001, Myrtle Beach, SC.
38. Kilinc, F. S. and Adanur, S., "Fabric Design and Analysis System in 3D Virtual Reality", National Textile Center Annual Forum, February 11-13, 2001, Myrtle Beach, SC.
39. Adanur, S., and Orak, H.., "Design and Manufacturing Automotive Chassis Frame with Net Shape Braided Composite Structures", 2001 NSF Design and Manufacturing Research Conference, January 7-10, 2001, Tampa, FL.

40. Adanur, S., Bakhtiyarov, S., and Beale, D., "Filling Yarn Insertion in AirJet Weaving", National Textile Center Annual Forum, January 27-29, 2000, Myrtle Beach, SC.
41. Adanur, S., and Xu, B., "Design and Manufacturing Automotive Chassis Frame with Net Shape Braided Composite Structures", 2000 NSF Design and Manufacturing Research Conference, January 3-6, 2000, Vancouver, British Columbia, Canada.
42. Adanur, S., Gowayed, Y., and Thomas, H., "On-Line Measurement of Fabric Properties ", National Textile Center Annual Forum, January 28-30, 1999, Myrtle Beach, SC.
43. Adanur, S., and Xu, B., "Fast Net Shape Manufacturing of Braided Textile Composites", NSF CAREER Awardees Meeting, January 10-12, 1999, Washington D.C.
44. Adanur, S., and Xu, B., "Process Development of Microwave Preheating and Infrared Post Curing of Braided Polymer/Epoxy Composites", The 1999 National Science Foundation (NSF) Design and Manufacturing Grantees Conference, January 5-8, 1999, Long Beach, CA.
45. Adanur, S., Liao, T., and Ghosh, T., "Design and Characterization of Geotextiles for High Performance Applications", National Textile Center Annual Forum, January 29-31, 1998, Panama City, FL.
46. Adanur, S., Gowayed, Y., and Thomas, H., "On-Line Measurement of Fabric Properties", National Textile Center Annual Forum, January 29-31, 1998, Panama City, FL.
47. Adanur, S., and Xu, B., "Fast, Net Shape Manufacturing of Textile Composites", National Science Foundation, Design and Manufacturing Grantees Conference, January 5-8, 1998, Monterrey, Mexico.
48. Adanur, S., Gowayed, Y., Ghosh, T., Goswami, B., Mallick, S. B., Zhai, H., "Design and Characterization of Geotextiles for High Performance Applications", National Textile Center Annual Forum, January 28-30, 1997, Myrtle Beach, SC.
49. Adanur, S., Thomas, H., Gowayed, Y., "On-Line Monitoring", National Textile Center Annual Forum, January 28-30, 1997, Myrtle Beach, SC.
50. Adanur, S., and Xu, B., "Fast, Net Shape Manufacturing of Textile Composites", National Science Foundation, Design and Manufacturing Grantees Conference, Seattle, Washington, Jan. 7-10, 1997.
51. Adanur, S., Mallick, S., and Zhai, H., "Analysis of Geotextile-Soil Interaction in Pull-Out Tests", IS Kyushu '96, International Symposium on Earth Reinforcement, November 12-14, 1996, Fukuoka, Japan.
52. Adanur, S., Mallick, S., and Zhai, H., "Design and Characterization of Geotextiles for High Performance Applications", National Textile Center Annual Forum, January 24-26, 1996, Raleigh, NC.
53. Adanur, S., et al., "Textile Structural Composites", National Textile Center Annual Forum, January 24-26, 1996, Raleigh, NC.
54. Adanur, S., Mallick, S., and Zhai, H., Design and Characterization of Geotextiles for High Performance Applications, National Textile Center, Annual Forum, Atlanta, GA, January 26-28, 1995.
55. Mohamed, M., Adanur, S., et al., "Textile Structural Composites", National Textile Center, Annual Forum, January 26-28, 1995, Atlanta, GA.
56. Adanur, S., and Tam, C. W., "Fabrication and Testing of On-loom Stitched 3-D Glass/Epoxy Laminar Composites", The 8th Annual Alabama Materials Research Conference, Tuscaloosa, AL, Sept. 26-27, 1994.
57. Walker, B., Beale, D., Broughton, R., and Adanur, S., "Improving the Woven Fabric Production Rate by Braiding Process", National Textile Center, Annual Forum, Greenville, SC, February 1994.
58. Mohamed, M., Adanur, S., et al., "Textile Structural Composites", National Textile Center, Annual Forum, Greenville, SC, February 1994.
59. Walker, B., Beale, D., Broughton, R., and Adanur, S., "Improving the Woven Fabric Production Rate by Braiding Process", National Textile Center, Annual Forum, Auburn, AL, February 1993.

60. Mohamed, M., Adanur, S., et al., "Textile Structural Composites", National Textile Center, Annual Forum, Auburn, AL, February 1993.

4.B.5 Senior Design Projects Supervised

1. Chris Lee, Chris Porter and Austin Yuill, "Formula SAE Composite Wheel", Fall 2012-Spring 2013.
2. Mason Brummal and James Smith (PFEN 4810-4820), "Weight Reduction of Mandrels Used in Composite Manufacturing", GKN Aerospace Alabama, Tallassee, AL, Fall 2011-Spring 2012.
3. Melanie McDonald and Charles Blackwell (PFEN 4820), "Bulkhead Core Crushing", GKN Aerospace Alabama, Tallassee, AL.
4. Joseph Rossi Schell, Steven Crace and James Clay Graben (PFEN 4820), "Carbon Tow Tension Control in Malimo Stitch Bonding Process for Composite Preform Manufacturing", V2 Composites, Auburn, AL.
5. Sam A. Missioum and Betsy Claunch (PFEN 4820), "Engineering Solutions for Increased Efficiency in Hollow-fiber Production of Hemodialysis", Gambro Renal Products, Opelika, AL.
6. Ozbasli, Halil, "Stadium Covers", TXMT 4900, Fall 2006.
7. Anthony, Rebecca, and Hudson, Katie, "Hail Storm Protective Fabrics, FBEN 4910-4920, Fall-Spring 2006.
8. George, Mellany, "Performance of Coated and Laminated Fabrics for Fuel Cells", FBEN 4920, Fall 2005.
9. Bates, Tiffany, and Williams, Jennie, "Medical Stents: Textile Materials versus Metals", FBEN 4920, Spring 2005.
10. Willams, Gerald, "Endovascular Stent Grafts", TXMT 4910, Spring 2005.
11. Cooper, Jared, "Biocompatible Polyester Stents for Vascular Applications", FBEN 4920, Fall 2004.
12. McCollum, Brian, "Composite Drumsticks", FBEN 4920, Fall 2004.
13. Stroud, Megan, "The Price of Turf", FBEN 4920, Fall 2004.
14. Nicole Sizemore, "Bubble Point Test Method", TXEN 4920, Summer 2004.
15. Andrea Rogers, "Operating Room Material Requirements", TXMT 4910, Spring 2004.
16. Joseph Godfrey, "Fiber Optics Woven into Fabrics", TXEN 4920, Fall 2003.
17. Melissa Mitchell, "UV Resistance of Coated Fabrics for Stadium Covers", Summer 2003.
18. Andrea Janel Smith, "Turfgrass Reinforcement", Spring 2003.
19. Thomas Hogan, "Composite Tree Climber", Spring 2003.
20. Carlos Eduardo Handal, "Recycling of T-shirt Waste, Spring 2003.
21. Jason Mattox, "Geocomposite Design", Spring 2003.
22. Kalitha Mitchell, "Carpet Tile Manufacturing Problems", Fall 2002.
23. Eric Chambers, "Composite Baseball Bat", Fall 2002.
24. Jeremy Legg, "Heat Stress Analysis: Making Aubie Cooler", Fall 2002.
25. Paula Bates, "An Examination of Acoustic Textile Structures", Spring 2002.
26. Margaret Harris, "Design of a Polymeric Y Shaped Braided Stent for Aortic Implantation", Spring 2002.
27. Colin Dawson, "The Design, Construction and Testing of Composite Canoes", Spring 2002.
28. Sarah Robinson, "Western Saddle Design", Spring 2002.
29. Dan C. Siggers, "Canine Body Armor", Spring 2002.
30. Leslie Alexander, "Development of Golf Driver Shaft Using Industrial Textiles", Fall 2001.
31. Rebecca A. Bevis, "Interfacial Shear Strength Evaluation of Thermplastic and Thermoset Resins by the Single Fiber Pullout Test", Fall 2001.
32. Kevin Hughes, "Carbon Composite Billiard Cue", Spring 2001.
33. Meredith Kaye Fetner, "Evaluation of Quality Problems Associated with the Manufacture of Inflatable Evacuation Systems", Spring 2001.

34. Fatma Erdonmez, "Fiber Reinforced Bricks", Spring 2000.
35. Heather M. Anders and Daniel A. Butts, "Fiber Reinforced Concrete", Spring 2000.
36. Mary M. Jacobs, Leia A. Cutcliffe and Ron Levitzke, Jody Aaron, "Composite Golf Club", Spring 2000.
37. Julee E. Diplacido, "Design and Fabrication of a Three Dimensional Woven Fabric Structure Using a Jacquard Loom", Winter 2000
38. Dina R. Tareea, "Composite Bone", Winter 2000.
39. Elizabeth A. Bray, "Braided Tennis Racquet", Winter 2000.
40. Tareek Mohamed, "Permeability of Geotextiles", Winter 99.
41. Leigh N. Haugseth, "Application of Sampling Plan for Codon Airbag Fabric", Winter 99.
42. Robert Gallardo and Dustin Jowers, "Design of a Polymer Stent", Winter 99.
43. Jason Eisele, "Puncture Resistant Military Textiles", Winter 99.
44. Rebecca Kenney and Charles Moore, "Design and Development of a New Geotextile Structure for Soil Reinforcement", Winter 99.
45. Casey Blythe and Wesley Greer, "Incorporating Polypropylene Filament Yarns and Nonwoven Structures for Geotextile Applications", Fall 98.
46. Jeannie Stephens, Erica Graves and Ryan Radel, "Composite Bicycle Frame", Spring 1998 (co-advisor with Dr. Gowayed).
47. James Collier and Kasey Myers, "Flame Resistant Military Fabrics", Spring 1998.
48. Mary Elizabeth Stahr, "Properties of Airbag Fabric Contributing to Strength and Foldability", Winter 1998.
49. Paul Roberts, "Geotextile Pullout Test: Study of Geotextile-Soil Interaction", Fall 1997.
50. Kenneth Cole and Russell Matoy, "Effects of Forming Fabrics on Paper Formation", Spring 1997.
51. Jonathan Douglas and Samuel Mooney, "Design and Development of a Y-Shaped Braided Polyester Aortic Stent", Winter 1997.
52. Barclay Payne, "Warp-out Process", Winter 1997.
53. Leanna Land, "Design of Polyester Stent for Aortic Implantation", Fall 1996.
54. Tara Schaneville and Rotricia Smith, "Design and Applications of Biomaterials for Coronary Artery Reinforcement", Spring 1996.
55. Michelle Struth, "Tiger Textiles", Winter 1996.
56. Stephanie Carnley, "Computers and Computer Aided Design in the Textile Industry", Winter 1995.
57. Coley Jay Smith, "Effects of Fabric Structure on Bending Stiffness", Winter 95.
58. Karen Countess, "Performance Comparison of Woven Geotextiles in Fabric-Soil Interaction", Winter 95.
59. Keith Rollins, "Adhesion Characteristics of Reinforcement Fabrics to Rubber", Fall 1994.
60. Amy N. Goddard, "Ultrasonic Seaming", Spring 94.
61. Dayna M. Smith, "Medical Textiles: Design of Absorbency Tester for Medical Toweling", Spring 94.
62. Brian Allen, "The Effects of ISO 9000 Quality Systems on Textile Product Quality", Winter 94.
63. Mike McCauley and Eva Shelton, "Design and Fabrication of a New Textile Structural Composite Racket" Winter 1994.
64. Brian Wingfield, "Pack Design for a 3/4" Laboratory Extruder", Winter 94.
65. Thomas L. Pritchard, "The Properties of Non-crimp Fabric Based Composites", Winter 94.
66. Westley Mixon, "The Effects of Forming Fabric Design Parameters on Tissue Paper Properties", Spring 93.
67. Philip Douglas Tierce, Jr., "The Effect of Forming Fabric Design on Final Sheet Qualities", Winter 93.
68. David C. Terrell, "Laminated Textile Structural Composites", Winter 93.

4.B.6 Patents / Inventions / Disclosures

1. Adanur, S, and Zheng, H., "A novel way of measuring proton conductivity of fuel cell membranes", AU Technology Disclosure, filed on 7/9/2010.
2. Adanur, S., Vakalapudi, J. S., and Liao, T., "VirtualFabric Design and Analysis System", Auburn University Software Disclosure, 20 July 2006.
3. Adanur, S., and Ascioglu, B., "Modification of Smooth Polymeric Surfaces with Nanofibers using Electrospinning", Auburn University Technology Disclosure, 12 October 2005.
4. Adanur, S., and Irsale, S., "Polymeric Textile Prostheses for Vascular Surgery Applications", Auburn University Technology Disclosure, 25 July 2005.
5. Adanur, S., "Air-Jet Filling Insertion Simulator", Auburn University Patent Technology Disclosure, Dec. 16, 2003.
6. Adanur, S., "Rotational Curing Device for Fast Net-shape Manufacturing of Braided Composites", Auburn University Patent Technology Disclosure, July 20, 2000.
7. Bakhtiyarov, S. I., Overfelt, R. A., and Adanur, S., "Reinforced Sand-Binder System for Coremaking Process", Patent Disclosure, November 1998.
8. Adanur, S., Hou, Z., and Broughton, R. M., "A New Method to Separate the Components of Coated Fabrics", Patent Disclosure, July 22, 1997.
9. McCumsey, K., and Adanur, S., "Two Layer Fabric with Two Extra Strands", Patent Disclosure, April 15, 1992.

4.B.7 Other Research Contributions

1. Irsale, S., "Exploring Textile Stents: Prototyping and Modeling", submitted to the Fiber Society Graduate Student Research Competition, March 3, 2006.

Technical Reports Submitted

- National Science Foundation annual reports
- Adanur, S., Gowayed, Y., Elton, D., and Ghosh, T. K., Design and Characterization of Geotextiles for High Performance Applications, Nonwovens Cooperative Research Center, Annual Report, Year 5, May 29, 1996, Raleigh, NC.
- National Textile Center (NTC) quarterly and annual reports
- Semi-annual and annual reports to US Army Natick
- NSF EPSCoR annual reports
- Final report to NSF for Instrumentation and Laboratory Improvement Program
- Monthly progress reports to Wellington Sears Company, Valley, AL.

Thesis and Dissertation

1. Adanur, S., "Dynamic Analysis of Single Nozzle Air-Jet Filling Insertion", Ph.D. Thesis, North Carolina State University, May 1989, 219 pages.
2. Adanur, S., "Air-Jet Filling Insertion: Velocity Measurement and Influence of Yarn Structure", Master's Thesis, North Carolina State University, 1985, 133 pages.

4.B.8 Grants and Contracts

Grants and Contracts Completed

1. Adanur, S., "Development of Composite and Sandwich Structured Fuel Cell Membranes", Sept. 2009-Aug. 2010, $100,000.00, 9/1/2009-8/31/2010.

2. 10, 862 kg of polymers and color additives were donated to the Polymer and Fiber Engineering by Thermo Fisher, whose value is around $21,600 (April 2010).

3. Adanur, S., Graduate Outreach Program (GOP) Grant, $135.00, Spring 2009 (teaching).

4. Adanur, S., "Nanoparticle Reinforced Hybrid Fibers and Films", Department of Commerce, $119,999.00, 6/1/08-5/31/09.

5. Davis, Ed (PI/Mentee), and Adanur, S. (Mentor), "Imogolite/PEO Nanocomposite Fibers and Membranes", $4,000.00, AU 2008 Faculty Mentoring Program.

6. Adanur, S., and 4 other researchers from Clemson University, "Development of Drug Eluting Textile Stents", $4,000, NTC, 2008-2009.

7. Tatarchuk, B. (PI), Adanur, S., and Broughton, R., Tank and Automotive Command Center (TACOM) Project, PFEN share $72,000, Fall 2005-Spring 2010.

8. Ikiz, Y., "Development of Nanofibers for Filtration Using Electrospinning", Pamukkale University, sponsored by TUBITAK of Turkey, 80,500 YTL (~$ 61,923), Jan. 2006-Dec. 2008, (Dr. Adanur is a "consultant" with no compensation).

9. Duke, S. (PI), Byrne, M. E. (Co-PI), Adanur, S., and 10 other researchers, "REU Site for Micro/Nano-Structured Materials, Therapeutics, and Devices", NSF Research Experiences for Undergraduates (REU), $297,846, Summer 2006-Summer 2008.

10. Adanur, S. (PI), and Aglan, H. (Co-PI, Tuskegee University), "U.S.-Turkey Cooperative Research: Design and Processing Characteristics of Novel Three Dimensional Fibrous Preforms for Composite Reinforcement", $34,201.00, Sept. 1, 2004-Aug. 31, 2007, National Science Foundation.

11. Adanur, S. (PI), Choe, B., Fan, Q., and Warner, S., "Coated and Laminated Fabrics for Fuel Cells", $318,074.00, May 1, 2004-April 30, 2008, National Textile Center.

12. Thomas, H., (PI), Adanur, S., Elton, D., and Riggs, L., "Reinforcement Fabrics with Electronic Transmission Capabilities", $278,390.00, May 1, 2005-April 30, 2008, National Textile Center.

13. Two injection molding machines were donated to Auburn University on May 3, 2007 by Thermofisher Scientific of Auburn:
    - FU CHIN SHIN 75 TON, MODEL: KT-75G, SERIAL # H03185, YEAR: 1988, Value: $4,500.00
    - FU CHIN SHIN 75 TON, MODEL: KT-75, SERIAL # H03172, YEAR: 1988, Value: $4,500.00.

14. Adanur, S., (PI), and Warner, S., "Textile Prostheses for Vascular Applications", $389,753.00, Auburn's share: $241,510.00, May 1, 2003-April 30, 2006, National Textile Center.

15. Patra, P. (PI), Adanur, S., and 4 other researchers, "Nano Engineered Fire Resistant Composite Fibers", Auburn's share: $90,920.00, May 1, 2002-April 30, 2005, National Textile Center.

16. Parker, F., Dyer, D. (leaders), Adanur, S., and several other Engineering Faculty, "AU Priority Areas; Transportation Pinnacle: Commercial Highway Systems", October 1, 99-September 30, 2004 (total budget amount is unknown at this time). Budget for Adanur: $24,000.

17. Adanur, S., (leader) ElMogahzy, Y., and Abdelhady, F., "Yarn and Fabric Design and Analysis in 3D Virtual Reality", National Textile Center, $ 177,938, May 1, 2000 - April 30, 2003.

18. Adanur, S. (PI), Bakhtiyarov, S., and Beale, D., "Characterization of Air-Yarn Interface in Air-Jet Weaving", National Textile Center, $ 262,742.00, May 1, 1999-April 30, 2002.

19. Equipment Secured for Air-Jet Research
    L5200 S 210 N2 IK TE Air-Jet Weaving Machine (L5200 series, filament execution, 210 cm max. reed width, low built (without superstructure), two color pick at will, crank shedding motion, electronic filling feeders)
    Manufacturing # 031166
    Serial # JA 2663
    Machine # 0003
    Manufacturing date: 1997.08
    Market Value: $15,000.00.
    Donor: Sulzer Textile, Inc.
    Date Received: Nov. 22, 2002

20. Adanur, S. , Fast Net-Shape Manufacturing of Polymer Composite Structures, 1995 NSF Faculty Early Career Development (CAREER) Program, National Science Foundation, $ 210,000.00; duration: 5 years, Sept. 1, 96-Aug. 31, 2001.

21. ElHalwagi, M. (leader), Adanur, S., and 15 other faculty, "Bicomplexity Incubation Project Proposal FY 2000-2002", $ 220,000.00, National Science Foundation, Duration: 1 year, Sept. 2000- August 2001.

22. Adanur, S., and Shalaby, S. E. (Egypt), "Design and Manufacture of Stitch Bonded, Thermoplastic Textile Composites", US-Egypt Science and Technology Joint Fund, $ 39,978, September 1, 1998 - August 31, 2001.

23. P. Jones (leader), C. A. Flood, S. Adanur, "Developing a Course Based on Equipment Design for Introduction to Engineering"; AU College of Engineering; $ 24,050; June 1, 1999-May 31, 2000.

24. Adanur, S. (team leader), Thomas, H., Gowayed, Y. and Ghosh, T., On-line Measurement of Fabric Mechanical Properties for Process Control, National Textile Center, $ 446,912.00; duration: 3 years, March 1, 96 – April 31, 2000.

25. Jang, B. Z., Yang, X. F., and Adanur, S. (30%), "Solid Free Form Fabrication of Advanced Alloys and Metal Matrix Composites", College of Engineering Graduate Research Assistantship, $ 20,000.00; duration: October 1, 1997-September 30, 1999.

26. Elton, D., and Adanur, S. (50%), "Waterjet Manufacturing of Custom Geotextiles", College of Engineering Infrastructural Awards, $ 62,524.00; duration: October 1, 1997-September 30, 1999.

27. Utilization of Solid Waste in Alabama, Y. Gowayed (Project Coordinator), S. Adanur and 15 other researchers, NSF/EPSCoR, $ 3 million, Dr. Adanur's share: $ 150,000.00; duration: 4 years, Aug. 95-July 99.

28. Design and Characterization of Geotextiles for High Performance Applications, National Textile Center, Sabit Adanur (PI) and 5 other researchers from 4 universities; amount: $ 915,000.00; Auburn's share $ 520,000.00; duration: March 1, 1994 - April 30, 1998.

29. A New Military Fabric with Flame Resistance Properties; US Army Natick R&D and Engineering Center; PI: S. Adanur (100%), $ 40,000.00; 24 months, Dec. 1995 - Dec. 97.

30. Fingerprinting and Backward Quality Projection in Textile Products, PIs: Y. Elmogahzy (leader), R. Broughton, S. Adanur, Y. Gowayed (Auburn), S. Jayaraman (Ga Tech), M. Suh, W. Oxenham, J. Woo, J. Rust (NC State), E. Backe (ITT), $ 540,000.00, Dr. Adanur's share: $ 40,000.00, National Textile Center, Duration: 1 year, March 1, 1995 - February 28, 1996.

31. Textile Structural Composites Laboratory, National Science Foundation, Instrumentation and Laboratory Improvement (ILI) Award, $ 87,185.00 (42.5% NSF, 42.5 % Auburn cost share, 15% Private Industry Contribution), PI: S. Adanur (95%), Co-PIs: W. Walsh, R. Walker, B. Jang, 30 months, September 1, 94 - August 31, 96 (See 4.A.5).

32. Textile Structures for Composites: Stitch Bonded Laminar Composites, National Textile Center, $ 2,310,000 for 4 universities; Auburn's share $ 223,656.00, PI: S. Adanur (50 %), Yasser Gowayed (50%), March 1, 1993 - February 28, 1996.

33. Wellington Sears Handbook of Industrial Textiles, Wellington Sears Company, Valley, AL, PI: Sabit Adanur (100%), $ 60,000.00, October 1, 1993-March 15, 1995.

34. Design of a Braiding Machine to Produce Wide, Flat Woven Structures at a Significantly Increased Production Rate, PIs: R. Walker (leader), R., Broughton , S. Adanur, D. Beale, M. Nelms, National Textile Center, $ 570,000.00, Adanur's share: $ 90,000.00, March 92 - February 94.

Contracts/Grants in Force

1. Broughton, R. (PI), Beale, D., Adanur, S., and Foster, W., Design and Analysis of Stiffeners and Tension Compression Struts Using Braided, Open-Architecture Composite Structures (O-ACS), $150,000.00, Nov. 2013-May 2015.

2. Adanur, S., Meir, A. J., and Cao, Y., "Virtual 3D Interlaced Fabric Design and Characterization", $37,500.00, AU-IGP, 1 February 2012 - 31 January 2014.

3. National Science Foundation, REU Site for Micro/Nano-Structured Materials, Therapeutics, and Devices, PI: M.E. Byrne, Co-PI: S. Duke, Period: 03/1/11 - 02/28/14; $357,191. Faculty Mentors: S. Adanur, M. Auad, M. Byrne, S. Duke, A. Gorden, E. Davis, V. Davis, O. Fasina, R. Gupta, J.W. Hong, E. Lipke, B. Prorok, W. Ravis, C. Roberts. Submitted 25 August 2010.

Fully Developed Proposals Submitted (Pending)

1. Adanur, S., "Activated Carbon Fiber Based Cathode Filters for Proton Exchange Membrane Fuel Cell Poisoning Prevention via Adsorption", $363,514.00, submitted to NSF, 17 Oct. 2013.
2. Adanur, S., and Cao, Y., "A Novel Scientific Methodology for Interlaced Fibrous Structure Design and Behavior in 3D Virtual Reality", submitted to NSF, 24 Sept. 2013, $442,001.00.

4.C. OUTREACH

Short Courses / Workshops / Seminars (presenter's name is in *Italic*)

1. *Adanur, S.*, Composite Materials, Short course given to Boy Scouts at Merit Badge University, March 2, 2013, Auburn University.
2. *Adanur, S.*, "Higher Education in Alabama", Panelist and presenter in "Workshop: Restructuring of Higher Education in Turkey, Problems and Solutions", Marmara University, Istanbul, Turkey, 6 July 2012.
3. *Adanur, S.*, Composite Materials, Short course given to Boy Scouts at Merit Badge University, March 3, 2012, Auburn University.
4. *Adanur, S.*, Composite Materials, Short course given to Boy Scouts at Merit Badge University, March 5, 2011, Auburn University.
5. *Adanur, S.*, Composite Materials, Short course given to Boy Scouts at Merit Badge University, March 6, 2010, Auburn University.
6. *Adanur, S.*, Composite Materials, Short course given to Boy Scouts at Merit Badge University, March 7, 2009, Auburn University.
7. *Adanur, S.*, Composite Materials, Short course given to Boy Scouts at Merit Badge University, March 17, 2007, Auburn University.
8. *Adanur, S., and Isikel, L.*, Fuel cell research at PFE, presentation and demonstration given to Civil Air Patrol students, July 17, 2006, Auburn.

9. *Adanur, S.*, and Demir, A., Manufacturing of Industrial Textiles, Workshop given to Hassan Textile Inc., Istanbul, Turkey, July 20, 1999.
10. *Adanur, S.*, " Manufacturing of Geotextiles", 5th NSF/IFAI Professor Training Course for Geosynthetics, AU Engineering Extension Service, Auburn, AL, August 9-14, 1998 (also, gave an instructional tour of the Geotextiles and Fabric Formation labs to the course participants).
11. *Adanur, S.*, "Wide World of Industrial Textiles", Seminar given to the faculty of the Department of Textile Science, University of Port Elizabeth, Port Elizabeth, South Africa, June 8, 1998.
12. *Adanur, S.*, "Testing of Technical Textiles", Industrial Textiles Short Course, Clemson University, January 28-29, 1998, Clemson, SC.
13. *Adanur, S.*, "Textile Research Update", presented at the Georgia Association of Family and Consumer Sciences District K Meeting, Tuesday, Nov. 11, 1997, Columbus, GA.
14. *Adanur, S.*, and Broughton, R. M., "Manufacturing, Properties and Testing of Geotextiles", AU-IFAI (Industrial Fabrics Association International) Educate the Educators Short Course, July 20-25, 1997, Auburn, AL (also, gave an instructional tour of the Geotextiles and Fabric Formation labs to the course participants).
15. *Adanur, S.*, and Hou, Z., "Recycling of Coated Fabrics", Workshop on Added Value Reclamation of Solid Waste, NSF EPSCoR, July 22-23, 1997, Auburn, AL.
16. Adanur, S. (90%), and *Mohamed, M. H. (10%)*, "Manufacturing of Industrial Textiles", US-Egypt Workshop on Manufacturing Technologies, Dec. 6-9, 1996, Alexandria, Egypt.
17. Prepared the Weaving and Knitting sessions for the short course Introduction to Textiles for Industry Professionals (ITIP-96), May 14-15, 1996 (cancelled).
18. *Adanur, S.*, "Overview of Industrial Textile Applications", Industrial Fabrics Association International (IFAI) Tutorial "Textiles Used in Structural Composites", 41st International SAMPE Symposium and Exhibition, March 24-28, 1996, Anaheim, CA.
19. *Adanur, S.*, "ISO 9000", Total Quality Management in the Textile Industry (SPC & Quality Engineering), Quality Tech, March 20-22, 1996, Pine Mountain, GA.
20. *Adanur, S.* (70%), and Broughton, R. M. (30%), "Manufacturing, Properties and Testing of Geotextiles", AU-IFAI (Industrial Fabrics Association International) Educate the Educators Short Course, July 7-12, 1996, Auburn, AL (also, gave an instructional tour of the Geotextiles and Fabric Formation labs to the course participants)..
21. *Adanur, S.* (50%) and Walker, R. P. (50%), "Yarn Preparation for Weaving in the Future (Yarn Preparation for the Second Loom)", the 33rd Annual Textile Slashing Short Course, September 20-22, 1993, Auburn University, AL.; enrollment: 81.
22. Member of the committee for AMTEX short course: Textile Fundamentals, 1994.
    - AMTEX Textile Fundamentals Short Course: Weaving, March 27-April 1, 1994, Atlanta, GA (cancelled)
    - AMTEX Textile Fundamentals Short Course: Knitting, March 27-April 1, 1994, Atlanta, GA (cancelled)

Technical Sessions Developed/Chaired

1. International Istanbul Textile Congress 2013, Session: New Materials, Room 3, May 30-31, 2013, 13.40-15.40, Istanbul, Turkey.
2. Session 202: Composites, Techtextil North America Symposium, Wednesday, April 2, 2008, 8:30 a.m. - 11:00 a.m., Atlanta, GA.
3. Session 3 (afternoon session) at the First Istanbul International Textile and Textile Machinery Congress, June 2, 2006, Istanbul, Turkey.
4. Session 4, 2nd International Technical Textiles Congress, Istanbul, Turkey, 13-15 July 2005.

5. Session TC-1: Computational Mechanics, 1.45 pm – 3.15 pm, Tuesday, August 17, 2004, SECTAM XXII, Twenty Second Southeastern Conference on Theoretical and Applied Mechanics, August 15-17, 2004, Tuskegee University, Tuskegee, AL.
6. Session 4a, NANO 4, 7.20 pm-10.00 pm, Monday August 9, 2004, ICCE-11, 11th Annual International Conference on Composites/Nano Engineering, Hilton Head, SC, August 8-14, 2004.
7. Session 203 Paper Making Fabrics, Techtextil Symposium North America, March 13-15, 2001, Atlanta, Georgia. Developed and chaired the session with 5 speakers.
8. ICCE/5, Fifth International Conference on Composites Engineering, Session 7a, Textile I, 3.40 pm-6.00 pm, July 5-11, 1998, Las Vegas, NV.
9. ICAPC-97, International Conference on Advanced Polymer Composites, Materials, Processing and Applications, Session 2, Mechanics of Composite Materials (I), Beijing University of Aeronautics and Astronautics, Beijing, China, June 3-5, 1997.
10. ICCE/4, Fourth International Conference on Composites Engineering, Session 16c, Textile V, 8.00 am-11.00 am, July 6-12, 1997, Big Island of Hawaii.
11. The Fiber Society, Fall 1996 General Technical Conference, Session IV: Marine Applications of Textiles, Wednesday, Oct. 16, 1996, Newport, Rhode Island.
12. ICCE/3 Third International Conference on Composites Engineering, July 21-26, 1996, New Orleans, LA. Session 12b , July 25, 96, 3.45 pm-5.45 pm, Textile Composites III, Adanur, S., and Wang, Y.
13. ICCE/2 Second International Conference on Composites Engineering, August 21-24, 1995, New Orleans, LA.
    - Session 4d, Aug. 22, 1995, 10.10 am-12.10 pm, Textiles: 3D structures.
    - Session 5d, Aug. 22, 1995, 1.20 pm - 3.20 pm, Textiles: Applications.
    - Session 9d, Aug. 23, 1995, 3.35 pm-5.35 pm, Textiles: Analysis.
14. Paper Machine Clothing: Materials and Technologies. Third International Hi-Tech Textiles Exhibition & Conference, June 21-22, 1994, Greenville, SC. Planned and organized the presentation topics and found five speakers.

Workshops Attended

1. Attended the ITM Texpo Eurosia 2013, in Istanbul, Turkey, May 29, 2013.
2. Composite Manufacturing Workshop, March 30-31, 2005, Auburn, AL.

Editorships

1. Member of the Editorial Board for Journal of Industrial Textiles, Sage Publications (Jan. 2000 - present).
2. Member of the Editorial Board for the Electronic Journal of Textiles (August 2002 – present)
3. Member of the Editorial Board for the POLITEKNIK (Turkish/English), Dec. 2004-2009.
4. Member of the Editorial Board for the Electronic Journal of Textiles (August 2002 – 2009.
5. Member of the Editorial Board for Journal of Coated Fabrics, Technomic Publishing, Co., Inc., Lancaster, PA, (January 1998 – Jan. 2000).
6. Member of the editorial board for Textile and Technique which is a specialized monthly textile magazine published in Turkey (Turkish/English), 1993-2003.

Other Extension Activities

- Member of the Fiber Society Award Committee, 2011-2013.

- Member of the Scientific Committee for the International Congress of Innovative Textiles, ICONTEX2011, 20-22 October, 2011, Tekirdag, Turkey. Reviewed manuscripts for acceptance to the conference.
- Gave the commencement speech at Marmara University, College of Engineering Graduation Ceremony, Istanbul, Turkey, 6 July 2011.
- Presented the NTC booth, 1.00-5.00 pm, Techtextil North America Symposium, April 2, 2008, Atlanta, GA.
- Organized the AU Textile Engineering booth for the Techtextil North America International Trade Fair for Technical Textiles and Nonwovens, March 23-25, 2000, Atlanta, GA.
- Gave a lecture to Prof. Richard Penaskovic's class RELG 0304 – Western Religions on June 1, 1999.
- Attended the Milliken Summer Challenge University/Industry Programs (1997 and 1998).
- Served as judge in the Industrial Fabrics Association International (IFAI)'s annual International Achievement Awards competitions (1995-present)
- International Advisory Board Member, International Conference on Composites Engineering (ICCE); ICCE/9 (2002 San Diego, CA), ICCE/8 (2001 Tenerif, Spain), ICCE/7 (2000, Denver, Colorado), ICCE/6 (1999, Florida Resort, FL), ICCE/5 (1998, Las Vegas, NV), ICCE/4 (1997, Big Island of Hawaii).
- Reviewer of Proposals for National Science Foundation (NSF)
- Attended the workshop "Integrating Design into the Engineering Curriculum", which was offered by the Southern Methodist University, in Dallas, TX on March 19-21, 1998. This was part of ABET preparation activities.
- "Two-man, Three Season, Double Walled Tent for the US Marine Corps Systems Command (MARCORSYSCOM)". Proposal prepared on behalf of National Apparel, Inc., of Montgomery, AL for the US Marine Corps. Project Total: $ 18,750,000.00; 150 pages, July 97.
- Gave a presentation to Alabama Congressional Delegation on Geotextiles, May 9, 1997.
- Prepared and presented the AU Textile Engineering booth during the 3rd International High-Tech Textiles Conference, Greenville, SC, June 94.
- Prepared and presented the AU Textile Engineering booth during the 2nd International High-Tech Textiles Conference, Greenville, SC, July 93.

4.D. SERVICE

Department, College and University Service Work

1. Member of the Academic Program Review Committee, Aug. 2013-Aug. 2016.
2. Prepared the SACS assessment reports for PFEN B.S., M.S., and Ph.D. programs for the SACS visit, March 21-22, 2013; updated the reports Oct. 14, 2013.
3. Participated in the AU Strategic Planning Focus Group sponsored by the Office of the Provost, 19 March 2013.
4. Member of the Academic Standards Committee, Aug. 2012-Aug. 2015.
5. Member of the Post Tenure Review Committee, Aug. 2012-Aug. 2015.
6. Prepared the 2011 SACS assessment reports for PFEN B.S., M.S., and Ph.D. programs, Jan.-Feb. 2012.
7. Member of the PFEN faculty search committee, Aug. 2011- Aug. 2012.
8. Member of the Faculty Handbook Review Committee, Aug. 2011-Aug. 2014.
9. Member of the Faculty Dismissal Committee, Aug. 2010-Aug. 2013.
10. Mentor - AU Early Career Faculty Mentoring Program, Sept. 2009-present.
11. Chair of the AU Faculty Grievance Committee, Aug. 2009-Aug. 2010.
12. Member of the Student Discipline Committee, Aug. 2009-Aug. 2012
13. Hosted TALON exhibit for incoming engineering freshman with Julia Freeman at the AU Hotel and Conference Center, Feb. 18, 2008.
14. Member of the new PFEN PhD Program Committee, Apr. 2008-present.
15. Member of the AU Faculty Grievance Committee, Nov. 2007-May 2009.

16. Member of the PFEN Faculty Search Committee (Chair: Dr. Buschle-Diller), Aug. 2007-Apr. 2008.
17. Member of the CoE Graduate Student Recruiting Committee (appointed by the Dean), Chair of the Best Practices Subcommittee, March. 2007-present (unofficially started Fall semester 2006).
18. Chair of the PFEN Faculty Search Committee, Fall 2006-Spring 2007.
19. Member of the Alumni Engineering Research Award Committee (meeting held on March 10, 2008).
20. Responsible for the polymer processing equipment purchase (visited University of Akron, Oct. 2006).
21. Chair of the AU Student Academic Grievance Committee, Jan. 2006-Aug. 2008.
22. Member of the AU Student Academic Grievance Committee, Aug. 2005- Dec. 2005.
23. Member of the AU Academic Honesty Committee, 2003-2006.
24. PFEN ABET Coordinator, Spring 2003-present (Attended the Learning Outcomes Seminar, Apr. 7, 2008, 200 Allison Lab).
25. Member of the Alumni Professorship Committee, 2002-2005.
26. Member of the Budget Advisory Committee, Feb. 2003-2005.
27. Graduate Faculty (reappointed November 2002)
28. Member of the Ginn Professorship Selection Committee, 2002.
29. Member of the Engineering Faculty Council (EFC), 2002-2205.
30. Member of the AU Diversity Leadership Council, May 2002-2004.
31. TE Department Futures Committee Member, 2001.
32. Mentoring Committee member for Dr. Aliecia McClain, Assistant Professor. February 2001- 2004.
33. Member of the AU Senate Research Grant-in-Aid Committee, Fall 2000- Fall 2003.
34. Member of the Textile Engineering Department Head Search Committee, 1999-2000.
35. Member of the College of Engineering Freshman Computing Initiative (FCI) Committee (1999-2000)
36. National Textile Center (NTC) Site Director for Department of Textile Engineering (June 1998 to October 2001). Responsible for the overall coordination of NTC proposals, projects and budgets for the Textile Engineering Department.
37. Chairman of the Textile Engineering Curriculum Committee (1993-2000).
38. Coordinated the Semester Transition activities for TXEN, TXCH, TXMT, TXTS and ITAS programs. Prepared/edited the departmental semester transition package (162 page document)
39. College of Engineering Priorities Task Force Member (1998). Participated in two task force teams: one in research and one in teaching.
40. Member of the College of Engineering Curriculum Committee (1993 to present)
41. Chairman of the Textile Engineering Award Committee. The committee nominated Pat Smith and Paul Brady for the Spirit of Excellence Award which they won (1992-2000).
42. Member of the new PhD program in Integrated Textiles and Apparel (ITAS) preparation committee (1994 - 1998).
43. Member of the three new faculty and two new technician search committees in Textile Engineering (1994-2000).
44. Participated in the 1994-1995 and 1995-96 Faculty/Student Mentor Program
45. Honorary Member of the Phi Psi Textile Fraternity.
46. Freshmen scholarship interviewer (1993-2000)

Professional Society Activities

- Member of the TASSA (Turkish-American Scientists and Scholars Association) Interim Council, 2004-2006.
- Member, Industrial Fabrics Association International (IFAI) Safety & Protective Products Division, 2003-present.

- Chair of the American Society of Mechanical Engineers-Textile Engineering Division, ASME-TED (2000-2001). Attended the ASME Technical Executives Committee (TEC) meeting in New York, NY, November 2001.
- Vice-Chair of the American Society of Mechanical Engineers-Textile Engineering Division, ASME-TED (1998-2000). Attended the ASME Technical Executives Committee (TEC) meeting in Houston, TX, March 3-5, 2000.
- Newsletter Editor of the American Society of Mechanical Engineers-Textile Engineering Division, ASME-TED (1995-present). Prepared and published the ASME Textile Engineering Division Newsletter - Fall 1996 issue.
- Secretary-Treasurer of the American Society of Mechanical Engineers-Textile Engineering Division, ASME-TED (1995-1997).
- Program Chairman of the American Society of Mechanical Engineers (ASME), Chattahoochee Section (1995-96)
- Secretary of the American Society of Mechanical Engineers (ASME), Chattahoochee Section (1994-95).
- Treasurer of the American Society of Mechanical Engineers (ASME), Chattahoochee Section (1993-94).
- Member of the American Society of Mechanical Engineers-Textile Engineering Division (ASME-TED) Revitalization Task Force. There has been a lack of enough activity in recent years in TED and the objective of the Task Force is to retain Textile Engineering as an active ASME technical division (1994 - 1995).

Membership

- Manufacture Alabama
- The Fiber Society
- Honorary member of the Phi Psi Textile Fraternity

Proposals Reviewed:

1. NSF Panelist for Nanomanufacturing Proposals (Panel #: P100737), Dec. 14, 2009, Arlington, VA. Reviewer/Lead/Scribe for 8 proposals, Panelist for 26 proposals.
2. Panelist for NSF SBIR-STTR Program, Aug. 23, 2007, National Science Foundation, Arlington, VA.
3. NSF Proposal No. 0242891 entitled "Human Powered Wearable Computers" by Hechmi Hamouda and Warren J. Jasper, November 2002.
4. Proposal No: INT-9811022, National Science Foundation
   PI: C. L. Smith, North Carolina State University, June 1998.
5. Reviewer for the National Textile Center Proposals (Fabrication Competency), 1998-2001.
6. Visited National Science Foundation on Nov. 4, 1999 as a panel reviewer of 15 CAREER proposals.

Reviewing for Journals:

Textile Research Journal, Journal of Elastomers and Plastics, International Composites Engineering Journal, Journal of Cotton Science, Journal of the Textile Institute (England). 67 articles have been reviewed to date.

Other:

- Judge for the "Turkey Innovation Week", Dec. 6-8, 2012, Istanbul, Turkey. Judged 10 proposals.
- Recommendation letter for promotion of a professor at an NTC University, December 2004.
- Helped with the Engineering Technologies Academy for Civil Air Patrol cadets, July 8-12, 2003, Auburn University.

Companies and Organizations Served

Majority of the work done was on a no charge bases. Inquiries varied; some visits, some by analysis and transmittal of samples and/or data, some literature search, technical reports, etc. The following list does not include companies that I served through the phone.

- KilpatrickStockton
- U.S. CRDF Science Center
- Dority-Manning
- Milliken
- Gallery Co.
- Southern Mills
- Berry Plastics
- NSF Panelist
- InterVascular
- Eastern Technologies
- Zyvex Corporation
- Mr. Les Letlow
- Tyco Industries, AL.
- Unsa, Istanbul, Turkey.
- EverCare Co.
- TrustForte Corporation.
- Mesa Associates.
- A-Carb LLC
- Illinois Tool Works
- Cordis Corp.
- SulzerTextil.
- Textrade.com
- N. V. Bekaert S. A., Belgium.
- Amoco Fabrics and Fibers Company, Bainbridge, GA.
- Hassan Textile Inc., Istanbul, Turkey.
- Kinedyne Corporation, Prettville, AL.
- Allied Signal, Medical Textiles, Virginia.
- 3Tex, Raleigh, NC. Analysis of McGinley System.
- PE Technikon and CSIR of South Africa. Textile Engineering education and research.
- Commissariat A L'energie Atomique and Aerospatiale of France. Composite research.
- Asten Forming Fabrics, Appleton, WI.
- Milliken & Company, Specialty Industrial Business, LaGrange, GA. Geotextiles, composites.
- Johnston Industries, Utilization Plant, Valley, AL. Fibrograph.
- Startex, Spartanburg, SC. Recycling of coated fabrics.
- National Apparel, Inc., Montgomery, AL. Combat tent.
- Sulzer-Ruti, Inc., Spartanburg, SC. Forming fabrics.
- Clark Schwebel, Inc. 3D weaving.
- Eaton Corp, Milwaukee, Woven and knit reinforcements for composites

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- Industrial Textile Associates, Greer, SC. Analysis of a rayon fabric carbonized after weaving.
- Environmental Technical Services. Recycling.
- Wellington Sears Co., Valley, AL.
- Emory University, Atlanta, GA. Polymeric stents.
- Bo-Tex Sales Corporation, Hogansville, GA. Recycling.
- Johnston Composite Reinforcements, Inc., Phenix City, AL. Process improvement.
- Twitchell Corporation, Dothan, AL.Weaving.
- Cooley Inc. Recycling.
- C. M. Offray & Son, Inc. Recycling.
- John Boyle & Co., Inc. Recycling.
- Weblon, Inc. Recycling.
- Bruin Plastics Co. Recycling.
- Industrial Fabrics Association International (IFAI). Recycling.
- AU Vet. School, testing of ligaments on Instron, Sept. 29-Oct. 3, 1995.
- Shakespeare Monofilament, Columbia, SC. Development of Forming Fabric, 1994.
- Development and testing of "Hail no Hail" fabric for Marks & Flinn of Montgomery, AL, 1994.
- Doran Textiles, Shelby, NC. Mr. Reuben Bond on 'Team Weaving' concept. (6.5.93)
- Lindsay Wire, Florence, MS. Mr. Ton Rietzelt on Jacquard Weaving (6.30.93)
- Deerfield Specialty Papers, Inc., Augusta, GA on wear of forming fabrics.
- Hoechst Celanese, Mr.Dan Cain, Spartanburg, SC on developing a warp knitted structure using elastomeric monofilament fiber.
- Seattle Textile Company, Seattle, WA, on testing of PVC coated polyester sheeting designed for use in flame resistant, coated fabric type hose.
- North Carolina State University, College of Textiles. Consultant for the Air-Jet Loom Simulator.
- US Geotextiles, Opelika, AL., Evaluation of ultrasonic seams of geotextiles.

Community Service

- Soccer coach, U13G, Auburn Parks and Recreation Department, Fall 2013 season
- Soccer coach, U13G, Auburn Parks and Recreation Department, Spring 2013 season
- Soccer coach, U13G, Auburn Parks and Recreation Department, Fall 2012 season
- Soccer coach, U10G, Auburn Parks and Recreation Department, Spring 2012season
- Participated at the Spring Fling, Yarbrough Elementary School, Apr. 29, 2011
- Soccer coach, U10G, Auburn Parks and Recreation Department, Spring 2011season
- Soccer coach, U16, Auburn Parks and Recreation Department, Fall 2010 season
- Soccer coach, U16, Auburn Parks and Recreation Department, Fall 2009 season
- Gave a tour of the Polymer Processing lab to Drake Middle School 6th graders Cosmic Cat team, Spring 2009.
- Chaperon for AU Explore field trip of Yarbrough Elementary School 5th graders, Apr. 25, 2008, 8.30-13.30.
- Soccer Coach for U13 Boys, Auburn Parks and Recreation Department, Fall 2007.
- Soccer Coach for U6 coed team, Auburn Parks and Recreation Department, Spring 2007 and Fall 2007.
- Attended the 'football throwing" booth at Yarbrough Elementary School's "Spring Fling", 28 April 2006.
- Gave a seminar about Polymer and Fiber Engineering to Mrs. Fleming's 5th grade class at Yarbrough Elementary School, Thursday, April 27, 2006.
- Soccer Coach for U10 and U13 Boys, Auburn Parks and Recreation Department, Spring 2006, Fall 2006, Spring 2007.
- Soccer Coach for U10 and U13 Boys, Auburn Parks and Recreation Department, Spring 2005 and Fall 2005.

- Participated at the Yarbrough Elementary School WinterFest, Feb. 25, 2005.
- Soccer Coach for U8 Boys, Auburn Parks and Recreation Department, Fall 2004
- President of the Auburn Ministerial Association (AMA) 2003-2004, member since 2002.
- Seminar given at the Leadership Alabama Retreat: "Religion: Does it Unite or Divide?", Tuskegee University Chapel, Jan. 30, 2004.
- Participated in home building for Habitat for Humanity (2002-present)
- Participated in Community Market activities (2003-present)
- Presentation made at the Interfaith Community Service of Thanksgiving, Nov. 21, 2000, Auburn University Chapel.
- Gave 5 seminars/tours to Auburn City School students between 1994 to 2000.
- Member of the United Way of Lee County, Campus Division, Campaign pilot program, 1996-present.
- Certified soccer coach for Under 6, Under 8, Under 10 and Under 13 years old kids, Auburn Parks and Recreation Department, 1993-present.
- Gave a lab tour to AU Child Study Center Preschool Class, January 19, 2000.

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Petitioner adidas AG - Exhibit 1016 - Page 57

A1901

Skechers EX1013-p. 5838
Skechers v Nike

Nov. 7, 1939. W. E. SCHUESSLER 2,178,941

KNITTED HELMET

Filed April 18, 1938

Fig. 1.

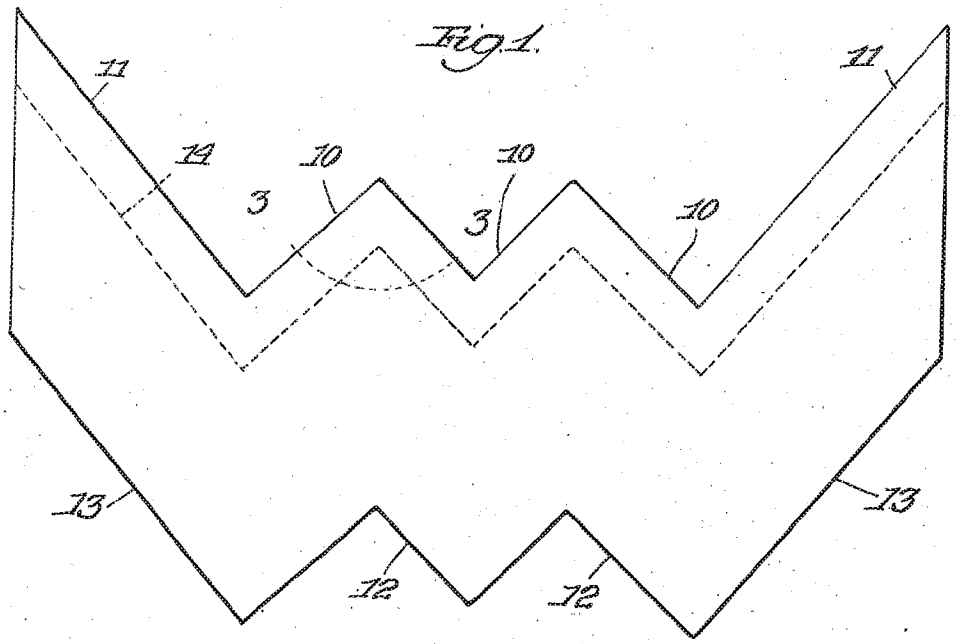


Fig. 2.

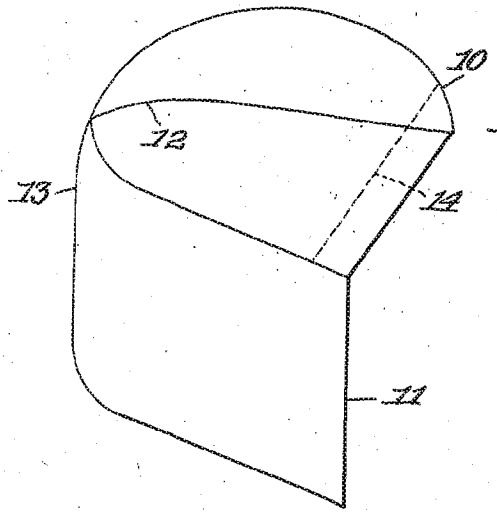
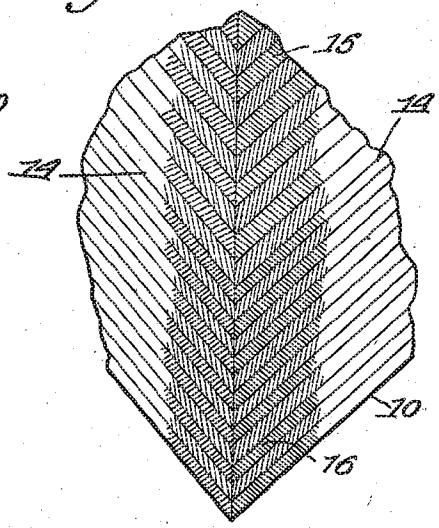


Fig. 3.



Inventor:
Walter E. Schuessler,
By Britton, Giles, Davis, Kirsch & Dawson,
Attys.

Patented Nov. 7, 1939 2,178,941

UNITED STATES PATENT OFFICE

2,178,941

KNITTED HELMET

Walter E. Schuessler, Chicago, Ill.

Application April 18, 1938, Serial No. 202,766

4 Claims. (Cl. 66—171)

This invention relates to a knitted helmet and to the method of making the same.

In the manufacture of knitted helmets, it is customary to form a knitted piece and then cut out portions and sew sections together to form the completed article. Such cutting operations require picking up the ends of the portions cut to prevent unraveling and then sewing the parts together. This operation results in uneven edges and often in loose stitches. Further, in the forming of a helmet, there is a tendency for the front side edges of the helmet not to fit closely to the face and to form loose portions which are caught by the wind.

An object of the present invention is to provide a method for forming a compact, neat and sturdy knitted helmet while rendering it unnecessary to cut any portion of the knitted swatch while at the same time providing a finished helmet with the front surfaces thereof forming a tight and inwardly turned edge which fits closely and snugly about the face. A further object is to provide a simple and expeditious method for forming helmets in a continuous manner, the helmets being completed from the swatches as knitted without requiring cutting, and requiring the joining of only a few edges. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated in a preferred embodiment by the accompanying drawing, in which—

Figure 1 is a plan view of a swatch knitted in accordance with my invention and adapted to have certain edge portions thereof joined to form my completed helmet; Fig. 2, a side view in elevation of the finished helmet; and Fig. 3, an inverted broken view of the portion enclosed by the line 3—3 in Fig. 1, the portion being greatly enlarged to illustrate the knitting.

In the practice of my process, I first knit a swatch such as is illustrated in Fig. 1 with the top or front portion thereof provided with three V recesses 10. The portion along the end recesses is extended to form the extension 11. On the lower or rear side of the swatch are formed two V recesses 12 and extension walls 13 joining the walls 12.

In the knitting operation, I form on the top or front side of the swatch an area of close stitches indicated by the numeral 14; that is, from line 14 to the upper or front edge of the swatch the stitches are tightly formed, while to the rear of line 14 the stitches are loosely formed. The loose and tight stitches may be formed in accordance with the disclosure in U. S. Patent No. 2,150,730 issued to Carl F. Schuessler on March 14, 1939, for Knitting machine. In this application is disclosed mechanism whereby needles are arranged with high and low butts whereby certain needles draw the yarn down tightly to form tight stitches while other needles are not depressed so far and do not draw the stitches so tight. Whatever mechanism is employed, I prefer to form tight stitches along the front or upper side of the swatch, as illustrated, for the purpose hereinafter described.

After the swatch has been knitted, as shown in Fig. 1, I complete the helmet by following few and very simple operations. In the first place, the sides of the central V recess at the front of the swatch are joined by knitting, sewing, or any suitable means. This is the only operation on the front side of the swatch.

The next step is to connect the sides of the two V recesses at the rear side of the swatch and then to join the two edges indicated by the numeral 13. This results in completely closing the rear side and forming a helmet, as shown in Fig. 2.

In the completed helmet, the closely knit stitches at the front side of the helmet, as shown in Fig. 2, tend to draw inwardly and cling to the contour of the face so that there is no tendency for wind to open the helmet. In other words, I provide the helmet at its only open side with the close stitching which serves to protect the opening. At the same time, it will be observed that the close stitching follows a single uniform line, as illustrated in Fig. 1, and is accomplished by setting the needles for the stitching initially and proceeding along in a uniform operation. In the illustration given, the loose stitches are indicated by the numeral 15 and the tight stitches are indicated by the numeral 16.

While it is known that swatches may be knitted in various shapes with ridges and V recesses on opposite sides, it is believed that no one has yet conceived the idea of employing this as a means for forming an integral helmet with selvage edges, the swatch being converted into a helmet solely by joining some of the edges.

While in Fig. 1, I have shown a swatch adapted for one helmet, it will be understood that this swatch may be knitted repeatedly in one continuous strip and then the swatch cut through at points so as to form separate portions, as shown in Fig. 1. In any arrangement where the helmet is provided with one cut or unselvaged side, the loose ends are picked up by hand or machine and thus closed.

The operation is extremely simple, taking but

a few moments for the completion of a helmet while at the same time providing a sturdy and almost integral structure which fits snugly in position about the head of the wearer.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible in view of the prior art.

I claim:

1. In a method for forming a knitted helmet, the steps of knitting a swatch in the shape illustrated with the front side thereof provided with three successive V recesses and the rear side provided with two V recesses, the outer portions of the swatch being extended beyond said V recesses, joining the opposing edges of the central V recess in the front side, joining the opposing edges of each of the V recesses at the rear side, and then joining the rear edges of said extension portions.

2. In a method for forming a knitted helmet, the steps of knitting a swatch in the shape illustrated with the front side provided with three successive V recesses and with the front edge portion thereof provided with stitches tighter than the rear portion of the swatch, the rear side of the swatch being provided with two V recesses and the outer portions of the swatch being extended beyond said V recesses, joining the opposing edges of the central V recess on the front side, joining the opposing edges of each of the two V recesses on the rear side, and joining the rear edges of said extension portions at the rear of the swatch.

3. A knitted helmet formed of a single knitted and uncut swatch, the front side of said swatch being provided with three successive V recesses, and the opposing edges of the center V recess being joined, and additional portions of the swatch as knitted being joined to form the completed helmet, said helmet having the front portion thereof adjacent the opening in the helmet formed of relatively tight stitches while the remainder of the helmet is formed of relatively loose stitches.

4. A knitted helmet formed of a single knitted and uncut swatch, the front side of said swatch being provided with three successive V recesses, the opposing edges of the central V recess being joined, the rear side being provided with two V recesses, the opposing edges of each of the two V recesses being joined, and the outer portions of said swatch being extended beyond said V recesses, said portions being joined at the rear edges thereof to form the completed helmet.

WALTER E. SCHUESSLER.

March 14, 1939. C. F. SCHUESSLER 2,150,730

KNITTING MACHINE

Filed Jan. 29, 1937

Fig. 1.

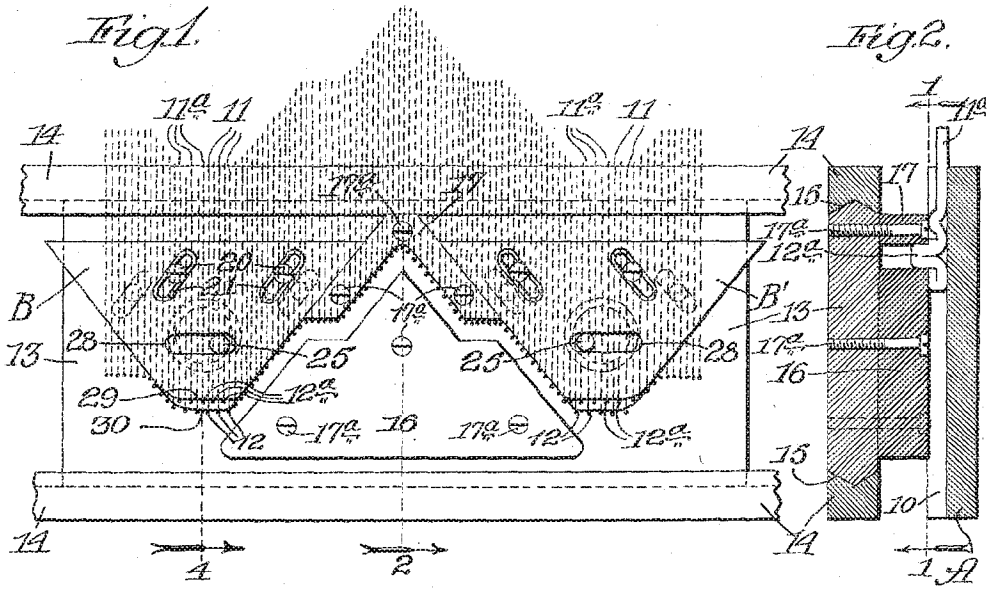


Fig. 2.

Fig. 3.

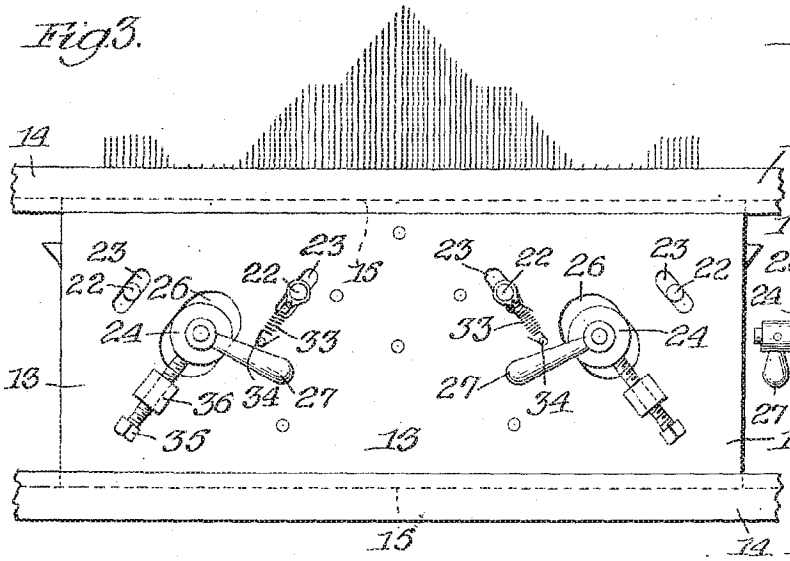
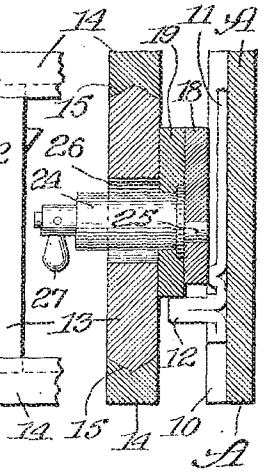


Fig. 4.



Inventor:
Carl F. Schuessler,
By Dyer, Horth, Lee, Chrittenden & Niles,
Attys.

Patented Mar. 14, 1939 2,150,730

UNITED STATES PATENT OFFICE

2,150,730

KNITTING MACHINE

Carl F. Schuessler, Chicago, Ill.

Application January 29, 1937, Serial No. 123,074

6 Claims. (Cl. 66—77)

This invention relates to flat and circular knitting machines, and more particularly to the loop forming mechanism of these machines. For the purpose of illustration, the flat machine alone will be described.

An object of the invention is to provide mechanism by which some of the needles are depressed to a greater extent than others so that some of the stitches may be made loose while others are tight.

Another object of the invention is to provide mechanism by which the tightness of certain of the stitches may be controlled independently of the other stitches. Still another object is to provide improved mechanism which is easily adjustable to produce stitches of various degrees of tightness and which can be adjusted to produce a series of stitches having the same or different degrees of tightness. Other specific objects will appear as the specification proceeds.

An embodiment of the invention is illustrated in the accompanying drawing in which—

Fig. 1 is a view of my improved mechanism, the view being taken as indicated at line 1—1 of Fig. 2, the needles being shown diagrammatically; Fig. 2, a sectional view, the section being taken as indicated at line 2 of Fig. 1; Fig. 3, a front view taken parallel with the needle bed and showing the needle tips diagrammatically; and Fig. 4, a sectional view, the section being taken as indicated at line 4 of Fig. 1.

The needle bed, designated by the character A, may be of the well known type commonly used in flat knitting machines. For purposes of illustration it is here shown in vertical position, but the bed may be inclined and mounted in the machine in any suitable position. It is provided with the slots 10 in which move the knitting needles. As in the ordinary construction for flat knitting machines, upon the prescribed movement of the needles in slots 10, stitches are formed and knitting takes place.

In this embodiment the needles are of two kinds. One kind, designated by the character 11, has the high butts 12; and the other kind, designated by the character 11a, has the low butts 12a. The difference in these two kinds is clearly seen by a comparison of the needles shown in Figs. 2 and 4.

The cam means for moving the needles in their slots is mounted on a cam plate 13 which is slidably mounted between spaced guide rails 14. Guide rails 14 are disposed parallel with the needle bed A and contain grooves 15 on their inside surfaces. The cam plate 13 is slidably mounted between rails 14 and has its edges engaging grooves 15. On the rear or inner side of plate 13 are cams 16 and 17 which are fixedly secured to plate 13 by means of bolts 17a. The cam 16 is of substantially triangular shape and is arranged to engage the butts of the needles on the underside to raise the needles. The cam 17, also fixedly secured to the cam plate, is in spaced relation to cam 16 and is adapted to engage the needle butts on their top sides when the needles are in raised position. Fig. 2 shows a needle in raised position, its butt being engaged on top and bottom by cams 17 and 16 respectively.

The cast off cams B are mounted on the inner side of plate 13 adjacent the stationary cams just described and are in sliding engagement with the stationary cam 17. Cams B comprise the cam 18 which is mounted directly to cam 19 by means of screws 20 extending through inclined slots 21 in cam 18. Cast off cam 19 is mounted to plate 13 by means of pins 22 extending through inclined slots 23 in plate 13. For adjusting the relative position of cams 18 and 19, I provide the rotatable member 24 which is journaled in cam 19 and has a pin 25 adjacent its rim which extends into laferal slot 26 of cam 18. Member 24 extends through slot 26 to the front of the mechanism and is provided with a crank 27. Because pin 25 is eccentric with respect to member 24, rotation of member 24 by crank 27 causes the cam 18 to be moved with respect to cam 19. The slot 28 in cam 18, which receives pin 25, is preferably so placed that when cam 18 is moved to its lowest position relative to cam 19, the bottom edge 29 of cam 18 will be flush and even with the bottom edge 30 of cam 19.

As before stated, cam 19 is adjustably mounted on plate 13, the pins 22 being slidable in inclined slots 23. On the face of plate 13 a spring 33, having its one end secured to post 34 on plate 13, is attached at its other end to one of pins 22 and so tends to urge the cam members to lowered position.

A set screw 35, which engages post 36 on plate 13, supports member 24 on the under side, and by turning this screw the position of cam 18 and its adjacent cam 19 may be concurrently adjusted. Cams 18 and 19 are held against upward movement by spring 33 and against downward movement by screw 35.

The cast off cams B', disposed on the other side of fixed cams 16 and 17, are constructed and mounted in a way similar to cams B, except that

their pins extend through slots in plate 13 which slots are inclined oppositely from slots 28. This allows cams B' to be moved along one outside edge of fixed cam 17 while cams B may be moved along the other outside edge of cam 17.

In the operation of the improved mechanism, plate 13 is moved laterally, its edges sliding in grooves 15, so that cast off cams B engage butts 12 and 12a of the needles. Cast off cam 18 is in a position to engage both butts 12 and 12a, but the cast off cam 19, being farther removed from the needles, is in a position to engage only high butts 12. Accordingly, when the cam plate 13 is moved laterally needles 11, having butts 12, are engaged by cam 18 and carried to a level determined by edge 30 on this cam, while needles 11a, having butts 12a, are engaged by cam 18 and carried down to a level determined by edge 29 of this cam. Thus, all needles having high butts are carried to lower levels, and the loop extensions formed by these needles are longer, which means that the stitches formed thereby are looser.

If it is desired to make the stitches alternately loose and tight, the needles may be arranged with alternately high and low butts as illustrated in Fig. 1 of the drawing. In this arrangement, a needle having a low butt will be depressed by cam 18 and a comparatively tight stitch formed, and the succeeding needle, having a high butt, will be engaged by cam 19 and a comparatively loose stitch formed. The needles may be arranged in any other desired manner, however. For example, two high butt needles may be placed together, and two low butt needles placed together; in this arrangement two comparatively loose stitches would be followed by two comparatively tight stitches.

Both of the above classes of stitches may be adjusted as to tightness by turning the set screw 35. When the operator wishes to make all of the stitches tighter, he turns screw 35 to allow member 24 to descend to a lower position. Cams B will always descend to the lowest position allowed by screw 35 because of the action of spring 33.

If the operator wishes to adjust the tightness of only the comparatively tight stitches, this may be done by loosening screws 20 and turning handle 27 in one or the other direction. If the stitches are to be made tighter, handle 27 is turned to raise pin 25; this causes pin 25 to move in slot 28 and raise cam 18. Cam 18, being itself raised, does not then depress the low butt needles to as great an extent and so forms tighter stitches with these needles, while cam 19, being unaltered in position, operates to depress the high butt needles as before to form stitches of the same degree of tightness as before. Thus, the tightness of the comparatively tight stitches may be altered independently of the looser stitches.

If the operator wishes to form stitches of all the same degree of tightness, he may turn handle 27 to move cams B to a position where edge 29 is flush with edge 30. When the machine is so adjusted, all needles are depressed equally, regardless of their butts, and uniform stitches are formed.

After being depressed by cast off cams B, the butts of the needles are guided by cams 16 and 17 to their upper positions, and are then caused to descend into contact with cams B'. The action of cams B' is similar to that of cams B, and the needles are again depressed to form a second course of stitches. Adjustment of the positions of cams B' may be made in the same way as described in connection with cams B, and this adjustment is effected altogether independently of cams B so that one course of stitches may be tighter or looser than the following one. Also it will appear that the relative tightness of stitches within the one course may be different from the relative tightness of stitches within the following course of stitches. For instance, it may be desired that the stitches in one course be regular and uniform and the stitches in the following course be irregular, some stitches being tighter than others; and to accomplish this, cams B are adjusted to bring edge 29 even with edge 30, and cams B' are adjusted to give the desired variation in the tightness of the stitches. An instance of this is the knitting of a product in which Lastex is knitted in even stitches, and cotton threads are knitted in tight and loose stitches, the cotton threads serving as a reinforcement for the Lastex.

While in the above description I have set forth a specific structure as illustrative of my invention, it will be understood that many changes in construction may be made without departing from the spirit of my invention. The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

What I claim as new and desire to secure by Letters Patent is:

1. In a knitting machine, a plurality of stitch-forming needles carried in a needle bed, some of said needles having low butts and some having high butts, a stitch cam adapted to depress said needles to a predetermined position, and a second stitch cam adapted to depress said high butt needles to a different predetermined position, the drawing of said needles to said different positions serving to produce tight and loose stitches, and means for moving one of said cams relative to the other whereby each of said cams depress needles to the same position.

2. In a knitting machine, a plurality of stitch-forming needles carried in a needle bed, some of said needles having low butts and some having high butts, a stitch cam adapted to depress said needles to a first predetermined position, and a second stitch cam adapted to depress said high butt needles to a second predetermined position, the drawing of said needles to said different positions serving to produce tight and loose stitches, and means for adjusting said first-mentioned cam relative to said second cam to change said first predetermined position independently of said second predetermined position.

3. In a knitting machine, a plurality of stitch-forming needles carried in a needle bed, said needles having butts of different shapes, a stitch cam adapted to depress said needles to a first predetermined position, and a second stitch cam adapted to depress some of said needles to a second predetermined position, the drawing of said needles to said different positions serving to produce tight and loose stitches, the needles to be depressed by said second cam being determined by the shape of their butts.

4. Apparatus as set forth in claim 3, in which said cams are urged into depressing position by spring means.

5. In a knitting machine, a plurality of needles carried in a needle bed, cam means for depressing said needles equally to a predetermined position to form one course of stitches and a second cam means for depressing said needles to form another course of stitches, said second cam means being effective without adjustment

within the course to depress some of said needles to one position and others to a different position whereby some of said stitches in said other course are tighter than others in the same course.

6. In a knitting machine, a plurality of needles carried in a needle bed, cam means for depressing said needles to predetermined positions to form one course of stitches, said means being effective without adjustment within the course to depress certain of said needles to deeper positions than others, and a second cam means for depressing said needles to form another course of stitches, said second means being effective without adjustment within the course to depress certain of said needles to deeper positions than others, and means for adjusting each of said cam means to change the variation of tightness in the stitches of either course independently of the other course.

CARL F. SCHUESSLER.

SUPPLEMENTAL DECLARATION OF EDWARD C. FREDERICK

I. INTRODUCTION

1. I, Dr. Edward C. Frederick, make this declaration in connection with the Opposition filed by adidas AG ("adidas") to Nike, Inc.'s ("Nike") Motion to Amend in the *Inter Partes* Review of U.S. Patent No. 7,347,011 ("the '011 Patent") owned by Nike.

2. I submitted a declaration presenting my opinions regarding the validity of claims 1-46 of the '011 Patent on November 28, 2012. Paragraph 98 of that declaration stated that: "I reserve the right to supplement my opinions in the future to respond to any arguments raised by the owner of the '011 Patent and to take into account new information as it becomes available to me." I incorporate my previous declaration by reference.

3. Paragraph 7 of my November 28, 2012 declaration included a list of the materials that I reviewed in preparation of that declaration. I have supplemented that list with additional materials that I reviewed in preparation of this declaration as follows: industry information provided by adidas; two on line articles on KnittingIndustry.com (Billy Hunter, editor, Editor's Viewpoint: Nike Flyknit: Quantum leap for flat knitting. Knitting Industry website 26 July 2012, Website link, http://www.knittingindustry.com/nike-flyknit-quantum-leap-for-flat-

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A2008

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knitting/; and Billy Hunter, editor, Editor's Viewpoint: Nike Flyknit: Ready, Steady, Go! 31st July 2012, Website link: http://www.knittingindustry.com/nike-flyknit-ready-steady-go/; U.S. Patent No. 2,178,941 "Knitted Helmet" to Schuessler, and U.S. Patent No. 2,150,730 "Knitting Machine" to Schuessler.

4. In addition to the materials I have referenced, I discussed with Dr. Sabit Adanur how a person of ordinary skill in the art ("POSITA") at the time the '011 Patent was filed would have been motivated to modify Nishida to incorporate a "knit to shape" flat knit textile, my understanding of the POSITA standard, and the proposed constructions for "flat knit textile element" and "flat knit edges."

5. Since submitting my November 28, 2012 declaration, counsel for adidas has asked me to review Nike's Motion to Amend the '011 Patent, the Declaration of Raymond F. Tonkel, and Exhibits submitted therewith, and a copy of the transcript of the November 5, 2013, cross-examination deposition of Raymond F. Tonkel. In particular, counsel for adidas has asked for my opinion regarding the statements by Mr. Tonkel regarding the secondary considerations of non-obviousness, as well as the obviousness of modifying Nishida's process of knitting the unitary upper in flat form as part of a larger structure with a "knit to shape" process of knitting the unitary upper in flat form.

II. Principles of Claim Construction and Proposed Constructions

6. As stated in Paragraph 12 of my November 28, 2012 declaration, I

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understand from counsel for adidas that, in a review proceeding, the claims are to be given their broadest reasonable construction consistent with the patent specification. I also understand that limitations from the specification are not to be read into the claims.

7. While the specification of the '011 Patent describes flat-knitting as a sub-type of weft knitting, the specification does not define "flat knit," "flat knit textile," or "flat knitting," or otherwise state that flat knitting is *exclusively* a sub-type of weft knitting. (Ex. 1015, pp. 34-36.)

8. Based on my discussion with Dr. Adanur, I understand that a broadest reasonable interpretation that is consistent with the '011 Patent specification of "flat knit textile element" is "a knitted textile that is knit in flat form." I also understand that a broadest reasonable interpretation that is consistent with the '011 Patent specification of "flat knit edges" is "edges of a knitted textile that are knit in flat form."

III. Motivation to Modify Nishida to Include "Knit to Shape" Flat Knit Textile Element

9. I have reviewed U.S. Patent No. 5,345,638 to Nishida ("Nishida"), U.S. Patent No. 2,178,941 to Schuessler ("Schuessler I"), and U.S. Patent No. 2,150,730 to Schuessler ("Schuessler II").

10. Nishida is directed to knitted textiles that are produced by

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A2010

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"conventional textile processes," which I understand was construed by the Board to "include knitting, including 'weft-knitting.'" (Ex. 1005, 3:6-12; Paper 18, p. 20.) Nishida discloses that the layout 2 is flat knit as part of a larger web of material 1 and removed therefrom to form the final shoe upper 3. (Ex. 1005, 3:6-42; 4:6-46.)

11. Nishida is directed to improving efficiency of manufacturing shoe uppers 3 by reducing the costs of materials needed to produce the uppers 3. (Ex. 1005, 1:10-37, 2:15-25.) However, Nishida also recognizes that there are advantages to reducing the amount of cutting waste, such as by having individual patterns or partial patterns already "produced directly in the production of the web of material in the desired shoe size, by which the cutting waste can be still further limited, since the individual patterns or partial patterns in the provided size can directly adjoin one another." (Ex. 1005, 2:27-32.)

12. I have also spoken with Dr. Adanur to confirm my understanding that this statement in Nishida would suggest to a POSITA at the time the '011 Patent was filed to modify Nishida's process of knitting the unitary upper in flat form as part of a larger structure with a "knit to shape" process of knitting the unitary upper in flat form.

13. Thus, a person of ordinary skill in the relevant art at the time the '011 Patent was filed would understand that Nishida suggests there may be certain benefits of additional reductions in cutting and material waste, which the skilled

person could reasonably understand to include flat knitting the layout 2 in final form without the need to remove the textile element from a larger textile structure.

14. For example, Schuessler I teaches knitting a swatch in flat form with edges that are stitched together to form a three-dimensional helmet (i.e., cap) by joining some of the edges. (Ex. 1020, 1:22-27, 1:48-2:2, 2:41-45.) Schuessler I and Nishida are in similar fields: the use of knitted two-dimensional textile elements having edges that are stitched together to form three-dimensional wearable items, and Schuessler II confirms that a flat knitting machine may be used to produce the two-dimensional textile elements of Schuessler I (Ex. 1021), which would be equally applicable to Nishida.

15. Because the textile elements of Schuessler I serve the same purpose when combined with Nishida's textile elements, namely to form a three-dimensional wearable item in an efficient and economical way from a knitted two-dimensional textile element, a person of ordinary skill in the relevant art at the time the '011 Patent was filed would have been motivated to combine Schuessler I's flat knitted textile elements having selvage edges that are sewn together with Nishida's knitted textile elements also having edges that are sewn together to create a wearable item.

IV. NIKE'S SECONDARY INDICIA OF NON-OBVIOUSNESS

16. The argument put forth in the declaration of Mr. Tonkel that the '011

Patent describes a method of making uppers that is "more efficient from a manufacturing perspective" is untenable. Before commenting on the specific statements made by Mr. Tonkel in his declaration, I would like to describe how the embodiments mentioned in the '011 Patent would be rendered into practice by a POSITA.

17. Making unitary uppers on a flat knitting machine requires considerable expertise and investment. A staff of programmers and skilled machine operators are required to keep these high-tech machines running and to program them to make the uppers properly. In addition, skilled shoemakers are still needed to finish the uppers, to ready them for the final steps in making finished shoes.

18. The website, *KnittingIndustry.com*, has analyzed the requirements for making uppers by these methods, and published an assessment of what would be needed in terms of equipment to produce sufficient uppers. I quote from an *Editorial Viewpoint* by *KnittingIndustry.com* editor, Billy Hunter,

> Based on information currently available and making some informed assumptions we calculate, not surprisingly, that very large numbers of flat knitting machines will be required to meet market demands, especially for the Nike Flyknit Trainer+ mass market product.
>
> If we assume Flyknit is knitted in 10 or 12 gauge and estimate a production time of approximately 30 minutes per upper, then one machine working 24/7 might produce around 320 uppers per week. That's only enough for 160 pairs of Flyknit shoes and at that rate, 1000 machines would be required to produce 160,000 pairs per week.
>
> The point is that these are small numbers by Nike standards and

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> therefore huge numbers of flat knitting machines could be involved if Flyknit is as successful as Nike anticipates.

Ex. 1024.

19. The key conclusions of this analysis are that approximately 30 minutes are required to knit each upper (*i.e.*, 60 minutes per pair), and that a large number of knitting machines would be required. The high-tech computer-controlled flat, weft-knitting machines, like a Stoll CMS 530 HP (cited as a likely candidate in another article by Mr. Hunter, Ex. 1025), which are required to make these uppers, cost well over one hundred thousand dollars each and they require expert technicians to maintain them and keep them operating.

20. It is not unusual for a well-run Asian supplier to produce 1500 to 2000 pair per line of production per day. This is a good measure of productivity. In order for the knitted uppers made by the methods described in the '011 Patent to match that current level of productivity, at least 60 to 80 knitting machines running 24/7 would be required to keep up with just one line of production. Multiple lines of production would require equivalent multiples of 60 to 80 knitting machines on the order of $120,000 to $150,000 per machine, which would be required just to match conventional manufacturing methods.

21. The best way to more fully understand what this all means in terms of the efficiencies and costs of manufacturing is to make a more detailed comparison of this way of making uppers with conventional methods.

22. Making a finished upper using conventional methods involves multiple steps. The component materials must be acquired. The individual pieces that may number from a few to dozens must be cut from larger pieces of material. These precisely cut pieces must be assembled into a complete upper. This upper assembly process is still most often done by stitching together the individual pieces.

23. This is indeed a tedious and labor intensive process. Taken together the steps required to create a finished upper ready for lasting, represent the most labor intensive part of shoemaking. In my experience about one-half to two-thirds of the labor required to make a shoe is tied up in making the upper. Depending on the complexity of the design and the type of shoe, it takes about 1.3 to 2 hours of labor to make each pair of shoes in an Asian shoe factory. Approximately one (1) hour of that total can be attributed to the steps required to make the upper. Labor rates for conventional shoemaking in Southern China are currently around $2 per hour and rising. Labor rates in other countries in Asia are generally below that figure.

24. The process of making a pair of uppers on a flat knitting machine trades the roughly one hour of low cost labor per pair required to make uppers conventionally, for highly-skilled, and more expensive, labor required to program and maintain these machines, amortization of the investment in these extremely expensive knitting machines, plus the skilled shoemaking labor required to finish

the knitted uppers readying them for lasting and the remaining steps in shoemaking. The total time required per upper to program, operate and monitor the special computerized knitting machines required to make a pair of uppers includes at least the 60 minutes of machine time required to complete the knitting, but, as I will show later in this report, other steps are also required to bring the upper to the point where it is equivalent to the finished upper made by conventional methods. Skilled labor that is trained and experienced in programming and operating computerized flat knitting machines would be many times more expensive than typical Asian shoe manufacturing labor rates. In addition to this technically skilled labor to program and monitor the machinery, approximately 30 minutes per pair of skilled shoemaking would still be required to bring these uppers to the point where they could be used to make a finished shoe.

25. The net effect of these tradeoffs is a reduction from one hour to ½ hour of hands-on shoemaking, and the addition of some amount of highly-skilled labor, and high costs to amortize large numbers of expensive machines.

26. The idea that knitting unitary uppers as described in the '011 Patent is a more efficient and economical method of manufacturing does not agree with these facts as I understand them. This will become even more apparent with respect to the specific comments made in the Tonkel declaration.

27. In paragraph 45 of his declaration, Mr. Tonkel states:

> One of skill in the art would also understand that by flat knitting the embodiments shown in Figures 8, 10 and 11 efficiency can be increased. As discussed above, the embodiment described in Figure 9 (and claimed in issued claim 36) requires that "[e]ach textile element 40 [be] removed from textile structure 60 with a die-cutting, laser-cutting, or other conventional cutting operation." (Ex. 1002 at 8:8-10). In contrast, the embodiments shown in Figures 8, 10 and 11 are formed without a surrounding textile structure from which the textile element must be removed. Such embodiments are more efficient from a manufacturing perspective because they eliminate the additional "cutting operation" after knitting associated with the embodiment shown in Figure 9.

Ex. 2010, ¶ 45.

28. The advantages of multiple sizes per unit, as described in Nishida (Ex. 1005, 2:27-32), is eliminated by the '011 Patent method, as acknowledged by Mr. Tonkel in his deposition. Ex. 1015, pp. 101-103. Being able to make multiple-size uppers is an advantage because it reduces the inventory of uppers required to meet production demands. It also reduces set-up time on the knitting machines as fewer uppers need to be programmed to meet size run requirements. The process of cutting specific sized uppers from a large textile element that covers multiple sizes would not be a difficult or time-consuming task for a typical shoe manufacturer.

29. The embodiments described in the '011 Patent are clearly not more efficient from a manufacturing perspective. The extra time, equipment, equipment amortization, and costly labor required to produce uppers like the embodiments shown in Figures 8, 10, and 11 are disadvantageous from a manufacturing

perspective as I have explained in detail above.

30. In paragraph 46 of his declaration, Mr. Tonkel states:

> In addition, such embodiments are efficient because they also eliminate the extra processing steps associated with stabilizing the cut edges. (*E.g.*, Glidden, Ex. 1007 p. 2, ll. 43-63; 'Where the cutting of the textile upper … leaves a raw textile edge which might ravel or fray, the edges may be protected, as by an overcast stitch …'); (Whiting, Ex. 1009 at 3:68 – 4:16; '[T]he last 16 may be provided with a guide groove 20 along which a cutter effects severance of portion 13 from the ultimate upper 11. … The shoe is now complete except for providing a finish for the contour edge of the upper. … [S]aid edge may be seared with a heated tool to fuse the fibers of the yarn along the severance line to coagulate the same and form a finishing bead 21. … Fig. 5 shows another edge finishing method, the same entailing the application of a binding 22 by stitching, cementing or pasting the same in place.'). Furthermore, such embodiments are environmentally beneficial because they reduce the expense and waste associated with the extra material that must be removed from the textile element.

Ex. 2010, ¶ 46.

31. Contrary to what Mr. Tonkel asserts, trimming and cutting are not totally eliminated by the process described in the '011 Patent. As is clearly visible in the photo of the unitary upper intended for a Nike Flyknit shoe that has been made on a flat knit machine (reproduced below), when uppers are made according to the methods described in the '011 Patent, these uppers are not complete and still need to be finished and readied for the next steps in making the shoe.



Ex. 1024.

32. The threads and loops of material around the perimeter need to be manipulated. In the case of this particular upper, a tongue also needs to be inserted, presumably by stitching on a separately flat-knitted tongue. Also there is a high likelihood of a need for a lining, for example in the inside heel area, and reinforcing such as the addition of a fabric tape to cover and reinforce any seams created by forming the upper into a 3D shape. The addition of finishing details like a logo would also be required. Most importantly, the edges that form the edges of

the base of the upper would need to be Strobel stitched to a Strobel board to complete the upper.

33. I hold this image of an upper from Exhibit 1024 as an example of what a unitary upper produced by flat-knitting might look like and to explain the extra finishing steps that would need to be performed to make it ready for assembly into a finished shoe.

34. In addition, the examples shown in Figure 8 of the '011 Patent show an internal edge (31 and 32, as well as 44b and c and 43b and c). This is the border to which a Strobel board or sockliner would be stitched in order to finish the upper to ready it for lasting, bottoming and making. The addition of the Strobel process in order to make the upper ready for lasting is a significant step. In other words, according to what a POSITA would understand, the upper is not finished as knitted by a flat knitting machine, either as shown in Exhibit 1024, or as it is described in the '011 Patent.

35. In paragraphs 177-179 of his declaration, Mr. Tonkel states:

> I understand that objective or secondary consideration factors can be considered when assessing whether an invention would have been obvious. I understand that one of those factors supporting non-obviousness is a long felt need for the invention. It is my opinion that there was a long felt need for the invention described in substitute claim 47.
>
> Nishida shows that reducing material waste during manufacture of textile footwear uppers was a long-felt need. Nishida asserted that

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> 'with the known material [as described in German Patent No. 627878] that has crosswise strips, the entire cutting waste . . . consists of an expensive tubular material, multilayer material or the like.' (Ex. 1005, 2:22-25). Over thirty years after that German Patent, Nishida's response to this problem was to make the "cutting waste" a simpler, lighter or cheaper material. (Id. at 2:15-18). Even if one assumes that Nishida teaches flat knitting of his 'web' with multiple 'layouts', however, this underlying problem remained. In particular, manufacturing uppers Patent Owner NIKE, Inc. Exhibit No. 2010 - page 93 91 from flat textile elements still resulted in material that must be wasted when a flat textile element is cut from a "web of material." Over ten years then elapsed between Nishida and the filing of the '011 patent application. Unlike Nishida, which simply tried to make "cutting waste" less expensive, the upper of substitute claim 47 solves the long-felt need to reduce flat textile footwear upper manufacturing waste by eliminating the need to cut a textile element from a textile structure, thereby eliminating "cutting waste" (and the associated cutting step) instead of simply making the cutting waste cheaper.
>
> Therefore, for at least these reasons, the objective factor of long felt need for the invention supports the non-obviousness of the inventions described in substitute claim 47, and the claims dependent thereon, i.e., substitute claims 48-50.

Ex. 2010, ¶¶ 177-179.

36. The elimination of cutting waste and reducing the need for extra steps may be a long-felt need in shoemaking, but it has to be put in perspective. Any invention that addresses such a need must pass certain tests. It must not increase labor costs or materials costs, and must not significantly decrease overall productivity. What is described in the '011 Patent fails this test in all three areas.

37. All labor required to make finished uppers via the flat knitting

approach, is not eliminated. In fact, labor costs might be equivalent or even increased because the manufacturer would need to retain at least ½ of the labor required to create a finished upper conventionally and would have to add to it much more expensive labor in the form of technical expertise to program and operate the knitting machines. This does not include significant amortization costs that I have folded into the material costs covered below.

38. The special yarns used to knit flat-knitted uppers are more expensive than the vast majority of materials used to make shoes conventionally, and the machines used to make these uppers are extremely expensive. One way to look at the cost of the materials is to combine the cost of the yarns with amortization for the machines used to knit the uppers. The amortization on the machinery required to produce 1500 to 2000 pair of unit uppers by flat knitting would be based on an initial outlay of as much as $10.8 million in US Dollars. And that would cover just one line of production. In my opinion, the net materials cost would be significantly greater for the methods described in the ‘011 Patent.

39. Lastly, the productivity of computerized knitting machines is poor compared to conventional manufacturing techniques. As I mentioned above, 60 to 80 knitting machines running 24/7 would be required just to keep up with one line of conventional production.

40. Therefore, the reduced waste resulting from making shoes by these

methods would come at an unacceptable cost for manufacturers in terms of increased labor and material costs as well as lower productivity.

41. It is clearly a good thing to reduce material waste. In fact, many footwear manufacturers invest in expensive computer-controlled cutting machines to reduce waste and improve yields (i.e., the percentage of useful parts vs waste from rolls of materials). Special computer programs are also used to reduce material waste by controlling the cutting paths of waterjet or laser cutting machines. It's not unusual, using these methods, to reduce waste to about 2% to 5%. These computer-controlled cutting machines, besides reducing waste, also boost productivity and reduce labor costs by allowing many more parts to be cut in a unit of time. In fact, the long-felt need to reduce material waste is already being addressed by these technologies, and with decidedly positive economic benefits for manufacturers.

42. In addition to the gains in addressing these long-felt needs with computer-controlled high-yield cutting methods, computer-controlled stitching machines have also been introduced to the stitching rooms of many manufacturers. This significantly improves the productivity and reduces waste due to errors of sewing machine operators charged with assembling the pieces of the upper, and by doing so, reduces labor rates.

43. I mention these relatively recent technical developments because these

are examples of addressing the long-felt need for greater efficiency and less waste, suggested by Tonkel. But contrary to the methods described in the '011 Patent, these methods increase efficiency and reduce waste in a way that makes economic sense.

44. Eventually the costs of the knitting machinery will come down and the yields and productivity will improve, but I don't foresee these factors ever improving to the point where they will be able to produce a shoe more quickly or more economically compared with conventional construction methods, even if we assume that conventional methods will not continue to evolve.

45. In conclusion, the argument put forth in the declaration of Raymond Tonkel that the '011 Patent describes a method of making uppers that is "more efficient from a manufacturing perspective" is untenable. In fact, the embodiments described are extremely capital-intensive, while being less efficient and more expensive in terms of material costs and reductions in productivity.

V. CONCLUSION

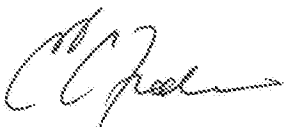
46. In signing this declaration, I recognize that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross examination in the case and that cross examination will take place within the United States. If cross examination is required of me, I will appear for

cross examination within the United States during the time allotted for cross examination.

47. I reserve the right to supplement my opinions in the future to respond to any arguments raised by the owner of the '011 Patent and to take into account new information as it becomes available to me.

48. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: 12 November 2013



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Editor's Viewpoint

Knitting Industry's founder and Editor Billy Hunter is a chartered textile technologist with more than 30 years of experience in knitted textiles manufacturing, knitting machinery, research and development and textiles journalism.

Nike Flyknit: Quantum leap for flat knitting

26th July 2012

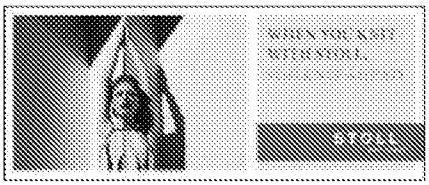
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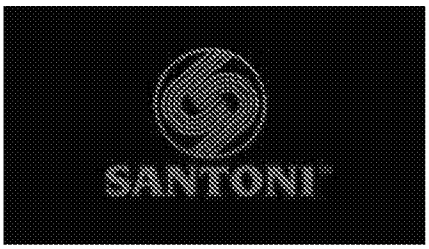
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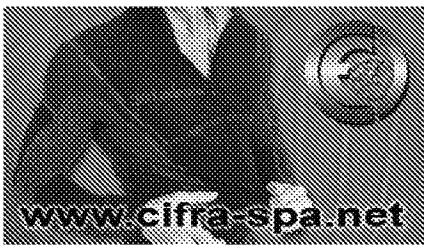
The knitting industry rumour mills have been running at warp speed (no puns intended) since we published an article on Nike's Flyknit integrally knitted running shoe upper in February - see Nike Flyknit – a seamlessly knitted running shoe!.

After taking a close look at images of the knitted upper, we can reveal that Flyknit is without any doubt made on an electronically controlled flat knitting machine - apologies to the flat knitters amongst you who probably think that was already very obvious.

Some have speculated that Flyknit is produced on circular knitting technology and although a version of Flyknit could be produced on a circular knitting machine, a substantial amount of post knit cutting would be required leaving 'raw edges' on the fabric. Flyknit has closed selvedges all around the upper.







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In addition, the insertion of the support/lacing cables on the shoe side would not be possible as the machine would need to have a reciprocating movement to allow the laying in of the cables from side to side.

Others have speculated about warp knitting or double needle bar raschel technology being involved but again post knit cutting would be required. Raschel and warp knitting machines have continuous warps and 'seamless' items still need to be cut from the machine. Weft insertion is possible on some machines but Flyknit would require a hybrid machine which also has jacquard needle selection.

Only flat knitting technology can give the result achieved in the Flyknit uppers shown so far. A modern flat knitting machine has the ability to produce closed selvedges all around the upper whilst imparting complex shape and laying in the support/lacing cables. Having said that, this is a very complex piece of knitting which will have taken a lot of developing.

Quantum leap

Nike Flyknit represents a quantum leap for flat knitting technology and heralds a new era for integrally knitted non-apparel products which can be manufactured on a large scale to meet global demand. Make no mistake – this is flat knitting technology's finest hour.

Ever since researchers at Courtaulds in the UK in the 1960s and 1970s explored the potential of the mechanical jacquard flat knitting machine for producing integrally knitted garments and non-apparel items, there has been a quest amongst machine builders and producers to take flat knitting technology into mass market non-apparel items.

The revelation that Nike Flyknit is an integrally knitted running shoe upper made on a flat knitting machine, now confirms the potential of the technology for producing non-apparel items as well as apparel.

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Until recently flat knitting successes outside of traditional knitwear (sweater) manufacturing, which is what the technology is aimed at, have tended to be in niche markets. Even the General Motors foray into integrally knitted car seat covers in the 1990s, never really reached the anticipated volumes, although they are still being produced.

However, success for flat knitting technology in volume technical applications could now be imminent with Nike Flyknit. This could be the big one for the leading flat knitting machine builders.

Rumours have been circulating in the industry and on the social networks and there has been much speculation about which technology has been employed in Flyknit. Those looking a bit more carefully are asking -- Shima or Stoll? Stoll or Shima?

Meeting market demand

As Nike Flyknit shoes were not scheduled to hit the shops until this month, we have had to speculate as to exactly how they are made and how long each upper takes to make. Nike has launched two Flyknit lines which use the same technology -- the Nike Flyknit Racer for elite athletes and the Nike Flyknit Trainer+, a running shoe for the mass market.

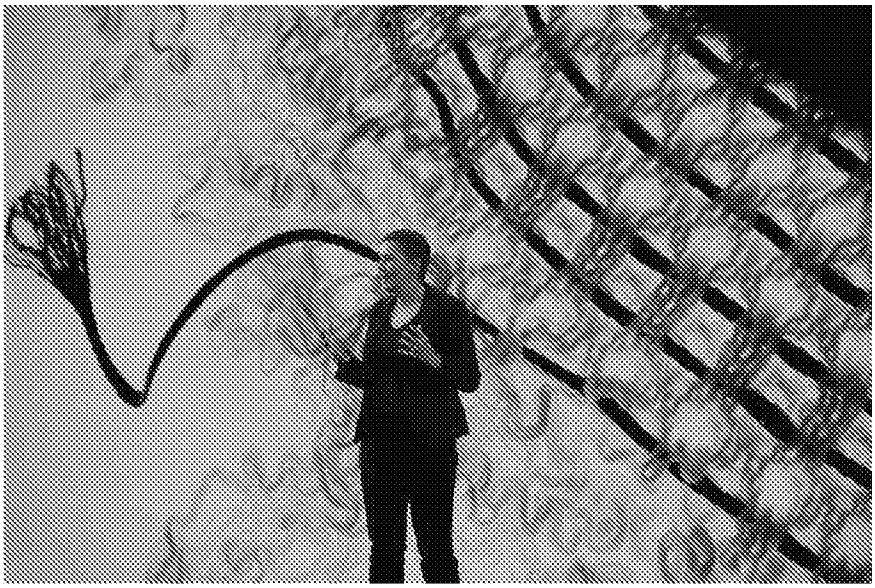
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The point is that these are small numbers by Nike standards and therefore huge numbers of flat knitting machines could be involved if Flyknit is as successful as Nike anticipates.

Production demands

Nike Flyknit Trainer+ is offered in a number of different styles which carry different patterns and a range of colours. Add to that the requirement to produce components for left and right feet (assuming the left and right uppers differ) and a full range of shoe sizes and the product developers, flat knitting technicians and production people amongst us will realise the complexity and immensity of getting such a range of integrally knitted styles ready for production.



This is a truly awesome project and we take our hats off to the product developers and technicians behind it.

Back in February we assumed that Nike would have set up a Flyknit development unit at their headquarters in Oregon, USA, sometime ago which may have developed into a sizeable production unit by the July launch. We also assumed that it would have hired some of the industry's best technicians to work on Flyknit because these are technically advanced products that require the highest level of skills available.

In the run up to the launch, Nike will have undoubtedly already made significant stocks of Flyknit uppers. It will also have in place the necessary production capabilities and capacities to ensure it meets what could be phenomenal market demand.

Nike discloses on its website, details of the more than 800 factories worldwide which manufacture all Nike Inc., products but where its flat knitting factories are located is not made clear.

Since writing this article we have been digging around a bit more and have contacted Nike with some questions. Tomorrow on Knitting Industry - on the opening day of the 2012 London Olympics and on the launch of Flyknit – we reveal more about Nike's revolutionary new product.

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Nike Flyknit: Ready, Steady, Go!

31st July 2012, London

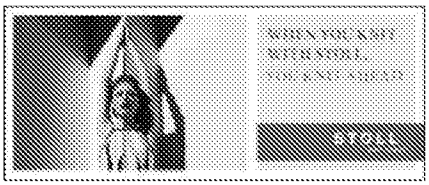
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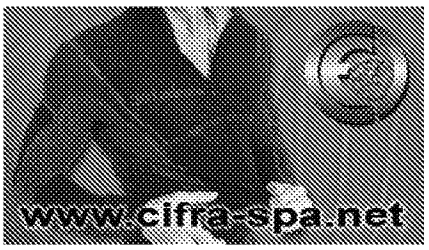
When sportswear and sports shoe giant Nike announced in February the launch of a revolutionary new running shoe which uses state-of-the-art integral knitting techniques to create a one piece upper, we published the following article - Nike Flyknit a seamlessly knitted running shoe! .

The article explains how the shoe upper is made using state-of-the art flat knitting technology and was our most read article since we launched Knitting Industry website in 2008 -- by a long way!

The story created a real buzz around the industry and the social networks were busy with comments and discussions about Flyknit, so we decided to contact Nike to see if we could find out a bit more about how this exciting new product was being made and of course where it was going to be made.







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- Missoni launches denim collection with Jean Machine



Nike had announced that two versions of Flyknit would launch in July just in time for the London games, so we assumed that manufacturing would already be in place in order to meet anticipated demand.

We told Nike we had heard it had set up a manufacturing unit to produce the shoe uppers on Stoll flat knitting machines. We asked how many machines the company had or was planning to have. We also asked which model and gauge of machine the company was using and whether the unit was located at Nike's HQ in Oregon.

Mary Remuzzi, Director, Global Corporate Communications at Nike replied to us saying.

"We can't comment on specific details, but we do have a prototype machine at our headquarters in Oregon."

We wanted to know whether the shoe uppers were being made in the USA, as clearly knitting the upper in one piece can be considered to be environmentally friendly in terms of waste minimisation, logistics and energy savings.

We also wanted to know about raw materials and the other components in the shoe -- what kind of yarns are being used and are they made in the USA? We also asked where the sole units were being made and whether the shoe was to be finally assembled in USA.

Nike responded, saying. "We can't comment on the sourcing for specific components. The final assembly for the shoe is in Asia."

"With regards to the yarns, we do use multiple variations of polyester yarns in any one upper, depending on the specific needs for a particular area," Mary Remuzzi explained.

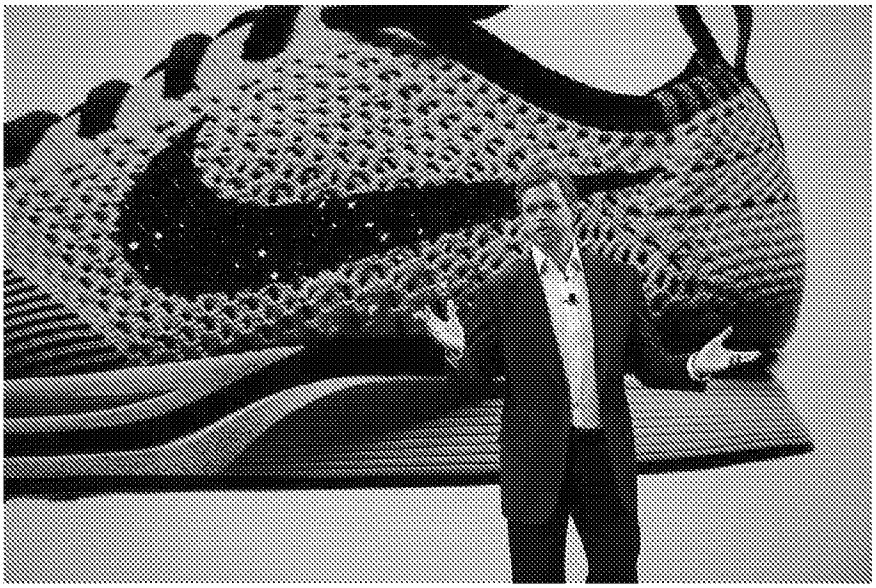
"For example, where we need stretch, you will find more elastic yarns. In areas for more support you may find multiple yarns of varying properties such as denier and strength," Mary clarified, adding:

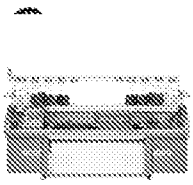
"Nike developed these yarns with a partner so they would meet the specific needs of high performance footwear."

We asked Nike if it had any data it could release on Flyknit manufacture versus conventional manufacture.

"We can't share specifics, but how the Nike Flyknit is manufactured gives us more flexibility in how product is made," Mary Remuzzi said.

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18 Knitwear UK Ltd
Leicester, UK

Taking Nike's responses to our questions and adding information we have picked up from various discussions which have been taking place around the knitwear industry, we have made some educated guesses about how the whole Flyknit manufacturing set up might work.

Recruiters were working the social networks some time ago looking for skilled flat knitting machine programmers and Nike has since hired a number of skilled flat knitting technicians in the USA. A wide range of Flyknit uppers have been developed for limited edition shoes which have already been released into the market in different styles and colours utilising a range of yarns and in a range of sizes, which amounts to a colossal amount of sampling and development work on flat knitting machines.

Add to that, the fact that the Flyknit Racer is the marathon shoe that the world's best runners, including those from Kenya, Great Britain, Russia and the US were scheduled to wear in this spring's marathons and in London over the next few weeks - and the Nike Flyknit and Nike Flyknit Trainer+ are scheduled to be available for all runners from July.

Then add to that the fact that Nike released its third instalment of the HTM Flyknit collection last week. HTM is the ongoing collaboration between Fragment Design Founder Hiroshi Fujiwara, Nike design legend Tinker Hatfield and Nike Inc. CEO and designer Mark Parker. HTM is said to "celebrate the groundbreaking performance attributes of a new technology that changes the way footwear is constructed."



Now with the games in London fully underway it is therefore obvious that Nike now has a significant flat knitting technology based development unit and has access to fairly large number of flat knitting machines somewhere which must have been in production for sometime in order to make the numbers of Flyknit uppers required for the projects mentioned above.

If we assume Flyknit is knitted in 10 or 12 gauge and estimate a production time of approximately 30 minutes per upper, then one flat knitting machine such as a Stoll CMS 530 HP working 24/7 might produce around 320 uppers per week. That's only enough for 160 pairs of Flyknit shoes and at that rate, 1000 machines would be required to produce 160,000 pairs per week.

Given the buzz Nike have created around Flyknit and the link with the London games, 160,000 pairs sounds like small numbers.

We have heard about one supplier of running shoes to Nike that has invested in 80 Stoll machines to produce Flyknit uppers – which would give around 12,800 pairs per week based on our production assumptions above.

Still sounds like relatively small numbers – so what about scaling up production?

And adidas has just released its adizero Primeknit show which looks very similar to Flyknit (see link below) – where are all the uppers going to be made and by whom?

More to follow shortly..

Further reading

Adidas unveils adizero Primeknit running shoe

Nike Flyknit: A seamlessly knitted running shoe!

Nike Flyknit: Quantum leap for flat knitting

Author: Billy Hunter

back to top ^

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Page 1 of 1

1 All

Ravi
28th September 2012 19:27PM

Why not Shima also develop a machine like this.... Amazing????

cifra sps
2nd August 2012 15:48PM

the bast machine do do this is raschel double needle bar jacquard

Display Name
1st August 2012 12:53PM

perhaps Shima Seiki machines were just not good enouhg to produce such kind of goods. Stoll is the leader

Tilak Dias @ NTU
1st August 2012 12:34PM

Very interesting analysis, and I would like to congratulate the editor. With my very limited knowledge on this type of knitting I think one would need a computerised flat-bed knitting machine with sinkers and a good take-down system to produce the flyknit upper.

Most viewed
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Still Standing – The real story of North Carolina's textiles industry

Costs of Spinning, Texturing, Weaving and Knitting Production in Nine Countries

Survey of the European Yarn Fairs for Spring/Summer 2014

World Textile and Apparel Trade and Production Trends: the EU (2013)

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Clothing exporters look towards emerging economies

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Wisconsin textile manufacturer plans to revive silver knitting in US

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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adidas AG,
Petitioner

v.

NIKE, Inc.
Patent Owner

Patent No. 7,347,011

Inter Partes Review No. 2013-00067

NIKE'S REPLY TO PETITIONER'S OPPOSITION TO NIKE'S MOTION TO AMEND U.S. PATENT 7,347,011

Skechers EX1013-p. 5873
Skechers v Nike

I. Claim Construction

A "flat knit textile element" is a weft knit textile element. Petitioner's newly contrived construction that would include warp knit fabrics is inconsistent with the '011 specification, the Petition, the original testimony of Petitioner's expert, an authoritative dictionary definition, and a knitting text submitted by Petitioner.

The '011 specification states that flat knitting is a "specific sub-type[]" of weft knitting and does not state it is a sub-type of warp knitting. (Ex 1002, 7:2-8). Petitioner and its expert originally agreed. (*See* Petition, p. 11, l. 8-9, p. 19, l. 4-8, p. 22, l. 4-8, p. 55, l. 1-4; Ex 1001, ¶54 ("Common examples of weft knits are circular knits and flat knits."), ¶56, ¶72 at p. 37)). A textile dictionary unequivocally states that "the trade uses the term flat knit fabric to refer to weft-knit fabrics made on a flat machine, rather than warp-knit fabrics." (Ex. 2011, p. 6; Ex 2017, p. 5; Ex. 2018, p. 6). The Spencer knitting book that Petitioner submitted with its Petition includes a chapter titled "Flat knitting, basic principles and structures," the entirety of which is directed to weft knitting. (Ex. 1012, pp. 234-250). Warp knitting is covered in separate chapters. (*Id.* at pp. 313 *et seq.*) On cross-examination, Petitioner's expert Dr. Frederick defined flat knitting as a sub-type of weft knitting:

> ***Q. Okay. What's your definition of the term flat knitting?***
>
> ***A. Flat knitting would be another type of weft knitting*** that would involve an end result that was, you know, on a curved surface, but more or less flat.

(Ex 2009, p. 89, l. 6-11; *see also* p. 61, l. 3-6) (emphasis added). He also admitted that he knew of no dictionaries, books or publications that would support his newly created construction of "flat knit textile element" as including a warp knit article. (Ex. 2020, p. 28, l. 10-24). Moreover, Petitioner incorrectly asserts that NIKE failed to propose a construction of "flat knit textile element." (*See* NIKE's proposed construction at Ex 2010, ¶60).

Equally untenable is Petitioner's construction that "flat knit edges" simply mean any edges of a textile so long as the textile was flat while knit. (Opp., pp. 7 – 8; Ex. 2020, p. 24, l. 14-19). This construction of "flat knit edges" includes edges not even formed by knitting at all but instead formed by cutting. (Ex. 2020, p. 24, l. 20 – p. 25, l. 23). This makes no sense. The word "knit" modifies the word "edge," so the claimed edge must be a knit edge—not a cut edge as in Nishida and as now proposed by Petitioner. "Flat" modifies "knit," not "edge." The edge must be knit and the knitting must be by flat knitting, which is weft knitting. This construction is also consistent with the context of the phrase in which this term appears, i.e., "…having flat knit edges free of surrounding textile structure such that the flat knit edges are not surrounded by textile structure from which the textile element must be removed…"

Petitioner impermissibly relies on Dr. Adanur for its constructions. (Ex 1016, ¶38). Although he purports to be a POSITA (Ex. 2021, p. 25, l. 9-19), he

unquestionably is not. For example, he has never even been involved in the conception and design of a shoe. (*Id.*, p. 28, l. 6-8; *see also* p. 20, l. 20-p. 21, l. 17; p. 22, l. 8-11; p. 29, l. 10-12; p. 30, l. 20-23; p. 39, l. 9-15). He never has even talked to a POSITA other than one, brief telephone call with Dr. Frederick. (*Id.,* p. 131, l. 16-19). Even if Dr. Adanur's comments are considered, the only dictionary definitions of "flat knit fabric" he knows of define the term as weft knit, not warp knit. (*Id,.* p. 134, l. 14 – p. 135, l. 2; Ex. 2011, p. 6; Ex 2017, p. 5; Ex. 2018, p. 6). Significantly, Dr. Frederick admitted it was not even necessary to speak to a knitting expert. (Ex. 2020, p. 19, l. 21-p. 20, l. 12). Indeed, Dr. Frederick knew little about Dr. Adanur and his supposed expertise – never saw his CV, never discussed his background, had no idea if he was a POSTIA and never saw his declaration. (*Id.* p. 11, l. 4-18; p. 31, l. 11-15).

II. Adequate Written Description

Glaringly absent from Petitioner's written description challenge is citation to any testimony from its experts. Whether the specification supports a claim is a fact issue assessed from the perspective of a POSITA. *Ariad Pharms., Inc. v. Eli Lilly & Co.,* 598 F.3d 1336, 1351-52 (Fed. Cir. 2010) (en banc). Here, Petitioner relies only on attorney argument, which is not evidence. *Gemtron Corp. v. Saint-Gobain Corp.*, 572 F.3d 1371, 1380 (Fed. Cir. 2009).

The specification of a patent need not have *ipsis verbis* support for a claim to provide an adequate written description. *Martin v. Johnson,* 454 F.2d 746, 751 (CCPA 1972). Figures alone can support the written description requirement. *Cooper Cameron Corp. v. Kvaerner Oilfields Products, Inc.,* 291 F.3d 1317, 1322 (Fed. Cir. 2002). As explained by Mr. Tonkel, to a POSITA, Figures 8, 10 and 11, along with original claims and the specification convey that the '011 application describes a textile element knit to the shape of Figures 8, 10 and 11 using flat knitting. (Ex 1003, p. 166, ¶[35], p. 168-69 ¶¶[42]-[43], p. 173 ¶[54], pp. 175-76, ¶[59], pp. 179-84, pp. 192-95; Ex 2010, ¶¶36-37, 40-42, 62-67). That structure is what is claimed in substitute claim 47. Indeed, Dr. Frederick admitted that the '011 patent teaches flat knitting an element with flat knitted edges (Ex. 2009, p. 116, l. 12-20) and flat knitting an upper to shape. (Ex. 1023, ¶31 (describing uppers "made according to . . . '011 Patent"); Ex. 2020, p. 48, l. 10-23).

III. The Claims Are Definite

Relying on the same flawed construction addressed above, Petitioner challenges the definiteness of certain phrases in the proposed claims. (Opp., pp. 6-8). When the claims are properly construed, Petitioner's argument evaporates.

IV. The Claims Are Patentable Over the Prior Art

Petitioner's anticipation argument relies on a claim construction that is shown above to be incorrect. Accordingly, claim 47 is not anticipated by Nishida.

Claim 47 also is not obvious over Nishida, either alone or in view of Schuessler I (which describes a "knitted helmet") and Schuessler II (which describes a knitting machine). Petitioner illogically argues that Nishida teaches reducing cutting waste by placing patterns closer together within a web, and that this somehow suggests knitting individual patterns to shape. Petitioner also argues that a POSITA would have been motivated to combine references because, *after* they are combined, the elements of each reference serve the same purpose. Petitioner's argument is legally flawed because it wrongly combines the references and uses the resulting combination as a motivation for making the combination in the first place.

Relying on Dr. Frederick, Petitioner also argues that a "knit to shape" upper would be too costly. (Opp., pp. 9-10; Ex. 1023, ¶¶16-45). Yet, Dr. Frederick admitted that has no personal experience with knitting machine line speed, line set up and maintenance, or amortization calculations. (Ex. 2020, p. 45, l. 3 – p. 46, l. 10). Moreover, Petitioner does not dispute that a "knit to shape" upper reduces undesirable waste (see Ex. 2010, ¶46; Ex, 2020, p.43, l. 15-20) or that Nishida did not think of it. In fact, Petitioner's arguments regarding alleged economic non-feasibility of "knit to shape" uppers actually counsel against obviousness.

V. Conclusion

NIKE respectfully requests that the Board grant the Motion to Amend.

Respectfully submitted,

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

ADIDAS AG,	
Petitioner,	
vs.	Patent No. 7,347,011
NIKE, INC.,	
Patent Owner.	

Inter Partes Review No. 2013-00067

VIDEOTAPE DEPOSITION OF

EDWARD C. FREDERICK

Tuesday, December 3, 2013
2:20 p.m.

Suite 2800
1100 Peachtree Street, N.E.
Atlanta, Georgia

Lisa A. Messina, RMR, CRR, CCR-A-421

A2102 Patent Owner NIKE, Inc. Exhibit No. 2020 - page 1
Skechers EX1013-p. 5879
Skechers v Nike

A. One was called "Editors Viewpoint: Nike Flyknit: Quantum Leap For Flat Knitting." And the second one was "Editor's Viewpoint: Nike Flyknit," that was one word, "Ready, Set, Go" -- "Steady, Go" -- "Ready, Steady, Go."

Q. And what did you conclude from reading these two articles?

A. In those articles I found some confirmation of information that I had been gathering over the last couple of years about the processing of shoes using weft knitting to produce unit shoe uppers, the types of machinery to be used, productivity that would result from using those machines, and some ideas about the requirements for machinery to make uppers in that fashion.

Q. And this all specifically relates to -- strike that.

The articles that you read are directed to Nike's Flyknit product?

A. The articles are directed to Nike Flyknit, that's correct.

Q. Did you agree that the Nike Flyknit is a quantum leap for flat knitting?

A. Those are the author's words, not mine.

Q. Did you agree or disagree with the author's words there?

A. I don't really have an opinion about that.

Q. Prior to reviewing these articles, had you ever seen any information that related to actual commercial production of flat-knit uppers?

A. I don't recall seeing anything before reading those articles, any articles before reading those online articles.

Q. So do those articles form the basis for the opinions that you offer in your discussion of secondary considerations?

A. I would characterize them more as confirming information that I gathered from discussions over the last couple of years as well as providing some specific details that I was missing.

Q. So I'm going to direct your attention to Exhibit 1005 which is the Nishida patent.

A. Okay. I have that in front of me.

Q. And that's a patent that you're familiar with?

A. Yes, it is.

Q. Okay. Referring to Figure 1 or any of the figures in the Nishida patent -- let me start that

flat-knitting machines and I want to understand a few points about that.

Have you ever set up a flat-knitting machine?

A. No.

Q. So I take it you've never programmed a flat-knitting machine either?

A. That's correct.

Q. Have you maintained a flat-knitting machine?

A. No.

Q. What's your personal experience with how fast a flat-knitting machine can knit an upper?

A. My personal experience -- I don't have any personal experience timing the knitting of a flat knit -- flat-knitted upper.

Q. Have you ever personally seen the steps in the process of taking an upper knit by a flat-knitting machine and then finishing the upper?

A. I've only seen parts of that process on video.

Q. And that's the video that you refer to in Paragraph 3? Actually, what video are you referring to?

A. It's the video I referred to in my first deposition.

Q. Okay. So just so I'm clear, the video that you're referring to is not cited in either of your declarations, right?

A. That's correct.

Q. You talk about amortization calculations for knitting machines. Have you ever performed any amortization calculations for knitting machines?

A. No.

Q. Okay. I want to direct your attention to the '011 patent, it's Exhibit 1002, and with respect to the uppers shown -- let me strike that.

With respect to the structures shown in Figures 8 and 10 and 11 of the '011 patent, with respect to those structures, do you have any personal experience as to what steps it would take to take those structures and make them into a finished product?

MS. WILLIAMS: Object to the form.

THE WITNESS: Would you ask the question again, please?

Q. (By Mr. van Es) Sure. With respect to the structures shown in Figures 8, 10 and 11 of the

Q. And explain what the '011 patent teaches in terms of an upper made on a flat-knit machine.

MS. WILLIAMS: Object to the form.

THE WITNESS: The methods described in the '011 patent describe a construction -- let's see. Give me a minute here. Well, I can read from the abstract.

Q. (By Mr. van Es) All right. Let me ask you this.

The Nike Flyknit shoe that you describe in Paragraph 31 that's being made according to the methods described in the '011 patent, that's uppers made on a weft flat-knitting machine, right?

A. That's my understanding, yes.

Q. So can you tell me in your own words what the '011 patent teaches you in terms of making an upper on a weft flat-knitting machine?

A. Not in a few words. I mean, I'd have to refer to the patent to get at all those details, but in general it describes a process for making an upper a unitary structure that can be formed into an upper with some additional processing and then used to make a complete shoe.

MR. VAN ES: Can we go off the record.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ADIDAS AG, Petitioner, vs. NIKE, INC., Patent Owner.	Patent No. 7,347,011

Inter Partes Review No. 2013-00067

VIDEOTAPE DEPOSITION OF

SABIT ADANUR

Tuesday, December 3, 2013
8:50 a.m.

Suite 2800
1100 Peachtree Street, N.E.
Atlanta, Georgia

Lisa A. Messina, RMR, CRR, CCR-A-421

construction hearing?

A. Yes.

Q. Do you recall if there was a claim construction hearing in the Sulzer case?

A. I believe there was.

Q. Do you know if you were at the claim construction hearing?

A. I don't think so. I don't remember that well, but I don't think so.

Q. Dr. Adanur, what field do you consider yourself an expert in?

A. Textile engineering, fibers and polymer processing.

Q. Do you consider yourself an expert in the design of footwear?

A. As far as the fabrics are concerned, yes.

Q. Have you ever designed any footwear?

A. No.

Q. So you've never designed a shoe upper?

A. Not necessarily for the shoes.

Q. Are you familiar with the term person of ordinary skill in the art?

A. Yes.

Q. Do you consider yourself a person of

ordinary skill in the art of footwear design?

A. Again, from the fabric side, yes.

Q. Well, in terms of the design of the footwear itself, do you consider yourself a person of ordinary skill in the art?

A. With my background I have -- I believe I have the knowledge in that area. I have a mechanical engineering background -- undergraduate degree also.

Q. I'd like to direct your attention to Paragraph 16 of your expert report -- excuse me, of your declaration.

Have you had a chance to review Paragraph 16 of your declaration?

A. Let me finish it. Yes.

Q. Did you create this definition of the level of ordinary skill in the art?

A. Yes.

Q. When did you create this definition?

A. Within the last month.

Q. How did you go about creating this definition of the level of ordinary skill in the art?

A. I looked at some patents that were involved in the case and also I talked with Dr. Frederick on the phone and discussed some issues

involving shoe manufacturing. And, as I said, I have an undergraduate degree in mechanical engineering that can be applied to shoemaking.

Q. Did you write this definition of the level of ordinary skill in the art?

A. Yes.

Q. And it's your testimony that you created this definition about a month -- within the last month or so?

A. Yes, approximately.

Q. Did you review any other written descriptions of the level of ordinary skill in the art before you wrote your definition here?

A. I read those documents that are listed in my declaration including Mr. Tonkel's declaration as well as deposition, I believe.

Q. Okay. Do you have several years of experience from the conceptual stage through the design stage -- let me start the question over again.

Do you have several years of experience with the aspect of shoemaking involving the conceptual stage through the design stage?

A. Not directly in the shoemaking area, but, again, for fabrics that are used in shoes and also in

polymer processing. I know how to process the polymers which are used in the sole of the shoes and other parts of the shoes. I've been teaching that course for several years now. In fact, I developed that course.

And also I'm an active sportsman, I should say, that uses lots of shoes and as an engineer I pay attention to the comfort, the structure of those shoes, so I feel very comfortable to give opinions in that area.

Q. Okay. So you say -- you would say that you have several years of experience in the field of shoemaking from the conceptual stage through the design stage?

A. No, I didn't say that exactly. I have the ingredients that can be used in designing and manufacturing of those shoes.

Q. Okay. Well, I'm just asking -- I'm trying to ask a specific question.

Do you have several years of experience with respect to shoemaking from the conceptual stage through the design stage of shoemaking?

A. I've never worked in the shoe manufacturing industry.

Q. So you've not ever been asked to design a fabric that was incorporated into a shoe, correct?

A. Not directly, yes.

Q. Do you have several years of experience in the development stage of shoemaking?

A. As I said, not directly involved, but again I have ingredients that goes into the shoemaking process.

Q. Do you have several years of experience in the commercialization stage of shoemaking?

A. I just follow the market regarding the companies and different shoes that they put out and watch the commercials, I follow the trends. Again, I use it quite often myself.

Q. But you have no personal experience in the commercialization of a shoe, right?

A. Not directly, no.

Q. Do you have several years of experience in the manufacturing stages of a shoe?

A. Yes. As far as polymer processing is concerned, yes. I've been teaching that course for several years and I developed that course. It did not exist in our department before.

I went and looked at other machines and

decided -- made a decision to purchase the polymer-processing equipment, the machines, and we did purchase those that can be used in shoe manufacturing. And also, of course, I have an industrial sewing machine in our department for our research purposes that also can be used in shoe manufacturing for stitching.

Q. Okay. But you don't have any experience actually manufacturing a shoe, right?

A. Right. I do not work in any shoe manufacturing company.

Q. Okay. Do you have knowledge of the biomechanical and functional requirements of footwear and shoes?

A. I believe so.

Q. Can you explain that?

A. Well, especially the sporting shoes should have the capability for dampening effect, to take the body weight without hurting the body when the foot hits the ground. It should be, of course, comfortable to wear. It should have enough flexibility for the comfort of the foot. It should have abrasion resistance. It should have non-slipping effect.

Q. Okay. Are you finished with your answer?

A. Yes.

Q. So your knowledge of the functional requirements of footwear, is that based on any work that you -- that's not based on any work that -- let me start the question over again.

Your knowledge that you have of the functional requirements of footwear, that's not based on any experience you have actually designing footwear, right?

A. That's right.

Q. You mentioned earlier some machines that are in your department. How many shoes have been made using the machines that are in your department?

A. None.

Q. Okay. I want to direct your attention to the second-to-last sentence of Paragraph 16 that reads, "For example, such a person would have the skills and capabilities to identify knitting machines, knitted fabric structures and their major properties."

Do you see that sentence?

A. Yes.

Q. Can you explain what you mean by that sentence?

A. Well, fabrics are used in shoes a lot

especially for sports. Therefore, a person who's designing a shoe I believe should know about the fabrics and those are mostly knitted fabrics. Therefore, the person should know about the knitting machines, what they produce, the type of fabric structure that each machine produces, and the major properties of the fabrics.

Q. Have you ever talked to a person that meets this definition in Paragraph 16 of a person of ordinary skill in the art?

A. Yes, I believe so. I talked to Dr. Frederick.

Q. Besides Dr. Frederick, have you ever spoken to anyone who meets the definition of a person of ordinary skill of the art in Paragraph 16?

A. I don't think so.

Q. So other than your work in this case you've never communicated with any people who have several years of experience in the design, development, commercialization, manufacturing of footwear, right?

A. Well, I have met so many people throughout my area and I might have, but I don't recall specifically.

Q. Do you know if Dr. Frederick meets the definition of a person of ordinary skill in the art in Paragraph 16?

A. I believe so.

Q. Why do you believe that?

A. When I talked to him it seemed that he has very good knowledge in the shoemaking business and also his CV I believe shows that.

Q. All right. So now that we've gone through Paragraph 16 and the definition of a person of ordinary skill in the art, would you agree with me that you do not meet this definition?

A. No.

Q. You believe that you do meet the definition?

A. Yes.

Q. So you believe that you are a person of ordinary skill in the art in the field of shoemaking?

A. With my background, yes, I believe so.

Q. And just so I'm clear, do you consider yourself an expert in the commercialization of footwear?

A. Again, I follow the trends in the market in terms of the shoe business, but I don't work in

that area, commercialization of the shoe industry.

Q. So do you consider yourself an expert in the commercialization of shoe products?

A. What do you mean by commercialization? I mean, can you be more open?

Q. Well, I'm referring to the definition that you said you created in Paragraph 16 that talks about the stage of commercialization.

My question to you is do you consider yourself an expert in the commercialization of shoemaking?

MS. WILLIAMS: Object to the form.

Q. (By Mr. van Es) You can answer the question.

A. With that word --

Q. Excuse me. Do you understand my question?

A. Can you repeat it?

Q. Sure. Do you consider yourself an expert in the commercialization of shoes?

A. For the success of the shoes in the market from a technical design I believe yes.

Q. Do you consider yourself an expert in the field of the development of shoes?

MS. WILLIAMS: Object to the form.

THE WITNESS: I believe I answered that question.

Q. (By Mr. van Es) What was your answer?

A. Again, I do not work directly in that area, but with my background and with all the degrees I have and all the courses I've been teaching I believe I have the ingredients to offer opinions as an expert in that area.

Q. Okay. But I'm just trying to get about -- can you describe for me the steps that are involved in the stages of conception through design of a shoe?

A. First, of course, the purpose for the shoe, in what kind of -- we are talking about sporting shoes, I assume -- in what kind of sports it is going to be used, whether it is going to have support for the ankle or other parts of the foot; and then the shape of the shoe for ease in movement depending on the sport, and then the sole structure for dampening effects; the materials that should be chosen, such as polyurethane and others, and then the fabric structure for strength, durability, flexibility, abrasion resistance that should be designed. And then joining all those, the fabric piece or pieces with the rubber products for the sole of the shoe.

Q. And do you have personal experience in -- excuse me. Do you have personal experience in those conception through design stages with respect to shoes?

A. What do you mean personal experience?

Q. Have you yourself been involved in the conception through design stage of a shoe?

A. Not specifically for the shoe.

Q. How much experience would a person of ordinary skill in the art as defined in Paragraph 16 have with respect to knowledge of knitting machines?

A. They should be familiar with the types of knitting machines, what kind of fabrics they produce and what are the properties of those fabrics, the major properties of those fabrics.

Q. Would a person of ordinary skill in the art know about the different types of knitting?

A. I think so. They should be able to -- as I said in my declaration, that person should have the skills and capabilities to identify knitting machines, knitted fabric structures and their major properties.

Q. Have you ever designed a piece of knitting equipment that was used to make footwear?

A. You mean the knitting machinery?

Q. Yes. Have you ever designed knitting machinery that was used to make footwear?

A. By design -- from scratch? You mean from scratch?

Q. Have you had any role in designing footwear -- excuse me. Have you had any role in designing manufacturing equipment that was used to make footwear?

A. Like knitting machines, you mean?

Q. Yes. Have you had any role in designing knitting machines used to make footwear?

A. No.

Q. Have you had any role in testing or using or programming knitting machines used to make footwear?

A. We use the -- I use the knitting machines to make fabrics that also could be used in footwear.

Q. Do you yourself have any experience using manufacturing equipment to make footwear?

A. Yes. I think I mentioned that in my declaration. Before I came to the U.S. my family had a knitting business in Istanbul, Turkey, and we had several circular-knitting machines and so I used to work there during the summer breaks.

And also my uncle had a hand in creating the flat-knitting machine that I used to use to make fabrics. And other than that, we had several machines in our department, warp-knitting machines, weft-knitting machines, and we were using those for the labs for our students to make knitted fabric structures.

Q. Okay. So I'm trying to ask a more specific question that relates to footwear.

Do you have any experience in -- do you have any experience using knitting machines to make footwear?

MS. WILLIAMS: Object to the form.

THE WITNESS: Those fabrics are knitted fabrics and they can be used in footwear and fabrics that are used in shoes are made with those machines.

Q. (By Mr. van Es) Do you know if any fabric that you've ever had -- let me strike the question.

Do you know if any piece of fabric that you've been involved in knitting was ever used to make a piece of footwear?

A. Not that I recall.

Q. Dr. Adanur, what opinions were you asked

provided that.

The next one, "Knitting Fundamentals," that's my class notes that I teach; in fact, I just taught it this semester.

And the next one, various knitting machine manufacturers' brochures, those are the brochures that I picked from the trade shows and companies that I visit to share with my students and to use in my classes, as well as the last item which is fabric samples. Again, I've been collecting those for the last 30 years from different manufacturers, different trade shows, different companies.

Q. I would like to direct your attention to Paragraph 36 of your declaration and in that paragraph you give a construction of flat-knit textile element, right?

A. Yes.

Q. And you say, "Flat-knit textile element means a knitted textile that is knit in flat form."

A. Yes.

Q. Okay. What does that mean?

A. Well, flat-knit textile element means that -- a knitted textile that is knit in flat form, as it is written there.

A. It is considered to be by different resources. I believe some resources consider it to be warp and others weft, but the structure is kind of in between.

Q. So some people consider milanese -- strike that.

Some people consider a milanese knit material to be warp knitting and some might consider it to be weft knitting?

A. Yes, that's possible, and actually it is in my declaration, Paragraph 25. It says, "In addition to warp knit and weft knit, milanese is another type of knitted textile in which the yarn is oriented diagonally knit across the textile."

Q. Dr. Adanur, can I just ask for the sake of the court reporter that when you read from any materials if you could read slowly so she can transcribe more easily.

A. I'm sorry. Okay. Shall I repeat? "In addition to warp knit and weft knit, milanese is another type of knitted textile in which the yarn is oriented diagonally across the textile." It is Exhibit 1018, Page 10. "Milanese has been a well-known form of knitting since at least 1921."

That's Exhibit 1019, Page 3.

Q. That's fine, Dr. Adanur.

A. Okay.

Q. But milanese is not considered to be a combination of both warp and weft knitting, correct?

A. No.

Q. That's correct, right?

A. That's right.

Q. Are there different types of weft knitting?

A. There are subcategories of weft knitting.

Q. What are the subcategories of weft knitting?

A. Circular knitting, which is the dominant form of weft knitting, and flat knitting.

Q. Are there different types of warp knitting?

A. Yes. Warp knitting also has flat knitting, which is a dominant way of making warp-knit fabrics, and also circular knitting.

Q. So is flat knitting a subset of warp knitting?

A. Yes. Actually, the major subset of warp knitting.

the edges are flat-knit edges.

Q. But if I hand you a finished product, could you tell whether the edges are flat knit under your definition of flat knit?

A. And let me refer to my declaration and I explain that in Paragraph 38. "Flat knit means" -- okay. "Flat knit edges when given it's broadest reasonable interpretation that is consistent with the '011 patent specification means edges of a knitted textile that are knit in flat form."

Q. So the edges are knitted or the material is knitted?

A. The material is knitted and the edges are part of the material. In a flat-knitted fabric you have to have edges because that's your end point. Therefore, flat-knit edges means edges of a knitted textile that are knit in flat form.

Q. Okay. Would the edges of a textile that's been knit in flat form be the same as the edges of a textile knit in circular form?

A. Circular form being circular would not have edges except at beginning and end points of the tubular structure.

Q. Well, when something is circular knit,

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571-272-7822

Paper 50
Date: January 13, 2014

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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adidas AG
Petitioner

v.

NIKE, Inc.
Patent Owner

Case IPR2013-00067
Patent 7,347,011 B2

Before JOSIAH C. COCKS, MICHAEL J. FITZPATRICK, and JAMES B. ARPIN, *Administrative Patent Judges.*

ARPIN, *Administrative Patent Judge.*

ORDER
Trial Hearing
37 C.F.R. § 42.70

Skechers EX1013-p. 5904
Skechers v Nike

On May 17, 2013, the instant *inter partes* review was instituted. Paper 18. Both parties requested a hearing pursuant to 37 C.F.R. § 42.70. Papers 47 and 48. The requests are *granted*.

Each party will have thirty (30) minutes of total time to present arguments. In an *inter partes* review, Petitioner bears the ultimate burden of proof that the challenged claims are unpatentable. In the present case, however, Patent Owner chose not to file a Patent Owner Response and, thus, waived any arguments for patentability. *See* Scheduling Order, Paper 19, 2-3. Further, in its Motion to Amend, Patent Owner moved to cancel claims 1-46. Motion to Amend, Paper 31, 1. Consequently, neither party shall present arguments regarding the patentability of claims 1-46 during the oral hearing. Therefore, with respect to Petitioner's request for oral hearing, we will not hear arguments regarding the first issue identified by Petitioner, namely,

> Whether original claims 1-46, if not canceled, are unpatentable based on the instituted rejections because Nike, Inc. ("Owner") has not defended the validity of any challenged original claim?

See Paper 48, 2.

The only remaining issues in this case relate to Patent Owner's Motion to Amend, and Patent Owner bears the burden of proof on its Motion to Amend. Patent Owner requests to argue first regarding its motion to amend (Paper 47, 2), and Petitioner does not object to this request (Paper 48). Therefore, at the hearing, Patent Owner shall present its arguments first in support of the Motion to Amend. Petitioner then may respond to Patent Owner's case as to the Motion to Amend. Patent Owner may reserve rebuttal time for its case as to the Motion to Amend.

Skechers EX1013-p. 5905
Skechers v Nike

The hearing will commence at 2:00 PM ET, on February 10, 2014, and it will be open to the public for in-person attendance, on the ninth floor of Madison Building East, 600 Dulany Street, Alexandria, Virginia. In-person attendance will be accommodated on a first-come, first-serve basis.

The Board will provide a court reporter for the hearing, and the reporter's transcript will constitute the official record of the hearing. Each party requests the ability to use audio-visual equipment to display demonstrative exhibits, including the use of a projector and screen for PowerPoint display. Although these requests are *granted*, the parties are reminded that the presenter must identify clearly and specifically each visual display, e.g., by slide or screen number, referenced during the oral hearing to ensure the clarity and accuracy of the reporter's transcript.

Under 37 C.F.R. § 42.70(b), demonstrative exhibits must be served at least five business days prior to the hearing. Such exhibits shall be filed at the Board at least two business days prior to the hearing, and the parties must initiate a conference call with the Board by two business days prior to the hearing to resolve any dispute over the propriety of any demonstrative exhibits. In preparing demonstrative exhibits, the parties are advised to consider guidance previously provided by the Board on the appropriate content of demonstrative exhibits at final oral hearing. *See* Order for Conduct of Proceeding in IPR2013-00033, Paper 118, 2-4.

The Board expects lead counsel for each party to be present at the hearing, although any backup counsel may make the presentation. If either lead counsel is unable to be present at the hearing, the Board shall be contacted via a joint telephone conference call no later than two business days prior to the hearing to discuss the matter.

Skechers EX1013-p. 5906
Skechers v Nike

IPR2013-00067
Patent 7,347,011 B2

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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adidas AG,
Petitioner

v.

NIKE, Inc.
Patent Owner

Patent No. 7,347,011

Inter Partes Review No. 2013-00067

NOTICE OF APPEAL TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT BY PATENT OWNER NIKE, INC.

Skechers EX1013-p. 5908
Skechers v Nike

Director of the United States Patent and Trademark Office
c/o Office of the General Counsel
P.O. Box 1450
Alexandria, VA 22313-1450

Notice is hereby given, pursuant to 35 U.S.C. §§ 141-44 and 319, and pursuant and 37 C.F.R. §§ 90.2(a) and 90.3, that Patent Owner NIKE, Inc. ("NIKE") hereby appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision entered on April 28, 2014 (Paper 60) ("Final Written Decision"), and from all underlying findings, orders, decisions, rulings and opinions adverse to NIKE, including, without limitation, those within the Decision on Institution of *Inter Partes* Review entered on May 17, 2013 (Paper No. 18).

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), NIKE further indicates that the issues on appeal include all issues decided adversely to NIKE in any orders, decisions, rulings and opinions. This includes, but is not limited to:

1. The Board's denial of NIKE's Motion To Amend U.S. Patent 7,347,011 (Paper 31), in its Final Written Decision, including the legal standard applied by the Board, the burden of proof applied by the Board, the Board's conclusion that NIKE did not meet its burden to show that proposed claims 47-50 would not have been obvious over the Nishida reference and are otherwise

patentable, and any other finding or determination (factual or legal) supporting or related to this decision, and the constraints imposed by the Board on the briefing.

Simultaneous with this submission, a copy of this Notice of Appeal is being filed with the Patent Trial and Appeal Board and the Clerk's Office for the United States Court of Appeals for the Federal Circuit.

Respectfully submitted,

Dated: June 30, 2014

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CERTIFICATES OF FILING AND SERVICE

I hereby certify that, in addition to being filed electronically through the Patent Trial and Appeal Board's Patent Review Processing System (PRPS), a true and correct original version of the foregoing NOTICE OF APPEAL TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT BY PATENT OWNER NIKE, INC. is being filed by Express Mail (Express Mail Label EI 975626858 US) on this 30th day of June, 2014, with the Director of the United States Patent and Trademark Office, at the following address:

Director of the United States Patent and Trademark Office
c/o Office of the General Counsel
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

I hereby certify that three (3) true and correct copies of the foregoing NOTICE OF APPEAL TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT BY PATENT OWNER NIKE, INC. are being filed by hand, on this 30th day of June, 2014, with the Clerk's Office of the United States Court of Appeals for the Federal Circuit, at the following address:

United States Court of Appeals for the Federal Circuit
717 Madison Place, N.W., Room 401
Washington, D.C. 20005

I hereby certify that on June 30, 2014, a copy of this NOTICE OF APPEAL TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT BY PATENT OWNER NIKE, INC. was served on the Petitioner by emailing a copy to mstockwell@kilpatricktownsend.com, wkadaba@kilpatricktownsend.com and tiwilliams@kilpatricktownsend.com.

/H. Wayne Porter /
H. Wayne Porter
Reg. No. 42,084
Back-Up Counsel for
Patent Owner

CERTIFICATE OF SERVICE

I hereby certify that I filed the foregoing Joint Appendix with the Clerk of the United States Court of Appeals for the Federal Circuit via the CM/ECF system this 8th day of June, 2015, and served a copy on counsel of record by the CM/ECF system.

/s/ Kevin A. Goldman

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'011 Patent Claims	Description of Prior Art
	Osamu discloses an upper incorporating a textile element having first and second areas with a unitary construction. Frederick Dec. at ¶ 91; Osamu at [0005]; [0007]; [0009]-[0012]; claim 1; FIGS. 1, 3. Osamu describes a woven textile element, rather than a weft-knitted textile element. Grounds 18-19; 24; 29; 35; 38: **Osamu + other art** Woven and knitted textiles are both suitable for use in uppers and were well-known in the art at the time of the priority date of the '011 patent. *See* Nishida at 1:61-62; 1:67-68; 2:42-45; 3:6-10; 3:45-52; 3;66-68; 5:63-6:2; 6:23-25; Curley at p. 7, lines 32-33; p. 8, lines 7-9; p. 16, lines 5-8. Additionally, Glidden, McDonald, Whiting, and Curley each disclose an upper incorporating a weft-knitted textile element. *See* Glidden at p. 1, 2:45-48; FIGS. 1, 6, 8; McDonald at p. 1, 2:26-39; Whiting at 2:39-56; Curley at p. 7, line 32-p. 8, line 25.
the first area being formed of a first stitch configuration, and the second area being formed of a second stitch configuration that is different from the first stitch configuration to impart varying properties to the textile element; and	Grounds 1-2: **Nishida** discloses that the first and second areas may be formed of different stitch configurations to impart varying properties to the textile element. Frederick Dec. at ¶ 72; Nishida at 3:15-4:18; 4:47-60; 5:41-45; 5:63-6:2; 6:4-41. Grounds 3; 7; 12: **Nishida + other art** Uppers incorporating different stitch configurations to impart varying properties to a textile element were well-known in the art at the time of the priority date of the '011 patent. *See* Glidden at p. 1, 2:33-44; *See* McDonald at p. 1, 2:26-49; FIG. 1. Grounds 15-17: **Glidden** discloses that the first and second areas may be formed of different stitch configurations to impart varying properties to the textile element. Frederick Dec. at ¶ 84; Glidden at p. 1, 2:33-44; FIGS. 1, 2, 6. Ground 18: **Osamu** discloses that the first and second areas may be formed of different stitch configurations to impart varying properties to the textile element. Frederick Dec. at ¶ 91; Osamu at [0005]; [0007]; [0009]; claim 1. Grounds 19; 24; 29; 35; 38: **Osamu + other art**

'011 Patent Claims	Description of Prior Art
	Uppers incorporating different stitch configurations to impart varying properties to a textile element were well-known in the art at the time of the priority date of the '011 patent. *See* Glidden at p. 1, 2:33-44; McDonald at p. 1, 2:26-49; FIG. 1; Nishida at 3:15-26; 3:43-52; 5:41-45.
a sole structure secured to the upper.	Grounds 1-3; 7; 12: **Nishida** discloses that a sole structure may be secured to the upper. Frederick Dec. at ¶ 72; Nishida at Abstract; 4:39-46; FIG. 3. Grounds 15-17: **Glidden** discloses that a sole structure may be secured to the upper. Frederick Dec. at ¶ 84; Glidden at p. 2, 1:9-19, 2:8-15, 2:23-30; FIGS. 1, 6. Grounds 18-19; 24; 29; 35; 38: **Osamu** discloses that a sole structure may be secured to the upper. Frederick Dec. at ¶ 91; Osamu at [0001], [0007], [0013], [0015].
17. The article of footwear recited in claim 16, wherein the first stitch configuration provides a substantially smooth texture to the first area, and the second stitch configuration provides a texture to the second area that is rougher than the smooth texture.	Grounds 3; 10; 11; 19; 27; 32-33; 35: **Nishida + other art** **Osamu + other art** Uppers with a first stitch configuration that provides a substantially smooth texture to the first area, and a second stitch configuration that provides a texture to the second area that is rougher than the smooth texture were well-known in the art at the time of the priority date of the '011 patent. *See* Glidden at p. 1, 2:35-44; McDonald, p. 1, 2:26-49; FIG. 1. Grounds 15-17: **Glidden** discloses that the first stitch configuration provides a substantially smooth texture to the first area, and the second stitch configuration provides a texture to the second area that is rougher than the smooth texture. Frederick Dec. at ¶ 84; Glidden at p. 1, 2:33-44; FIGS. 1, 2, 6.
18. The article of footwear recited in claim 17, wherein the second stitch configuration forms a rib structure in the second area.	Grounds 3; 10; 11; 19; 27; 32-33; 35: **Nishida + other art** **Osamu + other art** Uppers with a first stitch configuration that provides a substantially smooth texture to the first area, and a second stitch configuration that forms a rib structure were well-known in the art at the time of the priority date of the '011 patent. *See*

'011 Patent Claims	Description of Prior Art
	Glidden at p. 1, 2:35-44; FIGS. 1, 2, 6; McDonald at p. 1, 2:26-49; FIG. 1. Grounds 15-17: **Glidden** discloses that the second stitch configuration forms a rib structure in the second area. Frederick Dec. at ¶ 84; Glidden at p. 1, 2:33-44.
19. The article of footwear recited in claim 16, wherein at least one of the first stitch configuration and the second stitch configuration forms an aperture in the weft-knitted textile element.	Grounds 1-3; 7; 12: **Nishida** discloses that at one stitch configuration may form a net-like structure (i.e. having apertures) in the knit textile element. Frederick Dec. at ¶ 72; Nishida at 3:43-52; 6:25-31. Grounds 15-17: **Glidden** discloses that at least one stitch configuration may have high porosity for good ventilation (i.e., apertures) in the knitted textile element. Frederick Dec. at ¶ 84; Glidden at p. 1, 1:25-30; p. 2, 2:40-53; claims 1-5. Grounds 18-19; 24; 29; 35; 38: **Osamu** discloses at least one stitch configuration may form a weave structure with high breathability (i.e. having apertures) in the textile element. Frederick Dec. at ¶ 91; Osamu at [0009].
20. The article of footwear recited in claim 16, wherein the weft-knitted textile element is one of an exterior layer, an intermediate layer, and an interior layer of the upper.	Grounds 1-3; 7; 12: **Nishida** discloses that the textile element is one of an exterior layer, an intermediate layer, and an interior layer of the upper. Frederick Dec. at ¶ 72; Nishida at 3:6-9; 3:66-4:1; FIG. 3. Grounds 15-17: **Glidden** discloses that the knit textile element may at least be an exterior layer of the upper (*see* FIG. 1) and/or an interior layer of the upper. Frederick Dec. at ¶ 84; Glidden at p. 1, 2:3-23; p. 2, 1:68-74; FIGS. 1-3, 6-8. Grounds 18-19; 24; 29; 35; 38: **Osamu** discloses that the textile element is one of an exterior layer, an intermediate layer, and an interior layer of the upper. Frederick Dec. at ¶ 91; Osamu at [0001]; [0005]; [0010]; claim 1.
21. The article of footwear recited in claim 16, wherein the upper includes an exterior layer, an intermediate layer, and an interior	Grounds 1-2: **Nishida** discloses that the upper may include two or more layers, and the knit textile element may form at least a portion of the interior layer. Frederick Dec. at ¶ 72; Nishida at 3:6-9; 3:62-4:1. Grounds 4-5; 8-9; 12-13:

'011 Patent Claims	Description of Prior Art
layer, and the weft-knitted textile element forms at least a portion of the interior layer.	**Nishida + other art** Uppers incorporating three layers, wherein a knit textile element forms a portion of an inner layer and an outer layer were well-known in the art at the time of the priority date of the '011 patent. *See* Curley at p. 6, lines 30-32; p. 30, claim 34; p. 7, line 32-p. 8, line 5; Shiomura at 2:26-45. Grounds 15-17: **Glidden** discloses that the knit textile element may at least be an exterior layer of the upper and/or an interior layer of the upper. Frederick Dec. at ¶ 84; Glidden at p. 1, 2:3-23; p. 2, 1:9-19; p. 2, 1:68-74; FIGS. 1-2. Ground 18: **Osamu** discloses that the upper may include two or more layers, and the knit textile element may form at least a portion of the interior layer. Frederick Dec. at ¶ 91; Osamu at [0001]; [0005]; [0006]; [0010]; claim 1. Grounds 20-21; 25-26; 30-31; 36-38: **Osamu + other art** Uppers incorporating three layers, wherein a knit textile element forms a portion of an inner layer and an outer layer were well-known in the art at the time of the priority date of the '011 patent. *See* Curley at p. 6, lines 30-32; p. 30, claim 34; p. 7, line 32-p. 8, line 5; Shiomura at 2:26-45.
22. The article of footwear recited in claim 16, wherein the textile layer forms at least a portion of both the interior surface and an exterior surface of the upper.	Grounds 1-2: **Nishida** discloses that the knit textile element may form at least a portion of an interior surface and an exterior surface of the upper. Frederick Dec. at ¶ 72; Nishida at 3:6-4:46; FIG. 3. Grounds 4-6; 8-10; 12-14: **Nishida + other art** Uppers having a knit textile element that forms a portion of an interior surface and an exterior surface were well-known in the art at the time of the priority date of the '011 patent. *See* Curley at p. 6, lines 30-32; p. 30, claim 34; p. 7, line 32-p. 8, line 5; Shiomura at 2:26-45; Glidden at FIGS. 1-2, p. 1, 2:3-32. Grounds 15-17: **Glidden** discloses that the knit textile element forms at least a portion of an interior surface and an exterior surface of the upper. Frederick Dec. at ¶ 84; Glidden at p. 1, 2:3-23; p. 2, 1:68-74; FIGS. 1-3, 6-8.

'011 Patent Claims	Description of Prior Art
	Grounds 18-19; 24; 29; 35; 38: **Osamu** discloses that the textile element may form at least a portion of an interior surface and an exterior surface of the upper. Frederick Dec. at ¶ 91; Osamu at [0001]; [0005]; [0010]; claim 1.
23. The article of footwear recited in claim 16, wherein the weft-knitted textile element forms an interior surface of the upper.	Grounds 1-2: **Nishida** discloses that the knit textile element may form an interior surface of the upper. Frederick Dec. at ¶ 72; Nishida at 3:6-46. Grounds 4-6; 8-10; 12-14: **Nishida + other art** Uppers incorporating knit textile elements that form an interior surface of the upper were well-known in the art at the time of the priority date of the '011 patent. *See* Curley at p. 6, lines 30-32; p. 30, claim; Shiomura at 2:26-45; Glidden at FIGS. 1-2, p. 1, 2:3-32. Grounds 15-17: **Glidden** discloses that the knit textile element forms an interior surface of the upper. Frederick Dec. at ¶ 84; Glidden at p. 1, 2:3-23; p. 2, 1:68-74; FIGS. 1-3, 6-8. Grounds 18-19; 24; 29; 35; 38: **Osamu** discloses that the knit textile element forms an interior surface of the upper. Frederick Dec. at ¶ 91; Osamu at [0001]; [0005]; [0010]; claim 1.

C. "Textile Element Having A First Area With A First Unitary Construction And A Second Area With A Second Unitary Construction Different From The First Unitary Construction" in Claims 44-46

The '011 specification states that "[m]any conventional articles of footwear incorporate uppers with various material elements that each exhibit different properties. For example, a first material element may be smooth, and a second material element may be textured. The first and second material elements are then stitched together to form a portion of the conventional upper. Textile element 40' also exhibits smooth and textured

areas. In contrast with the conventional upper, however, ***first texture 46' and second texture 47' are incorporated into a single, unitary element of textile***, rather than two separate elements that are stitched or otherwise joined together." ('011 patent (Ex. 1002) 9:25-35 (emphasis added)).

As discussed above, the Applicants amended independent claim 44 to require "the flat-knitted textile element having a first area with a first unitary construction and a second area with a second unitary construction different from the first unitary construction." ('011 file history (Ex. 1003), at 01/12/2007 Response, p. 8).

The Applicants relied on this element as the sole basis for distinguishing claim 44 over U.S. Patent No. 6,308,438 to Throneburg ("Throneburg). ('011 file history (Ex. 1003), at 01/12/2007 Response, p. 10. The Applicants relied on language from the original claim, stating that U.S. Patent No. 1,888,172 to Joha ("Joha") does not have "a first area having a first set of properties and a second area having a second set of properties that is different from the first set of properties" as the sole basis for distinguishing claim 44 over Joha. *(Id.)*. Because the next action from the PTO was a Notice of Allowance, the Examiner appears to have relied on this ground as the reason for allowance of claim 44 over Throneburg.

Yet, several prior art references, which were not before the Examiner or were not applied by the Examiner for this feature during prosecution, teach textile elements having a first area with a first unitary construction and a second area with a second unitary construction different from the first unitary construction as required by claim 44. For

example, Nishida and Osamu each disclose textile elements having a unitary construction with two areas, each area having a different construction. (Frederick Dec. (Ex. 1001), ¶¶ 72, 91).

As demonstrated by the various references that either were not before the Examiner or were not applied by the Examiner for this feature during prosecution of the '011 patent, the use of textile elements with a unitary construction with a first area and a second area with a different construction from the first area, as well as flat-knitted textile elements having a first area having a first set of properties and a second area having a second set of properties that is different from the first set of properties, were well-known in the art at the time of the priority date of the '011 patent.

As set forth in the claim charts below, Nishida and Osamu anticipate or, at the very least, render obvious claims 44-46 of the '011 patent, alone or in combination with other prior art. Specifically, ground 1 sets forth that these claims are anticipated by Nishida, as further referenced in the charts below. Furthermore, the '011 patent claims merely recite the combination of "prior art elements according to known methods to yield predictable results" and/or the "[u]se of known technique[s] to improve similar devices (methods, or products) in the same way." *See* MPEP § 2143 (A, C). For example, a person of ordinary skill in the art would have understood that using flat-knitted textile elements having a unitary construction with a first area construction different from a second area construction, as well as flat-knitted textile elements having a first area having a first set of properties and a

second area having a second set of properties that is different from the first set of properties was a well-known endeavor among those in the textile industry. (Frederick Dec. (Ex. 1001), ¶¶ 72, 91). The prior art unquestionably discloses the combination of the other recited elements of claim 44 in uppers for an article of footwear.

Moreover, one of ordinary skill in the art would have understood and expected the benefits of using (a) unitary, flat-knitted textile elements having two areas with different constructions, as well as (b) flat-knitted textile elements having a first area having a first set of properties and a second area having a second set of properties that is different from the first set of properties with such an upper, would provide the advantages of different properties in the shoe upper, such as breathability and elasticity, while increasing the efficiency of the manufacturing process. Specifically, the prior art references cited in Section VI.A above teach the construction of and/or process for constructing a knitted shoe upper. The common teachings of these prior art references show that it would have been obvious for a person of ordinary skill in the art to combine their teachings in designing a knitted shoe upper to achieve the claimed features of the '011 patent. Thus, claims 44-46 of the '011 patent are not patentable in view of the above-noted references considered individually or in combination.

With respect to claims 44-46, the specific grounds of rejection are set forth in Section III.B above, and the specific citations to the teachings of the cited art are in the chart below.

As stated in the grounds, Nishida anticipates claims 44-46, and claims 44-46 are

also obvious in view of Nishida alone or Nishida and other prior art. With respect to claim 44, a POSITA at the time of the priority date of the '011 patent would have understood Nishida's teaching of "conventional" knitting processes to include flat knitting, which is a sub-type of weft knitting. (*See* cites in chart; Frederick Dec. at ¶ 72). In addition, it would have been obvious at the time of the priority date of the '011 patent to incorporate flat-knitted textile elements, such as those disclosed by Whiting or Curley, into Nishida's upper, for reasons such as those identified in *KSR*, 550 U.S. at 417-422. (*See* Frederick Dec. at ¶ 72).

As stated in the grounds, Osamu alone or in combination with other art renders claims 44-46 obvious. For example, Osamu describes every element of independent claim 44, except that Osamu discloses using a woven textile element rather a flat-knitted textile element. A POSITA at the time of the priority date of the '011 patent would have understood that woven and knitted textiles are both suitable for use in uppers and the selection of one versus the other is an obvious design choice, as described by Nishida and Curley for example. (*See* Frederick Dec. at ¶ 91). A POSITA at the time of the priority date of the '011 patent would have understood that the selection of flat knitting, a sub-type of weft knitting, is an obvious design choice or a selection from among a finite number of knitting techniques. (*See* Frederick Dec. at ¶ 91). In addition, it would have been obvious at the time of the priority date of the '011 patent to incorporate a flat-knitted textile -- as disclosed by Whiting, Nishida, or Curley -- into Osamu's upper, for reasons such as those

identified in *KSR*, 550 U.S. at 417-422. (*See* Frederick Dec. at ¶ 91).

With respect to Osamu and claim 45, a POSITA at the time of the priority date of the '011 patent would have understood that varying stitch configurations and/or yarn types to impart different properties to two different areas is an obvious design choice or a selection from among a finite number of techniques to do so. (*See* Frederick Dec. at ¶ 91). In addition, it would have been obvious at the time of the priority date of the '011 patent to different stitch configurations and/or yarn types -- as disclosed by Glidden, McDonald, or Nishida -- into Osamu's upper, for reasons such as those identified in *KSR*, 550 U.S. at 417-422.. (*See* Frederick Dec. at ¶ 91).

'011 Patent Claims	Description of Prior Art
44. An article of footwear comprising:	Grounds 1-2; 7; 12: **Nishida** discloses an article of footwear. Frederick Dec. at ¶ 72; Nishida at Abstract; FIG. 3. Grounds 18; 24; 29; 38: **Osamu** discloses an article of footwear. Frederick Dec. at ¶ 91; Osamu at Title; [0001]; [0007].
an upper incorporating a flat-knitted textile element, the flat-knitted textile element having a first area with a first unitary construction and a second area with a second unitary construction different from the first unitary construction,	Grounds 1-2: **Nishida** discloses an upper incorporating a knit textile element having first and second areas having constructions that are different. Frederick Dec. at ¶ 72; Nishida at Abstract; 3:6-12; 3:15-26; 3:31-42; 4:12-18; FIGS. 2-3. Grounds 7; 12: **Nishida + other art** Uppers incorporating textile elements formed by flat knitting were well-known in the art at the time of the priority date of the '011 patent. *See* Whiting at 2:39-56; Curley at p. 7, line 32-p. 8, line 25. Ground 18: **Osamu** discloses an upper incorporating a woven textile element having first and second areas having constructions that are different. Frederick Dec. at ¶ 91; Osamu at [0005]; [0007];

'011 Patent Claims	Description of Prior Art
	[0009]-[0012]; claim 1; FIGS. 1, 3. Grounds 24; 29; 38: **Osamu + other art** Woven and knitted textiles are both suitable for use in uppers and were well-known in the art at the time of the priority date of the '011 patent. *See* Nishida at 1:61-62; 1:67-68; 2:42-45; 3:6-10; 3:45-52; 3;66-68; 5:63-6:2; 6:23-25; Curley at p. 7, lines 32-33; p. 8, lines 7-9; p. 16, lines 5-8. Additionally, Nishida, Whiting, and Curley each disclose an upper incorporating a weft-knitted textile element. *See* Nishida at 3:6-12; Whiting at 2:39-56; Curley at p. 7, line 32-p. 8, line 25.
the first area having a first set of properties, and the second area having a second set of properties that is different from the first set of properties to impart varying characteristics to the textile element; and	Grounds 1-2; 7; 12: **Nishida** discloses that the first and second areas may have different properties that impart varying properties to the textile element. Frederick Dec. at ¶ 72; Nishida at 3:15-4:18; 4:47-60; 5:41-45; 5:63-6:2; 6:4-41. Grounds 18; 24; 29; 38: **Osamu** discloses that the first and second areas may have different properties that impart varying properties to the textile element. Frederick Dec. at ¶ 91; Osamu at [0005]; [0007]; [0009]; claim 1; FIGS. 1, 3.
a sole structure secured to the upper.	Grounds 1-2; 7; 12: **Nishida** discloses that a sole structure may be secured to the upper. Frederick Dec. at ¶ 72; Nishida at Abstract; 4:39-46; FIG. 3. Grounds 18; 24; 29; 38: **Osamu** discloses that a sole structure may be secured to the upper. Frederick Dec. at ¶ 91; Osamu at [0001], [0007], [0013], [0015].
45. The article of footwear recited in claim 44, wherein the first set of properties and the second set of properties are at least one of a stitch configuration and a yarn type.	Grounds 1-2; 7; 12: **Nishida** discloses that the first and second areas may have different stitch configurations and/or yarn types. Frederick Dec. at ¶ 72; Nishida at 3:15-26; 3:43-52; 5:63-6:2. Ground 18: **Osamu** discloses that the first and second areas may have different stitch configurations and/or yarn types. Frederick Dec. at ¶ 91; Osamu at [0007]; [0009]. Grounds 27-29: **Osamu + other art**

'011 Patent Claims	Description of Prior Art
	Uppers incorporating different stitch configurations and/or yarn types to impart varying properties to a textile element were well-known in the art at the time of the priority date of the '011 patent. *See* Glidden at p. 1, 2:33-44; McDonald at p. 1, 2:26-49; FIG. 1; Nishida at 3:15-26; 3:43-52; 5:41-45.
46. The article of footwear recited in claim 44, wherein the textile element is one of an exterior layer, an intermediate layer, and an interior layer of the upper.	Grounds 1-2; 7; 12; **Nishida** discloses that the textile element is one of an exterior layer, an intermediate layer, and an interior layer of the upper. Frederick Dec. at ¶ 72; Nishida at 3:6-9; 3:66-4:1; FIG. 3. Grounds 18; 24; 29; 38; **Osamu** discloses that the textile element is one of an exterior layer, an intermediate layer, and an interior layer of the upper. Frederick Dec. at ¶ 91; Osamu at [0001]; [0005]; [0010]; claim 1.

VII. CONCLUSION

The prior art references identified in this Petition contain pertinent technological teachings, either explicitly or inherently disclosed, that were not previously considered in the manner presented herein or applied during original examination of the '011 patent. At least by virtue of disclosing the limitations that served as the basis for the allowance of the claims at issue, the references relied upon herein should be considered important in determining patentability. In sum, these references provide new, non-cumulative technological teachings not previously considered and relied upon on the record, and they establish a reasonable likelihood of success as to Petitioner's assertions that claims 1-46 of the '011 patent are not patent eligible pursuant to the grounds presented in this Petition.

Accordingly, Petitioner respectfully requests institution of *inter partes* review for claims 1-46 of the '011 patent for each of the grounds presented herein.

Respectfully submitted,

Dated: December 10, 2012

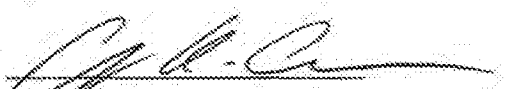
By: _____
Geoffrey K. Gavin
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Lead Counsel for Petitioner

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§ 42.8(e) and 42.105(b), the undersigned certifies that on December 10, 2012, a complete and entire copy of this Revised Petition for *Inter Partes* Review via UPS, next day delivery, costs prepaid, to the Patent Owner by serving the correspondence address of record as follows:

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Paper 18
Entered: May 17, 2013

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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adidas AG
Petitioner

v.

NIKE, Inc.
Patent Owner

Case IPR2013-00067
Patent 7,347,011 B2

Before MICHAEL P. TIERNEY, MICHAEL J. FITZPATRICK, and JAMES B. ARPIN, *Administrative Patent Judges*.

ARPIN, *Administrative Patent Judge*.

DECISION
Institution of *Inter Partes* Review
37 C.F.R. § 42.108

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I. INTRODUCTION

adidas AG ("Petitioner") filed a petition to institute an *inter partes* review of claims 1-46 of Patent No. US 7,347,011 B2 (Ex. 1002; the "'011 Patent") (Paper 3, "Pet."). Nike, Inc. ("Patent Owner") has filed a patent owner preliminary response (Paper 12; "Prel. Resp."). We have jurisdiction under 35 U.S.C. § 314.

The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a) which provides as follows:

> THRESHOLD -- The Director may not authorize an inter partes review to be instituted unless the Director determines that the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.

Upon consideration of the petition and patent owner preliminary response, we determine that the information presented in the petition establishes that there is a reasonable likelihood that Petitioner would prevail with respect to claims 1-46 of the '011 Patent. Accordingly, pursuant to 35 U.S.C. § 314, we authorize an *inter partes* review to be instituted as to claims 1-46 of the '011 Patent.

A. Related Proceedings

Petitioner does not identify any related proceedings. Pet. 1. Patent Owner identifies three Patents, identified by Nos. US 7,814,598 B2; US 8,042,288 B2, and US 8,266,749 B2 and one U.S. Patent Application, identified by No. 13/413,233. Paper 9, Patent Owner Mand. Notices at 2.

B. The '011 Patent

The '011 Patent relates to articles of footwear having a textile upper. '011

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Patent, col. 1, ll. 7-10. In particular, the patent describes articles of footwear having an upper incorporating a knitted textile element and having a sole structure secured to the upper. *Id.* at col. 3, ll. 20-47.

Conventional articles of athletic footwear may include two primary elements: an upper and a sole structure. *Id.* at col. 1, ll. 12-15. The upper may form a void on the interior of the footwear for receiving a wearer's foot, and the upper may extend over the instep and toe areas, along the medial and lateral sides, and around the heel area of the foot. *Id.* at ll. 30-35. The upper may be formed of multiple layers of materials, which may be selected for properties of wear resistance, flexibility, and air permeability. *Id.* at ll. 43-50. Thus, different areas of the exterior layer of the upper may be formed of different materials with differing properties. *Id.* at ll. 51-60.

> A textile may be defined as any manufacture from fibers, filaments, or yarns characterized by flexibility, fineness, and a high ratio of length to thickness. *Textiles generally fall into two categories.* The first category includes textiles produced directly from webs of filaments or fibers by randomly interlocking to construct non-woven fabrics and felts. The second category includes textiles formed through a mechanical manipulation of yarn, thereby producing a woven fabric, for example.

Id. at col. 2, ll. 6-14 (emphasis added). Techniques for mechanically manipulating yarn into a textile include weaving (e.g., producing a woven material) and knitting (e.g., producing a knitted material). *Id.* at ll. 36-46. Further, textiles for uppers may be formed of weft or warp, woven or knitted materials. *Id.* at ll. 40-41; *see also id.* at col. 3, ll. 30-32 (describing a weft knitted and warp knitted "textile

element").

Figure 8 of the '011 Patent is reproduced below.

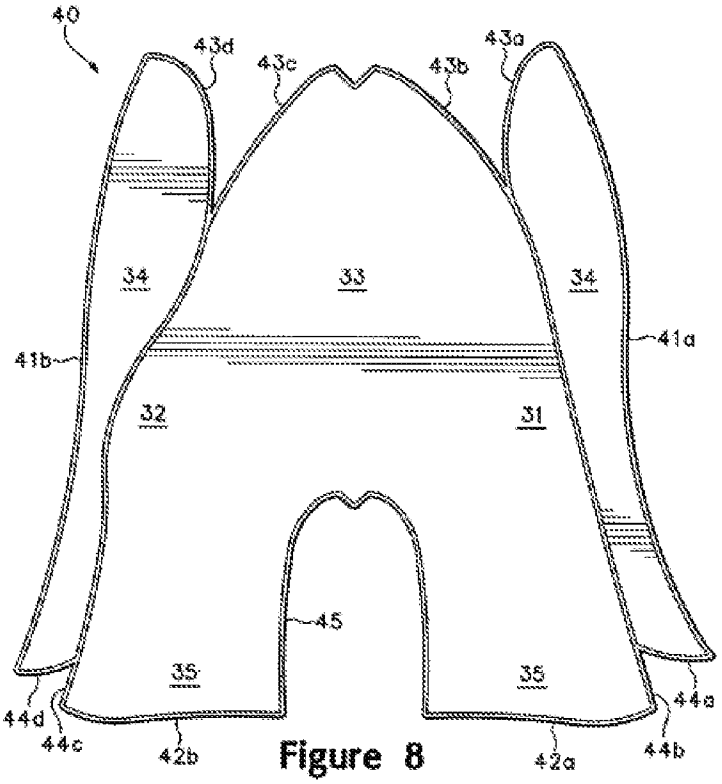


Figure 8

Figure 8 illustrates an embodiment of an upper according to the '011 Patent. *Id.* at col. 5, l. 58-col. 6, l. 65. A textile element 40 is a single material element with a unitary (i.e., one-piece) construction. *Id.* at col. 5, ll. 38-41. Consequently, textile element 40 is configured, such that portions of the textile element are not joined together with seams or other connections. *Id.* at col. 5, ll. 38-41; col. 6, ll. 41-46. Although edges 41a-44d are joined together to as shown in Figures 3-5 to form seams 51-54, thereby forming at least a portion of a void for receiving the

foot, a lateral region 31, a medial region 32, an instep region 33, lower regions 34, and heel regions 35 together have a unitary (i.e., one-piece) construction without seams (*id.* at col. 5, ll. 44-57; col. 6, ll. 47-50).

Figure 11 of the '011 Patent is reproduced below.

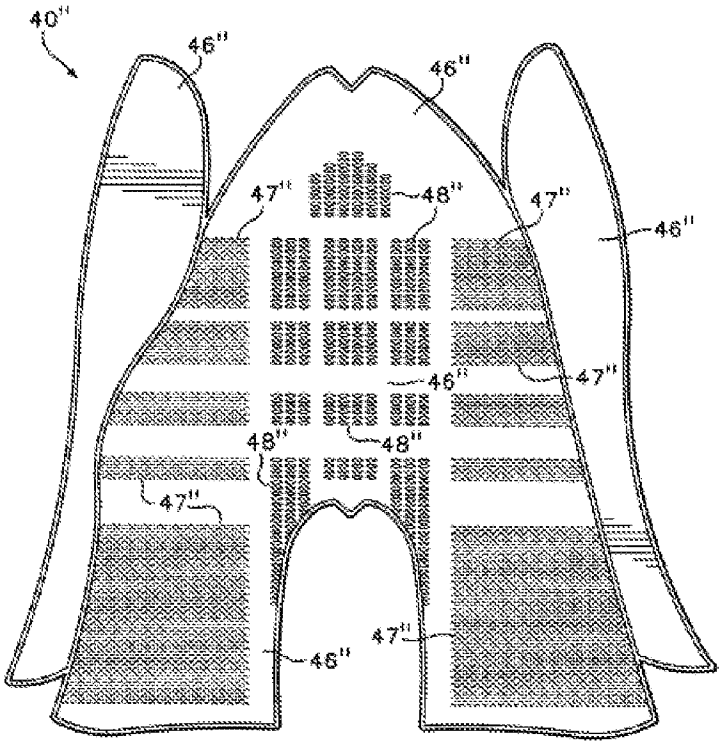


Figure 11

Figure 11 illustrates another embodiment of an upper according to the '011 Patent. *Id.* at col. 9, l. 36-col. 10, ll. 14. A textile element 40″ includes three different areas with three different textures. *Id.* at col. 9, ll. 38-39. A first texture 46″ is generally smooth and extends in strips across lateral region 31, medial region 32, and instep region 33 of the upper. *Id.* at ll. 39-42. In addition, textile element 40″ includes a second texture 47″ and a third texture 48″. *Id.* at ll. 42-46.

Moreover, the '011 Patent describes that

> [t]he different textures 46"-48" are formed *by merely varying the type of stitch formed* by the wide-tube circular knitting machine at each location of textile element 40". Textures 46"-48" may exhibit aesthetic differences, or the differences may be structural. *For example, the degree of stretch in areas with textures 46"-48" may be different, or the wear resistance of the areas may vary depending upon the stitch utilized.* The air-permeability of textile element 40" may also vary in the different areas.

Id. at ll. 46-54 (emphases added). Similarly, the type of yarn used in different areas may impart different properties to each area. *Id.* at col. 9, l. 65-col. 10, l. 14. Thus, the textures and properties of different areas of the upper may be varied by altering the stitching or yarn used in those areas.

C. Exemplary Claims

Of the challenged claims, claims 1, 16, 24, 36, and 44 are independent. Independent claims 1, 24, and 36 recite similar limitations describing the formation of a void to receive the foot, and independent claims 16 and 44 recite similar limitations describing the unitary construction of the textile element. As to the dependent claims, claims 2-15 depend from claim 1, claims 17-23 depend from claim 16, claims 25-35 depend from claim 24, claims 37-43 depend from claim 36, and claims 45 and 46 depend from claim 44. Claims 1, 16, and 44 are exemplary and are reproduced below to demonstrate the claimed subject matter (emphases added):

> 1. An article of footwear comprising:
> an upper incorporating a weft-knitted textile element *having edges that are joined together to define at least a portion of a void for*

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receiving a foot, wherein the weft-knitted textile element incorporates a single type of textile having a plurality of knit constructions; and

a sole structure secured to the upper.

16. An article of footwear comprising:

an upper incorporating a weft-knitted textile element, *the textile element having a first area and a second area with a unitary construction*, the first area being formed of a first stitch configuration, and the second area being formed of a second stitch configuration that is different from the first stitch configuration to impart varying properties to the textile element; and

a sole structure secured to the upper.

44. An article of footwear comprising:

an upper incorporating a flat-knitted textile element, *the flat-knitted textile element having a first area with a first unitary construction and a second area with a second unitary construction different from the first unitary construction*, the first area having a first set of properties, and the second area having a second set of properties that is different from the first set of properties to impart varying characteristics to the textile element; and

a sole structure secured to the upper.

D. Prior Art Relied Upon

Petitioner relies upon the following prior art references:

Glidden	US 2,147,197	Feb. 14, 1939	(Ex. 1007)
McDonald	US 2,314,098	Mar. 16, 1943	(Ex. 1008)
Whiting	US 2,641,004	June 9, 1953	(Ex. 1009)
Shiomura	US 4,785,558	Nov. 22, 1988	(Ex. 1011)
Curley	WO 90/03744	Apr. 19, 1990	(Ex. 1010)
Osamu	JP H06-113905	Apr. 26, 1994	(Ex. 1006)
Nishida	US 5,345,638	Sep. 13, 1994	(Ex. 1005)

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E. The Asserted Grounds

Petitioner alleges that the challenged claims are unpatentable under 35 U.S.C. § 102 or § 103, or both, based upon the listed prior art references, alone or in various combinations. The specific grounds are detailed below.

Reference(s)	**Basis**	**Claims challenged**
Nishida	§ 102 or § 103	1-16, 19-34, 36, and 39-46
Nishida	§ 103	35, 37, and 38
Nishida and McDonald	§ 103	1-7, 10-12, 14, 16-20, 32, 33, and 37
Nishida, McDonald, and Curley or Shiomura	§ 103	8, 9, 13, and 21-23
Nishida, McDonald, and Glidden	§ 103	9, 13, 22, and 23
Nishida and Whiting	§ 103	1-7, 10-12, 14-16, 19, 20, 32, 33, and 44-46
Nishida, Whiting, and Curley or Shiomura	§ 103	8, 9, 13, and 21-23
Nishida, Whiting, and Glidden	§ 103	9, 13, 17, 18, 22, and 23
Nishida, Whiting, and McDonald	§ 103	17 and 18
Nishida and Curley	§ 103	1-3, 16, 19-23, 30, 31, 34, 35, 38, and 43
Nishida and Shiomura	§ 103	8, 9, 13, 22, 23, 30, 31, 34, 34, 38, and 43
Nishida and Glidden	§ 103	9, 13, 22, 23, 30, 31, and 43
Glidden	§ 102	1, 2, 7-14, and 16-23

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Glidden[1]	§ 103	16-23
Glidden and McDonald or Whiting	§ 103	1, 2, 7-14, and 16-23
Osamu	§ 103	1-16 and 19-46
Osamu and McDonald	§ 103	1-7, 9, 10, 13, 14, 16-20, 22-33, 36, 37, and 39-43
Osamu, McDonald, and Curley	§ 103	8, 21, and 34
Osamu, McDonald, and Shiomura	§ 103	8, 21, 34, 35, and 38
Osamu, McDonald, and Glidden	§ 103	11 and 12
Osamu, McDonald, and Nishida	§ 103	11, 12, and 34
Osamu and Whiting	§ 103	1-7, 9, 10, 13-16, 19, 20, 22-33, 26, 39-44, and 46
Osamu, Whiting, and Curley	§ 103	8, 21, and 34
Osamu, Whiting, and Shiomura	§ 103	8, 21, 34, 35, and 38
Osamu, Whiting, and Glidden	§ 103	11, 12, 17, 18, and 45
Osamu, Whiting, and Nishida	§ 103	11, 12, 34, and 45
Osamu and Nishida	§ 103	1-7, 9-13, 16, 19, 20, 22-32, 34, 36, and 39-46
Osamu, Nishida, and Curley	§ 103	8 and 21
Osamu, Nishida, and Shiomura	§ 103	8, 21, 35, and 38

[1] Although this ground is not listed in the table included in the petition (Pet. 3-4), Petitioner does assert it at pages 43-44 of the petition.

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Osamu, Nishida, and Glidden	§ 103	17 and18
Osamu, Nishida, and McDonald	§ 103	14, 17, 18, 33, and 37
Osamu, Nishida, and Whiting	§ 103	14, 15, and 33
Osamu and Glidden	§ 103	1-7, 9-13, 16-20, 22-32, 36, and 39-43
Osamu, Glidden, and Curley	§ 103	8, 21, and 34
Osaamu, Glidden, and Shiomura	§ 103	8, 21, 34, 35, and 38
Osamu and Curley	§ 103	1-10, 13, 16, 19-32, 34, 36, 39-44, and 46
Osamu, Curley, and Shiomura	§ 103	35 and 38

II. ANALYSIS

A. Claim Construction

As a first step in our analysis for determining whether to institute a trial, we construe the claims. In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *see* Office Patent Trial Practice Guide, 77 Fed. Reg. 48756, 48766 (Aug. 14, 2012). Under the broadest reasonable interpretation standard, claim terms are presumed to be given their ordinary and customary meaning as understood by one of ordinary skill in the art at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). An inventor may rebut that presumption by providing a definition of the

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term in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). In this regard, however, we are careful not to read a particular embodiment appearing in the written description into the claim if the claim language is broader than the embodiment. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

Petitioner proposes that we adopt the broadest reasonable interpretation of the claim terms in view of the Specification. Pet. 9. Additionally, Petitioner provides express interpretations for certain claim terms. *Id.* at 10-12. Patent Owner does not challenge, in the preliminary response, the specific interpretations of claim terms proposed by Petitioner. We find it necessary to construe expressly the claim terms "a single type of textile," a "weft-knitted textile element," a "flat-knitted textile element," and "unitary construction," in order to determine whether to institute a trial.

1. "A Single Type of Textile"

Independent claims 1, 24, and 36 recite that a textile element incorporates "a single type of textile." Pet. 10. Petitioner points out that "textile element 40 is primarily formed from one or more yarns that are manipulated mechanically through either an interweaving, intertwining and twisting, or interlooping process." *Id.* (quoting '011 Patent, col. 6, ll. 51-54). Petitioner states that "[t]extile element 40 is a single material element that is formed to exhibit a unitary (i.e., one-piece) construction." Pet. 10 (quoting '011 Patent, col. 5, ll. 38-39). Thus, Petitioner contends that "a broadest reasonable interpretation of 'a single type of textile' is *a single material element* that may include one or more yarns." *Id.* (emphasis

added). This proposed interpretation, however, simply introduces a new term, i.e., a single material element, which does not appear in the claims, for construction. Consequently, we are not persuaded that this is the appropriate construction of this claim term.

"A single type of textile" is not defined expressly in the Specification of the '011 Patent. Nevertheless, a pertinent definition of the term "textile" is "any cloth or goods produced by weaving, knitting, or felting." RANDOM HOUSE WEBSTER'S COLLEGE DICTIONARY at 1351; *cf.* Spec. col. 2, ll. 6-14 (defining "textiles"). In addition, the term "textile" is defined more broadly as "[a] material made of natural or artificial fibers and used for the manufacture of items such as clothing or furniture fittings." MCGRAW-HILL DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS 1911 (4th ed. 1988). As noted above, the '011 Patent states that textiles generally fall into two categories: fabrics formed of randomly locked filaments or fibers, such as felts, and fabrics formed of mechanically manipulated yarn, such as woven or knitted fabrics. '011 Patent, col. 2, ll. 9-14.

The '011 Patent describes various techniques for mechanically manipulating yarn into woven fabrics or textiles, including interweaving (e.g., weaving), intertwining and twisting (e.g., braiding and knotting), and interlooping (e.g., knitting). *Id.* at ll. 36-46. In the Detailed Description of the Invention portion of the Specification, the '011 Patent further describes that

> [a] variety of mechanical processes have been developed to manufacture a textile. *In general, the mechanical processes may be classified as either warp knitting or weft knitting.* With regard to warp knitting, various specific *sub-types* that may be utilized to manufacture a textile include tricot, raschel, and double needle-bar

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> raschel (which further includes jacquard double needle-bar raschel). With regard to weft knitting, various specific *sub-types* that may be utilized to manufacture a textile include circular knitting and flat knitting. Various *types* of circular knitting include sock knitting (narrow tube), body garment (seamless or wide tube), and jacquard.

Id. at col. 6, l. 66-col. 7, l. 10 (emphases added).

We note that claims 1, 16, and 36 recite that the textile element is "knitted" (including "weft-knitted"), and, consequently, we construe the "single type of textile" in each those claims as a knitted textile. Further, each of claims 1, 24, and 36 recites that the "single type of textile" has "a plurality of knit constructions." We construe such "knit constructions" to mean various kinds of stitching, which exhibit aesthetic or structural differences, such as those in different areas of textile element 40″, depicted in Figure 11. *See id.* at col. 9, l. 36-col. 10, l. 14. Moreover, even though claim 24 does not recite that the textile element is "knitted," we also construe claim 24 to encompass "knitted" textile elements. *See id.* at Claims 32 (depending from claim 24 and additionally requiring a "weft knitted construction") and 34 (depending from claim 24 and additionally requiring a "warp knitted construction"). Because the '011 Patent describes warp and weft knitting as including various "sub-types," including circular and flat knitting, we construe the term "a single *type* of textile" to mean either a warp or weft type of knitted textile.

2. "Weft-Knitted Textile Element" and "Flat-Knitted Textile Element"

Petitioner argues that the terms "weft-knitted" and "flat-knitted" are well-

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known in the art. Pet. 10. We agree.

As noted above, the '011 Patent describes that various textile (e.g. knitted textile) types (e.g., warp and weft knitting) and sub-types (e.g., circular and flat knitted) may be used to manufacture textile elements for incorporation into the uppers of the claimed articles of footwear. '011 Patent, col. 6, l. 66-col. 7, l. 10. Although the '011 Patent does not include a definition of either term, a pertinent definition of "weft knitting" is "[a] knitting process in which *a continuous yarn* is carried *in crosswise rows*." MCGRAW-HILL DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS at 2054 (emphases added); *see also* Declaration of Edward Frederick (Ex. 1001) ¶ 56 ("Decl.")(reproducing H. Eberle et al., CLOTHING TECHNOLOGY, Sec. 3.3.1 (3rd English ed. 2002) (weft knitted fabric "[m]ay be made from a single yarn")). By comparison, a pertinent definition of the term "warp knitting" is "[a] knitting process in which *a group of yarns form rows running lengthwise* by an interlocking process." MCGRAW-HILL DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS at 2045 (emphasis added). For purposes of this decision, we agree that "it is reasonable to interpret these claim limitations as consistent with their ordinary meaning as conventional, known knitting techniques" and consistent with the definitions provided above. Pet. 11.

3. Independent Claim 16: The Textile Element Having First and Second Areas

Petitioner contends that the phrase "the textile element *having a first area and a second area* with a unitary construction" in claim 16 should be construed to require a textile element (1) having a unitary construction *and* (2) having a first

area and a second area, each area having stitching that imparts different properties to its area. Pet. 11-12. Thus, Petitioner contends that the textile element has a *single* unitary construction containing different areas. Petitioner contends, however, that separate unitary constructions in *different* areas of the textile element would be inconsistent with the invention, as described in the Specification. *Id.* at 12.

The '011 Patent expressly defines the term "unitary construction." '011 Patent col. 6, ll. 41-46. The '011 Patent states that, "[*a*]*s defined for purposes of the present invention*, unitary construction is intended to express a configuration wherein portions of a textile element are not joined together by seams or other connections, *as depicted with textile element 40 in FIG. 8*." *Id.* (emphases added); *see Paulsen*, 30 F.3d at 1480. For purposes of this decision, we agree with Petitioner and construe the phrase "the textile element having a first area and a second area with a unitary construction" to require a textile element having a unitary construction *and* having a first area and a second area.

4. Independent Claim 44: The Textile Element Having a First Area and a Second Area

As noted above, claim 16 recites that "the textile element [has] a first area and a second area *with a unitary construction*" (emphasis added). Claim 44 originally recited the same language as claim 16, but claim 44 was amended to recite that "the textile element [has] a first area *with a first unitary construction* and a second area *with a second unitary construction*." Pet. 11-12. Petitioner contends that, like claim 16, the phrase "the flat-knitted textile element having a first area

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with a first unitary construction and a second area with a second unitary construction different from the first unitary construction" should be construed to mean that the flat-knitted textile element "is a unitary construction with two areas, each [area] having a different construction and set of properties in accordance with the additional language of claim 44." Pet. 12; *see also* Decl. ¶ 35. Thus, Petitioner contends that this language of claim 44 should be construed to have substantially the same meaning as the related, but grammatically different, language of claim 16. *Id.* at 11-12. We disagree.

Unlike claim 16, claim 44 recites a *first* area with a *first* unitary construction and a *second* area with a *second* unitary construction. Further, as noted above, the language of claim 44 was identical to that of current claim 16, but the language of claim 44 was amended during prosecution to overcome a rejection based on cited art. *See* Pet. 11-12. Petitioner's proposed construction discounts both the prosecution history and the differences in the language of claims 16 and 44. As the Federal Circuit advises, "[a] claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so." *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Circ. 2005); *see Mangosoft, Inc. v. Oracle Corp.*, 525 F.3d 1327, 1330-31 (Fed. Cir. 2008) (rejecting claim construction that "ascribes no meaning to the term . . . not already implicit in the rest of the claim.").

For puposes of this decision, we interpret the phrase "the flat-knitted textile element having a first area with a first unitary construction and a second area with a second unitary construction different from the first unitary construction" to have

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its plain and ordinary meaning: two textile element areas, each having a unitary construction, but which areas may possess different structures, e.g., knit constructions or stitch configurations, resulting in different properties.

III. DECISION ON PETITION

For the reasons described below, we institute an *inter partes* review of each of claims 1-46 based on unpatentability either due to anticipation by Nishida or Glidden or due to obviousness over Nishida or Glidden. We deny as redundant institution based on alleged unpatentability due to obviousness over Osamu, alone, or over Nishida, Glidden, or Osamu in combination with each other or with one or more of McDonald, Curley, Whiting, and Shiomura.

Patent Owner asserts that each of the references relied upon by Petitioner in the request for *inter partes* review either was considered by the Examiner during the prosecution of the claims for which review is sought or that, to the extent that the applied references themselves were not considered previously, the references are cumulative with respect to previously considered references. Prel. Resp. 3-7 (citing 35 U.S.C. § 325(d)). Patent Owner concludes that, therefore, the Board should not institute trial on any of the proposed grounds for review.

Petitioner, however, presents different arguments and new supporting evidence that were not before the Examiner. As such, we decline to deny the proposed grounds of review under 35 U.S.C. § 325(d).

IV. GROUNDS FOR REVIEW

A. Nishida

Nishida is directed to the production of a shoe upper by (1) cutting out a layout

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in the form of the shoe upper from a web of material and (2) shaping the shoe upper by connecting material parts of the layout by the formation of seams. *See generally* Nishida, Abstract. By the disclosed process, such shoe uppers allegedly may be produced efficiently and in reduced time despite the many individual parts present or to be made visible. *Id.*

Figure 2 of Nishida is reproduced below.

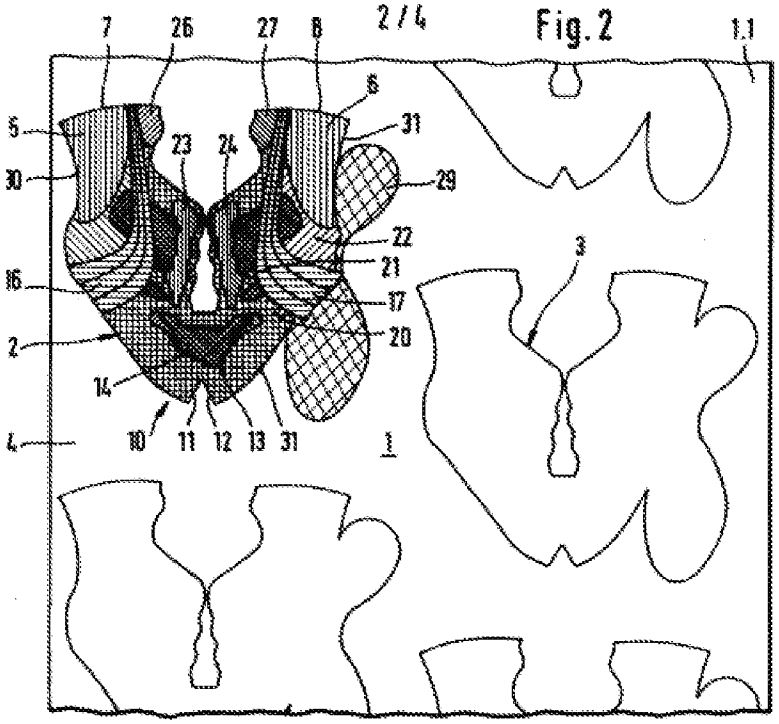


Figure 2 illustrates an embodiment of the upper layout according to Nishida. *Id.* at col. 3, ll. 6-12. A web of material 1 may include one or a plurality of layouts 2. Web of material 1 includes a backing 4 that may be a knitted material, and different areas of layout 2 may be formed by knitting different yarns or fibers on backing 4. *Id.* at col. 3, ll. 15-26; col. 5, l. 63-col. 6, l. 2.

Consequently, web of material 1 may be used to produce layouts 2 by different production measures, such as different styles, yarn material, color, material thickness, number of layers of material, or the like, simultaneously with the production of web of material 1. *Id.*; *see also* Nishida, Figs. 1, 2. Each layout 2, including a sole part, may be cut from web of material 1 as a unit and processed into an upper. *Id.* Nishida describes the manufacture of an article of footwear incorporating such an upper. Nishida, col. 3, ll. 9-12; Fig. 3.

1. Anticipation

Petitioner contends that claims 1-16, 19-34, 36, and 39-46 are anticipated by Nishida.

a. Claims 1-15, 24-34, 36, and 39-43

i. Independent Claim 1

As noted above and as recited in independent claim 1, Nishida discloses an article of footwear. Pet. 18. In particular, Nishida discloses an upper incorporating a textile element manufactured by a "conventional" textile process, such as knitting. *Id.* at 14, 18 (citing Nishida, col. 3, ll. 6-12). Petitioner contends, and Patent Owner does not rebut the contention, that a person skilled in the relevant art would understand such "conventional" knitting processes to include "weft-knitting." *See id.* at 17-19 (citing McDonald, col. 2, ll. 26-39; Whiting, col. 2, ll. 39-56; Curley, 7:32-8:25); *see also* Decl. ¶¶ 52, 54. Nishida discloses that layout 2 has edges that are joined together to form seams and to define at least a portion of a void for receiving a foot. *Id.* at 18 (citing Nishida col. 3, ll. 31-42; Figs. 2, 3).

Petitioner further contends that Nishida discloses that "the weft-knitted

textile element incorporates *a single type of textile* having a plurality of knit constructions" (emphasis added). Pet. 14, 16, 20. As noted above, we construe "a single type of textile" broadly as a manufacture formed by the mechanical manipulation, including interlooping (e.g., knitting), of one or more yarns. For the reasons set forth above, we are persuaded by Petitioner that Nishida's "conventional" textile process includes knitting, including "weft-knitting." *Id.* at 14, 20. Moreover, Nishida discloses that, in an embodiment, up to seven different textile fibers or yarns and the same number of different colors may be put into, e.g., woven into, web of material 1. *Id.* at 20 (citing Nishida, col. 4, ll. 47-60); *see also* Pet. 14-16. Further, Nishida discloses that the knit pattern, e.g., a "knit construction," in web of material 1 may be selected to achieve a deformably soft or elastic configuration or an air permeable configuration. *Id.* (citing Nishida, col. 3, ll. 43-52).

Finally, Petitioner contends that Nishida discloses a sole structure secured to the upper. Pet. 20 (citing Nishida, Fig. 3).

The explanations provided by Petitioner regarding how each element of claim 1 is met by Nishida are persuasive, and are unrebutted by Patent Owner. Thus, based on this record, we hold that Petitioner has demonstrated a reasonable likelihood that independent claim 1 is anticipated by Nishida.

ii. *Independent Claims 24 and 36*

As with claim 1, claims 24 and 36 are directed to the use of a textile element to form a void for receiving a foot. Claim 36 recites that the edges of a knitted "textile element are joined together to define at least a portion of a void for

receiving a foot." '011 Patent, col. 14, ll. 1-3; *see* Pet. 18-19, 38. For the reasons discussed above, we are persuaded that Petitioner has demonstrated that Nishida also discloses this limitation. Similarly, claim 24 requires "a textile element having edges that are joined together to form seams and define at least a portion of a void for receiving a foot[.]" '011 Patent, col. 13, ll. 2-4. Nishida discloses that edges 7 and 8 of layout 2 may be stitched together to form a vertical, heel seam and that edges 11 and 12 may be stitched together to form a seam in a shoe toe 10. Nishida, col. 3, ll. 31-42. Further, Nishida discloses that a sole part section 29.1 of a sole part 29 may be stitched together with a sole part section 29.2 of sole part 29 to form a longitudinal seam extending along sole part 29. Nishida, col. 5 ll. 3-13; Fig. 3. Thus, Petitioner also demonstrates that Nishida discloses, not only the joining of edges to form seams, but "the seams including a first seam and a second seam, the first seam extending from a heel area to a forefoot area of the footwear along a lower surface of the upper, and the second seam extending vertically in the heel area," as recited in claim 24. '011 Patent, col. 13, ll. 4-8.

Claim 36 further recites that the knitted textile element is "formed *with a knitting machine*, the textile element *being removed* from a textile structure that includes an outline of the textile element[.]" '011 Patent col. 13, l. 48-col. 14, l. 1 (emphases added). We construe this language to describe a product-by-process limitation. The Federal Circuit explains that

> even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. *The patentability of a product does not depend on its method of production.* If the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable

even though the prior product was made by a different process.

In re Thorpe, 777 F.2d 695, 697 (Fed. Cir. 1985) (emphasis added; internal citations omitted). Although Petitioner contends that Nishida discloses the process recited in claim 36, we conclude that such a disclosure is not necessary in order for claim 36 to be found unpatentable.

The explanations provided by Petitioner regarding how each element of claims 24 and 36 is met by Nishida are persuasive, and are unrebutted by Patent Owner. Thus, based on this record, we hold that Petitioner has demonstrated a reasonable likelihood that independent claims 24 and 36 are anticipated by Nishida.

iii. Dependent Claims 2-15, 25-34, and 39-43

Claims 2-6 depend from independent claim 1 and describe an upper having various sides and regions formed from the textile element (claim 2) and various seams formed by joining the edges of the textile element of claim 1 (claims 3-6). Claim 25 depends from independent claim 24, and claim 41 depends from independent claim 36. Each of these claims recites that the footwear includes a seam "extending through the forefoot area of the upper." *Cf.* Claim 6. Similarly, claims 39 and 40 depend from independent claim 36 and recite that the footwear includes a seam "extending longitudinally along a lower region of the upper" and "extending along a heel region of the upper," respectively. *Cf.* Claims 3, 4. Petitioner notes that Nishida discloses an upper having various sides and regions formed from layout 2 (Nishida, col. 3, l. 15-col. 4, l. 46; Fig. 3) and various seams formed by joining the edges of layout 2 (*id.*; *see also* Nishida, col. 5, ll. 3-13). Pet.

21-22, 31, 40-41.

Claims 7 and 8 recite that the weft-knitted textile element of claim 1 is one of an interior, exterior, or intermediate layer of the upper. *See* '011 Patent, Fig. 14 (depicting exterior layer 260, intermediate layer 250, and interior layer 240). Claims 29 and 30 depend from independent claim 24, and claim 42 depends from independent claim 36. *See* Pet. 31-32, 41. Claims 29 and 42 recite corresponding limitations to claim 7, and claim 30 recites corresponding limitations to claim 8. Petitioner notes that Nishida discloses that web of material 1 "can be woven or knitted in two or more layers." Pet. 22 (citing Nishida, col. 3, ll. 66-68).

Claims 8 and 13 also recite that the weft-knitted textile element forms at least a portion or all, respectively, of the interior surface of the upper. Claim 43 depends from independent claim 36 and recites limitations corresponding to those of claim 13. *See* Pet. 41. Claim 9 recites that the weft-knitted textile element forms at least a portion of both of the interior and exterior surface of the upper. As noted above, Nishida discloses that web of material 1 may be woven in a single or multiple layers. *See* Nishida, col. 3, ll. 66-68. Thus, as recited in claims 8 and 13, the weft-knitted textile element may form all (and, consequently, "at least a portion") of the interior surface of the upper. Pet. 23, 26. With respect to claim 9, Petitioner similarly notes that, if web of material 1 is a single layer, that layer may form both the interior and exterior surface of the upper. *See* Pet. 24 (citing Nishida, col. 3, l. 6-col. 4, l. 46).

Claim 10 recites that "an additional element is secured to the exterior surface [of the upper] and forms a portion of the exterior surface." Claims 11 and 12

depend from claim 10 and recite that the additional element is secured to the forefoot or the heel area, respectively, of the upper. *See, e.g.,* '011 Patent, Fig. 12 forefoot area element 132 and heel area element 134). Petitioner notes that Nishida discloses such additional forefoot (e.g., toe) and heel area elements secured to upper 3. Pet. 24-26 (citing Nishida, col. 3, ll. 37-42 (toe cap 15); col. 4, ll. 9-11(heel counter 28)); *see also* Nishida, Fig. 3.

Each of claims 14, 15, and 33 depends from claim 1 or 24, for which Petitioner has demonstrated a reasonable likelihood of anticipation by Nishida. Further, each of these claims differs from the claim from which it depends only by the inclusion of a product-by-process limitation. Claims 14 ("the weft-knitted textile element is created by circular knitting"), 15 ("a weft-knitted textile element created by flat knitting"), 33 ("the weft-knitted construction is produced by one of circular knitting and flat knitting"); *see* Pet. 27-28, 34 (citing Decl. ¶ 72 (describing web of materials 1 produced by a "conventional textile process" such as by knitting)). As noted above, however, "[t]he patentability of a product does not depend on its method of production." *Thorpe*, 777 F.2d at 697.

Finally, claims 26-28 recite embodiments of articles of footwear in which knit constructions form "an aperture in the textile element" (claim 26), "varying properties in the textile element including a varying elasticity of the textile element" (claim 27), or "varying properties in the textile element including a varying air permeability of the textile element" (claim 28). Pet. 31. With respect to claims 26 and 28, Petitioner notes that Nishida discloses selecting a suitable knit pattern to make toe area 14 "permeable to air." Nishida, col. 3, ll. 43-45; *see also*

Nishida, col. 6, ll. 25-31; Pet. 31 (citing Decl. ¶ 72 (pgs. 56-57)). In particular, Nishida discloses that good air exchange may be achieved "by a *net-like* woven or knitted structure." Nishida, col. 3, ll. 49-52 (emphasis added). Further, with respect to claim 27, Petitioner notes that Nishida discloses that patterns may be produced directly in the production of the web of material that may vary the elasticity of the web of material. Pet. 31 (citing Nishida, col. 2, ll. 26-37; col. 3, ll. 43-49).

The explanations provided by Petitioner as to how each element of the challenged dependent claims[2] is disclosed by Nishida are persuasive (Pet. 21-29, 31-37, and 38-42) and are unrebutted by Patent Owner. Thus, we hold that the Petitioner has demonstrated a reasonable likelihood that dependent claims 2-15, 25-34, and 39-43, as well as their base claims, independent claims 1, 24, and 36, are anticipated by Nishida.

b. Claims 16 and 19-23

i. Independent Claim 16

Petitioner contends that Nishida anticipates independent claim 16. As recited in claim 16, Nishida discloses an article of footwear having an upper incorporating textile element manufactured by a "conventional" textile process, such as knitting. Pet. 45 (citing Nishida, col. 3, ll. 6-12). As noted above, Petitioner contends, and Patent Owner does not rebut, the contention that such "conventional" knitting processes include "weft-knitting." *See id.* (citing

[2] Claims 32 and 34 are discussed above in our discussion of independent claim 24.

McDonald, col. 2, ll. 26-39; Whiting, col. 2, ll. 39-56; Curley, 7:32-8:25); *see also* Decl. ¶¶ 52, 54.

Petitioner further contends that Nishida discloses that "the textile element [has] a first area and a second area *with a unitary construction*, the first area being formed of a first stitch configuration, and the second area being formed of a second stitch configuration that is different from the first stitch configuration to impart varying properties to the textile element" (emphasis added). *See* Pet. 42-45. As noted above, we construe the term "textile element" to include textile elements with and without a unitary construction. Consequently, for purposes of this decision, we construe the phrase "the textile element having a first area and a second area with a unitary construction" as: a textile element having a unitary construction *and* having a first area and a second area. *Id.* at 42-43.

Referring to Figures 1 and 2, Nishida discloses that, "layout 2 is divided into different individual parts or areas, which differ from one another, such as by being of another material style and/or by being of different fibers . . .." Nishida, col. 3, ll. 15-18; *see* Pet. 47. As noted above, in an embodiment, up to seven different textile fibers or yarns and the same number of different colors may be put into, e.g., woven into, web of material 1. *Id.* Further, Nishida discloses that the knit pattern, e.g., a "stitch configuration," in web of material 1 may be selected to achieve a deformably soft or elastic configuration or an air permeable configuration. *Id.* (citing Nishida, col. 3, ll. 43-52). Thus, Nishida discloses that "the first area being formed of *a first stitch configuration*, and the second area being formed of *a second stitch configuration* that is different from the first stitch configuration to

impart varying properties to the textile element" (emphases added), as recited in claim 16. *See* Pet. 47 (citing Nishida, col. 4, ll. 47-60).

Finally, Petitioner contends that Nishida discloses a sole structure secured to the upper. Pet. 48 (citing Nishida, Fig. 3).

The explanations provided by Petitioner regarding how each element of claim 16 is met by Nishida are persuasive, and are unrebutted by Patent Owner. Thus, based on this record, we hold that Petitioner has demonstrated a reasonable likelihood that independent claim 16 is anticipated by Nishida.

ii. Dependent Claims 19-23

Claim 19 recites that at least one of the first and second stitch configurations of claim 16 "forms an aperture in the weft-knitted textile element." Different areas may have varying air permeability, and such apertures may be formed to "facilitate the transfer of air between the void within upper [30] and the area outside of upper [30]." '011 Patent, col. 9, ll. 53-60. As discussed above with respect to claims 26 and 28, Petitioner notes that Nishida discloses selecting a suitable knit pattern to make toe area 14 "permeable to air." Nishida, col. 3, ll. 43-45; *see also* Nishida, col. 6, ll. 25-31; Pet. 49 (citing Decl. ¶ 72 (pgs. 56-57)). In particular, Nishida discloses that good air exchange may be achieved "by a *net-like* woven or knitted structure." Nishida, col. 3, ll. 49-52 (emphasis added).

Claim 20 recites that the weft-knitted textile element of claim 16 is one of an interior, exterior, or intermediate layer of the upper. *See* '011 Patent, Fig. 14; *cf.* Claim 7 (discussed above). Petitioner notes that Nishida discloses that web of

material 1 "can be woven or knitted in two or more layers." Pet. 49-50 (citing Nishida, col. 3, ll. 66-68).

Finally, claims 21 and 23 recite that the weft-knitted textile element forms at least a portion or all, respectively, of the interior surface of the upper. Claim 22 recites that the weft-knitted textile element forms at least a portion of both of the interior and exterior surface of the upper. As noted above, Nishida discloses that web of material 1 may be woven in a single or multiple layers. *See* Nishida, col. 3, ll. 66-68. Thus, as recited in claims 21 and 23, the weft-knitted textile element may form all (and, consequently, "at least a portion") of the interior surface of the upper. Pet. 50, 52. With respect to claim 22, Petitioner similarly notes that, if web of material 1 is a single layer, that layer may form both the interior and exterior surface of the upper. Pet. 51 (citing Nishida, col. 3, l. 6-col. 4, l. 46).

The explanations provided by Petitioner as to how each element of the challenged dependent claims is disclosed by Nishida also are persuasive (Pet. 43, 48-52) and are unrebutted by Patent Owner. Thus, we hold that Petitioner has demonstrated a reasonable likelihood that dependent claims 19-23, as well as their base claim, independent claim 16, are anticipated by Nishida.

c. Claims 44-46

i. Independent Claim 44

Petitioner contends that Nishida anticipates independent claim 44. As noted above and as recited in claim 44, Nishida discloses an article of footwear having an upper incorporating textile element manufactured by a "conventional" textile

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process, such as knitting. Pet. 55-56 (citing Nishida, col. 3, ll. 6-12). Petitioner contends, and Patent Owner does not rebut the contention, that such "conventional" knitting processes include "flat-knitting." *See id.* at 56 (citing McDonald, col. 2, ll. 26-39; Whiting, col. 2, ll. 39-56; Curley, 7:32-8:25); *see also* Decl. ¶¶ 52, 54.

Petitioner further contends that Nishida discloses that "the flat-knitted textile element having a first area *with a first unitary construction* and a second area *with a second unitary construction* different from the first unitary construction, the first area having a first set of properties, and the second area having a second set of properties that is different from the first set of properties to impart varying characteristics to the textile element" (emphases added). Pet. 54-55, 57 (citing Nishida, col. 4, ll. 47-60). Referring to Figures 1 and 2, Nishida discloses that, "layout 2 is divided into different individual parts or areas, which differ from one another, such as by being of another material style and/or by being of different fibers . . .." Nishida, col. 3, ll. 15-18; *see* Pet. 46. As noted above, in an embodiment, up to seven different textile fibers or yarns and the same number of different colors may be put into, e.g., woven into, web of material 1. *Id.* Further, Nishida discloses that the knit pattern, e.g., "varying characteristics," in web of material 1 may be selected to achieve a deformably soft or elastic configuration or an air permeable configuration. *Id.* (citing Nishida, col. 3, ll. 43-52). Thus, Nishida discloses that "the first area being formed of a first stitch configuration, and the second area being formed of a second stitch configuration that is different from the first stitch configuration to impart varying properties to the textile

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element" (emphases added), as recited in claim 44. *See* Pet. 57 (citing Nishida, col. 4, ll. 47-60).

Finally, Petitioner contends that Nishida discloses a sole structure secured to the upper. Pet. 57 (citing Nishida, Fig. 3).

The explanations provided by Petitioner regarding how each element of claim 44 is met by Nishida are persuasive, and are unrebutted by Patent Owner. Thus, based on this record, we hold that Petitioner has demonstrated a reasonable likelihood that independent claim 44 is anticipated by Nishida.

ii. Dependent Claims 45 and 46

Claim 45 recites that the first and second sets of properties are "at least one of a stitch configuration and a yarn type." Petitioner notes that Nishida discloses that different areas of layout 2 may differ from one another based on the type of yarn used (Nishida, col. 3, ll. 15-26) or based on different knit patterns (*id.* at ll. 43-52). Pet. 57-58; *see also* Decl. ¶ 72. Further, Nishida describes that webs of materials may be produced, which vary according to the type of knit and the type of yarn. Nishida, col. 5, l. 63-col. 6, l. 2.

Claim 46 recites that the weft-knitted textile element of claim 44 is one of an interior, exterior, or intermediate layer of the upper. *See* '011 Patent, Fig. 14. Petitioner notes that Nishida discloses that web of material 1 "can be woven or knitted in two or more layers." Pet. 58 (citing Nishida, col. 3, ll. 66-68); *see also* Decl. ¶ 72.

The explanations provided by Petitioner as to how each element of the challenged dependent claims is disclosed by Nishida also are persuasive (Pet. 57-58) and are unrebutted by Patent Owner. Thus, we hold that Petitioner has demonstrated a reasonable likelihood that dependent claims 45 and 46, as well as their base claim, independent claim 44, are anticipated by Nishida.

2. Obviousness

Petitioner contends that claims 1-16 and 19-46 are rendered obvious by Nishida.

a. Claims 1-16, 19-34, 36 and 39-46

Because anticipation is the epitome of obviousness, a disclosure that anticipates under 35 U.S.C. § 102 also renders the claim unpatentable under 35 U.S.C. § 103. *See In re Pearson*, 494 F.2d 1399, 1402 (CCPA 1974); *In re Meyer*, 599 F.2d 1026, 1031 (CCPA 1979); *In re Fracalossi*, 681 F.2d 792, 794 (CCPA 1982). Therefore, for the reasons set forth above, we hold that Petitioner has demonstrated a reasonable likelihood that independent claims 1, 16, 24, 36, and 44, as well as dependent claims 2-15, 19-23, 25-34, 39-43, 45, and 46, are rendered obvious by Nishida.

b. *Claims 35, 37, and 38*

Each of claims 35, 37, and 38 depends from a claim for which Petitioner has demonstrated a reasonable likelihood that the claim is anticipated or rendered

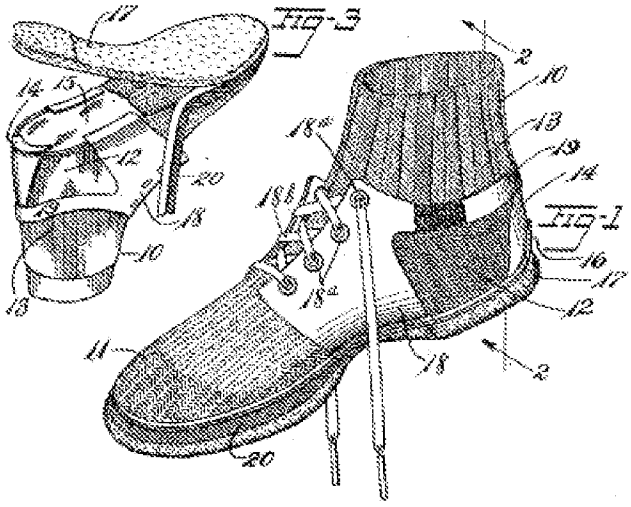
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obvious by Nishida. Further, each of these claims differs from the claim from which it depends only by the inclusion of a product-by-process limitation. Claims 35 (a construction "produced by a jacquard double needle-bar raschel"), 37 ("a structure formed by a wide-tube circular knitting machine"), 38 ("a structure formed by a jacquard double needle-bar raschel knitting machine"); *see* Pet. 36-40 (citing Nishida, col. 3, ll. 6-12 (describing web of materials 1 produced by a "conventional textile process" such as by knitting)). As noted above, however, "[t]he patentability of a product does not depend on its method of production." *Thorpe*, 777 F.2d at 697. Thus, for the reasons set forth above with respect to claims 24 and 36, from which claim 35 and claims 37 and 38 depend, respectively; we hold that Petitioner has demonstrated a reasonable likelihood that dependent claims 35, 37, and 38 are rendered obvious by Nishida.

B. Glidden

Glidden discloses an article of footwear produced by forming a sock-like, shoe upper 10, which may include a toe portion 11 and a heel portion 12, having different textures or properties. Glidden, pg. 1, 2:19-44; Figs. 1, 3. Further, upper 10 may have various parts applied to it, such as an outsole 17 and a blucher saddle 18. *Id.* at pg. 1, 2:11-17; pg. 2, 1:8-19.

Figures 1 and 3 of Glidden are reproduced below.



Figures 1 and 3, above, illustrate an embodiment of upper 10 according to Glidden. *Id.* at pg. 2, 1:5-38. Sock-like upper 10 is fabricated as a *unitary* upper, such as by knitting. *Id.* at pg. 1, 2:33-41. Different types of stitching and different types of yarn may be used to impart different textures, e.g., ribbing, and different properties, e.g., softness or elasticity, respectively, to different areas of upper 10. *Id.* at pg. 1, 2:19-32; pg. 1, 2:41-44.

1. Anticipation

a. Independent Claim 16

Petitioner contends that Glidden anticipates independent claim 16. As noted above and as recited in claim 16, Glidden discloses an article of footwear. Pet. 45 (citing Glidden, pg. 1, 1:1-4). Referring to Figures 1, 6, and 8, Glidden discloses an upper of a textile material, for example, a knitted material, "fabricated as an integral, shaped, *sock-like* article." *Id.* (citing Glidden, pg. 1, 2:3-10; 2:45-48 (emphasis added)). Such sock-like articles may be manufactured by circular

knitting (*see* Decl. ¶ 84), and such circular knitting is a form of weft knitting (Pet. 45-46; *see also* Decl. ¶ 54 ("Common examples of weft knits are circular knits . . ."); RANDOM HOUSE WEBSTER'S COLLEGE DICTIONARY at 1479 ("weft knitting" is "a knitting process in which the yarn is knitted horizontally *and in a circular form*" (emphasis added)). As noted above, Petitioner contends, and Patent Owner does not rebut the contention, that such "circular" knitting processes include "weft-knitting." *See* Pet. 45-46.

Petitioner further contends that Glidden discloses that "the textile element having a first area and a second area *with a unitary construction*, the first area being formed of a first stitch configuration, and the second area being formed of a second stitch configuration that is different from the first stitch configuration to impart varying properties to the textile element" (emphasis added). *See* Pet. 42-43, 45-46. As noted above, we construe the term "textile element" to include textile elements with and without a unitary construction. Consequently, for purposes of this decision, we construe the phrase "the textile element having a first area and a second area with a unitary construction" as: a textile element having a unitary construction *and* having a first area and a second area. *Id.* at 42-43.

Glidden discloses that,

> [i]n fabricating the *unitary* upper, as by knitting, areas thereof which are normally subjected to greater wear and in which a lower degree of elasticity is desired, such as the toe 11 and the heal portion 12, may be more densely fabricated to provide therein heavier weight and less extensibility than in the other parts of the upper, *as by changing the type of stitch* or the amount or thickness of the yarn in

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> the knitting. Other areas, such as the ankle portion 13, are preferably made so as to provide softness and elasticity, as by making them of ribbed construction, as shown [in Figure 8].

Pet. 43 (quoting Glidden, pg. 1, 2:33-44 (emphases added). Thus, Glidden discloses both an upper "with a unitary construction" and at least first and second areas of the upper, which areas may have different properties, based on their respective stitch configurations. Pet. 42-43, 45-47; *see also* Decl. ¶ 84.

Finally, Petitioner contends that Glidden discloses a sole structure secured to the upper. Pet. 48 (citing Glidden, pg. 2, 2:8-15; Fig. 1); *see also* Glidden, Figs. 2, 3, 7.

The explanations provided by Petitioner regarding how each element of claim 16 is met by Glidden are persuasive, and are unrebutted by Patent Owner. Thus, based on this record, we hold that Petitioner has demonstrated a reasonable likelihood that independent claim 16 is anticipated by Glidden.

b. Dependent Claims 17 and 18

Claim 17 depends from independent claim 16 and additionally requires that "the first stitch configuration provides *a substantially smooth texture to the first area*, and the second stitch configuration provides *a texture to the second area that is rougher than the smooth texture*" (emphases added). Claim 18 depends from claim 17 and additionally requires that "the second stitch configuration forms a *rib structure* in the second area" (emphasis added), i.e., in the area with the rougher texture. Glidden describes that "[o]ther areas, such as the ankle portion 13, are preferably made so as to provide softness and elasticity, as by making them of

ribbed construction" (emphasis added). Pet. 43 (quoting Glidden, pg. 1, 2:41-44). Thus, Glidden describes that areas of a unitary upper may be ribbed or unribbed, such that these areas may have a rougher, e.g., ribbed, or smoother, e.g., unribbed, texture, as recited in claims 17 and 18. Glidden, pg. 1, 2:41-44.

The explanations provided by Petitioner as to how each element of the challenged dependent claims is disclosed by Glidden are persuasive (Pet. 43, 48-49) and are unrebutted by Patent Owner. Thus, we hold that Petitioner has demonstrated a reasonable likelihood that dependent claims 17 and 18, as well as their base claim, independent claim 16, are anticipated by Glidden.

2. Obviousness

Petitioner contends that claims 16-18 are rendered obvious by Glidden, alone or in combination with McDonald or Whiting. Pet. 3, 43-44. Because anticipation is the epitome of obviousness, a disclosure that anticipates under § 102 also renders the claim unpatentable under § 103. *See In re Pearson*, 494 F.2d at 1402; *In re Meyer*, 599 F.2d at 1031; *In re Fracalossi*, 681 F.2d at 794. Therefore, for the reasons set forth above, we hold that Petitioner has demonstrated a reasonable likelihood that independent claim 16, as well as dependent claims 17 and 18, are rendered obvious by Glidden.

V. CONCLUSION

Petitioner has demonstrated that there is a reasonable likelihood of prevailing on its challenge to the patentability of claims 1-46 of the '011 Patent.

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The Petition is granted as to the following grounds for review:

claims 1-16, 19-34, 36, and 39-46 as anticipated by Nishida;

claims 16-18 as anticipated by Glidden;

claims 1-16 and 19-46 as obvious over Nishida; and

claims 16-18 as obvious over Glidden.

VI. ORDER

For the reasons given, it is

ORDERED that the Petition is granted as to claims 1-46 of the '011 Patent.

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(a), *inter partes* review of the '011 Patent is hereby instituted commencing on the entry date of this Order, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial.

FURTHER ORDERED that the trial is limited to anticipation by Nishida and Glidden and to obviousness over Nishida and Glidden and no other grounds are authorized.

FURTHER ORDERED that an initial conference call with the Board is scheduled for 2 PM ET on June 18, 2013. The parties are directed to the Office Trial Practice Guide, 77 Fed. Reg. 48756, 48765-66 (Aug. 14, 2012) for guidance in preparing for the initial conference call, and should come prepared to discuss any proposed changes to the Scheduling Order entered herewith and any motions the parties anticipate filing during the trial.

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Case IPR2013-00067
Patent 7,347,011 B2

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Paper 22
Date: June 19, 2013

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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adidas AG
Petitioner

v.

NIKE, Inc.
Patent Owner

Case IPR2013-00067
Patent 7,347,011 B2

Before MICHAEL P. TIERNEY, MICHAEL J. FITZPATRICK, and JAMES B. ARPIN, *Administrative Patent Judges.*

ARPIN, *Administrative Patent Judge.*

ORDER
Conduct of the Proceeding
37 C.F.R. § 42.5

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On June 18, 2013, an initial conference call was held including the following individuals:

(1) Geoffrey K. Gavin, counsel for adidas AG ("Petitioner");

(2) Jonathan van Es, counsel for Nike, Inc. ("Patent Owner"); and

(3) Michael Tierney, Michael J. Fitzpatrick, and James B. Arpin, Administrative Patent Judges.

The purpose of the call was to discuss the motions that the parties intend to file and any proposed changes to the Scheduling Order (Paper 19). Prior to the call, Nike filed a List of Proposed Motions (Paper 21).

Motions List

Nike's List of Proposed Motions identified four motions that it intends to or may file in this trial: (1) Motion to Amend, (2) Motions to Seal and Expunge, and (3) Motion to Submit Videotaped Testimony. Each of the proposed motions was discussed.

1) Motion to Amend

Nike requested guidance regarding the filing of a motion to amend, including the number of claims and the page limits for such a motion.

As discussed during the call, Nike is not obligated to add substitute claims during the proceeding. Further, if Nike seeks to add claims, Nike is not required to pursue all possible claims in this proceeding as other procedures exist to pursue amended claims, e.g., a reissue application. As to page limits, substitute claims included in an Appendix or Exhibit would be counted towards the page limits.

Additional guidance on motions to amend is provided in the Board's Trial Practice Guide and recent decisions, including Case IPR2012-00005, Paper 27, dated June 3, 2013, and Case IPR2012-00027, Paper 26, dated June 11, 2013 ("Idle

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Free"). For example, *Idle Free* explains that "in the absence of special circumstance, a challenged claim can be replaced by only one claim, and a motion to amend should, for each proposed substitute claim, specifically identify the challenged claim which it is intended to replace." *Idle Free* at 5.

2) Motions to Seal and Expunge

Nike indicated that during the course of the proceeding it may seek to submit evidence containing trade secrets or other confidential research. Nike stated that if they file such information, they would seek to seal the information and later expunge the information. No prior authorization is necessary for a motion to seal nor is prior authorization necessary to file a motion expunging sealed information.

If the parties propose a Protective Order other than the Board's default Protective Order, the parties are authorized to file a joint proposed Protective Order accompanied by a red-lined copy based on the default Protective Order in Appendix B to the Board's Trial Practice Guide. *See Office Patent Trial Practice Guide*, 77 Fed. Reg. 48756, 48769 (Aug. 14, 2012).

3) Motion to Submit Videotaped Testimony

The parties indicated that they may seek to enter videotape testimony into the record pursuant to 37 C.F.R. § 42.53(a). As provided in the rule, while the parties may agree to the taking of videotape testimony, entry of video-recorded testimony must be approved by the Board as the submission of potentially long, unedited video evidence in the proceeding would be contrary to the considerations identified in 35 U.S.C. § 316(b). Accordingly, the parties should seek authorization once the particular need for such submission has been identified and where the parties are in a position to discuss the extent of the submission, e.g, the amount of edited video to be submitted.

The parties have jointly modified Due Dates 2 and 3 (Paper 20). No further modifications to the Scheduling Order were sought by either party.

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It is:

Ordered that the parties are authorized to file a joint proposed protective order with a red-lined copy based on the default protective order.

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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adidas AG,
Petitioner

v.

NIKE, Inc.
Patent Owner

Patent No. 7,347,011

Inter Partes Review No. 2013-00067

NIKE, INC.'S MOTION TO AMEND
U.S. PATENT 7,347,011

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Skechers v Nike

I. PRECISE RELIEF REQUESTED

Patent Owner (NIKE) moves, pursuant to 37 C.F.R 42.121, to amend U.S. Patent 7,347,011 ("the '011 patent") by cancelling issued claims 1 through 46, substituting claim 47 for issued claim 16, substituting claims 48 and 49 for issued claim 19 and substituting claim 50 for issued claim 20. Appendix 1 lists exhibits cited in this motion.

II. CLAIM LISTING

Issued claims 1-46 are cancelled. Substitute claims 47–50 are shown in marked-up form relative to the issued claims for which they are substituted.

Claim 47. (Substitute for independent claim 16) An article of footwear comprising an upper incorporating a [weft-knitted] flat knit textile element, the flat knit textile element (1) having flat knit edges free of surrounding textile structure such that the flat knit edges are not surrounded by textile structure from which the textile element must be removed, some of the flat knit edges joined together to form an ankle opening in the upper for receiving a foot, the ankle opening having an edge comprised of one of the flat knit edges; and (2) having a first area and a second area with a unitary construction, the first area being formed of a first stitch configuration, and the second area being formed of a second stitch configuration that is different from the first stitch configuration to impart varying properties to the textile element; and

a sole structure secured to the upper.

Claim 48. (Substitute for dependent claim 19) The article of footwear recited in claim [16] 47, wherein at least one of the first stitch configuration and the second stitch configuration forms an aperture in the [weft-knitted] flat knit textile element and the joined edges shape the flat knit textile element to form a lateral region, a medial region, an instep region and a heel region of the upper.

Claim 49. (Second substitute for dependent claim 19) The article of footwear recited in claim [16] 47, wherein at least one of the first stitch configuration and the second stitch configuration forms [an aperture] a plurality of apertures in the [weft-knitted] flat knit textile element, the apertures formed by omitting stitches in the flat knit textile element and positioned in the upper for receiving laces.

Claim 50. (Substitute for dependent claim 20) The article of footwear recited in claim [16] 47, wherein the [weft-knitted] flat knit textile element is one of an exterior layer, an intermediate layer, and an interior layer of the upper, and the joined edges shape the flat knit textile element to form a lateral region, a medial region, an instep region and a heel region of the upper.

III. DISCUSSION OF SUBSTITUTE CLAIMS

As explained below and in the accompanying testimony of Ray Tonkel, Exhibit 2010, this amendment and the substitute claims comply with 35 U.S.C. §

316(d)(3), 37 CFR § 42.121, the Board's August 2, 2013 Order (Paper 29) and the Board's August 16, 103 Email. The amendment proposes a reasonable number of substitute claims, does not enlarge the scope of the claims and does not introduce new matter. The proposed claims are patentable over the prior art, including prior art identified by the Board in its Decision on whether to institute a trial and other prior art known to NIKE. Dependent claims 48 and 49 are also patentably distinct from each other. The proposed substitute claim language uses commonly understood terms that should be given their ordinary and customary meaning. (Tonkel Dec. (Ex. 2010), ¶¶ 60, 68, 71, 74, 78, 83, 87).

a. **Compliance with 35 U.S.C. § 316(d)(3) and 37 C.F.R. §§ 42.121(a)(2)(ii) and (b)(1)**

Substitute claims 47 - 50 do not enlarge the scope of issued claims 16, 19 or 20, do not introduce new matter and are supported by the original application that issued as the '011 patent ("'011 application").

Substitute claim 47 narrows the scope of issued claim 16 by changing "weft-knitted textile element" to "flat knit textile element." (*See* '011 application, Ex 1003, p. 168, ¶[42] ("weft knitting… include[s] circular knitting and flat knitting")). The '011 application supports this "flat knit" textile element limitation. Originally-filed claim 65 recites "an upper incorporating a textile element formed through a flat knitting process." (Ex. 1003 at 184; s*ee also* Ex. 1003 at pp. 179, 181 (originally-filed claims 19 and 38 reciting "flat knitting."); pp.

168-69, ¶¶ [42] - [43] (describing element 40 as being a flat knit element), p. 173, ¶[54]; pp. 175-76,¶[59]; Tonkel Dec. (Ex. 2010), ¶¶ 38-39, 58-59).

Claim 47 further narrows the scope of claim 16 by requiring that the textile element have "flat knit edges free of surrounding textile structure such that the flat knit edges are not surrounded by textile structure from which the textile element must be removed." Support for this limitation is provided by the support cited in the previous paragraph for "flat knit" textile element, by Figures 8, 10 and 11 and by the portions of the specification associated with those figures. (E.g., Ex 1003, pp. 192-95, p. 166, ¶[35], pp. 179-84 (originally filed claims 19, 38 and 65); *see also* Tonkel Dec. (Ex 2010), ¶¶40, 62-67). Figures 8, 10 and 11 illustrate configurations for the claimed textile element that, in contrast to the illustration in Figure 9 (Ex 1003, p. 193) and the accompanying description noted above, have flat knit edges without any surrounding textile structure. Contrary to the embodiment shown in Figure 9 and claimed in issued independent claim 36, a textile element flat knit to a configuration like that shown in the examples of Figs. 8, 10 and 11 need not be removed from a larger textile structure and already has a knit structure in a desired configuration. (Tonkel Dec. (Ex. 2010), ¶¶36-37, 40-41, 62-67).

The scope of issued claim 16 is further reduced by the added claim 47 limitation that recites "some of the flat knit edges joined together to form an ankle

opening in the upper for receiving a foot." The '011 application supports this limitation. For example, when edges 42a and 42b in Figure 8 (Ex. 1003, p. 192) are joined to form heal seam 52, one of the other edges 45 of the textile element, constituting a u-shaped area of the textile element, becomes an opening in the upper forming ankle opening 36 shown in Figures 1-4 and 6. (*See* Tonkel Dec. (Ex. 2010), ¶¶ 69-70; Ex 1003, pp. 187-191 and p.167, ¶[38])). The scope of issued claim 16 is further narrowed by the claim 47 limitation "the ankle opening having an edge comprised of one of the flat knit edges," which limitation is also disclosed by the '011 application. (Tonkel Dec. (Ex. 2010), ¶¶72-73). As just described, the edge 45 shown in Figure 8, which can be flat knit as discussed above, forms part of the ankle opening 36 shown in Figures 1-4 and 6. The remaining limitations of claim 47, regarding unitary construction, stitch configuration and sole structure, are part of originally-filed claim 20 and additional support may be found, for example, at Ex 1003 at p. 162, ¶[11]; and at p. 168, ¶[40]. (*See* Tonkel Dec. (Ex. 2010), ¶¶ 33, 35, 58). As is evident from Figures 1-8 and other portions discussed above, the '011 application discloses all the features of claim 47 in combination. (*Id.* at ¶75).

Substitute dependent claims 48-50 change "weft knitted textile element" of issued dependent claim 19 to "flat knit textile element" for consistency with claim 47. Claims 48 and 50 further narrow the scope of claims 19 and 20, respectively, by requiring that "the joined edges shape the flat knit textile element to form a

lateral region, a medial region, an instep region and a heel region of the upper." This limitation and its combination with other features of claim 48 and of claim 50 are supported in the '011 application, such as in originally-filed claim 1 (Ex 1003, p. 177), and in Figures 1-8 and the accompanying description. (Ex 1003, p. 165 ¶[31]; p. 166, ¶[35]; p. 167, ¶[37]; Tonkel Dec. (Ex. 2010), ¶¶77- 79, 86- 88). The '011 application discloses that following the joining of edges, the textile element exhibits the shape of upper 30 depicted in Figures 2-7 (Ex 1003, p. 167, ¶[36]), which has a lateral region, a medial region, an instep region and a heel region. (Ex1003, p. 166, ¶[34]; Tonkel Dec. (Ex. 2010), ¶77).

Claim 49 further narrows claim 19 to require that there are "a plurality of apertures in the flat knit textile element . . . formed by omitting stitches in the flat knit textile element and that are positioned in the upper for receiving laces." This limitation and its combination with other features of claim 49 are also described in the '011 application. (Ex 1003 at p. 174, continuation of ¶[54]; Tonkel Dec. (Ex. 2010), ¶¶ 81-84).

b. **Compliance with 37 C.F.R. 42.121(a)(2)(i)**

Substitute claim 47 patentably distinguishes over Nishida, Ex.1005. (*See* Tonkel Dec. (Ex. 2010), ¶¶93-106, 108-112, 114-124). Nishida only refers to knitting in a general and nonspecific way. Nishida does not specify either warp knitting or weft knitting and does not refer to flat knitting. (Tonkel Dec. (Ex.

2010), ¶101). Nishida's "layout" is surrounded by a textile structure from which it must be removed. Even if that layout is assumed to be knit, textile yarns forming the edges of the layout must be individually broken as the layout is cut out of the web that completely surrounds the layout. (*Id.*)

Nishida does not explain how the cut edges of the layout are processed prior to shaping the as-cut layout into the form of a shoe upper by connecting certain edges to form seams. However, in the absence of any processing, the prior art, such as Glidden (Ex. 1007) and Whiting (Ex. 1009), recognizes that such edges would be prone to fraying and, in a weft knit structure, would even be susceptible to unraveling. (Ex. 1007, p. 2, ll. 43-63; Ex. 1009 at 3:68-4:16; Tonkel Dec. (Ex. 2010), ¶¶102-104).

As the Board decision acknowledges, "Nishida is directed to the production of a shoe upper by (1) cutting out a layout in the form of the shoe upper from a web of material. . . ." (Paper 18 at pp. 17-18). As a result, and regardless of how Nishida's overall web and associated layouts are constructed, edges of a layout that are cut, as required by Nishida, have a structure substantially different from that of a flat knit edge such as is claimed in substitute claim 47. (Tonkel Dec. (Ex. 2010), ¶¶104, 105). Removal of Nishida's layout from a larger web of material requires that stitches at the layout edges be broken (such as by a knife, die cutter, or other cutting technique such as a laser) in order to separate the layout from a surrounding

textile structure. (Tonkel Dec. (Ex. 2010), ¶101). As discussed above, if untreated, the so-cut edges are subject to raveling and fraying. (*Id.* at ¶¶102-104). Conversely, the claimed "flat knit" edges in claim 47 inherently have a stable configuration where the yarn of stitches at the edges of the textile element are unbroken and joined from one row to the next row. (*Id.* at ¶105). Examples of this structure are shown in the Spencer textbooks relied on by the Petitioner as Exhibit 1012. (*Id.*) Yarn and fibers forming edges of the claimed textile element retain their integrity. (*Id.*) As a result, the footwear article defined by claim 47 is novel over Nishida. (*Id.* at ¶106).

Nishida also does not disclose the limitation of claim 49 regarding apertures. While figure 3 of Nishida indicates the upper includes openings for laces, Nishida contains no description or suggestion of forming such openings by omitting stitches in the layout. Thus, it appears such openings were created by an additional manufacturing step, e.g., punching out the openings. (*Id.* at ¶107).

Nor would Nishida have rendered obvious the article of claims 47-50. (*Id.* at ¶¶108-113). Nishida touted his approach to making an upper as an improvement over German Patent No. 627,878, which Nishida explained resulted in waste of textile material between patterns cut from a web. (Ex 1005 at 1:19-47). Nishida attempts to avoid this waste by using "simple, lightweight and inexpensive material" to form those portions of the web not constituting the layouts for the

uppers. (*Id.* at 2:20-22). However, Nishida does nothing to eliminate the added processing also required by the German patent that results from cutting the layout from a web of material. (Tonkel Dec. (Ex. 2010), ¶¶110-111). Also, just as the German patent, Nishida's article is made by a subtractive process and the portion of the textile web not constituting a layout is wasted. (*Id.* at ¶111).

In contrast, the claimed flat knit upper is made by an additive process that avoids the added processing associated with cutting and finishing the cut edges and reduces the wasting of textile material. (*Id.* at ¶112). The claimed article accomplishes these improvements by virtue of its textile element having flat knit edges – an entirely different structure than the cut edges produced by Nishida that must be finished and that result in wasted material. (*Id.*) In sum, there is no teaching, suggestion, motivation or other reason in Nishida, or in the knowledge generally available to one of ordinary skill in the art, establishing that it would have been obvious to modify Nishida to achieve any of the inventions described in the substitute claims.

In addition, Nishida fails to render obvious a structure where omitted stitches are used to form apertures, as recited in claim 49, that are positioned in the upper for receiving laces. Nishida contains no description of forming such openings by omitting stitches, and there was no motivation or reason that would have prompted a person of ordinary skill in the art ("POSITA") to modify Nishida.

(*Id.* at ¶113).

Claim 47 is also patentable over Glidden, Ex. 1007. (*See* Tonkel Dec. (Ex. 2010), ¶¶125-131). Glidden discloses knitting a "sock-like" tubular structure using circular knitting. (Ex. 1007 at p. 3, 2:45-47; Tonkel Dec. (Ex. 2010), ¶125). Glidden does not describe a "flat knit" textile element having "flat knit edges" or a textile element in which flat knit edges are joined to form an ankle opening. The claimed element is flat knitted as a generally planar element that does not have an ankle opening. The element has flat knit edges that are joined together to form an ankle opening for receiving a foot, as described in the substitute claims. In contrast, the ankle opening in Glidden is knitted directly as Glidden's sock is circular knitted. Knit edges are not joined to define an ankle opening for receiving a foot. (Tonkel Dec. (Ex. 2010), ¶¶125-131).

Glidden also does not anticipate the claimed structure where flat knit edges are joined to shape the flat knit textile element to form a lateral region, a medial region, an instep region and a heel region of the upper as in claims 48 and 50 (*id.* at ¶132), or a structure where omitted stitches are used to form apertures, as in claim 49. (*Id.* at ¶133).

Furthermore, none of the substitute claims would have been obvious in view of Glidden because there was no motivation or other reason that would have prompted a POSITA to modify Glidden to arrive at the claimed inventions. Such

modification would require a substantial reconstruction of the elements shown in Glidden and would change the basic principle under which Glidden was designed to operate. (*Id.* at ¶¶135-39). Glidden teaches using a circular knitting machine that knits an opening at the top of a sock-like tubular structure that serves as an opening for receiving a foot. No edges of the tubular structure are joined, either during or after the knitting process, to form an ankle opening for receiving a foot. In contrast, the substitute claims are directed to a flat knit textile element that is initially not shaped as an upper and thus does not have an ankle opening for receiving a foot. The claimed flat knit edges of the textile element must be joined together to form the upper and an ankle opening for receiving a foot. Hindsight modification of Glidden to arrive at the invention of the substitute claims would seem to have required circular knitting a tube structure, making a lengthwise incision in that tubular structure to obtain a flat structure, then rejoining edges of that incision to return the flat structure to a tubular form. A POSITA would have had no reason to have carried out such a procedure. (*Id.* at ¶¶137-138).

Dependent substitute claims 48-50 include additional limitations that further distinguish over Glidden alone, as discussed above. There was no reason or motivation that would have prompted one of ordinary skill in the art at the time of the invention to modify Glidden to include any of the additional features that have been added to substitute dependent claims 48-50. (*Id.* at ¶139).

Nor do any of the remaining combinations with secondary references originally cited by adidas in its Petition, *i.e.,* McDonald (Ex. 1008), Whiting (Ex. 1009), Curley (Ex. 1010), Shiomura (Ex. 1011) or Osamu (Ex. 1006), remedy any of the deficiencies of either Nishida or Glidden with respect to claims 47-50. (*See* Tonkel Dec. (Ex. 2010), ¶¶114-124, 140-168, 180-182). Even if the references were combined, the result would not include all of the elements in claims 47-50. Moreover, there would have been no reason to make the combinations. *See Heart Failure Technologies, LLC v. Cardiokinetix,* PTAB Case IPR2013-00183, Paper 12 (July 31, 2013) (there must be "some *reason* why a person of ordinary skill in the art would have thought to combine *particular* available elements of knowledge, as evidenced by the prior art, to reach the claimed invention") (emphasis in original) (citing *KSR Int'l Co. v. Teleflex, Inc.,* 550 U.S. 398, 418 (2007)).

Like Glidden, McDonald and Whiting form a circular knit sock-like structure. (Ex. 1008 at p. 1, ll. 1-6; Ex. 1009 at 2:39-42; Tonkel Dec. (Ex. 2010), ¶¶116-119, 142, 143). Even if McDonald or Whiting was combined with Nishida or Glidden, the combination would not result in the claimed invention. Neither McDonald nor Whiting suggests a structure of a flat knit textile element having flat knit edges free of surrounding textile structure from which the textile element should be removed, nor does either suggest flat knit edges joined to form an ankle opening in an upper for receiving a foot, the ankle opening having an edge

comprised of one of the flat knit edges. (Tonkel Dec. (Ex. 2010), ¶¶114-119, 121, 122, 141-145).

Additionally, a POSITA would not combine Nishida with the circular knit sock structures of McDonald or Whiting because that would require a substantial reconstruction of Nishida and would change the basic principle under which Nishida was designed to operate. (Tonkel Dec. (Ex. 2010), ¶¶123-124). Nishida's layout is cut from a web. To shape it into an upper with an opening for receiving a foot, the edges of the textile element must be finished and then joined together. McDonald and the circular knit embodiment in Whiting teach the direct formation of sock-like uppers using a circular knitting machine. The structures are not flat and instead are formed as tubular structures on the circular knitting machine. The circular knitting process results in an opening at one end of the tubular structure that serves as an opening for receiving a foot. No edges of the tubular structure are joined to form the opening that receives the foot. In light of these substantial differences, there was no motivation or other reason that would have prompted one of skill in the art at the time of the invention to combine these references to achieve the inventions claimed in the substitute claims. (*Id.*)

Curley describes a one piece shoe upper made of resilient foam material sandwiched between inner and outer layers and embossed on the upper layer to melt and depress regions of the foam. (*Id.* at ¶120). Accordingly, Curley fails to

teach or suggest a "flat knit" textile element or such an element having flat knit edges that are joined together to form an ankle opening in an upper, or edges free of surrounding textile structure such that the flat knit edges are not surrounded by a textile structure from which the textile element must be removed. Rather, Curley relies on the embossing procedure to seal the three-layered structure at its edges. Curley also does not describe a knit fabric having a plurality of knit constructions, or as having a first and a second area having different properties to impart varying characteristics to the knit material. (*Id.* at ¶¶120-122).

Osamu, like Nishida, discloses cutting textile elements from a surrounding textile structure. Osamu teaches a woven textile, not a knitted textile. For at least the same reasons that Nishida does not anticipate or render obvious, either alone or in combination with other references, neither does Osamu. (*Id.* at ¶¶146-167).

Shiomura, a seventh reference asserted in the Petition, was not applied to issued claims 16, 19 or 20. NIKE agrees that Shiomura is not relevant to those claims or to any of substitute claims 47-50. (*See id.* at ¶168).

Moreover, solving a long-felt need is an indicia of non-obviousness. *Transocean Offshore Deepwater Drilling v. Maersk Drilling USA*, 699 F.3d 1340, 1353-54 (Fed. Cir. 2012). As discussed, Nishida shows that reducing material waste during manufacture of textile footwear elements was a long-felt need. Nishida asserted that the prior art resulted in waste, but Nishida's only response to

this problem was to make the "cutting waste" a simpler, lighter or cheaper material. (Ex 1005, 2:15-18). Even assuming Nishida teaches flat knitting a "web" with multiple "layouts," the underlying problem – wasted materials – remained. Unlike Nishida, which tried to make "cutting waste" less expensive, the invention of substitute claim 47 solves the long-felt need to reduce textile footwear upper manufacturing waste by eliminating the need to cut a flat-knit upper from a web, thereby eliminating "cutting waste." (Tonkel Dec. (Ex. 2010), ¶¶177-179).

Finally, dependent claims 48 and 49 are patentably distinct from each other. (*Id.* at ¶¶169-176). Claim 49 does not teach or suggest "joined edges [that] shape the flat knit textile element to form a lateral region, a medial region, an instep region and a heel region of the upper." (*Id.* at ¶174). Claim 48 does not teach or suggest "apertures formed by omitting stitches in the flat knit textile element and positioned in the upper for receiving laces." (*Id.* at ¶176).

IV. CONCLUSION

NIKE respectfully requests that the Board grant this Motion to Amend and substitute claim 47 for issued claim 16, substitute claims 48 and 49 for issued claim 19 and substitute claim 50 for issued claim 20.

Respectfully submitted,

Dated: August 19, 2013 By: /J. Pieter van Es/

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Attorneys for Patent Owner
NIKE, Inc.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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adidas AG,
Petitioner

v.

NIKE, Inc.
Patent Owner

Patent No. 7,347,011
Inter Partes Review No. 2013-00067

VIDEO DEPOSITION OF EDWARD C. FREDERICK
July 23, 2013
8:16 a.m.
Kilpatrick Townsend & Stockton
1100 Peachtree Street, NE
Suite 2800
Atlanta, Georgia
Valerie N. Almand, RPR, CRR, CCR-B-531
Deidre Thomas, Legal Video Specialist

anyone.

Q. Did you speak with any knitting experts?

A. No.

Q. Does your declaration say anything about the consideration of -- let me take a step back.

Have you heard the term secondary considerations?

A. I'm in general familiar with that concept, yeah.

Q. In the context of offering an opinion on the validity of a patent, have you heard the term secondary considerations or objective indicia of nonobviousness?

A. It doesn't come to mind at the moment.

Q. Your declaration doesn't include any discussion of secondary considerations, does it?

A. The declaration speaks for itself.

Q. Well, and I'm asking you: Does the declaration contain any --

A. I'd have to review it to answer that question.

Q. So as you sit here right now you don't know whether your declaration has any discussion of secondary considerations.

MR. KADABA: Objection to form.

A. As I said, I'd have to review the declaration to be sure before I would make that statement.

BY MR. VAN ES:

Q. As far as you know, your declaration doesn't include any discussion of secondary considerations, correct?

MR. KADABA: Same objection.

BY MR. VAN ES:

A. Again, I'm saying I'd have to review.

Q. You have no idea one way or the other as you sit here today.

MR. KADABA: Objection to form.

A. The declaration speaks for itself.

BY MR. VAN ES:

Q. Mr. Frederick, we're here to learn about your opinions, and we have your declaration, and I'm now asking you about your declaration. And my question is: As you sit here today, as far as you know your declaration doesn't have any discussion of secondary considerations, does it?

MR. KADABA: Objection to form.

A. As far as I can recall right at this moment without having the ability to review the declaration, I would say that's correct.

WILMERHALE

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August 24, 2015

Via CM/ECF

The Honorable Daniel O'Toole
Clerk of Court
United States Court of Appeals for the Federal Circuit
717 Madison Place, N.W.
Washington, DC 20439

Re: *Nike, Inc. v. Adidas AG*, No. 2014-1719

Dear Mr. O'Toole:

Nike submits this Rule 28(j) letter to inform the Court about *MasterImage 3D, Inc. v. RealD Inc.*, IPR2015-00040, 2015 WL 4383224 (P.T.A.B. July 15, 2015) and U.S. Patent and Trademark Office, *Amendments to the Rules of Practice for Trials Before the Patent Trial and Appeal Board*, 80 Fed. Reg. 50720 (Aug. 20, 2015) ("Amendments"), which are pertinent to arguments in Nike's opening brief at pages 35-40, Adidas's brief at pages 61-63, the PTO's brief at pages 16-17, and Nike's reply brief at pages 16-20.

This appeal concerns the so-called *Idle Free* rule that, to amend a claim in IPR proceedings, a patent owner must distinguish both "prior art of record" and "prior art ***not of record*** but known to the patent owner." *Idle Free v. Bergstrom*, IPR2012-00027, 2013 WL 5947697, at *4 (P.T.A.B. June 11, 2013) (emphasis added). Applying that rule, the Board denied Nike's motion to amend because it did not address prior art not of record. A34-36.

The PTO has abrogated the *Idle Free* rule and no longer requires that a patent owner distinguish prior art not of record. In *MasterImage*, the Board qualified *Idle Free* and stated that demonstrating patentability over prior art not of record but known to the patent owner requires distinguishing "no more than ***the material prior art that Patent Owner makes of record in the current proceeding*** pursuant to its duty of candor and good faith." 2015 WL 4383224, at *3 (emphasis added). Similarly, in the Amendments, the PTO stated that it now applies the *Idle Free* rule as qualified by *MasterImage*, and that a patent owner need only distinguish "the prior art of record, including any art provided in light of a patent owner's duty of candor, and any other prior art or arguments supplied by the petitioner." 80 Fed. Reg. at 50722.

Because the PTO has withdrawn—and never should have imposed—the requirement that a patent owner distinguish prior art ***not*** of record, the Board's decision should be reversed, or, at a minimum, vacated and remanded for the Board to apply the new *MasterImage* rule in the first instance.

Very truly yours,

/s/ William F. Lee

William F. Lee

WFL:pb

cc: Counsel of record (via ECF)

Trials@uspto.gov
571-272-7822

Paper 42
Entered: July 15, 2015

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MASTERIMAGE 3D, INC. and
MASTERIMAGE 3D ASIA, LLC,
Petitioner,

v.

REALD INC.,
Patent Owner.

Case IPR2015-00040
Patent 8,220,934 B2

Before NATHAN K. KELLEY, *Deputy Chief Administrative Patent Judge*, SCOTT R. BOALICK, *Vice Chief Administrative Patent Judge*, JAMESON LEE, JAMES B. ARPIN, BART A. GERSTENBLITH, and SUSAN L.C. MITCHELL, *Administrative Patent Judges*.

LEE, *Administrative Patent Judge*.

Order
Conduct of Proceedings
37 C.F.R. § 42.5

INTRODUCTION

On July 14, 2015, a conference call was held to discuss Patent Owner's intent to file a Motion to Amend, pursuant to 37 C.F.R. § 42.121(a). Judges Lee, Arpin, and Gerstenblith, and respective counsel for the parties participated in the conference call. Patent Owner requested the conference call a mere two business days prior to the due date of its Motion to Amend. We suggest that, in the future, such a conference call be requested at least ten business days ahead of the due date of the motion.

DISCUSSION

With regard to its Motion to Amend, Patent Owner still should follow all requirements articulated by the Board in *Idle Free Systems, Inc. v. Bergstrom, Inc.*, Case IPR2012-00027 (PTAB June 11, 2013) (Paper 26) (informative). However, we take this opportunity to make three points of clarification regarding the following statement in *Idle Free*:

> The burden is not on the petitioner to show unpatentability, but on the patent owner to show patentable distinction over the *prior art of record* and also *prior art known to the patent owner*.

Id. at 7 (emphases added).

1.

The reference to "prior art of record" in the above-quoted text, as well as everywhere else in *Idle Free*, should be understood as referring to:

a. any material art in the prosecution history of the patent;

b. any material art of record in the current proceeding, including art asserted in grounds on which the Board did not institute review; and

c. any material art of record in any other proceeding before the Office involving the patent.

2.

The reference to "prior art known to the patent owner" in the above-quoted text, as well as everywhere else in *Idle Free*, should be understood as no more than the material prior art that Patent Owner makes of record in the current proceeding pursuant to its duty of candor and good faith to the Office under 37 C.F.R. § 42.11, in light of a Motion to Amend.[1] Because a proposed substitute claim is considered after the corresponding patent claim is determined unpatentable, Patent Owner's addition of a limitation to render the claim as a whole patentable places the focus, initially, on the added limitation itself.

Thus, when considering its duty of candor and good faith under 37 C.F.R. § 42.11 in connection with a proposed amendment, Patent Owner should place initial emphasis on each added limitation. Information about the added limitation can still be material even if it does not include all of the rest of the claim limitations. *See VMWare, Inc. v. Clouding Corp.*, Case IPR2014-01292, slip op. at 2 (PTAB Apr. 7, 2015) (Paper 23) ("With respect to the duty of candor under 37 C.F.R. § 42.11, counsel for Patent Owner acknowledged a duty for Patent Owner to disclose not just the closest primary reference, but also closest secondary reference(s) the teachings of which sufficiently complement that of the closest primary reference to be material.").

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[1] 37 C.F.R. § 42.11 states: "Parties and individuals involved in the proceeding have a duty of candor and good faith to the Office during the course of a proceeding."

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Skechers v Nike

With respect to a motion to amend, once Patent Owner has set forth a *prima facie* case of patentability of narrower substitute claims over the prior art of record, the burden of production shifts to Petitioner. In its opposition, Petitioner may explain why Patent Owner did not make out a *prima facie* case of patentability, or attempt to rebut that *prima facie* case, by addressing Patent Owner's evidence and arguments and/or by identifying and applying additional prior art against proposed substitute claims. Patent Owner has an opportunity to respond in its reply. The ultimate burden of persuasion remains with Patent Owner, the movant, to demonstrate the patentability of the amended claims. *See Microsoft Corp. v. Proxyconn, Inc.*, Nos. 2014-1542, 2014-1543, 2015 WL 3747257, at *12 (Fed. Cir. June 16, 2015).

CONCLUSION

The guidance provided by the Board in *Idle Free*, Case IPR2012-00027, Paper 26 (informative), should be read with the three points of clarification discussed above.

ORDER

It is

ORDERED that the due date for Patent Owner's Motion to Amend is set to July 22, 2015;

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FURTHER ORDERED that the due date for Petitioner's Opposition to Patent Owner's Motion to Amend, and the due date for Petitioner's Reply to the Patent Owner Response,[2] are set to October 7, 2015;

FURTHER ORDERED that the due date for Patent Owner's Reply to Petitioner's Opposition to Patent Owner's Motion to Amend is set to October 30, 2015; and

FURTHER ORDERED that Due Dates 4–6 are set as follows:

Due Date 4: November 11, 2015

Due Date 5: November 25, 2015

Due Date 6: December 2, 2015.

[2] The Patent Owner Response (Paper 40), filed on July 14, 2015, was late by one day due to technical difficulties with the Patent Review Processing System. The late filing is excused. Petitioner indicated that it does not object to accepting the late Patent Owner Response.

IPR2015-00040
Patent 8,220,934 B2

For PETITIONER:

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Part II

Department of Commerce

United States Patent and Trademark Office

37 CFR Part 42

Amendments to the Rules of Practice for Trials Before the Patent Trial and Appeal Board; Proposed Rules

DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

37 CFR Part 42

[Docket No. PTO–P–2015–0053]

RIN 0651–AD01

Amendments to the Rules of Practice for Trials Before the Patent Trial and Appeal Board

AGENCY: Patent Trial and Appeal Board, United States Patent and Trademark Office, U.S. Department of Commerce.

ACTION: Proposed rule.

SUMMARY: This proposed rule would amend the existing consolidated set of rules relating to the United States Patent and Trademark Office (Office or USPTO) trial practice for *inter partes* review ("IPR"), post-grant review ("PGR"), the transitional program for covered business method patents ("CBM"), and derivation proceedings that implemented provisions of the Leahy-Smith America Invents Act ("AIA") providing for trials before the Office.

DATES: *Comment date:* The Office solicits comments from the public on this proposed rulemaking. Written comments must be received on or before October 19, 2015 to ensure consideration.

Roadshow Dates: The Office, in concert with the American Intellectual Property Association ("AIPLA"), will have a Road Show Series in August 2015 where the proposed rules will be discussed. This AIPLA/USPTO Road Show Series, entitled "Enhancing Patent Quality and Conducting AIA Trials," will be held on August 24, 2015 in Santa Clara, California, August 26, 2015 in Dallas, Texas, and August 28, 2015 in Alexandria, Virginia.

ADDRESSES: Comments should be sent by electronic mail message over the Internet addressed to: *trialrules2015@uspto.gov*. Comments may also be submitted by postal mail addressed to: Mail Stop Patent Board, Director of the United States Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313–1450, marked to the attention of "Lead Judge Susan Mitchell, Patent Trial Proposed Rules."

Comments may also be sent by electronic mail message over the Internet via the Federal eRulemaking Portal. *See* the Federal eRulemaking Portal Web site (*http://www.regulations.gov*) for additional instructions on providing comments via the Federal e-Rulemaking Portal.

Although comments may be submitted by postal mail, the Office prefers to receive comments by electronic mail message to be able to more easily share all comments with the public. The Office prefers the comments to be submitted in plain text, but also accepts comments submitted in ADOBE® portable document format or MICROSOFT WORD® FORMAT. Comments not submitted electronically should be submitted on paper in a format that accommodates digital scanning into ADOBE® portable document format.

The comments will be available for public inspection at the Patent Trial and Appeal Board, currently located in Madison East, Ninth Floor, 600 Dulany Street, Alexandria, Virginia. Comments also will be available for viewing via the Office's Internet Web site *http://www.uspto.gov/patents/law/comments/index.jsp*. Because comments will be made available for public inspection, information that the submitter does not desire to be made public, such as address or phone number, should not be included in the comments.

FOR FURTHER INFORMATION CONTACT: Susan L. C. Mitchell, Lead Administrative Patent Judge by telephone at (571) 272–9797.

SUPPLEMENTARY INFORMATION:

Executive Summary: Purpose: This proposed rule would amend the existing consolidated set of rules relating to the United States Patent and Trademark Office (Office or USPTO) trial practice for *inter partes* review, post-grant review, the transitional program for covered business method patents, and derivation proceedings that implemented provisions of the Leahy-Smith America Invents Act ("AIA") providing for trials before the Office.

Summary of Major Provisions

In an effort to gauge the effectiveness of the rules governing AIA trials, the Office conducted a nationwide listening tour in April and May of 2014, and in June 2014, published a Federal Register Notice asking for public feedback about the AIA trial proceedings. The Office has carefully reviewed the comments and, in response to public input, already has issued a first, final rule, which was published on May 19, 2015. That final rule addressed issues concerning the patent owner's motion to amend and the petitioner's reply brief that involved ministerial changes. For instance, the final rules provided ten additional pages for a patent owner's motion to amend, allowed a claims appendix for a motion to amend, and provided ten additional pages for a petitioner's reply brief, in addition to other ministerial changes to conform the rules to the Office's established practices in handling AIA proceedings.

This second, proposed rule (the subject of this Federal Register document) addresses more involved proposed changes to the rules and proposed revisions to the Office Patent Trial Practice Guide. The Office presents the following proposed rules to address issues and public comments that were raised concerning the claim construction standard for AIA trials, new testimonial evidence submitted with a patent owner's preliminary response, Rule 11-type certification, and word count for major briefing. The Office will also later amend its Office Patent Trial Practice Guide to reflect developments in practice before the Office concerning how the Office handles additional discovery, live testimony, and confidential information. In response to the USPTO's roundtable on attorney-client privilege issues held in February 2015, the Office also requests input on recognizing privilege for communications between a patent applicant or owner and its U.S. patent agent or foreign patent practitioner in a possible future rulemaking.

The Office anticipates that it will continue to refine the rules governing AIA trials to continue to ensure fairness and efficiency while meeting the congressional mandate. Therefore, the Office continues to encourage comments concerning how the rules may be refined to achieve this goal.

Costs and Benefits: This rulemaking is not economically significant, and is not significant, under Executive Order 12866 (Sept. 30, 1993), as amended by Executive Order 13258 (Feb. 26, 2002) and Executive Order 13422 (Jan. 18, 2007).

Background

Development of These Proposed Rules

On September 16, 2011, the AIA was enacted into law (Pub. L. 112–29, 125 Stat. 284 (2011)), and shortly thereafter in 2012, the Office implemented rules to govern Office trial practice for AIA trials, including *inter partes* review, post-grant review, the transitional program for covered business method patents, and derivation proceedings pursuant to 35 U.S.C. 135, 316 and 326 and AIA 18(d)(2). *See* Rules of Practice for Trials Before the Patent Trial and Appeal Board and Judicial Review of Patent Trial and Appeal Board Decisions, 77 FR 48612 (Aug. 14, 2012); Changes to Implement *Inter Partes* Review Proceedings, Post-Grant Review Proceedings, and Transitional Program

for Covered Business Method Patents, 77 FR 48680 (Aug. 14, 2012); Transitional Program for Covered Business Method Patents—Definitions of Covered Business Method Patent and Technological Invention, 77 FR 48734 (Aug. 14, 2012). Additionally, the Office published a Patent Trial Practice Guide for the rules to advise the public on the general framework of the regulations, including the structure and times for taking action in each of the new proceedings. *See* Office Patent Trial Practice Guide, 77 FR 48756 (Aug. 14, 2012).

In an effort to gauge the effectiveness of these rules governing AIA trials, the Office conducted a nationwide listening tour in April and May of 2014. During the listening tour, the Office solicited feedback on how to make the trial proceedings more transparent and effective by adjusting the rules and guidance where necessary. To elicit even more input, in June of 2014, the Office published a Request for Comments in the **Federal Register** and, at stakeholder request, extended the period for receiving comments to October 16, 2014. *See* Request for Comments on Trial Proceedings Under the America Invents Act Before the Patent Trial and Appeal Board, 79 FR 36474 (June 27, 2014).

The Request for Comments asked seventeen questions on ten broad topics, including a general catchall question, to gather stakeholder feedback on any changes to the AIA trial proceedings that might be beneficial. *See* Request for Comments, 79 FR at 36476–77. The Office received thirty-seven comments from bar associations, corporations, law firms, and individuals encompassing a wide range of issues. The Office expresses its gratitude for the thoughtful and comprehensive comments provided by the public, which are available on the USPTO Web site: *http://www.uspto.gov/page/comments-trial-proceedings-under-america-invents-act-patent-trial-and-appeal-board*.

Several commenters expressed satisfaction with the current rules governing AIA trial proceedings, and several commenters offered suggestions on how to strengthen the AIA trial proceeding rules. For example, some suggestions concerned the claim construction standard used by the PTAB, motions to amend, discovery procedures, and handling of multiple proceedings. The Office addressed all public comments that involved changes to the page limitations for a patent owner's motion to amend or a petitioner's reply brief in the first, final rulemaking. The Office will address the remaining comments in this second, proposed rulemaking.

Differences Between the Proposed Rules and the Current Rules

The Office will address the differences between the proposed rules and the current rules in relation to the seventeen questions that the Office asked in the June 27, 2014 Notice concerning the following ten topics: (1) Claim construction standard; (2) a patent owner's motions to amend; (3) a patent owner's preliminary response; (4) additional discovery; (5) obviousness; (6) real party in interest; (7) multiple proceedings; (8) extension of one year period to issue a final determination; (9) oral hearing; and (10) general topics. *See* 79 FR at 36476. The comments provided support for, opposition to, and diverse recommendations on the current rules. The Office appreciates the thoughtful comments, and has considered and analyzed the comments thoroughly. In this discussion, the Office will respond to the comments submitted in response to the seventeen questions (besides those which involved suggestions for page limitation changes for a patent owner's motion to amend or petitioner's reply brief) and set forth proposed changes to the rules and the Office Patent Trial Practice Guide. In addition, in order to further attempt to prevent any misuse of the AIA proceedings, the Office proposes to amend 37 CFR 42.11 (which prescribes the duty of candor owed to the Office in these proceedings) to include a Federal Rule of Civil Procedure Rule 11-type certification for all papers filed with the Board in these proceedings, including a provision for sanctions for misconduct in connection with such papers. If appropriate, such misconduct in the course of AIA proceedings might also be reported to the Office of Enrollment and Discipline.

Claim Construction Standard

The Office asked, "Under what circumstances, if any, should the Board decline to construe a claim in an unexpired patent in accordance with its broadest reasonable construction in light of the specification of the patent in which it appears?" 79 FR at 36476. The Office received comments advocating various positions, including that it should continue to apply the broadest reasonable interpretation standard in construing terms of an unexpired patent, that it should use a *Phillips*-type construction standard for all patents at issue in AIA proceedings, and that it use the claim construction standard set forth in *Phillips* v. *AWH Corp.*, 415 F.3d 130 (Fed. Cir. 2005 (en banc), under certain circumstances. The Office will address each of these suggestions in turn.

Comment 1: Multiple commenters recommended that the Office continue to apply the broadest reasonable interpretation standard in construing terms of an unexpired patent at issue in an *inter partes* review proceeding, post-grant review proceeding, or covered business method review proceeding. These commenters stressed that "the broadest reasonable construction standard used during traditional *ex parte* prosecution, reissue, and reexamination practice is a reasonable standard to use in PTAB proceedings." These same commenters noted that the "PTO has a long-standing practice of giving patent claims their broadest reasonable interpretation during examination and during other post-issuance proceedings such as reexamination, reissue and interference for good reason," which "serves the public interest by reducing the possibility that claims, finally allowed, will be given broader scope than is justified."

Conversely, the Office received a comment suggesting the use of a *Phillips*-type construction standard for all patents, stating that "claims in AIA trials should be construed as they have been or would be construed in a civil action to invalidate a patent under Patent Act section 282, including construing each claim of the patent in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art, the prosecution history pertaining to the patent, and prior judicial determinations and stipulations relating to the patent." The commenter also stated that "the PTAB should apply the Phillips construction during AIA trials because they are adjudicative proceedings like litigation," and not examination proceedings like *inter partes* reexamination.

Response: The comments favoring retention of the BRI approach are adopted. The Office appreciates the suggestions and will continue to apply the broadest reasonable interpretation standard to claims in an unexpired patent at issue in an AIA proceeding. The United States Court of Appeals for the Federal Circuit ("Federal Circuit") has held recently that the Office is authorized to employ the broadest reasonable construction approach to construing terms of an unexpired patent at issue in an *inter partes* review proceeding—the Federal Circuit found that the BRI approach is consistent with legislative intent and reasonable under the Office's rulemaking authority. *In re Cuozzo Speed Techs., LLC,* No. 2014–

1301, 2015 WL 4097949, at *7–8 (Fed. Cir. July 8, 2015). In making this determination, the Federal Circuit observed that "[t]here is no indication that the AIA was designed to change the claim construction standard that the PTO has applied for more than 100 years. Congress is presumed to legislate against the background of the kind of longstanding, consistent existing law that is present here. Moreover, Congress in enacting the AIA was well aware that the broadest reasonable interpretation standard was the prevailing rule." *Id.* at *6. The Federal Circuit recognized that because an *inter partes* review proceeding provides the patent owner the opportunity to amend its claims, use of the broadest reasonable interpretation approach is appropriate, regardless of "the fact that IPR may be said to be adjudicatory rather than an examination." *Id.* at *16. The Federal Circuit also stated, "[a]lthough the opportunity to amend is cabined in the IPR setting, it is thus nonetheless available," and specifically addressed the prohibition on post-issuance broadening at issue in the case, further stating that at least this restriction on motions to amend "does not distinguish pre-IPR processes or undermine the inferred congressional authorization of the broadest reasonable interpretation standard in IPRs." *Cuozzo,* 2015 WL 4097949, at 7.

Comment 3: The Office received multiple comments recommending changing the claim construction standard in certain circumstances. These commenters advocated for the use of the claim construction standard set forth in *Phillips* v. *AWH Corp.,* 415 F.3d 1303 (Fed. Cir. 2005) (en banc) for some or all of the following circumstances: (a) Unexpired patents where the ability to amend claims is no longer present in the trial, such as when a patent owner has elected to forego the opportunity to amend; (b) unexpired patents where the patent will expire prior to the final decision; (c) unexpired patents subject to a terminal disclaimer prior to final decision; and/or (d) unexpired patents when the parties to the trial have each filed claim construction briefings in another tribunal on terms at issue in the trial.

Response: These comments are adopted in part. The Office agrees that the application of a *Phillips*-type claim construction for claims of a patent that will expire prior to the issuance of a final decision is appropriate. Such patents essentially lack any viable opportunity to amend the claims in an AIA proceeding. Therefore, for patents that will expire prior to issuance of any final written decision by the Office, the Office proposes to apply a *Phillips*-type standard during the proceeding.

A scenario where it is clear that a patent will expire before a final decision is issued by the Office is a definitive circumstance where a petitioner can determine which claim construction will be applied with guidance from the Office. Specifically, the Office proposes to amend 37 CFR 42.100(b), 42.200(b), and 42.300(b) to reflect this change in the claim construction standard for claims in patents that will expire before a final written decision is issued in an AIA proceeding. The Office also intends to issue specific guidelines in the Office Patent Trial Practice Guide. The Office invites comments on how to structure guidelines to implement this change. For instance, the Office welcomes comments on the following questions: Should the Office set forth guidelines where a petitioner may determine, before filing a petition, which claim construction approach will be applied by the Office based on the relevant facts? Should the petitioner, who believes that the subject patent will expire prior to issuance of a final written decision, be required to submit claim interpretation analysis under both a *Phillips*-type and broadest reasonable interpretation approaches or state that either approach yields the same result? Should the Office entertain briefing after a petition if filed, but before a patent owner preliminary response is filed, concerning what standard should be applied?

As to the remaining scenarios set forth by commenters, the Office will continue to apply a broadest reasonable interpretation standard because at the time that a petition is filed in each of those scenarios, the patent owner's ability to amend remains available. To allow the patent owner unilaterally to decide to forego any opportunity to amend after a petition has been filed, and thereby opt-in to a *Phillips*-type construction, appears to be unworkable, given the timeline applicable to AIA proceedings. In particular, the timeline would not allow a petitioner adequate time to amend the petition to reflect a different claim construction standard. The Office invites comments suggesting any workable and efficient solutions for scenarios where the patent owner chooses to forego the right to amend claims in an AIA proceeding, including any suggested revisions to the rules or the Office Patent Trial Practice Guide.

Patent Owner's Motions To Amend

The Office asked, "What modifications, if any, should be made to the Board's practice regarding motions to amend?" 79 FR at 36476. The Office received a spectrum of comments that ranged from seeking no change in amendment practice to proposals for liberal grant of amendments in AIA proceedings. The Office addresses these comments below.

Since receipt of these comments, the Office has clarified its statement made in *Idle Free System, Inc.* v. *Bergstrom, Inc.,* Case IPR2012–00027 (PTAB June 11, 2013) (Paper 26) (informative), that "[t]he burden is not on the petitioner to show unpatentability, but on the patent owner to show patentable distinction over the *prior art of record* and also *prior art known to the patent owner.*" *Id.* at 7 (emphasis added). Specifically, the Office addressed what the references to "prior art of record" and "prior art known to the patent owner" mean, and how the burden of production shifts to the petitioner once the patent owner has made its *prima facie* case for patentability of the amendment. *See MasterImage 3D, Inc.* v. *RealD Inc.,* Case IPR2015–00040, slip op. at 1–3 (PTAB July 15, 2015) (Paper 42). This decision clarifies that a patent owner must argue for the patentability of the proposed substitute claims over the prior art of record, including any art provided in light of a patent owner's duty of candor, and any other prior art or arguments supplied by the petitioner, in conjunction with the requirement that the proposed substitute claims be narrower than the claims that are being replaced.

Comment 1: A number of commenters expressed satisfaction with the Board's current rules and practices for motions to amend. One commenter identified *Idle Free Systems, Inc.* v. *Bergstrom, Inc.,* Case IPR2014–00027 (PTAB June 11, 2013) (Paper 26) (informative), as outlining practices consistent with congressional intent and "striking an appropriate balance between the public's interest in challenging the patentability of questionable patents and a patent owner's interest in maintaining patent protection for a legitimate invention." Another commenter stated that although the Board's current requirements for motions to amend provide patent owners with a fair opportunity to narrow claims in response to a petitioner's arguments and provide petitioners with fair notice regarding the type of amendment they need to rebut, the Office should consider providing consistent guidance through a precedential opinion or other means.

Response: These comments are adopted. The Office is committed to improving its rules and practices for motions to amend and AIA trial practice in general. Accordingly, the Office will

continue to make improvements and clarifications via the rule-making process, by updating the Office Patent Trial Practice Guide, and by designating opinions as precedential or informative, as warranted. For example, as discussed above, the Office has issued an opinion that clarifies what is meant by "prior art of record" and "prior art known to the patent owner" in the context of a patent owner's *prima facie* case of patentability in a motion to amend. *See MasterImage,* slip op. at 1–3.

Comment 2: One commenter advocated eliminating the opportunity to amend claims in AIA trial proceedings based on the premise that AIA trial proceedings are better designed to be expedited proceedings for determining claim patentability, not an examination.

Response: As the commenter recognizes, a patent owner's right to file a motion to amend is statutorily mandated (35 U.S.C. 316(d), 326(d)), as is the duty of the Director to provide standards and procedures for allowing such amendment (35 U.S.C. 316(a)(9), 326(a)(9)). Absent a change in statutory authority, the Office cannot withdraw the opportunity to amend claims in AIA trial proceedings.

Comment 3: Several commenters stated that the burden of proving the patentability of any proposed substitute claim should remain with the patent owner. Other commenters stated the contrary—that the burden should be shifted to the patent challenger to prove a proposed substitute claim unpatentable. Other commenters suggested intermediate positions targeted to reducing the burden on the patent owner, who submits a motion to amend, by requiring that the patent owner only bear the burden of proving patentability over the cited art in the petition or asserted grounds of unpatentability. Another commenter suggested that, similar to practice before the European Patent Office, motions to amend in AIA trials could include the participation of a USPTO Examiner from the technology center, preferably the examiner who originally granted the subject patent, and be limited to reviewing the broadest claim of a substitute claim set to allow patent owners to present multiple narrowing claim sets as fallback positions.

Response: These comments are adopted in part. The Board currently does not contemplate a change in rules or practice to shift the ultimate burden of persuasion on patentability of proposed substitute claims from the patent owner to the petitioner. Depending on the amendment, a petitioner may not have an interest in challenging patentability of any substitute claims. Therefore, the ultimate burden of persuasion on patent owner's motion to amend remains best situated with the patent owner, to ensure that there is a clear representation on the record that the proposed substitute claims are patentable, given that there is no opportunity for separate examination of these newly proposed substitute claims in these adjudicatory-style AIA proceedings. *See Microsoft Corp.* v. *Proxyconn, Inc.,* Nos. 2014–1542, 2014–1543, 2015 WL 3747257, at *12 (Fed. Cir. June 16, 2015) (stating ultimate burden of persuasion remains with the patent owner, the movant, to demonstrate the patentability of the substitute claims).

The Board's decision in *MasterImage* clarifies the meaning of the terms "prior art of record" and "prior art known to the patent owner" as set forth in *Idle Free,* which stated that the burden is on the patent owner "to show patentable distinction over the prior art of record and also prior art known to the patent owner." *Idle Free,* slip op. at 7. The Office stated in *MasterImage that,* "[t]he reference to 'prior art of record' in the above-quoted text, as well as everywhere else in *Idle Free,* should be understood as referring to: a. any material art in the prosecution history of the patent; b. any material art of record in the current proceeding, including art asserted in grounds on which the Board did not institute review; and c. any material art of record in any other proceeding before the Office involving the patent." *MasterImage,* slip op. at 2. The Office also stated that the term "prior art known to the patent owner," as used in *Idle Free,* "should be understood as no more than the material prior art that Patent Owner makes of record in the current proceeding pursuant to its duty of candor and good faith to the Office under 37 CFR 42.11, in light of a Motion to Amend." *Id.*

At this time, the Office does not contemplate seeking assistance from the Examining Corps for review of motions to amend.

In addition, the Office has clarified how the burden of production shifts between the parties with regard to a motion to amend. "With respect to a motion to amend, once Patent Owner has set forth a *prima facie* case of patentability of narrower substitute claims over the prior art of record, the burden of production shifts to the petitioner. In its opposition, the petitioner may explain why the patent owner did not make out a *prima facie* case of patentability, or attempt to rebut that *prima facie* case, by addressing Patent Owner's evidence and arguments and/or by identifying and applying additional prior art against proposed substitute claims. Patent Owner has an opportunity to respond in its reply. The ultimate burden of persuasion remains with Patent Owner, the movant, to demonstrate the patentability of the amended claims." *MasterImage,* slip op. at 2 (citing *Microsoft,* 2015 WL 3747257, at *12).

Comment 4: Several commenters suggested that patent owners should not be required to cancel a challenged claim in order to submit a substitute claim and/or should be permitted to propose more than one substitute claim per challenged claim.

Response: Rule 42.221(a)(3) provides that a motion to amend may "cancel a challenged claim or propose a reasonable number of substitute claims," and for efficiency, sets forth the rebuttable presumption "that only one substitute claim would be needed to replace each challenged claim." As 37 CFR 42.121(a)(3) and 42.221(a)(3) provides, this presumption "may be rebutted by a demonstration of need." This strikes a reasonable balance between maintaining the efficiency of the proceedings and allowing a patent owner to present additional substitute claims when need is shown. Although patent owners are encouraged to submit a single substitute claim for each canceled claim, the Rules do not prohibit a motion to amend that proposes more than one replacement claim for each cancelled claim. Patent owners are encouraged to confer with the Board where an appropriate showing of need can be made. The Board does not, however, contemplate a change in rules or practice at this time.

Comment 5: Several commenters suggested that motions to amend should be liberally allowed. One commenter suggested the Office should evaluate a motion to amend in the same way that the entry of a supplemental response in prosecution is evaluated, as under 37 CFR 1.111(a)(2).

Response: These suggestions are not adopted. Under 35 U.S.C. 316(a)(9) and 326(a)(9), the Office has the authority to set forth standards and procedures for allowing a patent owner to move to amend the patent under 35 U.S.C. 316(d) and 326(d). And 35 U.S.C. 316(d) and 326(d) sets forth certain statutory limitations for amendments for a patent in an AIA proceeding, including limiting the number of proposed claims to a "reasonable number of substitute claims" (35 U.S.C. 316(d)(1)(B)) and prohibiting amendments that "enlarge the scope of the claims of the patent or introduce new matter" (35 U.S.C.

316(d)(3)). Thus, by statute, motions to amend cannot be entered in the same way as amendments that are entered during prosecution, which are not bound by such restrictions.

Moreover, AIA proceedings are neither *ex parte* patent prosecution nor patent reexamination or reissue. The Board does not conduct a prior art search to evaluate the patentability of the proposed substitute claims, and any such requirement would be impractical given the statutory structure of AIA proceedings. If a motion to amend is granted, the substitute claims become part of an issued patent, without any further examination by the Office. Because of this constraint, the Office has set forth rules for motions to amend that account for the absence of an independent examination by the Office where a prior art search is performed as would be done during prosecution, reexamination, or reissue.

As set forth above, however, the Office does recognize a clarification of amendment practice that affirmatively states that a patent owner must argue for the patentability of the proposed substitute claims over the prior art of record, including art provided in light of a patent owner's duty of candor and any other prior art or arguments supplied by the petitioner, in conjunction with the statutory requirement that the proposed substitute claims be narrower than the claims that are being replaced. In light of these requirements, the Office has explained how the burden of production shifts to the petitioner once the patent owner has set forth a *prima facie* case of patentability of narrower substitute claims. *MasterImage,* slip op. at 3.

Comment 6: Several commenters suggested that the Office provide additional guidance in conferences regarding motion to amend practice, including guidance on what prior art the patent owner needs to distinguish in a motion to amend. One commenter stated that the Office could confirm for a patent owner whether a new prior art search is required and whether providing information similar to the accelerated examination support documents (ESD) would be sufficient for a patent owner to carry its burden. Another commenter suggested making clear in the Rules and the Trial Practice Guide that a reissue application can be utilized after a final written decision as an examination mechanism for amending claims and that the burden of persuasion for permitting the Board to consider a motion to amend is not the same as the burden of proof as to the patentability of any claims that are the subject to a motion to amend.

Response: These comments are adopted in part as set forth above. The Office has explained how the burden of production shifts to the petitioner once the patent owner has set forth a *prima facie* case of patentability of narrower substitute claims. *MasterImage,* slip op. at 3. Also, 37 CFR 42.121(a) and 42.122(a) require the patent owner to hold a conference call with the Office before the patent owner files a motion to amend. During that call, the judges provide technical guidance to the patent owner and the petitioner regarding the motion. If the parties have questions regarding the proper scope of a motion to amend, the parties may discuss those issues with the judges during the conference call. In addition, the Board notes the following Board decisions on motions to amend as further guidance: *MasterImage,* slip op. at 1–3); *Idle Free Systems, Inc.* v. *Bergstrom, Inc.,* Case IPR2012–00027 (PTAB June 11, 2013) (Paper 26) (informative); *Int'l Flavors & Fragrances Inc.* v. *United States of America,* Case IPR2013–00124 (PTAB May 20, 2014) (Paper 12) (informative); *Corning Optical Comms. RF, LLC* v. *PPC Broadband, Inc.,* Case IPR2014–00441 (PTAB Oct. 30, 2014) (Paper 19); *Riverbed Tech., Inc.* v. *Silver Peak Systems, Inc.,* Case IPR2013–00403 (PTAB Dec. 30, 2014) (Paper 33); *Reg Synthetic Fuels LLC* v. *Neste Oil OYJ,* Case IPR2014–00192 (PTAB June 5, 2015) (Paper 48).

As for whether to revise the Rules and the Trial Practice Guide to state that a reissue application can be utilized as a mechanism for amending the claims after final written decision, the Office declines to propose a blanket rule applicable to all reissues, which have additional requirements governing those proceedings.

As for distinguishing between the burden of persuasion for permitting the Board to consider a motion to amend and the burden of proof as to patentability, the patent owner has a statutory right to file a motion to amend under 35 U.S.C. 316(d) and 326(d). Thus, there is no burden of persuasion for permitting the Board to consider a motion to amend, as the Board must consider a motion to amend that is filed in a proceeding.

Comment 7: One commenter suggested that the Office should allow patent owners to cure minor defects in motions to amend, such as the failure to construe a claim term that the Board deems necessary or failure to provide written description support for the substitute claim language. The commenter further suggested that the petitioner should be allowed to respond to these further comments by the patent owner.

Response: If the Board deems it appropriate, the Board may allow a patent owner to cure minor defects in a motion to amend upon request. Given the time constraints of these proceedings, however, the suggested further exchange of briefing may be incompatible with the case schedule. To the extent a patent owner is aware of any such defects, the Office recommends that the patent owner seek authorization from the Board to revise its motion to amend as soon as possible.

Comment 8: Several commenters suggested that the Office should rescind the patent owner estoppel provision of 37 CFR 42.73(d)(3) because the commenters believed the Rule "precludes a patent owner from obtaining from the Office in another proceeding a patent claim that could have been filed in response to any properly raised ground of unpatentability for a finally refused or cancelled claim."

Response: This suggestion is not adopted. Under 37 CFR 42.73(d)(3), a patent applicant or owner is precluded from taking action inconsistent with the adverse judgment, including obtaining in any patent (1) A claim that is not patentably distinct from a finally refused or canceled claim; or (2) An amendment of a specification or of a drawing that was denied during the trial proceeding, but this provision does not apply to an application or patent that has a different written description. Thus, 37 CFR 42.73(d)(3) does not expressly preclude a patent owner from obtaining, in another proceeding, all patent claims that could have been filed in response to any properly raised ground of unpatentability for a finally refused or cancelled claim, as the commenters suggest. By its terms, this rule precludes a patent applicant or owner from obtaining, in another proceeding, claims that are not patentably distinct from a finally refused or canceled claim.

Comment 9: One commenter suggested that the rules are unfair because the patent owner must file its motion to amend at the same time that it files its patent owner response. The commenter states, "[t]herefore, the patent owner must put forward all its arguments for patentability without knowing whether the original or amended claims will be reviewed by the PTAB."

Response: When the patent owner files its patent owner response, the Board will have issued its decision on institution, which identifies the grounds and claims on which the *inter partes* or

post-grant review is instituted. Moreover, AIA proceedings before the Office are required, by statute, to be completed no later than one year from the date on which the Director notices the institution of a review, except where good cause is shown to extend the one-year period, which extension may be no more than six months. 35 U.S.C. 316(a)(11); 37 CFR 42.100(c). Due to the time constraints imposed on these proceedings, the Office deemed it most efficient for patent owners to file their motions to amend no later than the filing of the patent owner response. *See* 37 CFR 42.121, 42.221. The patent owner, however, may file a motion to amend at an earlier stage of the proceeding.

Comment 10: One commenter suggested that when a patent owner concedes the unpatentability of an existing claim and files a non-contingent motion to amend, claim cancellation should take place immediately. The commenter stated that, under current practice, the conceded claim remains in effect until the Board issues its final written decision, which allows the patent owner to assert the conceded claim in parallel proceedings. Accordingly, the commenter suggested that a patent owner should not be permitted to concede a claim's patentability before the Board while continuing to assert it in litigation.

Response: This suggestion is not adopted. The defendant in such litigation may seek relief before the district court. The Board typically considers all papers at once for purposes of rendering the final written decision. That practice is generally most efficient, in light of the large number of cases pending before the Board. Also, a patent owner who asserts a claim in a parallel proceeding that was conceded to be unpatentable may face potential sanctions, and registered practitioners who assert such a claim may face disciplinary investigation by the Office of Enrollment and Discipline. In the event, however, that a patent owner concedes unpatentability and requests cancellation of any claims, the parties may request a conference call with the panel to request cancellation of those claims before issuing the final written decision.

Comment 11: One commenter suggested that if a motion to amend is denied, the patent owner should be allowed to convert the denied motion to amend into an *ex parte* reexamination of the substitute claims. Accordingly, any prior art raised in either the motion or the opposition should be applied as the substantial new question of patentability in reexamination.

Response: This suggestion is not adopted. The rules for a request for *ex parte* reexamination apply different parameters than the rules for motions to amend in AIA proceedings. *Compare* 37 CFR 1.510(b) *with* 37 CFR 42.121, 42.221. Thus, the Office cannot convert a denied motion to amend into an *ex parte* reexamination of the proposed substitute claims that does not address the requirements of a request for *ex parte* reexamination.

Patent Owner's Preliminary Response

The Office asked, "Should new testimonial evidence be permitted in a Patent Owner Preliminary Response? If new testimonial evidence is permitted, how can the Board meet the statutory deadline to determine whether to institute a proceeding while ensuring fair treatment of all parties?" 79 FR at 36476. The Office received comments that range from advocating preserving the current prohibition on the patent owner's ability to assert new testimonial evidence at the preliminary response stage, an intermediate position of allowing new testimonial evidence on issues for which the patent owner bears the burden of proof or in response to petitioner's declarant, to allowance of new testimonial evidence by patent owner at the preliminary response stage with no restriction on scope. Commenters did express an overall concern with the ability of parties to conduct adequate discovery relating to testimonial evidence and adhering to the statutory timeline for instituting proceedings.

The Office proposes amending the rules to allow the patent owner to file new testimonial evidence with its preliminary response. In order to be able to meet the three-month statutory deadline for issuing a decision on institution, the rules will provide expressly that no right of cross-examination of a declarant exists before institution. Because the time frame for the preliminary phase of an AIA proceeding does not allow for such cross-examination as of right, nor for the petitioner to file a reply brief as of right, the Office proposes amending the rules to provide that any factual dispute that is material to the institution decision will be resolved in favor of the petitioner solely for purposes of making a determination about whether to institute. This is proposed, among other reasons, to preserve petitioner's right to challenge statements made by the patent owner's declarant.

Comment 1: Several commenters suggested that the patent owner should be allowed to rely on new testimonial evidence in its preliminary response to the petition given that the petitioner may rely upon such evidence in its petition, and that the current practice of not allowing a patent owner to rely on such evidence is unfair. Within these comments were examples of testimonial evidence that should be allowed in a preliminary response, such as testimony related to claim construction, issues regarding obviousness, and issues for which the patent owner has the burden of proof. Certain comments suggested that early development of the record would increase efficiency by leading to fewer institutions or institution on fewer grounds. Other comments said that the current rule should not be changed because the time period prior to institution does not allow a petitioner to evaluate fully the new evidence, the petitioner would not have an opportunity to cross-examine the witness, and the patent owner has a full opportunity to submit evidence post-institution.

Response: The Office proposes to amend the rules for the patent owner preliminary response (37 CFR 42.107, 42.207) to allow new testimonial evidence, thereby adopting the suggestions that the patent owner be allowed to rely upon supporting testimonial evidence in response to the petition. Sections 313 and 323 of Title 35 state that the patent owner may file a preliminary response that sets forth reasons why no institution should be granted. Therefore, the Office believes that it would be fair and equitable to consider supporting evidence submitted with a preliminary response.

If supporting evidence is submitted by a patent owner, cross-examination of the witness providing the testimony is likely to be permitted only after the institution of the proceeding, given the time constraints surrounding the institution decision. Section 316(a)(5)(A) of Title 35 states that the Director shall prescribe regulations setting forth standards and procedures for discovery of relevant evidence including the depositions of witnesses submitting affidavits or declarations. Allowing for cross-examination as of right prior to the institution of a proceeding would negatively impact the ability of the Office to meet the statutory requirements set out in 35 U.S.C. 314(b) and 324(c), and would result in more cost to the parties before a review is instituted.

In order for the Board to act consistently when confronted with material factual disputes in the institution decision briefing and evidence, the Office proposes that any

such factual disputes will be resolved in favor of the petitioner solely for purposes of deciding whether to institute. The petitioner also will be afforded an opportunity to seek permission to file a reply brief to respond to a preliminary response that presents testimonial evidence, though it will not be able to file such a reply as of right.

Comment 2: The Office received several comments suggesting that the Board provide for the submission of a petitioner reply to the patent owner preliminary response, particularly if the Board were to amend the rule for the patent owner preliminary response to allow new testimonial evidence. Many of these commenters stated that the petition itself is limited because the petitioner cannot anticipate all arguments that the patent owner may make (*e.g.*, the patent owner preliminary response may present additional claim constructions), and that a petitioner's rehearing request does not provide a timely opportunity for the petitioner to reply to the patent owner preliminary response. However, one commenter opposed this suggestion, stating that "in all fairness the only way to reasonably address such a drastic change were it implemented would be by the inventor/[patent owner] being allowed to then file a sur-reply to Petitioner's reply . . . ." Many of the commenters noted the short statutory timeframe for the pre-institution phase as a factor that limits the number of briefs that may be allowed.

Response: Because the Office proposes to amend the rules for the patent owner preliminary response (37 CFR 42.107, 42.207) to allow new testimonial evidence, the Office proposes to change the rules to provide for a petitioner to seek leave to file a reply to the patent owner preliminary response. In particular, each of 35 U.S.C. 316(a)(13) and 326(a)(12) states that the Director shall prescribe regulations providing the petitioner with "at least 1 opportunity to file written comments." The Office proposes to change the rules to provide expressly that a petitioner may seek leave to file a reply to a preliminary response including new testimonial evidence, so that the Office may allow a reply when the circumstances so warrant.

Comment 3: Several commenters requested clarification of "new testimonial evidence" as used in 37 CFR 42.107(c). These comments indicated that the current rules, procedures, and cases do not provide adequate guidance as to what testimonial evidence is permitted in a preliminary response.

Response: Because the Office proposes to amend the rules for the patent owner preliminary response (37 CFR 42.107, 42.207) to allow new testimonial evidence, additional clarification is not necessary.

Additional Discovery

The Office asked, "Are the factors enumerated in the Board's decision in *Garmin* v. *Cuozzo*, IPR2012–00001, appropriate to consider in deciding whether to grant a request for additional discovery? What additional factors, if any, should be considered?" 79 FR at 36476. The Office provides guidance on its Web site, *see, e.g., http://www.uspto.gov/blog/aia/entry/message_from_administrative_patent_judges*, in response to comments generated from these questions, and plans to revise the Office Patent Trial Practice Guide to reflect this guidance.

Comment 1: A number of comments indicated that the *Garmin* factors are appropriate. Some of the comments further noted that the *Garmin* factors help the Office to strike the right balance for AIA trial proceedings, permitting parties to obtain meaningful discovery while preventing expensive, broad discovery. The comments also urged the Office to continue applying those factors. Several comments also expressed the view that the first, third, and fifth *Garmin* factors provide an important safeguard to minimize costs and limit distractions, ensuring fast and efficient resolution on the merits.

Response: These comments are adopted. The Office appreciates the suggestions and will continue to apply the *Garmin* factors on a case-by-case basis when considering whether additional discovery in an *inter partes* review is necessary in the interest of justice, as follows:

1. More Than A Possibility And Mere Allegation. The mere possibility of finding something useful, and mere allegation that something useful will be found, are insufficient. Thus, the party requesting discovery already should be in possession of a threshold amount of evidence or reasoning tending to show beyond speculation that something useful will be uncovered. "Useful" does not mean merely "relevant" or "admissible," but rather means favorable in substantive value to a contention of the party moving for discovery.

2. Litigation Positions And Underlying Basis. Asking for the other party's litigation positions and the underlying basis for those positions is not necessarily in the interest of justice.

3. Ability To Generate Equivalent Information By Other Means. Discovery of information a party reasonably can figure out, generate, obtain, or assemble without a discovery request would not be in the interest of justice.

4. Easily Understandable Instructions. The requests themselves should be easily understandable. For example, ten pages of complex instructions are prima facie unclear.

5. Requests Not Overly Burdensome To Answer. The Board considers financial burden, burden on human resources, and burden on meeting the time schedule of the review. Requests should be sensible and responsibly tailored according to a genuine need.

Garmin Int'l, Inc. v. *Cuozzo Speed Techs. LLC*, Case IPR2012–00001, slip op. at 6–7 (PTAB Mar. 5, 2013) (Paper 26) (informative). The Office also applies similar factors in post-grant reviews and covered business method patent reviews when deciding whether the requested additional discovery is supported by a good cause showing and "limited to evidence directly related to factual assertions advanced" by a party. *See* 37 CFR 42.224; *Bloomberg Inc.* v. *Markets-Alert Pty Ltd*, Case CBM2013–00005, slip op. at 3–5 (PTAB May 29, 2013) (Paper 32).

Comment 2: A comment suggested that the Office should provide rule-based guidance on the "interest of justice" standard.

Response: As discovery disputes are highly fact dependent, the Office has found that the flexible approach as set forth in *Garmin* provides helpful guidance to the parties and assists the Office in achieving the appropriate balance, permitting meaningful discovery, while securing the just, speedy, and inexpensive resolution of every proceeding.

Comment 3: One comment suggested that the Office should continue to place emphasis on maintaining the one-year trial schedule by encouraging parties to raise discovery issues early in the proceeding, even during the pre-institution stage.

Response: This comment is adopted. As explained in *Garmin* regarding Factor 5—discovery requests must not be overly burdensome to answer—the Office will consider the burden on meeting the schedule of the proceeding. *Garmin*, Case IPR2012–00001, slip op. at 7. For example, as discussed below, the Office has granted reasonable, narrowly tailored discovery requests prior to institution when the patent owner raises sufficient concerns regarding the petitioner's identification of real parties-in-interest. Moreover, the Scheduling Order of each trial utilizes sequenced discovery, whereby parties can conduct meaningful discovery

before they are required to submit their respective motions and oppositions, taking into account the complexity of the proceeding, while ensuring that the trial is completed within one year of institution. Parties are encouraged to raise discovery issues, and confer with each other regarding such issues, as soon as they arise in a proceeding.

Comment 4: One comment suggested that Factor 2 should not be applied as a *per se* rule.

Response: *Garmin* sets forth a flexible approach in which the *Garmin* factors are not *per se* rules. As explained in *Garmin* regarding Factor 2, the Board has established rules and practices for the presentation of arguments and evidence, and there is a proper time and place for each party to make its presentation. *Garmin,* Case IPR2012–00001, slip op. at 13. For instance, under 37 CFR 42.51(b)(1) for routine discovery, a party has the opportunity to cross-examine the opposing party's declarant with regard to the basis of his or her testimony. Moreover, as discovery disputes are highly fact dependent, the Office decides each issue on a case-by-case basis, taking account of the specific facts of the proceeding. *See, e.g., Bloomberg Inc.* v. *Markets-Alert Pty Ltd.*, Case CBM2013–00005, slip op. at 6–7 (PTAB May 29, 2013) (Paper 32) (granting a specific and narrowly tailored request seeking information considered by an expert witness in connection with the preparation of his declaration filed in the proceeding).

Comment 5: One comment recommended that the Office expressly consider the specificity of the request, require parties to identify requested documents with the greatest possible specificity, and reject broad, amorphous requests that do not reasonably identify responsive documents. Other comments urged the Office to add the following additional factors, ensuring that the *Garmin* factors would be applied correctly and permitting additional discovery when it is actually warranted: (1) Whether the information is solely within the possession of the other party; (2) whether the information already has been produced in a related matter; and (3) whether the discovery sought relates to jurisdictional issues under 35 U.S.C. 315 and 325.

Response: *Garmin* sets forth a flexible and representative framework for providing helpful guidance to the parties, and assisting the Office to decide whether additional discovery requested in an *inter partes* review is necessary in the interest of justice, consistent with 35 U.S.C. 316(a)(5), or whether additional discovery in a post-grant review is supported by a good cause showing, consistent with 35 U.S.C. 326(a)(5). The list of factors set forth in *Garmin* is not exhaustive. The Office applies the factors on a case-by-case basis, considering the particular facts of each discovery request, including the particular arguments raised by a party seeking additional discovery. Under this flexible approach, parties are permitted to present their arguments using different factors including those suggested in the comments. In fact, the suggested additional factors are subsumed effectively already under the *Garmin* factors, and have been considered by the Office in deciding whether to grant additional discovery requests. *See, e.g., Int'l Sec. Exch., LLC* v. *Chi. Bd. Options Exch., Inc.,* Case IPR2014–00097 (PTAB July 14, 2014) (Paper 20) (granting a specific, narrowly tailored, and reasonable request for additional discovery of information that Patent Owner could not have obtained reasonably without a discovery request). As noted below, the Office frequently has granted reasonable discovery requests that are specific, narrowly tailored, and not overly burdensome in cases where a patent owner timely raises a real party-in-interest or privity challenge. *See, e.g., Nestle USA, Inc.* v. *Steuben Foods,* Case IPR2015–00195 (PTAB Feb. 27, 2015) (Paper 21) (granting Patent Owner's request for a sales agreement between Petitioner and another entity that allegedly contains indemnity, control, and cooperation provisions).

Comment 6: One comment suggested combining Factor 4 and Factor 5.

Response: Factor 4 and Factor 5 address different concerns. In particular, Factor 4 promotes the use of easily understandable instructions and, thereby, guards against the use of long and complex instructions that could unduly burden the producing party. Factor 5, by contrast, focuses on burdens and time constraints associated with complying with a request for additional discovery and, thereby, assists the Office in limiting discovery to requests that can be satisfied without disrupting the schedule, and which do not impose undue financial or human resource burdens on the producing party. As discussed above, parties have the flexibility under the *Garmin* framework to adopt a different combination of factors to present their arguments, including combining their analyses regarding Factor 4 and Factor 5.

Comment 7: Several comments indicated that, although the *Garmin* factors are appropriate, they sometimes are being applied incorrectly to require the moving party to have the actual evidence being sought.

Response: As explained in *Garmin,* the moving party, who is seeking additional discovery, should present a threshold amount of evidence or reasoning tending to show beyond speculation that something useful will be uncovered. *Garmin,* Case IPR2012–00001, slip op. at 7–8. This factor ensures that the opposing party is not overly burdened, and the proceeding not unnecessarily delayed, by speculative requests where discovery is not warranted. The Office, however, does not require the moving party to have any actual evidence of the type being sought, for example, where reasoning is presented that tends to show beyond speculation that something useful will be uncovered. Furthermore, a party who is dissatisfied with a decision and believes the Office misapprehended or overlooked a matter in denying additional discovery may file a request for rehearing, without prior authorization. *See* 37 CFR 42.71(d).

Obviousness

The Office asked, "Under what circumstances should the Board permit the discovery of evidence of non-obviousness held by the Petitioner, for example, evidence of commercial success for a product of the Petitioner? What limits should be placed on such discovery to ensure that the trial is completed by the statutory deadline?" 79 FR at 36476. The Office provides guidance on its Web site, *see, e.g., http://www.uspto.gov/blog/aia/entry/message_from_administrative_patent_judges,* in response to comments generated from these questions, and will revise the Office Patent Trial Practice Guide to reflect this guidance.

Comment 1: Several comments suggested that the Office should permit discovery of evidence of non-obviousness held by the petitioner in all cases. Another comment indicated that, if a request is narrowly tailored, this may be one situation where additional discovery may be permissible. In contrast, several other comments recommended that the Office should very rarely, if ever, permit discovery of the petitioner's product, as it would require a mini-trial on whether the petitioner's product infringes the patent, overwhelming the AIA trial process, undermining the efficient, focused procedure, making it impossible to conclude the AIA trial proceedings within the statutory deadline, and imposing a significant burden on the petitioner. Several comments further suggested that the Office should

continue to apply the *Garmin* factors (*see Garmin Int'l Inc.* v. *Cuozzo Speed Techs. LLC,* IPR2012–00001 (PTAB Mar. 5, 2013) (Paper 26) (informative)), allowing discovery only when the patent owner establishes that the additional discovery is in the interest of justice.

Response: The Office appreciates the varying points of view. The Office has considered these comments and believes that the *Garmin* factors currently provide appropriate and sufficient guidance for how to handle requests for additional discovery, which the Office will continue to decide on a case-by-case basis. The Office will continue to seek feedback as the case law develops as to whether a more specific rule for this type of discovery is warranted or needed. The Office encourages parties to confer and reach an agreement on the information to exchange early in the proceeding, resolving discovery issues promptly and efficiently. *See* 37 CFR 42.51(a). As explained in the Office Patent Trial Practice Guide, the parties may agree to certain initial disclosures, including information regarding secondary indicia of non-obviousness from the petitioner. Office Patent Trial Practice Guide, 77 FR at 48762. In situations in which there is a disagreement among the parties, the Office will decide on a case-by-case basis whether additional discovery in an *inter partes* review is necessary in the interest of justice, or whether additional discovery in a post-grant review is supported by a good cause showing, based on the particular facts of each request, consistent with 35 U.S.C. 316(a)(5) and 326(a)(5). As discussed above, the *Garmin* factors provide helpful guidance to the parties and assist the Office to achieve the appropriate balance, permitting meaningful discovery, while securing the just, speedy, and inexpensive resolution of every proceeding. The Office plans to add further discussion as to how the *Garmin* factors have been applied in the Office Patent Trial Practice Guide.

Comment 2: Several comments indicated that a patent owner seeking additional discovery regarding the petitioner's product in support of a commercial success non-obviousness argument should have to show that the challenged patent claims read on the petitioner's product, that the product was commercially successful, and that the alleged success resulted from the patented feature. Several other comments, however, suggested that requiring a patent owner to prove such a nexus between the evidence being sought and the claims places too high a burden on the patent owner. One comment urged the Office to allow a patent owner to obtain secondary consideration evidence from the petitioner when the patent owner presents a good-faith argument that there is a nexus between such evidence and the claims, such as by infringement contentions offered in the related district court litigation. Several comments recommended that a patent owner should be permitted to obtain additional discovery from a petitioner when the patent owner demonstrates that the petitioner is reasonably likely to possess evidence of secondary considerations, relaxing the first *Garmin* Factor. A few other comments suggested that the Office should permit limited discovery of the petitioner's evidence of secondary considerations when the patent owner has presented a sufficient showing of a nexus.

Response: The Office recognizes that it is important to provide a patent owner a full and fair opportunity to develop arguments regarding secondary considerations. The Office, therefore, agrees that a conclusive showing of nexus between the claimed invention and the information being sought through discovery is not required at the time the patent owner requests additional discovery. Nonetheless, some showing of nexus is required to ensure that additional discovery is necessary in the interest of justice, in an *inter partes* review, or is supported by a good cause showing, in a post-grant review. *See* 35 U.S.C. 316(a)(5) and 326(a)(5); 37 CFR 42.51(b)(2) and 42.224. Notably, as explained in *Garmin* concerning Factor 1, the mere possibility of finding something useful, and mere allegation that something useful will be found, are insufficient to demonstrate that the requested discovery is necessary in the interest of justice. *Garmin,* slip op. at 6. A patent owner seeking secondary consideration evidence from a petitioner should present a threshold amount of evidence *or reasoning* tending to show beyond speculation that something useful will be uncovered. A mere infringement contention or allegation that the claims reasonably could be read to cover the petitioner's product is generally insufficient, because such a contention or allegation, for example, does not show necessarily that the alleged commercial success derives from the claimed feature. Nor does it account for other desirable features of the petitioner's product or market position that could have contributed to the alleged commercial success. *See e.g., John's Lone Star Distrib., Inc.* v. *Thermolife Int'l, LLC,* IPR2014–01201 (PTAB May 13, 2015) (Paper 30). The Office plans to add further discussion on this issue to the Office Patent Trial Practice Guide.

Comment 3: One comment recommended that the Office permit the patent owner to serve a limited number of focused interrogatories and requests for production related to secondary considerations, and provide a schedule for the discovery.

Response: The Office declines to adopt a mandatory rule regarding additional discovery of secondary considerations, but will continue to entertain the need for such discovery on a case-by-case basis. Moreover, as provided in 37 CFR 42.51(a)(1) and (b)(2), parties may agree to additional discovery, including answering focused interrogatories and production of documents, even prior to institution. The Office also encourages and facilitates such cooperation between parties. *See, e.g., Square, Inc.* v. *REM Holdings 3, LLC,* Case IPR2014–00312, slip op. at 2–4 (PTAB Sep. 15, 2014) (Paper 23) (In response to the Board's request, the parties conferred and reached an agreement as to the Patent Owner's focused and narrowly tailored interrogatories and document request.). Balancing fairness concerns with the need to meet statutory deadlines, the Office, at this time, declines to make additional discovery on secondary considerations available as a matter of right, given that all other types of additional discovery may be obtained only upon a showing based on the *Garmin* factors.

Real Party in Interest

The Office asked, "Should a Patent Owner be able to raise a challenge regarding a real party in interest at any time during a trial?" 79 FR at 36476. The Office provides guidance below in response to comments generated from these questions, and will revise the Office Patent Trial Practice Guide to reflect this guidance.

Comment 1: A number of comments indicated that a patent owner should be able to raise a challenge regarding a real party-in-interest or privity at any time during a trial proceeding. A few comments also suggested that the Office should encourage or require the patent owner to raise this challenge in its preliminary response, so that the Office could consider this issue when determining whether or not to institute a review and resolve it promptly. Several comments further recommended that a patent owner may raise this challenge after institution if it provides a reasonable explanation as to why it could not have raised such a challenge

earlier in the proceeding. One comment, however, opposed any change that would allow a patent owner to challenge the identity of a real party-in-interest at any time during a trial. Another comment also opposed allowing patent owners to make a belated challenge under 35 U.S.C. 312(a) for a petitioner's failure to name all real parties-in-interest.

Response: The Office recognizes that it is important to resolve real party-in-interest and privity issues as early as possible, preferably in the preliminary stage of the proceeding prior to institution, to avoid unnecessary delays and to minimize cost and burden on the parties and the resources of the Office. In most cases, the patent owner also recognizes the benefit of raising a real party-in-interest or privity challenge early in the proceeding, before or with the filing of its preliminary response, to avoid the cost and burden of a trial if the challenge is successful.

To balance efficiency with fairness, the Office, in general, will permit a patent owner to raise a challenge regarding a real party-in-interest or privity at any time during a trial proceeding. Such a position is consistent with the final rule notice. *See* Changes to Implement *Inter Partes* Review Proceedings, Post-Grant Review Proceedings, and Transitional Program for Covered Business Method Patents; Final Rule, 77 FR 48680, 48695 (Aug. 14, 2012) ("After institution, standing issues may still be raised during trial. A patent owner may seek authority from the Board to take pertinent discovery or to file a motion to challenge the petitioner's standing."). With respect to a late challenge that reasonably could have been raised earlier in the proceeding, the Office will consider the impact of such a delay on a case-by-case basis, including whether the delay is unwarranted or prejudicial. The Office also will consider that impact when deciding whether to grant a motion for additional discovery based on a real party-in-interest or privity issue. The Office plans to add further discussion on this issue to the Office Patent Trial Practice Guide.

Comment 2: A few comments suggested that the rules should be revised to require both parties to provide certain documents associated with the real party-in-interest or privity of the parties. In particular, the comments recommended requiring the parties to provide the following information: (1) Joint defense group agreements, (2) indemnity agreements, (3) identification of counsel representing a defendant in related litigations, (4) identification of parties participating in the preparation of the petition or in the review, and (5) identification of all parties funding the expenses associated with the review. In contrast, another comment urged the Office not to impose such burdensome mandatory disclosure requirements and indicated that the Office's current practice is appropriate for resolving real party-in-interest and privity issues in a low-cost and efficient manner.

Response: As many cases do not involve real party-in-interest or privity disputes, the Office, at this time, does not believe that any benefit resulting from requiring the parties to provide these highly sensitive, and possibly privileged, documents in every case would outweigh the additional cost and burden on the parties and the Office. When a patent owner timely raises real party-in-interest or privity challenges, which are highly fact dependent, the Office will continue to consider the need for additional discovery on a case-by-case basis, taking into account the specific facts in the proceeding to determine whether additional discovery is necessary in the interest of justice, in an *inter partes* review, or supported by a good cause showing, in a post-grant review. *See, e.g.*, 37 CFR 42.51(b)(2); *Garmin, Case* IPR2012–00001, slip op. at 7; Office Patent Trial Practice Guide, 77 FR at 48760; *Unified Patents, Inc.* v. *Dragon Intellectual Prop., LLC,* Case IPR2014–01252 (PTAB Feb. 12, 2015) (Paper 37) (A non-party does not become a real party-in-interest or privy solely because it is a member of a trade association or joint defense group.). The Office also encourages the parties to confer on the issue of additional discovery early in the proceeding, and attempt to reach an agreement on a reasonable amount of information to exchange, so that the issue may be resolved promptly and efficiently. *See* 37 CFR 42.51(b)(2) ("The parties may agree to additional discovery between themselves.").

Comment 3: A few comments suggested that patent owners should be able to discover information concerning a real party-in-interest freely at any time. In contrast, several other comments urged the Office to limit discovery to that which is truly necessary, by applying the statutory standards for additional discovery.

Response: As discussed above, the Office generally will permit a patent owner to raise a challenge regarding a real party-in-interest or privity at any time during a proceeding. The scope of discovery in AIA proceedings, however, differs significantly from the scope of discovery available under the Federal Rules of Civil Procedure in district court proceedings. Because Congress intended AIA proceedings to be a quick and cost-effective alternative to litigation, the statute provides only limited discovery in trial proceedings before the Office. *See* 35 U.S.C. 316(a)(5) and 326(a)(5); 37 CFR 42.51(b)(2) and 42.224. Under the current practice—applying these statutory standards—the Office frequently has granted discovery requests directed to real-party-in-interest or privity information, where the requests were specific, narrowly tailored, and not unduly burdensome. *See, e.g., Arris Group, Inc.* v. *C-Cation Techs., LLC,* Case IPR2015–00635 (PTAB May 1, 2015) (Paper 10) (informative); *Zerto, Inc.* v. *EMC Corp.,* Case IPR2014–01254 (PTAB Nov. 25, 2014) (Paper 15); *Gen. Elec. Co.* v. *Transdata, Inc.,* Case IPR2014–01380 (PTAB Nov. 12, 2014); *Medtronic, Inc.* v. *Robert Bosch Healthcare Sys., Inc.,* Case IPR2014–00488 (PTAB Nov. 5, 2014); *Samsung Elects. Co.* v. *Black Hills Media, LLC,* Case IPR2014–00717 (PTAB Oct. 2, 2014); *Atlanta Gas Light Co.* v. *Bennett Regulator Guards, Inc.,* Case IPR2013–00453 (PTAB Apr. 23, 2014) (Paper 40); *RPX Corp.* v. *VirnetX Inc.,* Case IPR2014–00171 (PTAB Feb. 20, 2014) (Paper 33).

Comment 4: One comment urged the Office to provide additional guidance regarding issues concerning real party-in-interest or privity, including specific questions and factors that petitioners should consider in determining what entities to identify, which would allow petitioners and patent owners to evaluate these issues early and in a more efficient manner.

Response: The Office appreciates the interest in additional guidance on these complex issues. As the Supreme Court has instructed, however, whether an entity is a real party-in-interest is a highly fact dependent question that is not amenable to any bright-line test. *Taylor* v. *Sturgell,* 553 U.S. 880, 893–895 (2008). Whether a non-party is a real party-in-interest or privy for a trial proceeding before the Office is a highly fact dependent question that takes into account how courts generally have used the term to "describe relationships and considerations sufficient to justify applying conventional principles of estoppel and preclusion." Office Patent Trial Practice Guide, 77 FR at 48759. The Office Patent Trial Practice Guide sets forth a detailed discussion on the relevant common law principles and Federal case law. Further helpful guidance is provided in recent Board decisions. *See, e.g., Askeladden LLC* v. *Sean I. McGhie and Brian Buchheit,* Case IPR2015–00122, slip op. at 3–16 (PTAB Mar. 6, 2015) (Paper 30); *Zerto,*

Inc. v. *EMC Corp.*, Case IPR2014–01254, slip op. at 6–15 (PTAB Mar. 3, 2015) (Paper 35); *Aruze Gaming Macau, Ltd.* v. *MGT Gaming, Inc.*, Case IPR2014–01288, slip op. at 6–20 (PTAB Feb. 20, 2015); *Unified Patents, Inc.* v. *Dragon Intellectual Prop., LLC*, Case IPR2014–01252, slip op. at 8–13 (PTAB Feb. 12, 2015) (Paper 37); *GEA Process Eng'g, Inc.* v. *Steuben Foods, Inc.*, Case IPR2014–00041, slip op. at 3–26 (PTAB Dec. 23, 2014) (Paper 140); *Samsung Elecs. Co.* v. *Black Hills Media, LLC*, Case IPR2014–00737, slip op. at 3–4 (PTAB Nov. 4, 2014) (Paper 7); *First Data Corp.* v. *Cardsoft LLC*, Case IPR2014–00715 (PTAB Oct. 17, 2014); *RPX Corp.* v. *VirnetX Inc.*, Case IPR2014–00171, slip op. at 6–10 (PTAB July 14, 2014) (Paper 49); *Alcon Research, Ltd.* v. *Dr. Joseph Neev*, Case IPR2014–00217, slip op. at 6–7 (PTAB May 9, 2014) (Paper 21); *Zoll Lifecor Corp.* v. *Philips Elecs. N. Am. Corp.*, Case IPR2013–00606, slip op. at 3–12 (PTAB Mar. 20, 2014) (Paper 13). The Office plans to add further discussion on this issue to the Office Patent Trial Practice Guide.

Comment 5: A few comments recommended that the Office establish a rule or precedential opinion stating that the existence of a real party-in-interest and privity are determined based on the facts in existence at the time of petition filing.

Response: Limiting the inquiry to the time of petition filing would undercut the core functions underlying the requirement to name all real parties-in-interest and privies. Those core functions include resolution of conflicts of interest and ensuring the proper application of statutory estoppel provisions—concerns that persist throughout the course of an AIA trial proceeding. *See* 35 U.S.C. 315(e)(1) (real party-in-interest or privy of the petition may not "request or maintain" a proceeding); 35 U.S.C. 325(e)(1) (same). As real party-in-interest and privity issues are highly fact dependent, in certain situations the issue may involve supporting evidence that comes into existence after the filing of a petition. *See, e.g., GEA Process Eng'g, Inc.* v. *Steuben Foods, Inc.*, Case IPR2014–00041 (PTAB Dec. 23, 2014) (Paper 140, Public Version) (finding that a non-party who paid the Petitioner's legal fees for the *inter partes* review is a real party-in-interest, and rejecting the argument that post-filing funds cannot retroactively change the facts as of the filing date, because "[t]ypically, legal bills are billed and paid for after the services have been rendered"). Therefore, such bright-line rules as suggested by the comments would not be in the interest of justice and are not adopted.

Comment 6: A comment urged the Office to permit petitioners to correct the identification of real parties-in-interest without affecting the filing date if a "good faith attempt" was made to satisfy 35 U.S.C. 312(a).

Response: The statute requires a petition to identify all real parties-in-interest without qualification. *See* 35 U.S.C. 312(a); *see* 37 CFR 42.8 and 42.104. In the situation where the failure to identify a real party-in-interest was a mere clerical error, the petitioner may correct the petition without affecting the filing date. *See, e.g.*, 37 CFR 42.104(c); *Coleman Cable, LLC* v. *Simon Nicholas Richmond*, Case IPR2014–00935 (PTAB Aug. 28, 2014) (Paper 12). The Office is unable, however, to allow for the correction of any other such errors without changing the filing date because of the statutory requirement.

Comment 7: A comment urged the Office to confirm that the petitioner bears the burden of producing evidence that it has standing, as well as the burden of persuasion on the issue.

Response: As discussed previously, additional discovery may be authorized where patent owner raises sufficient concerns regarding the petitioner's identification of real parties-in-interest. Several recent decisions have acknowledged that the ultimate burden of proof on the issue lies with the petitioner. *See, e.g., Askeladden*, slip op. at 8 (Paper 30); *Zerto*, slip op. at 6–7 (Paper 35); *Atlanta Gas Light Co.* v. *Bennett Regulator Guards, Inc.*, Case IPR2013–00453, slip op. at 6–8 (PTAB Jan. 6, 2015) (Paper 88); *Atlanta Gas Light Co.* v. *Bennett Regulator Guards, Inc.*, Case IPR2013–00453, slip op. at 2–7 (PTAB Feb. 23, 2015) (Paper 91). This allocation of the burden acknowledges that a petitioner is more likely than a patent owner to be in possession of, or have access to, evidence relevant to the issue. *Zerto*, slip op. at 6–7. The Office plans to add further discussion on this issue to the Office Patent Trial Practice Guide.

Multiple Proceedings

The Office asked a series of questions relating to how multiple proceedings, such as an AIA trial, reexamination, or reissue proceeding, before the Office involving the same patent should be coordinated, including whether one proceeding should be stayed, transferred, consolidated, or terminated in favor of another. The questions are replicated below, followed by the comments responsive to those questions and the Office's responses to the comments.

Question 7: How should multiple proceedings before the USPTO involving the same patent be coordinated? Multiple proceedings before the USPTO include, for example: (i) Two or more separate AIA trials; (ii) an AIA trial and a reexamination proceeding; or (iii) an AIA trial and a reissue proceeding? 79 FR at 36476.

Comments: Multiple commenters recommended that the Board continue to exercise its discretion, on a case-by-case basis, to stay, transfer, consolidate, or terminate multiple proceedings involving the same patent claims. Several commenters urged the Board to consolidate multiple proceedings involving the same or related patents.

Commenters urged the Board to manage multiple AIA proceedings by manipulating the dates for the patent owner's preliminary response. Several commenters suggested that the Board should delay the time period for filing the patent owner's preliminary response to a second petition, "so as to effectively stay the filing of" that response, until after the first-filed petition is resolved by termination or a final written decision. One commenter remarked that this effective stay of the time for filing the patent owner's preliminary response in a second proceeding is especially appropriate where the proceeding, instituted on the first-filed petition, is near completion.

Another commenter proposed that, where a second petition is filed before the date on which the patent owner's preliminary response is filed in the first proceeding, the patent owner's preliminary response in the first proceeding should be reset to three months from the notice of filing date accorded the second petition. The commenter also urged that, under those circumstances, scheduling and briefing should be consolidated in the two proceedings. The same commenter proposed that the Board should stay all activity on a second petition that is filed after trial is instituted on a first petition.

Several commenters proposed requiring petitioners, who file a petition challenging the same patent claims at issue in an earlier-filed petition, to identify what issues were previously raised. Commenters also advocated requiring such petitioners to state whether they are amenable to joinder with the earlier proceeding. On that point, one commenter urged that duplicative petitions, filed after the deadline for joinder, "should be terminated at an early stage to conserve Patent Owner costs and [Board] resources." Another commenter stated

that, "[f]or consolidated AIA trials involving the same patent with at least one challenged claim in common, the current rules that the Board uses for joinder seem to be working well." Some commenters urged that duplicative petitions, filed outside the permissible period for joinder, should not be granted.

Response: The current rules afford the Board broad discretion to manage multiple proceedings by tailoring the solution to the unique circumstances of each case and, thereby, optimizing efficiencies and promoting fair results in each case. *See Prism Pharma Co.* v. *Choongwae Pharma Corp.*, IPR2014–00315 (PTAB July 8, 2014) (Paper 14) (informative) (denying institution of *inter partes* review based on second-filed petition that was based on the same prior art and same arguments previously considered by the Office during prosecution of the patent being challenged); *Medtronic, Inc.* v. *Nuvasive, Inc.*, Case IPR2014–00487 (PTAB Sept. 11 2014) (Paper 8); *Unified Patents, Inc.* v. *PersonalWeb Techs., LLC*, Case IPR2014–00702 (PTAB July 24, 2014) (Paper 13); *Unilever, Inc.* v. *Procter & Gamble Co.*, Case IPR2014–00506 (PTAB July 7, 2014) (Paper 17); *Medtronic, Inc.* v. *Robert Bosch Healthcare Systems*, Inc., Case IPR2014–00436 (PTAB June 19, 2014) (Paper 17); *Intelligent Bio-Systems, Inc.* v. *Illumina Cambridge Ltd.*, Case IPR2013–00324 (PTAB Nov. 21, 2013); *ZTE Corp.* v. *ContentGuard Holdings, Inc.*, Case IPR2013–00454 (PTAB Sept. 25, 2013) (Paper 12). The Board will continue to take into account the interests of justice and fairness to both petitioners and patent owners where multiple proceedings involving the same patent claims are before the Office.

The Board also must consider its ability to meet the statutory deadlines imposed by Congress on AIA trials. The Board agrees with the commenters that the timing of the patent owner's preliminary response may be altered, when helpful and fair in an appropriate case. No rule change is needed to accomplish that goal.

The Board has considered the comment that second petitioners should self-identify repetitive challenges, and state their amenability to joinder. As a practical matter, the Board is well-positioned to determine whether a second petition raises the same or substantially the same challenges presented in a first petition that is identified as a related matter. The Board is also adept at determining whether a grant of the second petition, with joinder, serves the interests of fairness, efficiency, and economy of process. In addition, pursuant to 37 CFR 42.8(b)(2), petitioners are required to identify other proceedings involving the same challenged patent, and petitioners are encouraged to identify any substantive similarities with other proceedings in the petition. No rule change requiring petitioners to self-identify repetitive challenges is warranted at this time.

The Board agrees with the commenters that a factor which may be relevant in appropriate cases is whether the petitioner in a later-filed proceeding is amenable to joinder with an earlier-filed proceeding involving the same patent claims. *See, e.g., Motorola Mobility LLC* v. *Softview LLC*, IPR2013–00257 (PTAB June 20, 2013) (Paper 10) (order granting joinder where a second petitioner neither introduced new grounds of unpatentability nor raised procedural issues that would delay the schedule set for the first proceeding). The Board will continue to take account of all factors, bearing on the propriety and feasibility of joinder, based on the particular facts of the involved proceedings.

Based on the comments, the Office determines that the current rules provide a workable framework for the Board to manage multiple proceedings that involve the same patent claims. No revision of the rules for managing such proceedings is necessary at this time.

Question 8: What factors should be considered in deciding whether to stay, transfer, consolidate, or terminate an additional proceeding involving the same patent after a petition for AIA trial has been filed? 79 FR at 36,476.

Comments: Some commenters suggested that the Office promulgate new rules that define the factors that the Office will take into account when considering multiple petitions directed to the same patent claims. Commenters advocated for the application of a variety of factors, which fall into three main categories: (1) The impact on scheduling and the Office's ability to meet the deadlines imposed by Congress in AIA proceedings; (2) prejudice to the patent owner; and (3) prejudice to the petitioner.

Response: The issues raised by Question 8 are closely related to the issues raised by Question 7. The interests of fairness, speed, efficiency, and economy are served by retaining the Office's ability to balance the competing interests of the petitioner and patent owner, where multiple petitions are filed that challenge the same patent claims. Managing multiple petitions demands highly fact-specific inquiries, and the Office requires broad discretion to craft results that are tailored to the particular circumstances presented in each case. The Office agrees with the comments that recognize the issues raised by multiple petitions are best resolved on a case-by-case basis.

The Office recognizes that approaching each case on its own facts raises consistency concerns that could be ameliorated by identifying a set of factors that apply in all cases. The Office agrees with the comments, however, suggesting that the interests, which bear on the propriety of a stay, transfer, consolidation, or termination where multiple proceedings are directed to the same patent claims, are best served by allowing the constellation of relevant factors to evolve gradually, tethered to the facts of individual cases. A restrained evolution, on a case-by-case basis, promotes fair and rational results in each case, and equips the Office with necessary flexibility to customize resolutions suitable for each particular case. The Office will develop relevant factors, tethered to specific facts raised in particular cases, through its body of case law. Given the still-evolving nature of AIA proceedings, the Office believes that this gradual approach is prudent and preferred over a premature attempt to establish a rule or factors divorced from particular facts raised in a particular case, which may not address the relevant concerns in every case. The Office plans to add further discussion on this issue to the Office Patent Trial Practice Guide.

Question 9: Under what circumstances, if any, should a copending reexamination proceeding or reissue proceeding be stayed in favor of an AIA trial? If a stay is entered, under what circumstances should the stay be lifted? 79 FR at 36476.

Comments: The Office received comments in favor of staying a copending reissue or reexamination. Commenters proposed that a stay for copending proceedings be determined on a case-by-case basis, with other commenters proposing that the stay be imposed upon institution of trial on the same patent. Another commenter proposed that a copending reissue or reexamination be stayed automatically, unless there was a showing of "good cause," which includes factors such as avoiding: (a) Inconsistent decisions by the Office; (b) duplicative work for the Board; and (c) disruption to the trial schedule. Other factors to consider in granting a stay, according to another commenter, include the statutory deadlines of the proceeding, the issues raised in the multiple proceedings, the parties involved, the likelihood of a reissue application being granted, and whether the decision adversely affects a party's ability to reach a timely

conclusion on a patentability issue. Another commenter provided additional factors to consider in granting a stay, such as the stage where amendments are possible, whether claim construction is inconsistent with the claim construction applied during trial, and agreement of the parties regarding a stay.

For those commenters favoring a stay, the circumstances regarding when a stay should be lifted ranged from the rendering of a final written decision to when appeal to the Federal Circuit has been exhausted. Other commenters have requested that the Office clarify that it will not terminate the reexamination or reissue once the final written decision issues, so that a patent owner may pursue claim amendments in those proceedings.

In the circumstances when a copending reexamination or reissue is not stayed and when there is no overlap of claims involved in the copending proceedings and the instituted trial, a commenter stated that the Office should preclude the presentation of new amended claims in the copending proceedings involving the same patent because a "sequential," rather than a "simultaneous," evaluation of the claims is consistent with the legislative history of the AIA.

Other commenters proposed that the Office consider allowing the reexamination and reissue to continue in parallel with or before the instituted trial. One commenter stressed that the purpose of a reissue is to correct errors, and therefore the remedial nature of the proceeding counsels against waiting for a trial to conclude. The same commenter offered that staying a reexamination is unjust to the patent owner because reexaminations are given "special dispatch" under 35 U.S.C. 305, a statutory requirement that remained unchanged with the passage of the AIA. Because in an instituted trial only one amendment is allowed by motion, the same commenter stated that a stay would preclude examination of claims amended in a reexamination or reissue to address the newly cited prior art or correct an error that was not present or addressed during the original examination of the patent. In particular, one commenter stressed that a reexamination should be allowed to run its course, and in any event, because an AIA proceeding would replace reexamination, copending AIA and reexamination would not be a problem much longer.

In the event a reexamination is not stayed, one commenter suggested that the Board's claim construction should be applied in the reexamination, or briefing on claim construction for the reexamination should be allowed in light of the claim construction involved in the trial.

Response: The Office has been determining whether to stay a reexamination or reissue on a case-by-case basis, and agrees with the commenters advocating that various factors should be considered, including the overlap of issues presented in the copending proceeding and the stage of the copending proceeding to avoid duplicative work for the Office. *See, e.g., Kaiser Aluminum* v. *Constellium Rolled Prods. Ravenswood, LLC,* IPR2014–01002 (PTAB Feb. 19, 2015) (Paper 25) (denying request to stay a reexamination on the same patent and some of the same references because the proceeding involved evidence different from the evidence presented in the *inter partes* review (IPR) and the reexamination was not sufficiently underway such that it would conclude before a final decision would issue in the IPR); *Chicago Mercantile Exch., Inc.* v. *5th Market, Inc.,* CBM2014–00114 (PTAB Jan. 9, 2015) (Paper 20) (denying request to stay copending reexamination because claims amended in reexamination were not at issue in the instituted covered business method review, where Patent Owner did not file a motion to amend, and finding that parallel proceedings would not result in duplication of efforts at the Office because the instant proceedings did not involve a complete overlap of claims); *Geortek, Inc.* v. *Knowles Elecs.,* LLC, IPR2013–00614 (PTAB Nov. 13, 2013) (Paper 11) (granting Patent Owner's motion to stay copending reexamination that had been ongoing for three years where Patent Owner argued that stay would prevent inconsistent results with regard to potential amendments of the same claims challenged in the *inter partes* review); *Google, Inc.* v. *Grandeye, Ltd.,* IPR2013–00548 (PTAB Sept. 30, 2013) (Paper 7) (granting unopposed motion to stay copending reexamination by Patent Owner because concurrent proceedings would duplicate efforts within the Office and could potentially result in inconsistencies among the proceedings, especially in light of amendments of the challenged claims in the reexamination).

The Office is not proposing changes at this time to the Rules or to the Office Patent Trial Practice Guide to give guidance regarding the timing on lifting a stay or how to proceed in a copending reexamination or reissue that is not stayed. These determinations have been proceeding appropriately on a case-by-case basis, noting, among many factors, the impact of the concurrent reexamination on the trial and whether the trial has concluded. *See, e.g., GEA Process Eng'g, Inc.* v. *Steuben Foods, Inc.,* IPR2014–00043 (PTAB Feb. 19, 2015) (Paper 121) (ordering lift of stay of a copending reexamination after the trial was terminated and timing for filing a request for rehearing had expired, and ordering that Patent Owner provide a copy of the Decision on Institution to the Central Reexamination Unit for consideration in light of alleged inconsistencies); *Gnosis S.p.A.* v. *Merck & CIE,* IPR2014–00117 (PTAB Feb. 5, 2015) (Paper 74) (ordering lift of stay of a copending reexamination after issue of a final written decision, and in consideration of the following: (1) The reexamination involved overlapping claims; (2) Patent Owner did not amend claims involved in *inter partes* review; (3) added claims were alleged to be narrower in scope; and (3) Examiner in the reexamination had issued a final rejection); *Avaya Inc.* v. *Network-1 Sec. Solutions, Inc.,* IPR2013–00071, slip op. at 31–32 (PTAB May 22, 2014) (Paper 103) (lifting stay, sua sponte and after final written decision issued, of a reexamination involving a non-asserted claim and different prior art presented in the *inter partes* review).

The Office will continue to determine, on the facts of each case in which there is a copending reexamination or reissue, whether a stay is warranted or a stay should be lifted under the circumstances of each case.

Question 10: Under what circumstances, if any, should an AIA trial be stayed in favor of a copending reexamination proceeding or reissue proceeding? If a stay is entered, under what circumstances should the stay be lifted? 79 FR at 36476.

Comments: The Office received comments in favor of not staying AIA trials in favor of a copending reexamination or reissue. One reason provided for not staying the trial is that statutory deadlines apply to the trials. One commenter observed an exception that may warrant a stay of AIA proceedings, *i.e.,* to account for when the copending reexamination or reissue was not stayed and a new claim is about to issue. In that circumstance, the commenter suggested that a limited stay should be granted to allow a petitioner to raise the new claim in the pending trial. Another commenter also stated that limited circumstances may warrant a stay, such as when the copending reexamination is in the late stages of appeal and there is significant overlap in claims between the trial and the copending proceeding. This same commenter stressed that if the parties agree that patentability should be

determined first in the reexamination, a stay of the trial may be warranted.

Other comments favored the request for and grant of a stay of the trial in favor of the copending reexamination or reissue. One commenter noted that such a stay should be granted when the copending reexamination or reissue is near completion, and another commenter stressed that the stay may be implemented before the trial is instituted such that the statutory deadlines are not impacted.

Another commenter provided that denial of institution should result for grounds with claims that are at issue in a copending reexamination or reissue, where amended claims were filed in the copending proceeding before the deadline for the Board to determine institution. To clarify whether the Board would have jurisdiction over such a trial, the same commenter advocated revising the Office Patent Trial Practice Guide to include clarification regarding the timing on when a notice of intent to issue a reexamination certificate or notice of allowance of a reissue would be effective.

Response: The Office will continue to proceed with the determination whether to institute trial on a case-by-case basis with no delay of the proceedings unless warranted by the facts or circumstances of the case. *See, e.g., Intromedic Co., Ltd.* v. *Given Imaging Ltd.*, Case IPR2015–00579 (PTAB Aug. 5, 2015) (Paper 9) (denying institution of review because the only claim being challenged by Petitioner has been amended in the copending reexamination, and the advanced stage of the reexamination involving the same parties); *Juniper Networks, Inc.* v. *Linex Techs., Inc.*, IPR2014–00595 (PTAB Sept. 26, 2014) (Paper 19) (denying institution of *inter partes* review because a Reexamination Certificate in a copending reexamination had issued and reexamination had concluded with all original claims amended and new claims issued). The Office agrees with the commenters that stress that a statutory deadline does not favor staying trials in favor of a copending reexamination or reissue, which have no statutory deadlines. *See, e.g., Mercedes-Benz USA, LLC* v. *Velocity Patent, LLC*, IPR2015–00290 (PTAB Jan. 21, 2015) (Paper 9) (denying authorization for motion to stay *inter partes* review in favor of a copending reexamination because the argument that new claims would issue there first and *inter partes* review would be amended to include those claims were not sufficient reasons to lengthen the pendency of the *inter partes* review, which is designed to secure the just, speedy, and inexpensive resolution of the dispute); *see also American Simmental Assn.* v. *Leachman Cattle of Co.*, LLC, PGR2015–00003 (PTAB Dec. 14, 2014) (Paper 4) (denying request to stay institution of post-grant review (PGR) in favor of pending reissue because of the status of the PGR, Patent Owner had not sought amendment or cancellation of the claims challenged in the PGR, and the Office had not taken any substantive action on the reissue application).

At this time, the Office does not propose changes to the Rules or the Trial Practice Guide to list specific circumstances under which a party may show that a stay of either a decision on institution or a trial may be appropriate. The Office will continue to decide motions to stay proceedings according to the facts and circumstances of each case.

Question 11: Under what circumstances, if any, should a copending reexamination proceeding or reissue proceeding be consolidated with an AIA trial? 79 FR at 36477.

Comments: The Board received several comments concerning the circumstances under which a copending reexamination or reissue should be consolidated with an AIA trial. Those circumstances fall roughly into two categories. The first category of comments indicated that consolidation of an AIA trial with copending reexaminations or reissues was impractical and that rules requiring such consolidation could, in some cases, prejudice patent owners. The second category of comments provided several factors that should be considered and weighed by the Board in determining whether to consolidate such proceedings. Those factors included: (1) Type of additional proceeding; (2) time between filing date of initial proceeding and additional proceeding; (3) stage of initial proceeding; (4) duration of additional proceeding; (5) scope of each proceeding; (6) third party filers (same, different); (7) relation between third party filer of additional proceeding and filer of initial proceeding; (8) number of total proceedings filed against the patent; (9) whether the additional proceeding is a reexamination: *ex parte* reexamination should not be transferred to PTAB because patent owner would lose certain procedural mechanisms such as ability to interview case; (10) whether pending district court litigation has been stayed pending resolution of the reexamination; (11) whether validity of claims at issue in AIA trial is currently on appeal to the Federal Circuit; (12) express interests of the parties in the proceedings; (13) issues raised in the different proceedings; (14) ability of Board to reach a timely conclusion of a patentability issue in any proceeding; and (15) saving of costs and resources gained by the parties and the Board by consolidation, for example, by coordination of procedures common to the proceedings.

Response: The Office appreciates the comments and has been considering the above factors, among others, in deciding requests to consolidate a copending reexamination or reissue with AIA trials. *See, e.g., Mercedes-Benz USA, LLC et al.* v. *Velocity Patent LLC*, Case IPR2014–01247 (PTAB Dec. 15, 2014) (Paper 12) (denying Petitioner's request to file a motion to consolidate AIA trial proceeding with a related reexamination, where the only claims at issue in the AIA trial proceeding were added in the reexamination, and Patent Owner cancelled those claims in the reexamination); *GEA Process Engineering, Inc.* v. *Steuben Food, Inc.*, Case IPR2014–00041, slip. op. at 3–5 (PTAB Dec. 6, 2013) (Paper 13) (denying Petitioner's motion to consolidate AIA trial proceeding with a related reexamination, where Patent Owner stipulated to not amend claims in the related reexamination); *GEA Process Engineering, Inc.* v. *Steuben Food, Inc.*, Case IPR2014–00051, slip. op. at 2–3 (PTAB Dec. 6, 2013) (Paper 12) (denying as moot Petitioner's motion to consolidate AIA trial proceeding with a related reexamination, where the reexamination had terminated and the reexamination certificate had issued). The Office agrees with the commenters who noted that there are many difficulties in consolidating copending reexaminations or reissues with AIA trials, and that all relevant factors, including but not limited to those set forth above, should be taken into consideration. The Office has performed similar analyses weighing a myriad of factors in analogous contexts, for example, in determining whether to stay a copending reexamination or reissue in favor of an AIA trial, or vice versa. *See, e.g.*, Responses to Questions 9 and 10 set forth above.

The Office does not propose to change the Rules or the portion of the Office Patent Trial Practice Guide pertaining to consolidation of a copending reexamination or reissue with AIA trials at this time. The Office will continue to determine on the facts of each case, in which consolidation is requested, whether a particular request sets forth facts sufficient to warrant consolidation of a copending reexamination or reissue with AIA trials.

Question 12: How should consolidated proceedings be handled

before the USPTO? Consolidated proceedings include, for example: (i) Consolidated AIA trials; (ii) an AIA trial consolidated with a reexamination proceeding; or (iii) an AIA trial consolidated with a reissue proceeding? 79 FR at 36477.

Comments: The Office received comments suggesting ways in which consolidated proceedings should be conducted. Suggestions included: (1) Multiple AIA trials concerning the same (or related) patents (or parties) should be consolidated or handled by the same panel; (2) consolidated proceedings should follow the district court model with the same schedule applying to the proceedings; (3) a petitioner should be required to select a single lead and backup counsel, but taking into consideration the interests of the parties, in some circumstances the Board may determine coordination should not be required; and (4) panels should consider adjusting page limits in cases where different parties may be asserting different positions.

Response: The Office agrees with the commenters that conducting consolidated proceedings in the manner set forth in the comments above may be appropriate. The Board has consolidated *inter partes* reviews involving the same parties and the same patent into a single proceeding where appropriate. *See Ford Motor Co.* v. *TMC Fuels Injection System, LLC,* Case IPR2014–00272 (PTAB Jun 26, 2014) (Paper 12) (consolidating IPR2014–00272, which was instituted on challenges under 35 U.S.C. 103, with IPR2014–00273, which was instituted on different challenges to the same claims under 35 U.S.C. 102 and 103 in which some of the applied references were common to both proceedings). In some cases where different parties have been joined to a proceeding, the panel has provided opportunities for limited additional briefing on issues where the petitioners may take different positions. *See, e.g., Motorola Mobility LLC* v. *Softview LLC,* Case IPR2013–00257 (PTAB June 20, 2013) (Paper 10) (joining proceeding to IPR2013–00004 and providing for consolidated filings and limited separate filings by Petitioners on points of disagreement only).

The Office received a further comment that claim amendments should be allowed if an AIA trial is consolidated with a copending reexamination or reissue. The Office notes that claim amendments are available currently in all of these proceedings. Insofar as the commenter may be suggesting that all claim amendments be entered as a matter of right in a consolidated proceeding, the Office disagrees, and instead leaves entry of claim amendments to be determined by the panel conducting the consolidated proceeding in accordance with the statutory and regulatory framework applicable to each of the proceedings.

Some commenters suggested that the Board has coordinated and should continue coordinating schedules of multiple related proceedings without formally consolidating the proceedings, for example, so as to allow different petitioners flexibility to pursue different arguments and to allow patent owner all of its allotted pages to respond to those different arguments. The Office has been coordinating schedules of multiple related proceedings without formally consolidating the proceedings, on a case-by-case basis, and agrees with the commenters that such practices should be continued, as appropriate. *See, e.g., Taiwan Semiconductor Mfg. Co., Ltd.* v. *Zond, LLC,* Case IPR2014–001089, slip. op. at 2–3 (PTAB Feb. 2, 2015) (Paper 17) (setting forth procedure for consolidated trial schedule, filings, and discovery in multiple related proceedings). The Board has also coordinated hearings in related cases and has scheduled hearings in related cases to occur on consecutive days in related cases. *See Samsung Electronics Co., Ltd.* v. *Black Hills Media, LLC,* Case IPR2014–00709 (PTAB Dec. 10, 2014) (summary of initial conference during which it was decided that IPR2014–00709, –00711, and –00718 would be heard together, IPR2014–00737 and –00740 would be heard together, IPR2014–00718 and –00721 would be heard together, and IPR2014–00717 and –00735 would be heard together, on consecutive days). *See, e.g.,* Responses to Question 7 set forth above.

The Office does not propose to change the Rules or the portion of the Office Patent Trial Practice Guide pertaining to handling of consolidated proceedings. The Office will continue to determine based on a case-by-case basis the proper manner in which such consolidated proceedings should be handled.

Question 13: Under what circumstances, if any, should a petition for an AIA trial be rejected because the same or substantially the same prior art or arguments previously were presented to the USPTO in a different petition for an AIA trial, in a reexamination proceeding or in a reissue proceeding? 79 FR at 36477.

Comments: The Board received many comments in favor of denying AIA petitions that raise the same or substantially the same prior art or arguments that were raised in an earlier-filed petition, whether raised by the same or a different petitioner. One commenter stated that the Board "should aggressively exercise" its discretion to deny cumulative or overlapping grounds in multiple proceedings, "even when different parties file petitions." Some commenters advocated denial of serial petitions filed by the same real party-in-interest. Other commenters stated that the Board should consolidate multiple petitions where feasible.

Several commenters suggested a general policy of "one and done" to duplicative petitions, to prevent harassment of patent owners, minimize costs, and ensure quiet title of patent rights. Those same commenters also recommended that the citation of new art in a subsequent petition should create a rebuttable presumption that substantially the same prior art or arguments are not raised in that petition. Commenters also urged the Board to apply principles of redundancy, across different petitions, to deny duplicative grounds raised in later-filed petitions.

Other commenters stated that "[t]he Board should treat each petition independently," and that a different petitioner, not in privity with the first petitioner, should be permitted to raise the same prior art in a subsequent petition. Some commenters proposed that duplicative petitions should not be denied where arguments in a later-filed petition differ in scope from those presented in an earlier-filed petition. Another commenter, by contrast, proposed a rule of "horizontal stare decisis" that would require treating a first decision on patentability as "binding law of the case" in subsequent proceedings, challenging the same patent claims, based on the same or substantially the same prior art or arguments.

Response: The Office has and will continue to balance the interests of petitioners, who seek to present new prior art and arguments in a later-filed petition, against patent owners' interest in preventing harassment that takes the form of repetitive, serial petitions that challenge the same patent claims. The Office is best able to balance those competing interests by approaching multiple petitions, which may raise the same or substantially the same prior art or arguments against the same patent claims, on a case-by-case basis, taking into account the unique facts and relative equities raised in each particular proceeding.

The comments do not suggest a need for a rule change at this time. The current rules provide the Board with broad discretion adequate to take all

relevant factors into account, when deciding whether to proceed on a petition that challenges the same patent claims at issue in an earlier-filed petition. Nor is a rule change necessary to enumerate the factors that the Board may take into account when making case-specific determinations, regarding the degree of overlap between the prior art and arguments raised in multiple petitions. The Office believes that the Board's current practice should continue to allow those factors to develop in its growing body of case law, tethered to the facts of particular proceedings, with such decisions of the Board providing guidance to practitioners.

Issued decisions already provide useful guidance in that regard. The Board has considered many factors, including, for example: (1) The degree of overlap between the prior art and arguments raised in the multiple petitions; (2) the identity of the petitioner in the later-filed proceeding; (3) whether the petitioner in the later-filed proceeding uses a prior decision on institution as a roadmap to refine and recycle arguments presented in an earlier-filed petition; (4) whether the circumstances surrounding the later-filed petition raises the specter of patent owner harassment; and (5) whether granting the later-filed petition is in the interests of justice. *See, e.g., ZTE Corp.* v. *ContentGuard Holdings Inc.*, IPR2013–00454 (PTAB Sept. 25, 2013) (Paper 12) (informative) (denying institution of *inter partes* review of a patent based on substantially the same prior art and same arguments presented previously in an earlier-filed petition filed by the same Petitioner for which institution was in-part denied, and citing 35 U.S.C. 325(d), to determine that "[a] decision to institute review on some claims should not act as an entry ticket, and a how-to guide, for the same Petitioner who filed an unsuccessful joinder motion, and is outside of the one-year statutory period, for filing a second petition to challenge those claims which it unsuccessfully challenged in the first petition"); *Medtronic, Inc.* v *Robert Bosch Healthcare Systems, Inc.*, IPR2014–00436 (PTAB June 19, 2014) (Paper 17) (informative) (denying institution of *inter partes* review where petition was based on redundant prior art and substantially the same arguments that were presented previously in an earlier-filed petition challenging the same patent and filed by a different Petitioner, but where the Petitioner in the later-filed case acknowledged that it was a real party-in-interest in the earlier-filed proceeding, due to its acquisition of the Petitioner in the earlier-filed proceeding); *Unilever* v. *Procter & Gamble Co.*, IPR2014–00506 (PTAB July 7, 2014) (Paper 17) (informative) (denying institution of *inter partes* review based on a later-filed petition, filed by same Petitioner and on same patent as an earlier-filed petition, where the later-filed petition attempted to correct deficiencies in the earlier-filed petition for claims for which earlier trial was not instituted); *Dell Inc.* v. *Electronics and Telecomms. Res. Inst.*, Case IPR2015–00549 (PTAB March 26, 2015) (Paper 10); *Zimmer Holdings, Inc.* v. *Bonutti Skeletal Innovations LLC*, Case IPR2014–01080 (PTAB Oct. 31, 2014) (Paper 17); *Prism Pharma Co., Ltd.* v. *Choongwae Pharma Corp.*, Case IPR2014–00315 (PTAB July 8, 2014) (Paper 14).

The Office recognizes that a "one and done" approach to multiple petitions may favor patent owners by diminishing the opportunity for harassment and ensuring some certainty for patent rights. In that regard, the Board already has applied its broad discretion to curtail multiple challenges against a patent as described above.

The competing interests of fairness to petitioners and the public interest, however, favor retaining the Office's discretion to grant or deny multiple petitions, rather than imposing a rigid rule that would require denial and, in effect, bind all potential challengers to the outcome of a first-filed petition, regardless of the facts and equities that surround the filing of the subsequent petitions.

The Office also acknowledges that petitioners may benefit from a "rebuttable presumption" that would render inapplicable the provisions of section 325(d), where a subsequent petition raises even one prior art reference that was not raised in the first-filed petition. Such an approach, however, unfairly would provide petitioners a fail-safe mechanism for avoiding the provisions of the statute, by filing serial petitions that add a single new reference to support the same grounds raised in an earlier petition. Such an approach fails to take into account the unfairness, including the potential for harassment, to patent owners when "substantially the same" prior art is raised sequentially against the same patent claims. The Office's discretion to grant or deny subsequent petitions, by viewing all relevant circumstances as a whole, on a case-by-case basis, is preferable to setting down a rigid rule.

Within the existing framework of the statute and rules, the Office has discretion to consider the relative scope of the challenges raised in multiple petitions. If a petition raises challenges that are based on the same or substantially the same prior art as a prior petition, but advances arguments of different scope, the Office has discretion to deny or grant the second petition based on the totality of facts presented in the case. A rule of "horizontal stare decisis" would, therefore, abolish the Board's discretion, especially where two cases do not present the same facts or identical considerations.

The Office will to continue to apply the existing framework, based on discretion to customize a result based on the facts and equities of each case. No rule changes are indicated at this time.

Extension of One Year Period To Issue a Final Determination

The Office asked, "What circumstances should constitute a finding of good cause to extend the 1-year period for the Board to issue a final determination in an AIA trial?" 79 FR at 36477.

Comments: The Office received comments in favor of the current strict adherence to the one-year statutory period and advocating that the granting of extensions should be rare. Many of these commenters stated that the Office should "continue to strive for completion of each trial in one year," the "good cause" bar should be very high, and extensions of the deadline should be "rare" and used only "in the most extreme circumstances" such as "where unforeseen circumstances make it impossible to complete proceedings in a fair manner." These same commenters stressed that "one of the most important benefits of [these proceedings]" and "a major driver in the widespread adoption of the AIA procedures" is that the Office renders a decision within one year. The commenters warned about eviscerating these benefits by a "systematic extension of the one-year period."

The Office also received comments advocating that the Office make more generous use of the option to extend the one-year statutory period under certain circumstances. For example, commenters proposed that an extension of the one-year deadline would be appropriate under the following circumstances: (1) "where a comparative test(s) are deemed necessary;" (2) where there is "delay by the party not seeking the extension;" (3) "if there is a later-filed AIA proceeding on the same patent that will not reach a final decision until after the first proceeding is concluded;" (4) "where

additional discovery is sought . . . in regard to secondary considerations or real party in interest;" (5) "in situations in which more time is needed to consider amended claims;" and (6) "where an irreplaceable, key participant becomes unexpectedly unavailable."

Many commenters also suggested that an extension would be appropriate in complex cases "in the interests of justness, fairness to the parties" and "to conduct a full and fair review of the record." The commenters described examples of complex cases as including: (1) "where there is a complex situation with multiple proceedings;" (2) when "the [Patent] Owner is involved in multiple proceedings simultaneously;" (3) "when an invention is particularly complex;" (3) "where multiple AIA trials are consolidated or joined;" (4) "where there are a large number of parties involved;" and (5) "where the trial involves complicated discovery issues."

Response: The Office will continue to strive to meet the one-year statutory time period for trial. By striving to meet the one-year statutory time period in most cases, the Office safeguards a core function of the administrative process as a speedy alternative to district court litigation. The Office does not propose to change the rules pertaining to the one-year pendency from institution-to-decision to provide for specific circumstances under which "good cause" may be shown. The Board will continue to determine on the facts of each case, in which an extension is requested, whether a particular request sets forth facts sufficient to meet the "good cause" standard to extend the one-year statutory deadline to complete a trial. The Office proposes, however, to revise the Office Patent Trial Practice Guide to provide examples of instances in which an extension of the one-year statutory period may be warranted. These examples will not be an exclusive list.

Oral Hearing

The Office asked, "Under what circumstances, if any, should live testimony be permitted at the oral hearing? What changes, if any, should be made to the format of the oral hearing?" 79 FR at 36477.

Comment 1: Several commenters asked the Board to be more willing to permit live testimony of declarants. Some suggested that live testimony be considered when requested or when the issues turn on conflicting expert testimony. Others commented that live testimony is rarely needed in AIA trials and the format of oral hearings should not change. One party suggested establishing a reasonable time limit when live testimony is permitted.

Response: The Office will continue its present practice of considering requests for oral hearings on a case-by-case basis. Thus far, the Office has authorized and granted one such motion requesting oral testimony. *See K–40 Electronics, LLC* v. *Escort, Inc.*, Case IPR2013–00203 (PTAB May 21, 2014) (Paper 34). The Office does not expect that oral testimony will be required in every case where there is conflicting testimony. When requested by the parties, however, and where the panel believes oral testimony will be helpful in making a determination, the Office will permit oral testimony. The format for presenting live testimony is left to the discretion of the panel.

Comment 2: Two commenters suggested that the Office should revise the definition of "hearing" or "trial" to clarify that live testimony at the final hearing is part of an AIA trial.

Response: The current definition of what constitutes a trial is intended to establish an endpoint for the receipt of evidence. Thus, unless otherwise authorized, no new evidence can be presented at the final oral hearing, as that would create surprise and be unfair to the party against whom the evidence is being offered. However, in the case of oral testimony at the final hearing, it is understood, and the Board will make clear at the hearing, that the testimony is evidence that becomes part of the record.

Comment 3: Several commenters suggested that the Office should alter its format for final oral hearings to allow each party to reserve time for a main and rebuttal argument.

Response: The comment is not adopted. The current format of oral hearings and the availability of rebuttal arguments are dictated by burdens of proof. Consequently, the petitioner, who has the burden of proving the challenged claims unpatentable, is permitted to rebut the patent owner's opposing argument on that issue. Likewise, a patent owner who presents argument on a motion to amend at final hearing is permitted to rebut petitioner's opposing argument on that issue. Providing a rebuttal to patent owner, as a matter of right, on unpatentablilty would disadvantage the party with the burden of proof. The Board, however, has broad discretion to conduct final oral hearings in a manner that is in the interests of justice.

Comment 4: A commenter requested that the Office clarify whether the parties are limited to presenting argument on issues specified in the oral hearing request.

Response: The comment is adopted. The Office will provide guidance on this issue in the FAQs on the PTAB Trials Web site and in the Office Patent Trial Practice Guide.

Comment 5: A commenter requested that the Office provide the parties with additional days to permit exchange and conference on demonstratives.

Response: The comment is adopted. The Office's rules for oral hearings are proposed to be modified to require the exchange of demonstratives seven business days before the final hearing date.

Comment 6: A commenter requested that the Office revise its guidelines on the nature of demonstrative exhibits at oral argument to make them more "relaxed."

Response: The comment is not adopted. The guidelines on demonstrative exhibits are intended to prevent a party from supplementing the record with additional evidence and arguments after the period for presenting evidence has ended.

Comment 7: One commenter suggested upgrading technology resources so that hearings can be held in regional offices.

Response: Currently, the Office is planning to upgrade its ability to hold hearings in regional offices.

Comment 8: One commenter suggested that hearing rooms be open at least 30 minutes before the scheduled hearing time to allow the parties to organize themselves and connect any equipment to be used during the hearing.

Response: The current Office practice is to open PTAB hearing rooms to the parties and public 30 minutes before the hearing is scheduled to start. The Office will continue this practice.

Comment 9: A commenter advocated allowing a recess during oral argument to confer with an expert when there is a question of specific claim construction.

Response: The panel hearing a final argument will evaluate a party's request for a recess on a case-by-case basis.

Comment 10: A commenter suggested that all judges of a proceeding be available for multiple session final arguments.

Response: This comment is adopted in part. Sometimes several related cases having different assigned panels are heard at the same time in a multi-session hearing. The Office ensures that, absent extenuating circumstances, the panel members assigned to a particular case are present at the session when that case is heard. The Office also encourages the panel members assigned to the related cases to be present for all

the sessions. Occasionally a scheduling conflict prevents a panel member from attending a session in a related case.

General Topics

The Office asked, "What other changes can and should be made in AIA trial proceedings? For example, should changes be made to the Board's approach to instituting petitions, page limits, or request for rehearing practice?" 79 FR at 36477.

Comment 1: Several comments suggested reduced filing fees for smaller businesses such as micro-entities and technology start-ups, especially those involved in litigation.

Response: The Office does not adopt this proposal. The Office was not given authority to provide for small entity and micro-entity filing fee reduction for reviews under AIA. The current filing fee schedule, available at *http://www.uspto.gov/learning-and-resources/fees-and-payment/uspto-fee-schedule,* takes into account the costs and expenses for maintaining the operation of the Office, and in particular, the operation of the Board in conducting AIA proceedings.

Comment 2: The Office received comments regarding the use of party confidential information produced under a protective order in parallel district court proceedings. Commenters expressed concern that such party confidential information may be submitted in an AIA proceeding by the opposing party where there is "little incentive to . . . either limit the evidence to that which has a nexus to the challenged claims or to provide sufficient argument to maintain" confidentiality. Commenters further suggested procedural safeguards whereby, prior to filing an opponent's confidential information, a party is required to: (1) Initiate a conference call with the Board; (2) identify the materials to be used; and (3) explain why there is a nexus between the evidence and the challenged claims. The same commenters recommended that, once the Board authorizes the filing of this evidence, the opponent be afforded an opportunity to explain why the evidence be maintained under seal.

Additionally, some commenters suggested that Section 4(A)(i) and (ii) of the default protective order should be modified to place the burden on the party designating the information confidential to show good cause for maintaining the information under seal. Other commenters recommended that the default protective order be entered automatically, and that the parties request authorization to file a motion to modify the default protective order.

Response: In promulgating the rules for the treatment of confidential information in an AIA proceeding, the Office attempted to strike the proper balance between protecting the discloser's confidential information and the rights of others to use that information. There is a strong public policy in favor of making information filed in an AIA proceeding open to the public, especially because the proceeding determines the patentability of claims in an issued patent and, therefore, affects the rights of the public. Nonetheless, if a party wishes the Board to consider truly sensitive information in making a patentability determination, the current rules provide a mechanism for the party to seek protection of that information from public disclosure by providing for motions to seal and the filing of a proposed protective order. 37 CFR 42.54.

With respect to the specific situation identified by the commenters regarding the filing of an opponent's confidential information, the current rules provide mechanisms to maintain confidentiality of such information. For example, under Rule 42.14, information subject to a motion to seal is "provisionally sealed on receipt of the motion and remain[s] so pending the outcome of the decision on the motion." Following the filing of the motion to seal, an opponent may contact the Board and raise concerns regarding the other party's motion and the confidentiality of the opponent's information while the information is provisionally sealed. Further, under Rule 42.54, if applicable, the Board may issue an order to protect a party or person from disclosing confidential information, including "[f]orbidding the disclosure or discovery." Moreover, to the extent that confidential information may have been improperly filed, Rule 42.56 provides for the expungement of this information from the record.

Additionally, a party need not wait for the filing of a motion to seal or proposed protective order to bring issues of confidentiality to the Board's attention. Parties are encouraged to discuss discovery matters, including the discovery of confidential information, early in proceedings to resolve potential disputes before these occur. These discovery matters include whether a protective order is necessary for the proceeding. The automatic entry of a protective order in every proceeding is not necessary, especially as the majority of evidence in these contested proceedings is non-confidential. Nevertheless, should the parties desire more or less protection than that provided by the default order in the Office Trial Practice Guide (Appendix B), the parties are always free to propose a stipulated protective order for consideration by the Board. The purpose of the default order is to encourage the parties to reach such agreements promptly, as lengthy disputes over complex protective order provisions are inconsistent with the legislative goal of providing a more efficient, less costly alternative to litigation. As always, if the parties are unable to come to agreement on any issue, the Board is available to provide guidance.

In light of the above, the Office does not propose any rule change in response to these comments. However, the Office appreciates the comments directed to affording the "opponent" an opportunity to explain why the evidence is confidential and placing the burden on the designating party to show good cause in sealing the information. The Office agrees it is reasonable that the party designating information as confidential is in the better position of explaining that designation and bearing the burden of maintaining confidentiality. Accordingly, the Office will revise the protective order in the Office Trial Practice Guide to include language addressing this concern.

Comment 3: Several commenters recommended the use of word count instead of page limits.

Response: This comment is adopted for the petition, preliminary response, patent owner response, and petitioner's reply brief. For all other briefing, a page limitation will be maintained. This change will allow the Office to gain administrative efficiencies. For example, with the use of word counts for the main briefing for AIA proceedings, petitions will no longer be reviewed to determine if any claim charts contain argument. This will streamline administrative review of petitions and reduce the number of non-compliant petitions that require correction.

Comment 4: One comment suggested that a petition page limit should be determined by the number of claims challenged to avoid the filing of multiple petitions on a single patent. Another comment has favored an alternative approach that provides automatic page extension tied to excess claim fees.

Response: This comment is not adopted. Based on the Board's experience, considering solely the number of claims at issue to determine a page limit for a petition does not provide sufficient flexibility in a petition to present "the precise relief requested" and "the reasons for the relief requested, including a detailed

explanation of the significance of the evidence including material facts, and the governing law, rules, and precedent" as required under Rule 42.22(a). Although, the number of claims at issue may affect the length of a petition, more often, the page length is governed by the discussion of the substantive unpatentability issues presented. In the Board's experience, the substantive issues for multiple claims in the same patent involve similar discussions of technology, claim construction, and prior art references. The Office expects that the word limits for *inter partes* review petitions, covered business method patent review petitions, and post-grant review petitions will be sufficient in all but exceptional cases. Furthermore, petitioners may seek waiver of the word limits in appropriate circumstances. 37 CFR 42.24(a)(2).

Comment 5: The Office received several comments regarding the use of claim charts. One commenter suggested claim charts should be attached separately from a petition and should not count toward the page limit. Other commenters requested clarification on the permitted contents in claim charts. For example, one commenter suggests that claim charts only include quotations from and citations to the prior art. Another commenter suggested allowing citations to declarations in the claim chart to support arguments as long as the declaration does not "bootstrap arguments not also presented in the briefing."

Response: In considering the use of claim charts, the Office has always been mindful of the concerns that claim charts may be used improperly by parties to circumvent page limits. Indeed, claim charts have been improperly used by parties to present attorney arguments and the incorporation by reference of evidence and arguments (*e.g.*, copious citations to declarations) that would otherwise exceed the page limits if provided elsewhere in briefing. As explained in the Board's frequently asked questions, D12, "[p]lacing one's argument and claim construction in a claim chart to circumvent the double spacing requirement is not permitted, and any such argument or claim construction may not be considered by the Board." Further, D12 explains the "Board previously accepted a few petitions with claim charts that included claim constructions, arguments, and explanations as to how the claim is unpatentable because the procedure for filing AIA petitions was new. However, correction is now required when a petition includes improper usage of claim charts." With the advent of the change from page limits to word count for the petition, patent owner preliminary response, patent owner response, and reply brief, however, a party could present its case by including argument in claim charts.

Comment 6: Several comments proposed allowing petitioners to file a reply brief responsive to the patent owner's preliminary response. Commenters suggest that the ability to file a reply brief will provide a more complete record, reduce the burden on the Office, and reduce the number of requests for rehearing filed by petitioners. Another comment, however, contends this proposed practice at the preliminary stage of the review would afford petitioners an unfair advantage in including arguments in the reply not addressed in the petition.

Response: The Office does not adopt the proposal of a petitioner's reply as of right in the pre-institution phase of an AIA review. Adding a reply as of right to the record at the preliminary stage would increase the burden on Office review by introducing additional arguments into the record not presented in the petition, which is the focus of the institution decision. Further, under Rule 42.5 the Office exercises discretion in administering the proceedings to balance the ideal of precise rules against the need for flexibility to achieve reasonably fast, inexpensive, and fair proceedings. Accordingly, the Board will continue to consider a petitioners' requests for filing reply briefs on a case-by-case basis, such as in response to testimonial evidence submitted by a patent owner in its preliminary response.

Comment 7: Several comments proposed increased page limits for the petitioner's reply to patent owner's response. Other comments suggested allowing patent owners to file a surreply to the petitioner's reply to patent owner's response addressing new issues that appear in replies. Another comment proposed replacing the motion for observations with a surreply.

Response: The Office has recently issued rules that adopt the proposed change for increasing the page limit of the petitioner's reply to twenty-five (25) pages. The Office does not adopt the other proposed changes regarding surreplies. The Office Patent Trial Practice Guide provides that "a reply that raises a new issue or belatedly presents evidence will not be considered and may be returned." Thus, a surreply is not required to address new issues raised in a petitioner's reply because such new issues are not considered by the Board.

Comment 8: Several comments advised against implementing mandatory settlement discussions that impact the statutory timeline for AIA proceedings. Other comments agreed with the Board's approach of encouraging but not requiring settlement discussions. Further comments advised that additional Board resources should not be expended on promoting settlement. Additionally, other commenters disagreed on whether a proceeding should be terminated following settlement.

Response: The Office agrees with comments recommending the encouragement of settlement and often includes a meet-and-confer requirement in a Scheduling Order. Additionally, the Office notes that the extent of the Board's involvement in settlement discussions, if any, will be determined on a case-by-case basis, especially where the parties request such involvement.

With respect to the issue of termination following settlement, current Rule 42.74 provides the Board with discretion to determine issues of unpatentability after a settlement in a proceeding. In the Board's experience, this rule allows the Board greater flexibility to balance the public interest in resolving issues of unpatentability with the need to efficiently allocate Board resources. Thus, the Office does not adopt any rule change.

Comment 9: The Office received a number of comments suggesting that the Board designate more decisions as precedential or informative to improve consistency of Board decisions, although one commenter suggested that the Office should not announce policy changes inferentially, for example, by selectively publishing decisions as informative. One commenter suggested the assignment of an assistant chief judge to identify precedential and informative decisions, and the promulgation of a rule-based designation process. Another commenter advocated revising SOP 2 to streamline the designation process.

Response: The Office does not adopt these changes. Standard Operating Procedure 2 (rev. 9) ("SOP 2") provides that any member of the Board may recommend to the Chief Judge that an opinion be designated as precedential or informative. This procedure ensures that all members of the Board, and not just an assigned member, have the opportunity to nominate a case of which others may not be aware. Further, SOP 2 provides that parties to a proceeding or a third party member of the public may, within 60 days of issuance of an opinion, request that the opinion be

made precedential. This procedure further engages stakeholders in the process of maintaining consistency at the Board by bringing cases of interest to stakeholders to the Board's attention. Additionally, the Office does not adopt a rule-based approach given that SOP 2 provides clear and sufficient guidance on the procedures taken at the Board for the designation of cases as informative or precedential.

Also, in addition to the informative and precedential decisions, the Board further provides a list of representative orders and decisions at *http://www.uspto.gov/patents-application-process/appealing-patent-decisions/decisions-and-opinions/representative-orders*. Although not informative or precedential, representative orders and decisions provide guidance on the Board's treatment of recurring issues in AIA proceedings. *See* Standard Operating Procedure 2 (Rev. 9) (explaining distinction between routine, representative, informative, and precedential), *http://www.uspto.gov/sites/default/files/documents/sop2-revision-9-dated-9-22-2014.pdf*.

Comment 10: One commenter suggested that the Office Patent Trial Practice Guide should be updated periodically.

Response: The Office is currently working on a revised Office Patent Trial Practice Guide that will be published with the final rulemaking for these proposed rules. The Office further expects revisions to the Office Patent Trial Practice Guide will be issued as needed in the future.

Comment 11: Several commenters advocated improvements to the Board's Web site and docketing case system. Suggestions included the integration of the PTAB docketing system with Patent Application Information Retrieval ("PAIR"), improvements to Patent Review Processing System ("PRPS") searching capabilities and user interface, and increased availability of statistics concerning AIA proceedings. One commenter suggested that all final written decisions should be uploaded into PAIR.

Response: The Office has considered the commenters' suggestions and is working with vendors to improve PRPS and provide additional functionality such as searching in the case docketing system. With respect to integration with PAIR, after the issuance of a final written decision in an AIA proceeding, the final written decision also is uploaded into PAIR. In the Office's experience, this provides sufficient continuity of information between PRPS and PAIR. Additionally, the Office posts all final Board decisions to the Office's eFOIA site at *http://e-foia.uspto.gov/Foia/PTABReadingRoom.jsp*, and has endeavored to maintain up-to-date and archived statistics on AIA proceedings, available at *http://www.uspto.gov/patents-application-process/patent-trial-and-appeal-board/statistics*. Thus, at this time no changes to the availability of statistics or the underlying data are adopted.

Comment 12: Several commenters expressed concern about the Office's practice of allowing institution based on some, but not all, of the grounds presented in a Petition. Commenters are concerned that because the decision on institution is not appealable, and any ground on a challenged claim that is not instituted is not reflected in the final, appealable decision, a petitioner has no redress for grounds on which the Office chooses to not institute. Also, one commenter suggested, allowing claim amendments for any "challenged" patent claim as contemplated by the AIA would be at odds with a practice where all challenged claims may not be in a trial. A commenter suggested shifting the redundancy determination to the final written decision, so that such a decision is appealable. One commenter stated that redundancy should not be applied where grounds are in different statutory classes, or when a reference can be sworn behind. Another commenter suggested requiring patent owner to submit a claim construction at the preliminary stage so that the Office could render a definitive construction in its decision on institution, subject to broadening in view of claim construction opinions in concurrent litigation, and avoid redundancy determinations between grounds under sections 102 and 103, that may prove during trial to be unduly constraining.

Response: The Office appreciates the concerns expressed by the comments, but must balance these concerns with the workload in AIA proceedings and the statutory time constraints under which AIA review proceeding must be decided. In order to ensure a fair and efficient process to resolve reviews in a timely fashion, the Office uses partial institution as one tool to manage effectively AIA reviews. The Office is cognizant of the ramifications of partial institution where the grounds are in different statutory classes, or when a reference may be overcome by swearing behind it, and strives to strike an appropriate balance between what can be accomplished during the finite time frame for a trial and fairness to the parties in fully vetting patentability issues on challenged claims. The Office will continue to assess whether such balance is appropriately struck.

Comment 13: One commenter suggested that the scope of estoppel under 37 CFR 42.73(d)(3) is too broad because it encompasses a finally refused or cancelled claim of a patent owner in an AIA review as prior art to be used against the patent owner, and may not allow a patent owner to pursue narrower, patentably distinct claims in a separate reissue, reexamination, or continuing application. Another commenter requested that the Office should maintain its rules regarding patentee estoppel to prevent a patentee from seeking new, but patentably indistinct claims in another proceeding before the Office. Commenters also requested clarification of the estoppel rule to make clear that an estoppel does not arise where an amendment is proposed, but not granted.

Response: The Office appreciates the comments, but does not propose any rule change in response. The rule that the comment addresses, 37 CFR 42.73(d)(3), appropriately precludes an applicant or owner from obtaining a claim that is not patentably distinct from a finally refused or canceled claim.

Comment 14: Several commenters were concerned with a panel's perceived reluctance to revisit a decision, whether on rehearing or on final written decision after institution. One commenter suggested that the Office should consider designating one Administrative Patent Judge ("APJ") for the decision on institution and a panel of three APJs for the corresponding AIA trial because of a real or perceived challenge for panel members to remain impartial in conducting an AIA trial on the merits when they participated in the decision to institute the trial. The commenter further stated that having the same three APJs consider an incomplete, preliminary record to decide institution, and subsequently issuing a final written decision based on the complete trial record, creates an actual or perceived bias against the patent owner. Another commenter suggested that the panel that institutes should be different from the panel that makes a final decision on the merits because it would increase due process protections, reduce any bias or perception of bias, and more fully meet AIA requirements by avoiding any blurring of the distinction between the threshold standard for institution and the higher standard for a determination on the merits of patentability. Several commenters suggested that requests for rehearing should be freely allowed and an expanded panel of APJs should be used to have "another set of eyes" to

ensure that rehearing requests will be duly considered, with another commenter suggesting that a completely different panel of APJs should consider requests for rehearing. Another commenter suggested that the Office should clarify what types of decisions are appropriate for an expanded panel review. One commenter asked for a requirement that a party requesting rehearing should file a statement specifically identifying conflicting Board or court decisions. Another commenter suggested that a reply brief for a petitioner should be allowed before a decision on institution is made, rather than relying on the availability of a request for rehearing that has a deferential standard, because the panel that decided the original decision may be reluctant to revisit it.

Response: The Office believes that the panel deciding whether to institute an AIA proceeding is not predisposed to rule in favor of any party, whether the petitioner or patent owner, and that each panel applies the appropriate legal standard to make a fair and unbiased decision based upon the evidence and arguments of record. In response to these comments and to explore gaining further efficiencies in AIA proceedings, however, the Office may seek, in a separate Request for Comments, comments on a proposed pilot program under which the determination of whether to institute an IPR will be made by a single APJ, with two additional APJs being assigned to the IPR if a trial is instituted. In that separate Request for Comments, the Office also may seek comments on any other issues relevant to fair and efficient decision making.

The Office recently has revised SOP1 to describe situations in which an expanded panel may be utilized, where the decision to expand a panel is made on a case-by-case basis. In SOP1, the Office has included reasons that may warrant expansion of a panel. This guidance may be found on the Office's Web site at: *http://www.uspto.gov/sites/default/files/documents/SOP1%20-%20Rev.%2014%202015-05-08.pdf.* Also, a petitioner always has the ability to request that a panel authorize the filing of a reply brief at the preliminary stage. Although a petitioner is not afforded a reply brief as of right before institution, the Office has provided in these proposed rules an explicit provision affording an opportunity to seek permission to file a reply brief to respond to a preliminary response that presents testimonial evidence.

A request for rehearing is an opportunity to address whether a panel misapprehended or overlooked a matter in rendering its opinion, which may include identification of conflicting Board or court decisions, but does not necessitate such a statement. *See* 37 CFR 42.71(d). Requiring a moving party to identify all matters the party believes the Board misapprehended or overlooked, and the place where each matter was previously addressed in a motion, an opposition, or a reply is appropriate for a rehearing request. *See id.*

Comment 15: Two commenters sought a more generous schedule for parties to conduct the trial and advocated a more proactive management of the trial by earlier rulings on interlocutory motions, such as motions to amend, claim construction disputes, and motions to exclude, to narrow the issues for trial.

Response: Although there is discretion in how to schedule due dates for an AIA trial, the Office is cognizant of the constraints on parties to engage in and complete discovery in a timely manner. To that end, the standard Scheduling Order generally entered in each case allows the parties to stipulate to adjustment of deadlines for the filing of patent owner's response, petitioner's reply, briefing for any motion to amend, and briefing on any motions for observations and any motion to exclude except for the reply briefs for the motion to exclude (due dates 1 through 5). If a problem arises in meeting the schedule set forth by the Office on dates for which the parties may not stipulate to a change or on which the parties do not agree to a new date, the parties are encouraged to contact the Office to resolve the issue. The Office continues to review the AIA proceedings to assess where efficiencies may be gained for both the Office and the parties, but does not contemplate at this time requiring resolution of interlocutory motions at certain points in the trial timeline. As always, should any party believe that a particular motion in a case warrants early attention to resolve an issue that will truncate the proceeding, such party is invited to bring that issue to the attention of the Office in that case.

Comment 16: One commenter suggested changing 37 CFR 42.20(c) to refer to both the burden of proof and persuasion, and to refer to the burden being placed on the "petitioning or moving" party, as opposed to "moving party" only.

Response: The Office appreciates the comment, but declines to amend the rule.

Comment 17: One commenter suggests that further training of APJs in the payments industry may be necessary for those working on covered business method patent reviews. Another commenter suggests that 37 CFR 42.301(b) should be amended to reflect that both factors for determining a technological invention must not exist for a claim to be found to fail to define a "technological invention."

Response: The Office appreciates these comments and continues to assess the training needs for employees. The Office declines to amend 37 CFR 42.301(b) as it reflects properly the standard for determining whether a patent is for a technological invention.

Comment 18: One commenter advocates application of an issue preclusion analysis in deciding whether to adopt a prior claim construction in another proceeding.

Response: Although the Office considers prior claim constructions rendered in another proceeding, the Office is mindful that the Board follows a different claim construction approach than that of district courts, and the evidentiary record in the later AIA proceeding may be different than the one in the prior proceeding. Therefore, a strict issue preclusion analysis would not be appropriate for every case. The Office will determine the claim construction on a case-by-case basis depending on the facts presented in the particular proceeding.

Comment 19: Several commenters had suggestions for deposition practice before the Office in AIA trials. One commenter suggested that 37 CFR 42.53(d)(4) is too restrictive by requiring a notice of deposition to be filed at least 10 days before a deposition takes place, because in practice, parties often do not agree on the place and time of a deposition within this time frame. Another commenter asked for clarification concerning when counsel may object to a line of questioning in a deposition as beyond the scope of the witness's direct testimony. Two commenters requested clarification of 37 CFR 42.53(g) governing which party should bear the costs associated with the testimony of a witness. Another commenter seeks a blanket prohibition on a party's ability to confer with a witness during the deposition, especially between cross-examination and re-direct, which the commenter asserts encourages rehearsal of testimony for re-direct.

Response: The Office appreciates these comments. The Office invites further comment on how to amend section 42.53(d)(4). For instance, should the rule be amended to reduce the amount of lead time for filing a notice of deposition before the deposition, allow the parties to stipulate to the timing for filing, or allow both options? Determining when a party's line of questioning in a deposition is beyond

the scope of the deposition is best handled on a case-by-case basis, and the Office is amenable to handling timely these issues as they arise in a deposition. The Office has provided guidance on which party should bear the costs associated with the testimony of a witness in the Office Patent Trial Practice Guide in discussing witness expenses associated with discovery. *See* 77 FR at 48761. The Office invites further comment on any additional clarification that is needed. The Office appreciates the comment concerning when a party may confer with its witness during a deposition, but believes that the guidance in the Office Patent Trial Practice Guide strikes the correct balance concerning when a party may confer with its witness.

Comment 20: One commenter suggested that a patent owner be required to serve any evidence regarding authentication or public availability of a prior art reference on which trial has been instituted, concurrent with any objections the patent owner is making to the petitioner's evidence.

Response: The Office appreciates the comment. The rules currently provide that unless previously served, a party must serve relevant information that is inconsistent with a position advanced by the party during the proceeding concurrent with the filing of the documents or things that contains the inconsistency. *See* 37 CFR 42.51(b)(1)(iii). Therefore, a patent owner advancing the position that evidence is not authentic or was not available publicly has an obligation to serve this information on the petitioner.

Comment 21: To facilitate electronic filing, one commenter suggested that backup counsel's login credentials should be able to be used for filing documents and that service may be made to electronic mail addresses specified in the mandatory notices without requiring agreement of the parties.

Response: The Office appreciates the suggestions and is working to improve its electronic filing and case management system. Parties are now permitted to identify one backup counsel who will have the same permissions as lead counsel and be permitted to file documents in the system. Parties may identify additional backup counsel, but only the lead counsel and first backup counsel may file documents. With respect to service under § 42.6(e), the Office believes that the ability to serve electronically should remain optional upon agreement of the parties, rather than mandatory, to accommodate users who do not use electronic mail regularly or who prefer service by mail.

Comment 22: Two commenters questioned how experts are utilized in AIA proceedings. One commenter favors significant sanctions for counsel to author a report that an expert signs without authorship. A second commenter seeks amendment of 37 CFR 42.65(a) to require that an unsupported expert report be entitled to "no weight."

Response: The authority of the Office to sanction a party for misconduct, *see* 37 CFR 42.12, including abuse of process or any other improper use of the proceeding, is robust, and the Office proposes adding a Rule 11-type certification for all papers filed with the Board with a provision for sanctions for noncompliance that would apply to practitioners as well as parties. Therefore, the Office has the ability to sanction inappropriate conduct that is brought to its attention. The Office declines to amend 37 CFR 42.65(a) to require that an unsupported expert report must be entitled to "no weight."

Comment 23: One commenter stated that an Office decision nullifying the claims of a patent or an affirmance of such a decision should operate to trigger the failure-to-market forfeiture provisions under 21 U.S.C. 355(j)(5)(D)(i)(I).

Response: The Office appreciates the comment, but as the commenter recognizes, such a request is beyond the Office's jurisdiction to accomplish.

Comment 24: Several commenters expressed concern about the perception of overall fairness of AIA proceedings to both the petitioner and patent owner. For instance, several commenters expressed concern that the Office is more concerned with the speed and efficiency with which it handles AIA proceedings than with the perception of fairness of the proceedings to all involved parties. Several commenters expressed a perception that AIA proceedings are skewed in favor of petitioner.

Response: The Office appreciates these comments and continues to actively engage with the public and practitioners who utilize AIA proceedings, as the Office has done with this notice of proposed rulemaking, to continually monitor the fairness of the proceedings for all involved parties, as well as examining ways to ensure that the process is as efficient and fair as possible under the congressional mandate. For instance, in the Office's "Quick-Fix" rulemaking, the Office provided for additional pages for briefing for motions to amend and the petitioner's reply brief and provided for a claims appendix. The Office has also issued further guidance on motions to amend through decisions, such as *MasterImage 3D, Inc.* v. *RealD Inc.*, Case IPR2015–00040 (PTAB July 15, 2015) (Paper 42), and currently proposes allowing Patent Owners to present new testimonial evidence at the preliminary stage of the proceeding. The Office also is proposing a word count for major briefing to allow the parties to present arguments and evidence to the Office in a way that the party deems is most effective, and is proposing a Rule-11 type certification be applied to police the actions of counsel, as well as parties, in AIA proceedings. Based upon input from the public and experience with the proceedings, the Office will continue its efforts to make the proceedings as fair and effective as possible under congressional mandate.

Comment 25: One commenter expressed concern over use of AIA proceedings by a second petitioner that uses prior art or arguments from a previously filed petition and expressed concerns about consistency in the joinder process. This commenter suggested assigning the second petitioner the role of junior party, who should not be allowed to continue the proceeding if the original petitioner and patent owner successfully settle the AIA proceeding.

Response: The Office appreciates these comments, and notes that the Office has the discretion concerning whether to institute an AIA review and the authority to decline to institute where the same or substantially the same prior art or arguments were previously presented to the Office. *See* 35 U.S.C. 314(a), 315(d), 324(a), 325(d). Although the Office strives for consistency in the treatment of parties before the Office, the Office declines to adopt the suggestion to assign a second petitioner, asserting similar argument or prior art as a first petitioner, the role of "junior party" and to discontinue a proceeding if the original petitioner and the patent owner settle their dispute. The Office will not terminate a proceeding that has not been settled as to all parties because each party is entitled to assert its interest in the proceeding.

Comment 26: Commenters suggested eliminating the proposed statement of material facts option in 37 CFR 42.22 and 42.23 because it is not used often and panels have differed as to whether such statements are counted in the page limits.

Response: The Office appreciates this comment, but declines to adopt it in order to maintain the option of a party to choose to file a proposed statement of material facts. *See* 37 CFR 42.24

(including any statement of material facts to be admitted or denied in support of a petition or motion in the page limits).

Comment 27: Several commenters expressed concern over the use of demonstrative exhibits. For instance, one commenter wanted the timing for exchanging demonstratives that allows parties to address objections and achieve resolution before the oral hearing. Another commenter seeks to be able to use argument in demonstratives with proper citation, and another commenter states that striking of demonstratives should be very rare and that problems with demonstratives should go to the weight to be accorded.

Response: The Office appreciates the comments and understands the difficulty in resolving disputes concerning demonstrative exhibits. The Office believes, however, that the most efficient way to handle such disputes is on a case-by-case basis with the panel for the case.

Comment 28: One commenter encourages the Office to continue outreach by roundtables and webinars.

Response: This comment is adopted. The Office continues to host Board-side chats, road shows, and lunch-and-learn programs that will begin in the fall of 2015. The Office considers these interactive programs to provide valuable input into how to improve the fairness and effectiveness of the AIA proceedings.

Comment 29: Two commenters ask that the patent owner's preliminary response be made mandatory for certain disclosures such as claim construction and antedating of references, which will merely shift the timeframe in which a patent owner must present such information and argument.

Response: The Office appreciates this comment. In this proposed rulemaking, the Office proposes allowing a patent owner to present new testimonial evidence with the patent owner preliminary response, which may encourage patent owners to participate in the preliminary phase by filing such a response and addressing issues raised in the petition with argument and supporting evidence. The Office declines, however, to make a patent owner preliminary response mandatory in light of the statutory framework of AIA, which provides a patent owner a right to file a preliminary response. *See* 35 U.S.C. 313.

Comment 30: One commenter requested that guidance in the Office Patent Trial Practice Guide that is not reflected in any rule, be incorporated into a rule, and that criteria for *pro hac* vice motions that are reflected in current case law be incorporated into a revised rule.

Response: The Office appreciates these comments. The Federal Circuit recognizes that "the choice between rulemaking and adjudication lies in the first instance within the agency's discretion." *Microsoft Corp.* v. *Proxyconn, Inc.*, 789 F.3d 1291 (Fed. Cir. 2015) (citing *NLRB* v. *Bell Aerospace Co. Div. of Textron*, 416 U.S. 267, 294 (1974)) (internal quotation marks omitted). At this time, an effective and efficient way to provide guidance to practitioners is through the Office Patent Trial Practice Guide and through adjudication—the development of case law that resolves specific issues in light of specific facts before the Office. The Office will continue to develop guidance through these avenues, as well as through rulemaking, where appropriate.

Comment 31: Several comments addressed formatting for briefing in AIA proceedings. For instance, one commenter asks that the requirement that each page of an exhibit be uniquely numbered in sequence be amended to apply only if such page numbering does not exist already on the document to avoid confusion as to which numbering scheme is referenced in a brief. Another commenter asked that block quotes be single spaced, and that incorporation by reference be allowed at a panel's discretion when the same argument from another proceeding is applicable.

Response: The Office appreciates the comments, but declines to adopt them. Rule 42.63(d)(2)(i) requires that each page of an exhibit must be uniquely numbered in sequence, but does not require a new set of unique numbers be applied to an exhibit for which unique numbers exist. The Office proposes using a word count for major briefing, which would negate any advantage for using single spacing for a block quote, and the Office requires 1.5 spaced block quotations for readability. *See* 37 CFR 42.6(a)(2)(iii). The Office declines to allow incorporation by reference at the panel's discretion because such incorporation may subvert the page or word limit and each proceeding should be self-contained within the docket for that proceeding for efficiency and completeness.

Comment 32: Another commenter suggested that the Office allow the parties to file papers, such as claim construction orders or other statements from co-pending litigation, as supplemental information.

Response: The Office appreciates that claim construction orders and other papers from co-pending litigation could be helpful to resolve the parties' disputes in the proceeding before the Office in certain situations. From the Office's experience, petitioners had submitted such papers with their petitions to support their proposed claim constructions. Similarly, patent owners proffered district court's claim construction determinations with their preliminary responses or patent owner responses in support of their position on patentability. In fact, parties may file co-pending litigation papers to support their motions, oppositions, or replies. Parties also may seek leave to file a motion to submit supplemental information pursuant to § 42.123, but such papers must be relevant to a claim for which the trial has been instituted.

Comment 33: One commenter suggested a clarification in 37 CFR 42.121(b)(1) to change the "support in the original disclosure of the patent" to the "support in the original disclosure of the application from which the patent issued."

Response: The Office appreciates this comment, but does not adopt it as the rule, as applied, is clear.

Comment 34: Several comments were directed to the treatment of sole inventors and small entities. One commenter asked for more guidance for independent inventors or small business who may want to utilize the AIA proceedings *pro se*. For instance, the commenter stated that AIA proceedings should be no more onerous than prosecution before the Office, should be affordable, fair, and accessible for smaller companies, and should be preferential to small entities and sole inventors, who spend a greater percentage of time and capital securing patents than larger entities.

Response: The Office does not adopt these proposals. The Office was not given authority to provide for small entity and micro-entity filing fee reduction for reviews under AIA. The current filing fee schedule, available at *http://www.uspto.gov/learning-and-resources/fees-and-payment/uspto-fee-schedule*, takes into account the costs and expenses for maintaining the operation of the Office, and in particular, the operation of the Board in conducting AIA proceedings. The Office also provides guidance for AIA proceedings through its Office Patent Trial Practice Guide and on its Web site.

Comment 35: One commenter suggested that the Office should encourage Congress to expand the scope of AIA proceedings by advocating that Congress include section 101 challenges in *inter partes* reviews, make covered business method patent reviews permanent, and expand covered

business method patent reviews to include a broader variety of patents.

Response: The Office remains open to all ways of strengthening our patent system and appreciates the comment, and notes that these issues were considered by Congress during the legislative process for AIA.

Comment 36: One commenter proposed that the Office amend Rule 42.52(d)(2) to state that cross-examination should ordinarily take place after any supplemental evidence relating to the direct testimony has been *served*, as opposed to *filed*, because supplemental evidence is *served* under Rule 42.64(b)(2), and not *filed* until after a motion to exclude has been filed, which occurs well after most depositions have taken place. Another commenter suggests requiring filing of supplemental evidence as exhibits versus just serving.

Response: The Office will adopt these comments and resolve the issue presented, but seeks further comment on the best way to resolve the issue. For instance, should the Office amend Rule 42.52(d)(2) as suggested or amend Rule 42.64(b)(2) to require that supplemental evidence be filed as opposed to served?

Comment 37: Several commenters expressed views concerning the types of arguments to be made in AIA proceedings. For instance, one commenter suggested that the Office should distinguish between appropriate analysis and inappropriate "argument" in claim charts. A second commenter sought a limitation on the number of invalidity arguments. Another commenter wanted clarification of the rules that a patent owner is also under a burden to support affirmative factual statements with evidence.

Response: The Office appreciates the comments. In the current proposed rule, the Office proposes to use a word count for major briefing, such as the petition, patent owner preliminary response, patent owner response, and petitioner's reply. A change from page limits to word count for major briefing allows the parties to structure arguments in briefing in any way that the party deems best for presenting its case to the Office, including presenting analysis and arguments in claim charts. Because the Office has the discretion under 35 U.S.C. 314(a) and 324(a) whether to institute an AIA trial and takes the opportunity at institution to focus the trial on grounds which meet the threshold standards in 35 U.S.C. 314(a) and 324(a) and which reasonably may be decided within the statutory imposed time-frame for the trial, the Office declines to place a limitation on the number of grounds that a petitioner may present. Also, if patent owner does not support affirmative factual statements with evidence, such statements will be given little or no weight.

Rule 11-Type Certification

To further attempt to prevent any misuse of the AIA proceedings, the Office proposes to amend § 42.11, which prescribes the duty of candor owed to the Office, to include a Rule 11-type certification for all papers filed with the Board with a provision for sanctions for noncompliance. The Board also may refer possible misconduct in the course of AIA proceedings to the Office of Enrollment and Discipline for investigation and, if warranted, further proceedings under 37 CFR 11.19–11.61.

Recognizing Privilege for Communications With Domestic Patent Agents and Foreign Patent Practitioners

In 2015, the Office launched an outreach initiative to explore various issues associated with confidential communications with patent agents or foreign patent practitioners. The Office published a notice convening a roundtable in February 2015 and requesting public comments. *See* Domestic and International Issues Related to Privileged Communications Between Patent Practitioners and Their Clients, 80 FR 3953 (Jan. 26, 2015). Nineteen parties submitted written comments in response to the **Federal Register** notice, which are available on the USPTO Web site at: *http://www.uspto.gov/learning-and-resources/ip-policy/roundtable-domestic-and-international-issues-related-privileged*. Some of these comments raised the issue of unclear or inconsistent privilege rules for agents and foreign practitioners during discovery in PTAB proceedings.

Consistent with that earlier outreach initiative, the Office here seeks comments on the subject of attorney-client privilege or other limitations on discovery in PTAB proceedings, including on whether rules regarding privilege should be issued in connection with PTAB proceedings. Such rules could, for example, explicitly recognize privilege for communications between patent applicants or owners and their domestic patent agents or foreign patent practitioners, under the same circumstances as such privilege is recognized for communications between applicants or owners and U.S. attorneys. The Office invites the public to provide any comments on language, scope, or other considerations for creating such a privilege, including possible amendments to any of 37 CFR 42.51, 42.52, 42.55, 42.62, or 42.64 to accomplish this purpose.

Discussion of Specific Rules

Subpart A—Trial Practice and Procedure

Claim Construction Standard

The Office proposes to amend 37 CFR 42.100(b), 42.200(b), and 42.300(b) as follows:

- Amend 37 CFR 42.100(b) to add the phrase "that will not expire before a final written decision is issued" after "an unexpired patent."
- Amend 37 CFR 42.200(b) to add the phrase "that will not expire before a final written decision is issued" after "an unexpired patent."
- Amend 37 CFR 42.300(b) to add the phrase "that will not expire before a final written decision is issued" after "an unexpired patent."

The Office will add further clarifying instructions in the Office Patent Trial Practice Guide concerning how a petitioner may determine which standard to apply in the petition.

Patent Owner Preliminary Response

The Office proposes to amend 37 CFR 42.107(a) to provide that the patent owner is not prohibited from including new testimonial evidence with a preliminary response and that the patent owner's preliminary response to the petition is subject to the word count under 37 CFR 42.24. See the proposed text in the amendatory instructions below.

The Office proposes to amend 37 CFR 42.107 to delete paragraph (c) so that the patent owner is not prohibited from including new testimonial evidence with a patent owner preliminary response.

The Office proposes to revise 37 CFR 42.108(c) provide that the Board's decision whether to institute an *inter partes* review will take into account a patent owner preliminary response where such a response is filed, but supporting evidence concerning disputed material facts will be viewed in the light most favorable to the petitioner for purposes of deciding whether to institute an *inter partes* review, and that the petitioner may seek leave to file a reply to the preliminary response. See the proposed text in the amendatory instructions below.

The Office proposes to revise 37 CFR 42.207(a) to provide that the patent owner is not prohibited from including new testimonial evidence with a preliminary response and that the patent owner's preliminary response to the petition is subject to the word count under 37 CFR 42.24. See the proposed text in the amendatory instructions below.

The Office proposes to amend 37 CFR 42.207 to delete paragraph (c) so that the patent owner is not prohibited from including new testimonial evidence with a patent owner preliminary response.

The Office proposes to revise 37 CFR 42.208(c) provide that the Board's decision whether to institute a post-grant review will take into account a patent owner preliminary response where such a response is filed, but supporting evidence concerning disputed material facts will be viewed in the light most favorable to the petitioner for purposes of deciding whether to institute a post-grant review, and that the petitioner may seek leave to file a reply to the preliminary response. See the proposed text in the amendatory instructions below.

Oral Hearing

The Office proposes to amend 37 CFR 42.70(b) to require at least seven, not just five, days before oral argument for exchange of exhibits to provide additional time for the parties to resolve disputes concerning demonstrative exhibits.

Word Count

The Office proposes to amend 37 CFR 42.24 to implement a word count limitation for petitions, patent owner preliminary responses, patent owner responses, and petitioner's replies, by:

- Adding "Type-volume or" to the title;
- adding "word counts or" before the words "page limits" or "page limit" and adding "or word count" after "a certificate of service" in paragraph (a)(1);
- substituting "14,000 words" for "60 pages" in paragraphs (a)(1)(i) and (a)(1)(iv);
- substituting "18,700 words" for "80 pages" in paragraphs (a)(1)(ii) and (a)(1)(iii);
- substituting "word counts" for "page limits" and "word count" for "page limit" in paragraph (a)(2) except for the last sentence in which "word counts or" is added before "page limits;"
- adding "word counts or" before the "page limits" in paragraph (b);
- substituting "word counts" for the two instances of "page limits" in paragraph (b)(1);
- substituting "word counts" for the two instances of "page limits" in paragraph (b)(2);
- adding "word counts or" before the two instances of "page limits" and adding "or word count" after "a certificate of service" in paragraph (c);
- substituting "5,600 words" for "25 pages" in paragraph (c)(1);
- adding paragraph (d) concerning word count certification. See the proposed text in the amendatory instructions below.

Rule 11-Type Certification

The Office proposes to amend 37 CFR 42.11 to add "signing papers; representations to the Board; sanctions" to the title of the section, to designate existing text as paragraph (a), and to add paragraphs (b) through (d) to include a Rule 11-type certification for all papers filed with the Board with a provision for sanctions for noncompliance. See the proposed text in the amendatory instructions below.

Rulemaking Considerations

A. Administrative Procedure Act (APA)

This proposed rule would revise the consolidated set of rules relating to Office trial practice for *inter partes* review, post-grant review, the transitional program for covered business method patents, and derivation proceedings. The changes proposed in this notice do not change the substantive criteria of patentability. These changes involve rules of agency practice. *See, e.g.,* 35 U.S.C. 316(a)(5), as amended. These rules are procedural and/or interpretive rules. *See Bachow Commc'ns Inc.* v. *F.C.C.,* 237 F.3d 683, 690 (D.C. Cir. 2001) (rules governing an application process are procedural under the Administrative Procedure Act); *Inova Alexandria Hosp.* v. *Shalala,* 244 F.3d 342, 350 (4th Cir. 2001) (rules for handling appeals were procedural where they did not change the substantive requirements for reviewing claims); *Nat'l Org. of Veterans' Advocates* v. *Sec'y of Veterans Affairs,* 260 F.3d 1365, 1375 (Fed. Cir. 2001) (rule that clarifies interpretation of a statute is interpretive); *JEM Broad. Co.* v. *F.C.C.,* 22 F.3d 320, 328 (D.C. Cir. 1994) (rules are not legislative because they do not "foreclose effective opportunity to make one's case on the merits").

Accordingly, prior notice and opportunity for public comment are not required pursuant to 5 U.S.C. 553(b) or (c) (or any other law), and thirty-day advance publication is not required pursuant to 5 U.S.C. 553(d) (or any other law). *See Cooper Techs. Co.* v. *Dudas,* 536 F.3d 1330, 1336–37 (Fed. Cir. 2008) (stating that 5 U.S.C. 553, and thus 35 U.S.C. 2(b)(2)(B), do not require notice and comment rulemaking for "interpretative rules, general statements of policy, or rules of agency organization, procedure, or practice") (quoting 5 U.S.C. 553(b)(A)); *U.S.* v. *Gould,* 568 F.3d 459, 476 (4th Cir. 2009) ("The APA also requires publication of any substantive rule at least 30 days before its effective date, 5 U.S.C. 553(d), except where the rule is interpretive * * *."). The Office, however, is providing a sixty day comment period in order to seek the benefit of the public's views.

B. Regulatory Flexibility Act

For the reasons set forth herein, the Deputy General Counsel for General Law of the United States Patent and Trademark Office has certified to the Chief Counsel for Advocacy of the Small Business Administration that changes proposed in this notice will not have a significant economic impact on a substantial number of small entities. *See* 5 U.S.C. 605(b). The changes proposed in this document are to revise certain trial practice procedures before the Board. Any requirements resulting from these proposed changes are of minimal or no additional burden to those practicing before the Board. Specifically, proposed changes pertaining to representation would not present any additional burden as the duty of candor and good faith are already requirements under existing Board trial practice (37 CFR 42.11), USPTO rules of professional conduct, and, for those who are attorneys, applicable State bars. Second, changes imposed by converting certain page limits to word counts for petitions and motions are not expected to result in any material change to filings, other than the addition of a certification that the filing is compliant. Finally, the proposed changes pertaining to the inclusion of supporting evidence in a patent owner preliminary response to petition are not required to be filed, but merely available to parties should they choose. Moreover, the Office anticipates that the vast majority of those that will provide such supporting evidence during the petition review stage would have provided such information later anyway, if and when, a trial were instituted. For the foregoing reasons, the changes proposed in this notice will not have a significant economic impact on a substantial number of small entities.

C. Executive Order 12866 (Regulatory Planning and Review)

This rulemaking has been determined to be not significant for purposes of Executive Order 12866 (Sept. 30, 1993).

D. Executive Order 13563 (Improving Regulation and Regulatory Review)

The Office has complied with Executive Order 13563. Specifically, the Office has, to the extent feasible and applicable: (1) Made a reasoned

determination that the benefits justify the costs of the rule; (2) tailored the rule to impose the least burden on society consistent with obtaining the regulatory objectives; (3) selected a regulatory approach that maximizes net benefits; (4) specified performance objectives; (5) identified and assessed available alternatives; (6) involved the public in an open exchange of information and perspectives among experts in relevant disciplines, affected stakeholders in the private sector and the public as a whole, and provided on-line access to the rulemaking docket; (7) attempted to promote coordination, simplification, and harmonization across government agencies and identified goals designed to promote innovation; (8) considered approaches that reduce burdens and maintain flexibility and freedom of choice for the public; and (9) ensured the objectivity of scientific and technological information and processes.

E. Executive Order 13132 (Federalism)

This rulemaking does not contain policies with federalism implications sufficient to warrant preparation of a Federalism Assessment under Executive Order 13132 (Aug. 4, 1999).

F. Executive Order 13175 (Tribal Consultation)

This rulemaking will not: (1) Have substantial direct effects on one or more Indian tribes; (2) impose substantial direct compliance costs on Indian tribal governments; or (3) preempt tribal law. Therefore, a tribal summary impact statement is not required under Executive Order 13175 (Nov. 6, 2000).

G. Executive Order 13211 (Energy Effects)

This rulemaking is not a significant energy action under Executive Order 13211 because this rulemaking is not likely to have a significant adverse effect on the supply, distribution, or use of energy. Therefore, a Statement of Energy Effects is not required under Executive Order 13211 (May 18, 2001).

H. Executive Order 12988 (Civil Justice Reform)

This rulemaking meets applicable standards to minimize litigation, eliminate ambiguity, and reduce burden as set forth in sections 3(a) and 3(b)(2) of Executive Order 12988 (Feb. 5, 1996).

I. Executive Order 13045 (Protection of Children)

This rulemaking does not concern an environmental risk to health or safety that may disproportionately affect children under Executive Order 13045 (Apr. 21, 1997).

J. Executive Order 12630 (Taking of Private Property)

This rulemaking will not affect a taking of private property or otherwise have taking implications under Executive Order 12630 (Mar. 15, 1988).

K. Congressional Review Act

Under the Congressional Review Act provisions of the Small Business Regulatory Enforcement Fairness Act of 1996 (5 U.S.C. 801 *et seq.*), prior to issuing any final rule, the United States Patent and Trademark Office will submit a report containing the rule and other required information to the United States Senate, the United States House of Representatives, and the Comptroller General of the Government Accountability Office. The changes in this final rule are not expected to result in an annual effect on the economy of 100 million dollars or more, a major increase in costs or prices, or significant adverse effects on competition, employment, investment, productivity, innovation, or the ability of United States-based enterprises to compete with foreign-based enterprises in domestic and export markets. Therefore, this final rule is not a "major rule" as defined in 5 U.S.C. 804(2).

L. Unfunded Mandates Reform Act of 1995

The changes set forth in this rulemaking do not involve a Federal intergovernmental mandate that will result in the expenditure by State, local, and tribal governments, in the aggregate, of 100 million dollars (as adjusted) or more in any one year, or a Federal private sector mandate that will result in the expenditure by the private sector of 100 million dollars (as adjusted) or more in any one year, and will not significantly or uniquely affect small governments. Therefore, no actions are necessary under the provisions of the Unfunded Mandates Reform Act of 1995. *See* 2 U.S.C. 1501 *et seq.*

M. National Environmental Policy Act

This rulemaking will not have any effect on the quality of the environment and is thus categorically excluded from review under the National Environmental Policy Act of 1969. *See* 42 U.S.C. 4321 *et seq.*

N. National Technology Transfer and Advancement Act

The requirements of section 12(d) of the National Technology Transfer and Advancement Act of 1995 (15 U.S.C. 272 note) are not applicable because this rulemaking does not contain provisions which involve the use of technical standards.

O. Paperwork Reduction Act

The Paperwork Reduction Act of 1995 (44 U.S.C. 3501–3549) requires that the Office consider the impact of paperwork and other information collection burdens imposed on the public. This final rule involves information collection requirements which are subject to review by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501–3549). This rulemaking does not add any additional information requirements or fees for parties before the Board. Therefore, the Office is not resubmitting information collection packages to OMB for its review and approval because the revisions in this rulemaking do not materially change the information collections approved under OMB control number 0651–0069.

Notwithstanding any other provision of law, no person is required to respond to, nor shall any person be subject to, a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB control number.

List of Subjects in 37 CFR Part 42

Administrative practice and procedure, Inventions and patents.

For the reasons set forth in the preamble, the Office proposes to amend 37 CFR part 42 as follows:

PART 42—TRIAL PRACTICE BEFORE THE PATENT TRIAL AND APPEAL BOARD

■ 1. The authority citation for 37 CFR part 42 continues to read as follows:

Authority: 35 U.S.C. 2(b)(2), 6, 21, 23, 41, 135, 311, 312, 316, 321–326 and Public Law 112–29.

Subpart A—Trial Practice and Procedure

■ 2. Section 42.11 is revised to read as follows:

§ 42.11 Duty of candor; signing papers; representations to the Board; sanctions.

(a) *Duty of candor.* Parties and individuals involved in the proceeding have a duty of candor and good faith to the Office during the course of a proceeding.

(b) *Signature.* Every petition, response, written motion, and other paper filed in a proceeding must be signed by at least lead counsel or designated backup counsel under

§ 42.10 in the attorney's or registered practitioner's name—or by a party personally if the party is unrepresented. The Board may expunge any unsigned submission unless the omission is promptly corrected after being called to the counsel's or party's attention.

(c) *Representations to the Board.* By presenting to the Board a petition, response, written motion, or other paper—whether by signing, filing, submitting, or later advocating it—an attorney, registered practitioner, or unrepresented party certifies that to the best of the person's knowledge, information, and belief, formed after an inquiry reasonable under the circumstances:

(1) It is not being presented for any improper purpose, such as to harass, cause unnecessary delay, or needlessly increase the cost of the proceeding;

(2) The claims, defenses, and other legal contentions are warranted by existing law or by a non-frivolous argument for extending, modifying, or reversing existing law or for establishing new law;

(3) The factual contentions have evidentiary support; and

(4) The denials of factual contentions are warranted on the evidence.

(d) *Sanctions*—(1) *In general.* If, after notice and a reasonable opportunity to respond, the Board determines that paragraph (c) of this section has been violated, the Board may impose an appropriate sanction on any attorney, registered practitioner, law firm, patent agent, or party that violated the rule or is responsible for the violation. Absent exceptional circumstances, a law firm must be held jointly responsible for a violation committed by its partner, associate, or employee.

(2) *Motion for sanctions.* A motion for sanctions must be made separately from any other motion and must describe the specific conduct that allegedly violates paragraph (c) of this section. The motion must be authorized by the Board under § 42.20. Prior to seeking authorization to file a motion for sanctions, the moving party must provide written notice to the other party of the basis for the proposed motion. A motion for sanctions must not be filed or be presented to the Board if the challenged paper, claim, defense, contention, or denial is withdrawn or appropriately corrected within 21 days after service of such notice or within another time the Board sets. If warranted, the Board may award to the prevailing party the reasonable expenses, including attorney's fees, incurred for the motion.

(3) *On the Board's initiative.* On its own, the Board may order an attorney, registered practitioner, law firm, or party to show cause why conduct specifically described in the order has not violated paragraph (c) of this section.

(4) *Nature of a sanction.* A sanction imposed under this rule must be limited to what suffices to deter repetition of the conduct or comparable conduct by others similarly situated and should be consistent with § 42.12.

(5) *Requirements for an order.* An order imposing a sanction must describe the sanctioned conduct and explain the basis for the sanction.

(e) *Inapplicability to discovery.* This rule does not apply to disclosures and discovery requests, responses, and objections.

■ 3. Section 42.24 is revised to read as follows:

§ 42.24 Type-Volume and page-limits for petitions, motions, oppositions, and replies.

(a) *Petitions and motions.* (1) The following word counts or page limits for petitions and motions apply and include any statement of material facts to be admitted or denied in support of the petition or motion. The word count or page limit does not include a table of contents, a table of authorities, a certificate of service or word count, exhibits, appendix, or claim listing.

(i) Petition requesting *inter partes* review: 14,000 words.

(ii) Petition requesting post-grant review: 18,700 words.

(iii) Petition requesting covered business method patent review: 18,700 words.

(iv) Petition requesting derivation proceeding: 14,000 words.

(v) Motions (excluding motions to amend): 15 pages.

(vi) Motions to Amend: 25 pages.

(2) Petitions to institute a trial must comply with the stated word counts but may be accompanied by a motion to waive the word counts. The petitioner must show in the motion how a waiver of the word counts is in the interests of justice and must append a copy of proposed petition exceeding the word count to the motion. If the motion is not granted, the proposed petition exceeding the word count may be expunged or returned. Any other motion to waive word counts or page limits must be granted in advance of filing a motion, opposition, or reply for which the waiver is necessary.

(b) *Patent owner responses and oppositions.* The word counts or page limits set forth in this paragraph do not include a listing of facts which are admitted, denied, or cannot be admitted or denied.

(1) The word counts for a patent owner preliminary response to petition are the same as the word counts for the petition.

(2) The word counts for a patent owner response to petition are the same as the word counts for the petition.

(3) The page limits for oppositions are the same as those for corresponding motions.

(c) *Replies.* The following word counts or page limits for replies apply and include any statement of facts in support of the reply. The word counts or page limits do not include a table of contents, a table of authorities, a listing of facts which are admitted, denied, or cannot be admitted or denied, a certificate of service or word count, or appendix of exhibits.

(1) Replies to patent owner responses to petitions: 5,600 words.

(2) Replies to oppositions (excluding replies to oppositions to motions to amend): 5 pages.

(3) Replies to oppositions to motions to amend: 12 pages.

(d) *Certification.* Any petition, preliminary response, patent owner response, or reply whose length is specified by type-volume limits must include a certification stating the number of words in the petition, motion, opposition, or reply. A party may rely on the word count of the word-processing system used to prepare the petition, preliminary response, patent owner response, or reply.

■ 4. Section 42.70 is amended by revising paragraph (b) to read as follows:

§ 42.70 Oral argument.

* * * * *

(b) Demonstrative exhibits must be served at least seven business days before oral argument and filed no later than the time of the oral argument.

Subpart B—Inter Partes Review

■ 5. Section 42.100 is amended by revising paragraph (b) to read as follows:

§ 42.100 Procedure; pendency.

* * * * *

(b) A claim in an unexpired patent that will not expire before a final written decision is issued shall be given its broadest reasonable construction in light of the specification of the patent in which it appears.

* * * * *

■ 6. Section 42.107 is amended by revising paragraph (a) and removing and reserving paragraph (c) to read as follows:

§ 42.107 Preliminary response to petition.

(a) The patent owner may file a preliminary response to the petition. The response may set forth the reasons why no *inter partes* review should be

instituted under 35 U.S.C. 314 and can include supporting evidence. The preliminary response is subject to the word count under § 42.24.

* * * * *

(c) [Reserved]

* * * * *

■ 7. Section 42.108 is amended by revising paragraph (c) to read as follows:

§ 42.108 Institution of inter partes review.

* * * * *

(c) *Sufficient grounds. Inter partes* review shall not be instituted for a ground of unpatentability unless the Board decides that the petition supporting the ground would demonstrate that there is a reasonable likelihood that at least one of the claims challenged in the petition is unpatentable. The Board's decision will take into account a patent owner preliminary response where such a response is filed, but supporting evidence concerning disputed material facts will be viewed in the light most favorable to the petitioner for purposes of deciding whether to institute an *inter partes* review. If the patent owner submits supporting evidence with its preliminary response, the petitioner may seek leave to file a reply to the preliminary response in accordance with § 42.24(c).

Subpart C—Post-Grant Review

■ 8. Section 42.200 is amended by revising paragraph (b) to read as follows:

§ 42.200 Procedure; pendency.

* * * * *

(b) A claim in an unexpired patent that will not expire before a final written decision is issued shall be given its broadest reasonable construction in light of the specification of the patent in which it appears.

* * * * *

■ 9. Section 42.207 is amended by revising paragraph (a) and removing and reserving paragraph (c) to read as follows:

§ 42.207 Preliminary response to petition.

(a) The patent owner may file a preliminary response to the petition. The response may set forth the reasons why no post-grant review should be instituted under 35 U.S.C. 324 and can include supporting evidence. The preliminary response is subject to the word count under § 42.24.

* * * * *

(c) [Reserved]

* * * * *

■ 10. Section 42.208 is amended by revising paragraph (c) to read as follows:

§ 42.208 Institution of post-grant review.

* * * * *

(c) *Sufficient grounds.* Post-grant review shall not be instituted for a ground of unpatentability unless the Board decides that the petition supporting the ground would, if unrebutted, demonstrate that it is more likely than not that at least one of the claims challenged in the petition is unpatentable. The Board's decision will take into account a patent owner preliminary response where such a response is filed, but supporting evidence concerning disputed material facts will be viewed in the light most favorable to the petitioner for purposes of deciding whether to institute a post-grant review. If the patent owner submits supporting evidence with its preliminary response, the petitioner may seek leave to file a reply to the preliminary response in accordance with § 42.24(c).

* * * * *

Subpart D—Transitional Program for Covered Business Method Patents

■ 11. Section 42.300 is amended by revising paragraph (b) to read as follows:

§ 42.300 Procedure; pendency.

* * * * *

(b) A claim in an unexpired patent that will not expire before a final written decision is issued shall be given its broadest reasonable construction in light of the specification of the patent in which it appears.

* * * * *

Dated: August 12, 2015.

Michelle K. Lee,

Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office.

[FR Doc. 2015–20227 Filed 8–19–15; 8:45 am]

BILLING CODE 3510–16–P

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

NIKE, INC., Appellant, v. ADIDAS AG, Appellee.	Appeal No. 2014-1719

UNOPPOSED MOTION OF THE USPTO DIRECTOR FOR SEPARATE ORAL ARGUMENT

Pursuant to Fed. R. App. 27 and Federal Circuit Rule 27, the Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office ("Director"), as intervenor in this appeal, respectfully requests time for oral argument separate from the time allotted to the appellant and appellee. The Director requests five minutes to present its argument in this case as intervenor. Appellant Nike, Inc. and Appellee Adidas AG do not oppose this motion.

As explained in the Director's brief, the Director intervened in this appeal to address only a subset of issues raised in Nike's appeal. In particular, the Director's brief defends the Patent Trial and Appeals Board's decision denying Nike's motion to amend because Nike's motion failed to address prior art not of record but known to Nike. The Director's interest in this case thus relates to institutional concerns

regarding the proper management of the system of inter partes review that go beyond the scope of the private dispute between Nike and Adidas.

For these reasons, the Director requests that, rather than having time deducted from that allotted to either party, a separate period of five minutes be allotted for it to present its position and answer any questions that the Court might have.

Respectfully submitted,

Dated: September 3, 2015

/s/ Michael S. Forman

THOMAS W. KRAUSE
Acting Solicitor

SCOTT C. WEIDENFELLER
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Skechers EX1013-p. 6028
Skechers v Nike

CERTIFICATE OF SERVICE

I hereby certify that on September 3, 2015, I electronically filed the foregoing UNOPPOSED MOTION OF THE USPTO DIRECTOR FOR SEPARATE ORAL ARGUMENT with the Court's CM/ECF filing system, which constitutes service, pursuant to Fed. R. App. P. 25(c)(2), Fed. Cir. R. 25(a), and the Court's Administrative Order Regarding Electronic Case Filing 6(A) (May 17, 2012).

/s/ Michael S. Forman
MICHAEL S. FORMAN
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United States Patent & Trademark Office
Mail Stop 8
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Alexandria, Virginia 22313-1450

NOTE: This order is nonprecedential.

United States Court of Appeals for the Federal Circuit

NIKE, INC.,
Appellant

v.

ADIDAS AG,
Appellee

2014-1719

Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Inter Partes Review No. IPR2013-00067.

ON MOTION

PER CURIAM.

O R D E R

Upon consideration of the intervenor, Michelle K. Lee, Director of the United States Patent and Trademark Office ("Director"), motion to present argument separate from the appellant and appellee's argument

IT IS ORDERED THAT:

The motion is granted. The Director will have five minutes to present its argument in this case.

FOR THE COURT

September 8, 2015
Date

/s/ Daniel E. O'Toole
Daniel E. O'Toole
Clerk of Court

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

NOTICE OF ENTRY OF JUDGMENT ACCOMPANIED BY OPINION

OPINION FILED AND JUDGMENT ENTERED: 02/11/2016

The attached opinion announcing the judgment of the court in your case was filed and judgment was entered on the date indicated above. The mandate will be issued in due course.

Information is also provided about petitions for rehearing and for rehearing en banc. The questions and answers are those frequently asked and answered by the Clerk's Office.

No costs were taxed in this appeal.

Regarding exhibits and visual aids: Your attention is directed Fed. R. App. P. 34(g) which states that the clerk may destroy or dispose of the exhibits if counsel does not reclaim them within a reasonable time after the clerk gives notice to remove them. (The clerk deems a reasonable time to be 15 days from the date the final mandate is issued.)

FOR THE COURT

/s/ Daniel E. O'Toole
Daniel E. O'Toole
Clerk of Court

14-1719 - Nike, Inc. v. Adidas AG
United States Patent and Trademark Office, Case No. IPR2013-00067

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

Questions and Answers

Petitions for Panel Rehearing (Fed. Cir. R. 40)
and
Petitions for Hearing or Rehearing En Banc (Fed. Cir. R. 35)

Q. When is a petition for panel rehearing appropriate?

A. Petitions for panel rehearing are rarely considered meritorious. Consequently, it is easiest to first answer when a petition for panel rehearing is not appropriate. A petition for panel rehearing should not be used to reargue issues already briefed and orally argued. If a party failed to persuade the court on an issue in the first instance, they do not get a second chance. This is especially so when the court has entered a judgment of affirmance without opinion under Fed. Cir. R. 36, as a disposition of this nature is used only when the appellant/petitioner has utterly failed to raise any issues in the appeal that require an opinion to be written in support of the court's judgment of affirmance.

Thus, as a usual prerequisite, the court must have filed an opinion in support of its judgment for a petition for panel rehearing to be appropriate. Counsel seeking panel rehearing must be able to identify in the court's opinion a material error of fact or law, the correction of which would require a different judgment on appeal.

Q. When is a petition for rehearing en banc appropriate?

A. En banc decisions are extraordinary occurrences. To properly answer the question, one must first understand the responsibility of a three-judge merits panel of the court. The panel is charged with deciding individual appeals according to the law of the circuit as established in the court's precedential opinions. While each merits panel is empowered to enter precedential opinions, the ultimate duty of the court en banc is to set forth the law of the Federal Circuit, which merits panels are obliged to follow.

Thus, as a usual prerequisite, a merits panel of the court must have entered a precedential opinion in support of its judgment for a petition for rehearing en banc to be appropriate. In addition, the party seeking rehearing en banc must show that either the merits panel has failed to follow decisions of the Supreme Court of the United States or Federal Circuit precedential opinions, or that the merits panel has followed circuit precedent, which the party seeks to have overruled by the court en banc.

Q. How frequently are petitions for panel *rehearing granted by merits panels or petitions for rehearing en banc granted by the court?*

A. The data regarding petitions for panel rehearing since 1982 shows that merits panels granted some relief in only three percent of the petitions filed. The relief granted usually involved only minor corrections of factual misstatements, rarely resulting in a change of outcome in the decision.

En banc petitions have been granted less frequently. Historically, the court has initiated en banc review in a few of the appeals decided en banc since 1982.

Q. Is it necessary to have filed either of these petitions before filing a petition for certiorari in the U.S. Supreme Court?

A. No. All that is needed is a final judgment of the Court of Appeals.

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

INFORMATION SHEET

FILING A PETITION FOR A WRIT OF CERTIORARI

There is no automatic right of appeal to the Supreme Court of the United States from judgments of the Federal Circuit. You must file a petition for a writ of certiorari which the Supreme Court will grant only when there are compelling reasons. (See Rule 10 of the Rules of the Supreme Court of the United States, hereinafter called Rules.)

Time. The petition must be filed in the Supreme Court of the United States within 90 days of the entry of judgment in this Court or within 90 days of the denial of a timely petition for rehearing. The judgment is entered on the day the Federal Circuit issues a final decision in your case. [The time does not run from the issuance of the mandate, which has no effect on the right to petition.] (See Rule 13 of the Rules.)

Fees. Either the $300 docketing fee or a motion for leave to proceed in forma pauperis with an affidavit in support thereof must accompany the petition. (See Rules 38 and 39.)

Authorized Filer. The petition must be filed by a member of the bar of the Supreme Court of the United States or by the petitioner representing himself or herself.

Format of a Petition. The Rules are very specific about the order of the required information and should be consulted before you start drafting your petition. (See Rule 14.) Rules 33 and 34 should be consulted regarding type size and font, paper size, paper weight, margins, page limits, cover, etc.

Number of Copies. Forty copies of a petition must be filed unless the petitioner is proceeding in forma pauperis, in which case an original and ten copies of the petition for writ of certiorari and of the motion for leave to proceed in forma pauperis. (See Rule 12.)

Where to File. You must file your documents at the Supreme Court.

Clerk
Supreme Court of the United States
1 First Street, NE
Washington, DC 20543
(202) 479-3000

No documents are filed at the Federal Circuit and the Federal Circuit provides no information to the Supreme Court unless the Supreme Court asks for the information.

Access to the Rules. The current rules can be found in Title 28 of the United States Code Annotated and other legal publications available in many public libraries.

Revised December 16, 1999

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

NOTICE OF ENTRY OF JUDGMENT ACCOMPANIED BY OPINION

OPINION FILED AND JUDGMENT ENTERED: 02/11/2016

The attached opinion announcing the judgment of the court in your case was filed and judgment was entered on the date indicated above. The mandate will be issued in due course.

Information is also provided about petitions for rehearing and suggestions for rehearing en banc. The questions and answers are those frequently asked and answered by the Clerk's Office.

No costs were taxed in this appeal.

Regarding exhibits and visual aids: Your attention is directed Fed. R. App. P. 34(g) which states that the clerk may destroy or dispose of the exhibits if counsel does not reclaim them within a reasonable time after the clerk gives notice to remove them. (The clerk deems a reasonable time to be 15 days from the date the final mandate is issued.)

FOR THE COURT

/s/ Daniel E. O'Toole
Daniel E. O'Toole
Clerk of Court

cc: Mark Christopher Fleming
Michael Sumner Forman
Kevin Goldman
Andrea Weiss Jeffries
Vaibhav P. Kadaba
Nathan K. Kelley
William F. Lee
Mitchell G. Stockwell
Scott Weidenfeller
Tiffany L. Williams

14-1719 - Nike, Inc. v. Adidas AG
United States Patent and Trademark Office, Case No. IPR2013-00067

United States Court of Appeals for the Federal Circuit

NIKE, INC.,
Appellant

v.

ADIDAS AG,
Appellee

2014-1719

Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in No. IPR2013-00067.

Decided: February 11, 2016

MARK CHRISTOPHER FLEMING, Wilmer Cutler Pickering Hale and Dorr LLP, Boston, MA, argued for appellant. Also represented by WILLIAM F. LEE, KEVIN GOLDMAN; ANDREA WEISS JEFFRIES, Los Angeles, CA.

MITCHELL G. STOCKWELL, Kilpatrick Townsend & Stockton LLP, Atlanta, GA, argued for appellee. Also represented by VAIBHAV P. KADABA, TIFFANY L. WILLIAMS.

MICHAEL SUMNER FORMAN, Office of the Solicitor, United States Patent and Trademark Office, Alexandria, VA, argued for intervenor Michelle K. Lee. Also repre-

sented by NATHAN K. KELLEY, THOMAS W. KRAUSE, SCOTT WEIDENFELLER.

Before CHEN, MAYER, and STOLL, *Circuit Judges*.

CHEN, *Circuit Judge*

This appeal arises from the inter partes review (IPR) of U.S. Patent No. 7,347,011 (the '011 patent) owned by Nike, Inc. (Nike). The United States Patent and Trademark Office, Patent Trial and Appeal Board (Board) granted the IPR petition filed by adidas AG (Adidas) and instituted inter partes review of claims 1–46 of the '011 patent. Nike then filed a motion to amend in which it requested cancellation of claims 1–46 and proposed substitute claims 47–50. The Board granted Nike's motion to cancel claims 1–46, but denied the motion as to the substitute claims because Nike failed to meet its burden of establishing patentability of substitute claims 47–50.

Nike now appeals the Board's denial of its motion to amend, and the Director of the United States Patent and Trademark Office (Director) intervened to defend the Board's decision. For the reasons stated below, we affirm-in-part, vacate-in-part, and remand for further proceedings consistent with this opinion.

BACKGROUND

I

Articles of footwear generally consist of two primary components: a sole structure and an "upper." The '011 patent, entitled "Article of footwear having a textile upper," relates to the "upper" component, which has the general shape of a foot and forms a void for receiving the foot that is accessed using the ankle opening. The upper disclosed in the '011 patent is made from a knitted textile using any number of warp knitting or weft knitting processes. '011 patent, 3:30–32. It is undisputed that

weft knitting is well known in the art and includes "flat knitting," where the textile is knit as a sheet or flat piece of textile, and "circular knitting," where the textile is produced as cylindrical textile structure. *Id.* at 7:5–8, 29–32.

The knitted textile upper of the '011 patent specifically consists of "a single material element that is formed to exhibit a unitary (i.e., one-piece) construction" *Id.* at 5:38–39. In another embodiment, this unitary textile element "may be formed as a part of a larger textile element" where the upper is then cut and "removed from the larger textile element." *Id.* at 5:43–45. Once manufactured, the unitary textile element is then "formed or otherwise shaped to extend around the foot." *Id.* at 5:40–41. By manufacturing the upper component in this fashion, the "unitary construction is intended to express a configuration wherein portions of a textile element are not joined together by seams or other connections." *Id.* at 6:43–46.

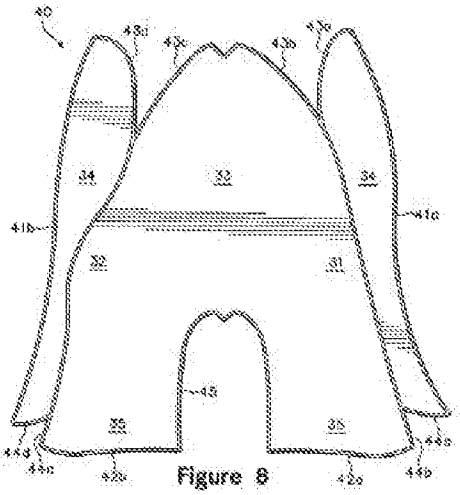
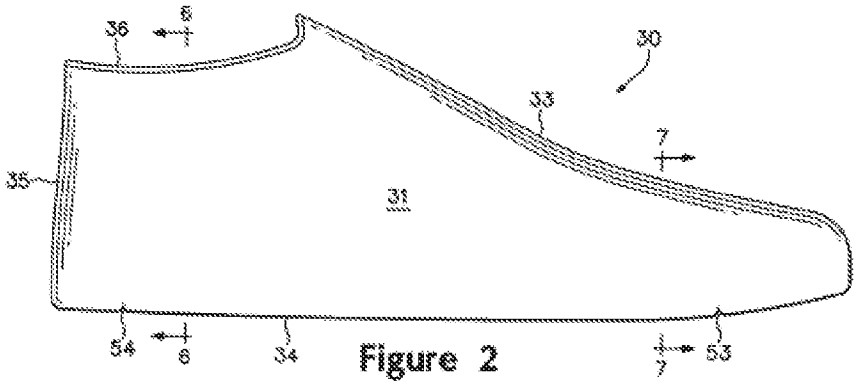


Figure 8 of the '011 patent illustrates the shape of the seamless unitary textile element before the various edges of the element are joined by seams in certain places to form the shape of the upper, as depicted in Figure 2.



Nike's proposed substitute claims generally relate to a unitary flat-knitted textile element:

Claim 47. (Substitute for independent claim 16) An article of footwear comprising an upper incor-

> porating a flat knit textile element, the flat knit textile element
>
> (1) having flat knit edges free of surrounding textile structure such that the flat knit edges are not surrounded by textile structure from which the textile element must be removed, some of the flat knit edges joined together to form an ankle opening in the upper for receiving a foot, the ankle opening having an edge comprised of one of the flat knit edges; and
>
> (2) having a first area and a second area with a unitary construction, the first area being formed of a first stitch configuration, and the second area being formed of a second stitch configuration that is different from the first stitch configuration to impart varying properties to the textile element; and a sole structure secured to the upper.

Joint Appendix (J.A.) 1226–27.

II

Adidas petitioned the Board for inter partes review of the '011 patent, asserting that all forty-six claims were unpatentable under either 35 U.S.C. § 102 or § 103 in view of numerous prior art references. The Board granted review of certain of Adidas's challenges to the patentability of all claims. After the Board issued its institution decision, Nike filed a motion to amend the claims in which it sought cancellation of claims 1–46 and proposed four substitute claims. In its final written decision, the Board granted Nike's request to cancel claims 1–46. The Board denied, however, Nike's request to enter substitute claims 47–50 for two alternate reasons. First, the Board acknowledged the requirement announced in the Board's *Idle Free* decision that a patent owner "persuade the Board that the proposed substitute claim is patentable over the prior art of record, *and over prior art not of*

record but known to the patent owner." J.A. 34–36. Because Nike's motion included only a conclusory statement that the proposed claims were patentable over prior art not of record but known to Nike, the Board denied Nike's motion. Alternatively, the Board denied entry of the substitute claims because Nike failed to establish that the substitute claims were patentable over the Nishida and Schuessler references.

Nike filed a timely appeal from the Board's decision, and the Director intervened. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

DISCUSSION

We review the Board's conclusions of law de novo and its findings of fact for substantial evidence. 5 U.S.C. § 706(2)(E); *In re Sullivan*, 498 F.3d 1345, 1350 (Fed. Cir. 2007). "Substantial evidence is more than a mere scintilla. It means such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 217 (1938).

In this appeal, Nike raises three primary arguments. First, Nike asserts that the Board erroneously shifted to Nike (the patent owner) the burden of proving patentability of its proposed substitute claims 47–50. Second, Nike contests the Board's finding on the merits that the proposed substitute claims are unpatentable as obvious. Finally, Nike objects to the Board's practice of requiring a patent owner to establish patentability of substitute claims over all prior art known to the patent owner, including prior art not of record but known to the patent owner.

I. Burden of Proof

When Congress created IPR proceedings, it also enacted 35 U.S.C. § 316, which directs the PTO to "prescribe regulations" governing a considerable number of different aspects of these new proceedings. 35 U.S.C. § 316(a).

Particularly relevant to this case is § 316(a)(9), in which Congress delegated authority to the PTO to prescribe regulations "setting forth standards and procedures for allowing the patent owner to move to amend the patent under [§ 316](d) to cancel a challenged claim or propose a reasonable number of substitute claims." *Id.* § 316(a)(9); *see also id.* § 316(d)(1) ("During an inter partes review . . . , the patent owner may file 1 motion to amend the patent in 1 or more of the following ways: (A) Cancel any challenged patent claim. (B) For each challenged claim, propose a reasonable number of substitute claims."). Consistent with § 316(a)(9), the PTO promulgated a regulation relating to motions practice, 37 C.F.R. § 42.20, which explains that "[r]elief, other than a petition requesting the institution of a trial, must be requested in the form of a motion" and that "[t]he moving party has the burden of proof to establish that it is entitled to the requested relief." 37 C.F.R. § 42.20(a), (c).

The Board addressed these regulations in its *Idle Free* "informative" decision in which it interpreted section 42.20(c) and explained that "[t]he burden is not on the petitioner to show unpatentability [of new, substitute claims], but on the patent owner to show patentable distinction over the prior art." *Idle Free Sys., Inc. v. Bergstrom*, IPR 2012-00027, 2013 WL 5947697, at *4 (PTAB June 11, 2013); *see also* Patent Trial and Appeal Board, Standard Operating Procedure 2 (Revision 9), at 3 (¶ IV.A–B) (Standard Operating Procedure 2), *available at* http://www.uspto.gov/sites/default/files/documents/sop2-revision-9-dated-9-22-2014.pdf (explaining that Board decisions labeled "informative" are "not binding authority," but provide "Board norms on recurring issues," "guidance on issues of first impression," and "guidance on Board rules and practices").

In our recent decision in *Microsoft Corp. v. Proxyconn, Inc.*, we held that the Board's interpretation of section

42.20(c) was permissible in light of the text of § 316(a)(9) and the language of the PTO's regulation. 789 F.3d 1292, 1306–08 (Fed. Cir. 2015); *see also id.* at 1307 ("Nor can we say that the Board's interpretation of § 42.20(c) in *Idle Free*—requiring the patentee to show patentable distinction [of the substitute claims] over the prior art of record—is plainly erroneous or inconsistent with the regulation or governing statutes." (alteration in original) (citation omitted)). We further explained that placing this burden on the patent owner for its newly formulated claims is appropriate given "the very nature of IPRs," which are distinctly different from a typical PTO examination or reexamination where a patent examiner performs a prior art search and independently conducts a patentability analysis of all claims, whether newly proposed or previously existing. *Id.* at 1307.

> During IPRs, once the PTO grants a patentee's motion to amend, the substituted claims are not subject to further examination. Moreover, the petitioner may choose not to challenge the patentability of substitute claims if, for example, the amendments narrowed the claims such that the petitioner no longer faces a risk of infringement. If the patentee were not required to establish patentability of substitute claims over the prior art of record, an amended patent could issue despite the PTO having before it prior art that undermines patentability.

Id. at 1307–08; *see also* 35 U.S.C. § 318(a) (instructing the Board to "issue a final written decision with respect to the patentability of any patent claim challenged by the petitioner and any new claim added under section 316(d)"). In this way, placing the burden on the patent owner ensures that proposed substitute claims are critically analyzed before they are entered as claims that are part of the issued patent.

Consistent with the language of the regulation and our subsequent conclusion in *Proxyconn*, the Board in the present case stated that Nike's proposed substitute claims could not be "entered automatically," but instead could be entered only "upon [Nike]'s having demonstrated the patentability of the substitute claims." *Adidas*, 2014 WL 1713368, at *5. Ultimately, the Board denied Nike's motion because it failed to carry this burden. Nike now argues that the understanding of the authority delegated in § 316(a)(9) from *Idle Free* and from *Proxyconn* is incorrect in light of § 316(e):

> **Evidentiary standards.**—In an inter partes review instituted under this chapter, *the petitioner shall have the burden* of proving a proposition of unpatentability by a preponderance of the evidence.

35 U.S.C. § 316(e) (emphasis added). On its face, § 316(e) places the burden of proving unpatentability on the petitioner as it relates to any patent claim included in the Board's decision instituting the IPR proceedings. Nike interprets this provision as also placing on the petitioner the burden of proving unpatentability of any newly proposed substitute claim that the patent owner seeks to introduce during the proceedings. When § 316(e) is read in isolation, Nike's position is not without some merit. But after considering the entire statute, we disagree that this section has such a broad command. *See also Synopsys Inc. v. Mentor Graphics Corp.*, No. 14-1516, slip op. at 24–26 (Fed. Cir. Feb. 10, 2016).

First, Nike's interpretation is in tension with Congress's direction that the PTO "shall prescribe regulations" "setting forth standards and procedures for allowing the patent owner to move to amend." § 316(a)(9). In other words, Congress delegated to the PTO the *specific* authority to establish the standards and procedures with which a patent owner must comply to amend its

patent during an IPR. Furthermore, the specific language in § 316(a)(9) also directs the PTO to set "standards and procedures . . . ensuring that any information submitted by the patent owner in support of any amendment entered under subsection (d) is made available to the public." In this way, § 316(a)(9)'s requirement that the patent owner has some obligation to provide "information . . . in support of any amendment," indicates that the patent owner carries an affirmative duty to justify why newly drafted claims—which, unlike the issued claims, had never been evaluated by the PTO—should be entered into the proceeding.

This conclusion is further supported by inspection of the language of § 316(e). Specifically, the evidentiary standard set forth in § 316(e) applies to "an inter partes review instituted under this chapter," making clear that the burden of proof is on the petitioner to prove unpatentable those issued claims that were actually challenged in the petition for review and for which the Board instituted review. *Synopsys*, No. 14-1516, slip op. at 24–26; *see also* 35 U.S.C. § 314(a) (authorizing IPR proceedings only when the information in a petition for review and any response "shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition"). The evidentiary standard of § 316(e), when read together with § 316(a)(9), therefore does not necessarily apply to claims that were not in existence at the time a petition is filed, such as newly offered substitute claims proposed by a patent owner in a motion to amend filed as part of an already-instituted IPR proceeding.

For these reasons, Nike's attempt to undo our conclusion in *Proxyconn*—that the PTO may impose the burden of establishing the patentability of proposed substitute claims on the patent owner—is not persuasive. Nike's argument focuses solely on a small portion of the language in § 316(e) and ignores the context supplied by the

entirety of § 316. *See Davis v. Mich. Dep't of Treasury*, 489 U.S. 803, 809 (1989) ("[S]tatutory language cannot be construed in a vacuum. It is a fundamental canon of statutory construction that the words of a statute must be read in their context with a view to their place in the overall statutory scheme."). Our precedent recognizes that § 316(a)(9) instructed the PTO to promulgate a regulation setting forth the standard for motions to amend a patent that might be filed as part of an IPR proceeding. The PTO did just that in 37 C.F.R. § 42.20(c) and, as we held in *Proxyconn*, the Board permissibly interpreted this regulation as imposing the burden of proving patentability of a proposed substitute claim on the movant: the patent owner. Section 316(e), on the other hand, speaks to a different context. Section 316(e) places the burden on the petitioner to prove unpatentability of any issued claim for which the Board has instituted review and requires that the petitioner carry this burden by a preponderance of the evidence. Thus, the Board did not err by placing the burden on Nike to establish patentability over the prior art of Nike's proposed substitute claims.

II. Obviousness

Nike next asserts that the Board nevertheless erred in concluding that Nike failed to carry its burden of establishing that proposed substitute claims 47–50 were patentable under 35 U.S.C. § 103. Section 103 forbids issuance of a claim when "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art." 35 U.S.C. § 103. The ultimate determination of obviousness under § 103 is a question of law based on underlying factual findings. *In re Baxter Int'l, Inc.*, 678 F.3d 1357, 1361 (Fed. Cir. 2012) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966)). These underlying factual considerations consist

of: (1) the "level of ordinary skill in the pertinent art," (2) the "scope and content of the prior art," (3) the "differences between the prior art and the claims at issue," and (4) "secondary considerations" of non-obviousness such as "commercial success, long-felt but unsolved needs, failure of others, etc." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (quoting *Graham*, 383 U.S. at 17–18).

A claimed invention may be obvious even when the prior art does not teach each claim limitation, so long as the record contains some reason why one of skill in the art would modify the prior art to obtain the claimed invention. *See Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1307 (Fed. Cir. 2006). Whether a person of ordinary skill in the art would have had such a reason to combine the teachings of prior art references is also a question of fact. *Pregis Corp. v. Kappos*, 700 F.3d 1348, 1353 (Fed. Cir. 2012). Although an analysis of the teaching, suggestion, or motivation to combine elements from different prior art references is helpful, we must always be mindful that an obviousness inquiry requires an "expansive and flexible approach." *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1360 (Fed. Cir. 2012) (citing *KSR*, 550 U.S. at 415, 419). Importantly, we have repeatedly emphasized that an obviousness inquiry requires examination of all four *Graham* factors and that an obviousness determination can be made only after consideration of each factor. *Id.*

On appeal, Nike objects to three components of the Board's obviousness analysis. First, Nike contests the Board's finding that a person of skill in the art would have a reason to combine the two relevant prior art references to arrive at the unitary upper claimed in the substitute claims. Second, Nike argues that the Board failed to consider Nike's evidence of secondary considerations in violation of this court's precedent. Finally, Nike contends that, at the very least, proposed claim 49 recites a limitation absent from the cited prior art references.

A. Motivation to Combine

In concluding that substitute claims 47–50 were unpatentable,[1] the Board pointed to three prior art references: (1) U.S. Patent No. 5,345,638 (Nishida), entitled "Process for producing a shoe-shaped part from a web of material and resulting shoe-shaped part"; (2) U.S. Patent No. 2,178,941 (Schuessler I), entitled "Knitted helmet"; and (3) U.S. Patent No. 2,150,730 (Schuessler II), entitled "Knitting machine." In its Final Written Decision, the Board acknowledged that because Nike declined to file a response to the petition, the Board would "accept as unchallenged that Nishida teaches or suggests all of the limitations of [the] original claims." *Adidas*, 2014 WL 1713368, at *18. This left only the added limitation in proposed substitute claims 47–50, namely, the recitation of "flat knit edges free of surrounding textile structure." The Board found this limitation disclosed in Schuessler I and Schuessler II (collectively, the Schuessler References). The Board then concluded that a person of skill in the art would have reason to modify Nishida using the teachings of the Schuessler References to arrive at the unitary, flat-knitted textile upper recited in the proposed substitute claims. Nike argues that this finding is not supported by substantial evidence. We disagree.

1.

As mentioned above, the Board's obviousness conclusion rested on three prior art references: Nishida and the two Schuessler References.

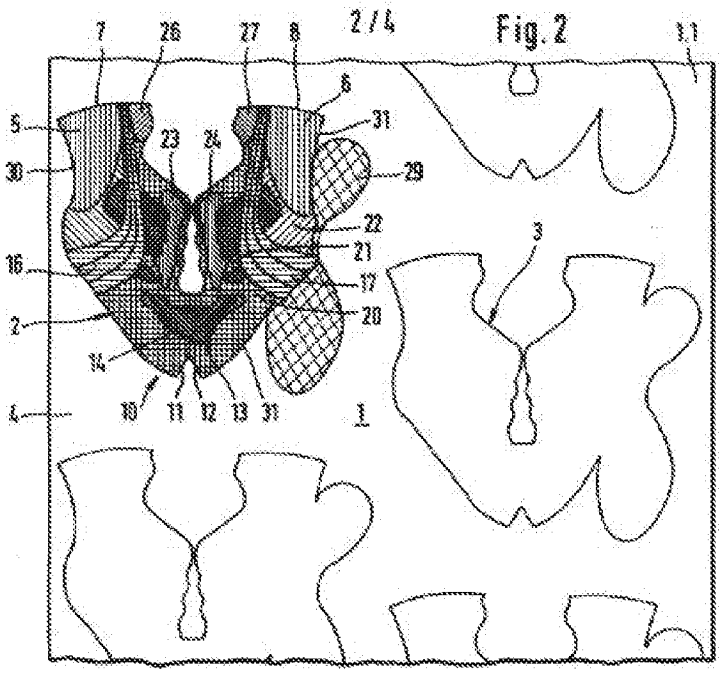
Nishida discloses a process that reduces the amount of waste produced when manufacturing shoe uppers. Nishida accomplishes this goal using a pattern where

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[1] Nike does not argue claims 48–50 separately from claim 47 for the purposes of this argument.

> only just those parts of the web of material are produced in the necessary quality, thickness, multilayers or the like which correspond to the pattern or to an area of a pattern of the shoe upper or the related sole part. The remaining area of the web of material in contrast can consist of a simple lightweight or inexpensive material quality, which holds together only the patterns . . . .

'638 patent, 2:11–18. As shown in Figure 2 of Nishida, the textile corresponding to the pattern for the shoe upper is of a different quality or thickness than the remainder of the textile web.



Id. at Figure 2. The process disclosed in Nishida then requires that the portion of the pattern corresponding to the shoe upper be cut from the surrounding textile web. *Id.* at 2:20–22. After the upper is cut out, the "cutting

waste" "represents a simple, lightweight and inexpensive material." *Id.* Nishida therefore improves on the prior art, where the cutting waste consisted of the normal, more "expensive tubular material, multilayer material or the like." *Id.* at 2:24–25.

The Schuessler References both issued in 1939 to the same inventor. Schuessler I discloses "a method for forming a . . . knitted helmet while rendering it unnecessary to cut any portion of the knitted swatch while at the same time providing a finished helmet," '941 patent, 1:16–19, rather than the traditional method of "form[ing] a knitted piece and then cut[ting] out portions and sew[ing] sections together to form the completed article," *id.* at 1:4–6. This manufacturing process allows the creation of the knitted article "in a continuous manner" "without requiring cutting." *Id.* at 1:24–26. Schuessler I further recognizes that this cutting-free method avoids the need for additional processing "to prevent unraveling" before the parts are sewn together. *Id.* at 1:8. Schuessler I specifically references Schuessler II as an example of a knitting machine that can be used to form the knitted helmet disclosed in Schuessler I. *See also Adidas*, 2014 WL 1713368, at *19 ("The knitted helmet [of Schuessler I] may be formed from a swatch knit on a flat knitting machine, such as that described in Schuessler II."). Schuessler II discloses a flat-knitting machine. '730 patent, 1:1–5. Thus, the flat-knitting machine can be used to manufacture the unitary textile element with flat-knit (not cut) edges that can be stitched in certain places to form a knitted helmet as disclosed in Schuessler I.

2.

The Board found that one of skill in the art would have reason to combine Nishida and the Schuessler References because these references are in similar fields and address the same problem. Nike asserts that the Board's finding lacks substantial evidence because the

processes in these references are sufficiently different such that a person of skill in the art would not think to combine them. According to Nike, Nishida discloses a "subtractive" process, which requires the additional step of cutting the textile from a larger textile web. Nike contends that Nishida's subtractive process bears no resemblance to the "additive" process in the Schuessler References, where the textile shape is created by flat knitting to shape in the first instance. Nike's argument is not persuasive.

In *KSR*, the Supreme Court instructed that "any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." 550 U.S. at 420. The three references all relate to the creation of three-dimensional, knitted articles created in an efficient and economical way by joining the edges of two-dimensional knit textiles. Nishida recognizes the desire to minimize the amount of wasted textile resulting from cutting the shoe upper pattern from a larger textile web. Schuessler I describes its preferred process, carried out by the flat-knitting machine in Schuessler II, for creating an article knitted to a specific shape "'*without requiring cutting*.'" *Adidas*, 2014 WL 1713368, at *19 (emphasis in original) (quoting Schuessler I, 1:25–26). We thus agree with the Board that the prior art references "serve the same purpose" of efficiently creating knitted articles. *See id.* And a skilled artisan interested in Nishida's preference to minimize waste in the production process would have logically consulted the well-known practice of flat-knitting, which eliminates the cutting process altogether. In other words, a person of skill in the art would have been motivated to address the problem identified in Nishida by applying the teachings of the Schuessler References to arrive at the invention in Nike's proposed substitute claims.

Nike next points to our decision in *Leo Pharmaceuticals Products, Ltd. v. Rea*, and argues that the age of these references and the passage of time between their public availability and the inventions recited in the proposed substitute claims should have precluded the Board from finding a reason to combine the references. 726 F.3d 1346, 1356–57 (Fed. Cir. 2013). Nike over reads our precedent. The relevant portion of *Leo Pharmaceuticals* stands for the proposition that the age of a reference can highlight the fact that no one in the art understood the problem to be solved.

True enough, *Leo Pharmaceuticals* discusses the number of years that passed from the time the prior art was invented until the filing of the patent at issue. *See id.* at 1355, 1356–57. But, our reversal of the Patent Board's obviousness determination hinged on the fact that nothing in the cited prior art appreciated the problem the invention recognized and then solved. *Id.* at 1353 ("The '013 patent, however, is not simply a combination of elements found in the prior art. The inventors . . . recognized and solved a problem . . . that the prior art did not recognize."). Because there was no prior recognition of the problem solved by the subject invention, there was no reason in the record why one of skill in the art would attempt to combine the cited prior art to arrive at the claimed invention. *Id.* at 1354 ("Only after recognizing the existence of the problem would an artisan *then* turn to the prior art and attempt to develop [the claimed invention]."); *see also id.* at 1356–57 (rejecting an obvious-to-try argument because "[u]ntil the advancement made by the inventors . . . [t]he problem was not known, the possible approaches to solving the problem were not known or finite, and the solution was not predictable").

In this way, our decision in *Leo Pharmaceuticals* is entirely consistent with established precedent that "[t]he mere age of the references is not persuasive of the unobviousness of the combination of their teachings, absent

evidence that, notwithstanding knowledge of the references, the art tried and failed to solve the problem." *In re Wright*, 569 F.2d 1124, 1127 (CCPA 1977); *see also Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1325 (Fed. Cir. 2004) ("Absent a showing of long-felt need or the failure of others, the mere passage of time without the claimed invention is not evidence of nonobviousness.").[2] *Leo Pharmaceuticals* recognizes the natural consequence of this idea: Persons of skill in the art cannot have tried and failed to solve the problem if they were never aware of that problem to begin with. Thus, the number of years that passed between the prior art and the claimed invention may be a relevant factor to underscore that skilled artisans had long failed to appreciate the problem solved by that invention. Here, there is no question that skilled artisans knew of the desire to reduce waste when producing wearable, knitted shoe uppers because that problem is expressly recognized in Nishida. Thus, *Leo Pharmaceuticals* does not control the present case.

B. Secondary Considerations

In Nike's brief supporting the motion to amend filed at the Board, Nike argued that reducing waste was a long-felt need in the shoe manufacturing industry and that Nishida did not resolve this need because the process in Nishida still resulted in some waste. Nike specifically pointed to its expert's declaration, which explained that

> Nishida shows that reducing material waste during manufacture of textile footwear uppers was a

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[2] As discussed in the next section, we must remand for reconsideration of obviousness in light of Nike's evidence of secondary considerations. As such, it may be appropriate for the Board to consider the passage of time in connection with Nike's secondary considerations evidence on remand.

> long-felt need. . . . Nishida's response to this problem was to make the "cutting waste" a simpler, lighter or cheaper material. . . . Unlike Nishida, which simply tried to make "cutting waste" less expensive, the upper of substitute claim 47 solves the long-felt need to reduce flat textile footwear upper manufacturing waste by eliminating the need to cut a textile element from a textile structure, thereby eliminating "cutting waste" (and the associated cutting step) instead of simply making the cutting waste cheaper.

J.A. 1647–48. Despite this argument and evidence, the Board's final written decision lacks a discussion, or even an acknowledgement, of secondary considerations.

1.

Evidence of secondary considerations plays a critical role in the obviousness analysis because it serves as objective indicia of nonobviousness and "may often be the most probative and cogent evidence in the record. It may often establish that an invention appearing to have been obvious in light of the prior art was not." *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538–39 (Fed. Cir. 1983). It is well-established that "evidence rising out of the so-called 'secondary considerations' must always when present be considered en route to a determination of obviousness." *Id.* at 1538. In fact, we have expressly stated that "when secondary considerations are present . . . it is *error not to consider them*." *In re Kao*, 639 F.3d 1057, 1067 (Fed. Cir. 2011) (emphasis added).

Nike argues that the Board erred by failing to address secondary considerations. Neither Adidas nor the PTO disputes that the Board's Final Written Decision lacks an acknowledgment of Nike's secondary considerations evidence. Adidas instead argues that this omission is not an automatically reversible error. Similarly, the PTO argues that the Board did not err because it "*implicitly*

found that reducing waste was not a long-felt but unresolved need." Intervenor Br. 19 (emphasis added). Because long-felt need is indisputably a secondary consideration, *see Graham*, 383 U.S. at 17–18, our precedent dictates that the Board is bound to fully consider properly presented evidence on the long-felt need for a claimed invention. Recognizing that the Board operates under stringent time constraints, we do not hold that it is obliged to explicitly address conclusory and unsupported arguments raised by a litigant. *Cf. Fresenius USA, Inc. v. Baxter Int'l, Inc.*, 582 F.3d 1288, 1296 (Fed. Cir. 2009) (holding that a party cannot preserve an argument if it presents "only a skeletal or undeveloped argument to the trial court"). Under the particular circumstances presented here, however, we conclude that the Board should have explicitly acknowledged and evaluated Nike's secondary considerations evidence.

2.

Adidas attempts to minimize this gap in the Board's decision by relying on our decisions stating that there is no requirement that a decision explicitly enumerate each *Graham* factor and include findings specifically in terms of the factors so long as "the required factual determinations were actually made and it is clear that they were considered while applying the proper legal standard of obviousness." *Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 990 (Fed. Cir. 1988); *see also MySpace, Inc. v. GraphOn Corp.*, 672 F.3d 1250, 1263–64 (Fed. Cir. 2012) (finding no error for failing to explicitly mention secondary considerations because "the record establishe[d] that the evidence was properly before and considered by the [district] court").

Both *Specialty Composites* and *MySpace* are distinguishable from the facts of this case. In these earlier cases, we were able to confirm that the respective district courts had weighed the evidence of secondary considera-

tions and reached a conclusion on that evidence because it was presented in written briefing and oral arguments and, critically, the courts made fact findings on that evidence. The absence of express recognition of secondary considerations was inconsequential. *Specialty Composites*, 845 F.2d at 990 (affirming the district court's obviousness determination because the record established that "the required factual determinations were actually made and it [was] clear that they were considered while applying the proper legal standard of obviousness"); *MySpace*, 672 F.3d at 1263–64 (finding no error for failing to explicitly mention secondary considerations because "the record establishe[d] that the evidence was properly before and considered by the [district] court"). Under these cases, we could perhaps be satisfied with the Board's decision, even without it mentioning the secondary considerations factor, if the decision had contained some findings indicating a basis for why the Board had rejected Nike's evidence of long felt need. However, such findings are absent in this case. *See Loctite Corp. v. Ultraseal Ltd.*, 781 F.2d 861, 873 (Fed. Cir. 1985) ("[W]e must be convinced from the opinion that the district court actually applied *Graham* and must be presented with enough express and necessarily implied findings to know the basis of the trial court's opinion."), *overruled on other grounds by Nobelpharma AB v. Implant Innovations, Inc.*, 141 F.3d 1059 (Fed. Cir. 1998).

Contrary to the PTO's arguments, the Board's statements describing the teachings of the prior art do not amount to an "implicit" rejection of Nike's long-felt-need evidence and argument. The Board made these statements in its motivation to combine analysis. *See Adidas*, 2014 WL 1713368, at *19. Nothing in that discussion, or in any other part of the Board's decision, suggests that the Board weighed and rejected Nike's evidence of long-felt need to eliminate waste in the manufacture of knit textile uppers en route to concluding that the proposed

substitute claims were unpatentable as obvious. We must therefore remand for the Board to examine Nike's evidence and its impact, if any, on the Board's analysis under the first three *Graham* factors.

3.

Adidas finally argues that we can alternatively affirm the obviousness determination, despite the absence of findings on secondary considerations, because there is no nexus between Nike's evidence and the merits of the invention in substitute claims 47–50. *See In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995) ("For objective evidence [of secondary considerations] to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of the claimed invention."). Whether the requisite nexus exists is a question of fact. *Pro-Mold & Tool Co., Inc. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573 (Fed. Cir. 1996). As such, we cannot resolve this factual dispute in the first instance. *Comiskey*, 554 F.3d at 974. We therefore express no opinion on this argument, except to recognize that the Board may certainly consider it on remand.

C. Claim 49

As mentioned above, Nike filed a motion to amend pursuant to 35 U.S.C. § 316(d) in which it sought to cancel the challenged patent claims and propose substitute claims. Section 316(d) provides that a patent owner's ability to propose substitute claims is limited to proposing a "*reasonable number* of substitute claims." *Id.* § 316(d)(1)(B) (emphasis added). The PTO interpreted this limit in 37 C.F.R. § 42.121(a)(3) by explaining that "[t]he presumption is that only one substitute claim would be needed to replace each challenged claim." The regulation also acknowledges that this presumption "may be rebutted by a demonstration of need." *Id.* In its *Idle Free* informative decision, the Board further explained that when a patent owner seeks to provide more than one

substitute claim for a challenged claim, "the patent owner needs to show patentable distinction of the additional substitute claim over all other substitute claims for the same challenged claim." 2013 WL 5947697, at *5. If the patent owner fails to carry this burden, "then at the Board's discretion, the proposed additional claim may be denied entry, or it may be grouped with, or deemed as standing and falling with, another substitute claim for the same challenged claim, *e.g.*, the first substitute claim, for purposes of considering patentability over prior art." *Id.*

Nike's proposed substitute claims 48 and 49, both of which depend from substitute claim 47, recite:

> **Claim 48.** (Substitute for dependent claim 19) The article of footwear recited in claim [16] 47, wherein at least one of the first stitch configuration and the second stitch configuration forms an aperture in the [weft-knitted] flat knit textile element and the joined edges shape the flat knit textile element to form a lateral region, a medial region, an instep region and a heel region of the upper.
>
> **Claim 49.** (Second substitute for dependent claim 19) The article of footwear recited in claim [16] 47, wherein at least one of the first stitch configuration and the second stitch configuration forms [an aperture] a plurality of apertures in the [weft-knitted] flat knit textile element, the apertures formed by omitting stitches in the flat knit textile element and positioned in the upper for receiving laces.

J.A. 1227. Claim 48 is directed to the general shape of the flat-knitted textile upper. Claim 49, on the other hand, is directed to a knit textile upper containing "apertures" that can be used to receive laces and that are formed by omitting stitches in the knit textile.

Thus, because Nike proposed substitute claims 48 and 49 to replace challenged claim 19, under *Idle Free*, Nike was required to demonstrate that proposed claims 48 and 49 were patentably distinct from one another. On appeal, Nike argues only that the Board erred in its treatment of claim 49 and asserts that the Board should have ultimately found claim 49 patentable.

1.

The Board explained that, under *Idle Free*, whether both claim 48 and claim 49 could be substituted for original claim 19 depended on whether those claims were patentably distinct from each other.[3] Despite recognizing this standard, the Board proceeded to compare the limitations in each of these claims *to the prior art*. As to claim 48, the Board observed that "Nishida describes joining the edges of the layout to form various portions of the upper."[4] *Adidas*, 2014 WL 1713368, at *12. With respect to claim 49, the Board stated that "Nishida describes forming lacing areas by knitting." *Id.* The Board then concluded that Nike had not demonstrated "that claims 48 and 49 are patentably distinct from each other." *Id.* Rather than deny entry of claims 48 and 49 on this basis, the Board decided to follow the alternate option provided in *Idle Free* and "group[ed] claim 49 with claim 48, for patentability purposes." *Id.*

We agree with Nike that, despite correctly reciting the *Idle Free* standard that multiple substitute claims are permissible if they are patentably distinct *from each other*, the Board nevertheless did not engage in any such analysis comparing proposed substitute claims 48 and 49.

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[3] Neither party objects to *Idle Free*'s interpretation of 37 C.F.R. § 42.121(a)(3) or to the PTO's interpretation of § 316(d)(1)(B) in section 42.121(a)(3).

[4] Nike does not dispute this conclusion.

Thus, the Board's decision to group substitute claims 48 and 49 together, meaning that claim 49 would stand and fall with claim 48, is not consistent with the rule set out by the Board in *Idle Free*. The Board has not provided a supported basis for grouping the two claims together in this manner. We must therefore remand for a proper determination of how these claims should be treated per the standard set forth in *Idle Free*, and, if necessary, a full consideration of the patentability of each.

2.

Even though the Board did not engage in the proper analysis to group claims 48 and 49 together, Adidas argues that Nike never separately argued the patentability of claim 49, and for that reason it was appropriate to nevertheless find claim 49 unpatentable. Contrary to Adidas's assertion, Nike did argue to the Board that claim 49 was separately patentable. In its motion to amend, Nike explained that "Nishida also does not disclose the limitation of claim 49 regarding apertures." J.A. 1233. Nike supported this argument with its expert declaration:

> Nishida also does not teach the limitation requiring "a plurality of apertures in the flat knit textile element, the apertures formed by omitting stitches in the flat knit textile element and positioned in the upper for receiving laces." While figure 3 of Nishida indicates the upper includes openings for laces, Nishida contains no description or suggestion of forming such openings by omitting stitches in the layout. Thus, it appears such openings were created by an additional manufacturing step, e.g., punching out the openings.

J.A. 1610.

Adidas seems to imply that Nike insufficiently preserved the argument by raising it only in its motion to amend and not in its reply brief. An issue is preserved for

appeal, however, so long as it can be said that the tribunal was "'fairly put on notice as to the substance of the issue.'" *Consolidation Coal Co. v. United States*, 351 F.3d 1374, 1378 (Fed. Cir. 2003) (quoting *Nelson v. Adams USA, Inc.*, 529 U.S. 460, 469 (2000)). Nike raised this argument in its motion to amend and supported the argument with its expert declaration. This was sufficient to put the Board on notice that Nike was asserting the "apertures formed by omitting stitches . . . and . . . for receiving laces" limitation as a patentable distinction. We therefore cannot agree with Adidas that Nike has waived its arguments relating to the patentability of claim 49.

3.

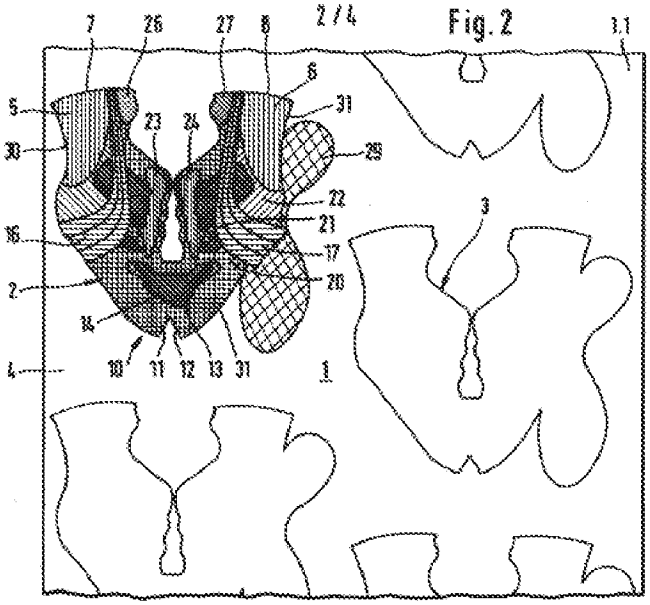
Adidas also argues that we can nevertheless affirm the Board's conclusion that claim 49 is unpatentable in light of Nishida and the Schuessler References. Adidas even asserts that the Board itself engaged in this analysis and found that the additional limitations in claim 49 were disclosed in Nishida. To support this argument, Adidas points to the Board's above-mentioned, less-than-clear analysis purporting to analyze whether claims 48 and 49 were "obvious over each other." *Adidas*, 2014 WL 1713368, at *12.

Claim 49 adds the limitation: "a plurality of apertures . . . formed by omitting stitches in the flat knit textile element and positioned in the upper for receiving laces." J.A. 1227. The Board merely explained that "[w]ith respect to the additional limitations of claim 49, Nishida describes forming lacing areas by knitting. Further, the Specification of the '011 Patent describes the omission of stitches, as recited in claim 49, to provide air permeability to the upper." *Adidas*, 2014 WL 1713368, at *12 (citations omitted). The Board supported its conclusion that "Nishida describes forming lacing areas by knitting," by first citing to (but not discussing) Nishida's

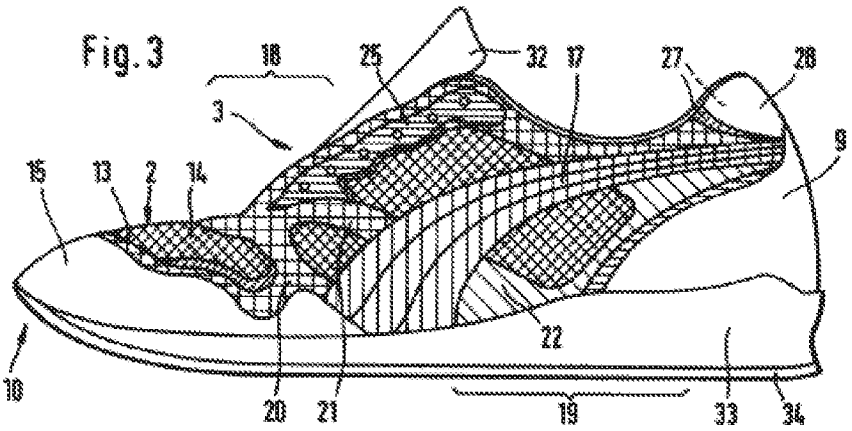
specification, which describes the concept of shoe laces and lacing areas, as seen in Figures 2 and 3 of Nishida:

> [T]he material can be woven or knitted in two or more layers or can be especially thick or additionally embroidered. Similarly, the lacing areas 23 and 24 can be made dimensionally stable in corresponding manners, especially if, for example, no additional trimmings, such as the lacing strips 25, shown in FIG. 3, are to be applied.

'638 patent, 3:67–4:5.



'638 patent, Figure 2 (illustrating lacing areas 23 and 24 in Nishida's knit textile upper pattern).



'638 patent, Figure 3 (depicting a completed shoe with the optional lacing strips 25 attached to lacing area 23 or 24). In this same discussion, the Board also pointed to Nike's own patent, the '011 patent, because it "describes the omission of stitches . . . to provide air permeability to the upper."[5] *Id.* (citing '011 patent, 9:57–62). Finally, the Board cited, in a parenthetical, to Nishida's disclosure that the toe area of the upper can have "good air exchange capability . . . by [using] a net-like woven or knitted structure." '638 patent, 3:49–52. The Board did not provide any explanation of the relevance of this passage nor the conclusions that it drew therefrom. Nevertheless, from these passages, the Board concluded that Nike had

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[5] We are troubled by the Board's citation to the '011 patent's written description and the corresponding appearance of using the '011 patent to find claim 49 unpatentable. Given the confusing analysis of comparing the substitute claims to the prior art to conclude that the substitute claims are not patentably distinct from one another, we are unsure for what purpose the Board was referring to the '011 patent's written description. This confusion can also be resolved on remand.

not demonstrated that claims 48 and 49 were patentably distinct from one another and then decided to group the two proposed substitute claims together for patentability purposes. At no point did the Board refer to the *Graham* factors and conclude that Nishida renders proposed substitute claim 49 obvious.

The Board's statements are insufficient to support a conclusion that proposed substitute claim 49 is unpatentable as obvious. As discussed above, obviousness determinations require underlying fact-findings, many of which are missing from the Board's decision as it relates to the specific limitations in claim 49. Adidas contends that no additional fact-finding is needed by pointing to the holes in the lacing area depicted in Nishida's Figure 3. But, the Board did not point to any disclosure in Nishida that explains the manner in which these holes were created, whether through knitting or some other way. In fact, the Board's short discussion did not even address the presence of the holes in either claim 49 or Nishida. Further, Nishida's specification never specifically discusses the lacing holes of its upper; they are only shown in Figure 3. It may well be that the Board intended to convey that claim 49 was obvious in light of Nishida because skipping stitches to form apertures, even though not expressly disclosed in Nishida, was a well-known technique in the art and that understanding perhaps would be a basis to conclude that one of skill in the art would utilize this technique to create holes for accepting shoe laces.[6] But, the Board did not articulate these

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[6] Adidas also asserts that the manner in which the lacing holes are created is irrelevant because the "formed by omitting stitches" portion of the limitation is nothing more than a product-by-process limitation. Because this was not raised to the Board during the IPR proceedings, we decline to opine on the issue except to say that, if given

findings. This portion of the Board's analysis on whether Nike's proposal of claim 48 and 49 constituted a reasonable number of substitute claims for originally issued claim 19 lacks critical fact-findings needed for any obviousness determination. We are unable to engage in such fact-finding in the first instance and must therefore remand for further proceedings. *See Ariosa*, 805 F.3d at 1365 ("But we must not ourselves make factual and discretionary determinations that are for the agency to make.").

4.

Nike, on the other hand, requests that we reverse and find claim 49 patentable because Nishida does not disclose the formation of apertures by omitting stitches. Nike specifically argues that the Board misunderstood the scope of claim 49 and the disclosure of Nishida. According to Nike, the Board failed to realize that claim 49 requires more than just knit "lacing areas," but requires apertures formed from skipping stitches in the knit pattern in an orientation such that the resulting apertures are capable of accepting shoe laces. *See Adidas*, 2014 WL 1713368, at *12 ("With respect to the additional limitations of claim 49, Nishida describes forming lacing areas by knitting.").

To support this argument, Nike points to its expert, who opined that, "[w]hile figure 3 of Nishida indicates the upper includes openings for laces, Nishida contains no description or suggestion of forming such openings by omitting stitches in the layout. Thus, it appears such

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the opportunity, Adidas may raise this argument to the Board on remand. *See Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1367 (Fed. Cir. 2015) ("We do not direct the Board to take new evidence or, even, to accept new briefing. The Board may control its own proceedings, consistent with its governing statutes, regulations, and practice.").

openings were created by an additional manufacturing step, e.g., punching out the openings." J.A. 1610. Nike asserts that this interpretation of the lacing holes in Nishida is correct based on Nishida's explanation that the knit upper "can be provided with an embroidery, especially with an English embroidery (i.e., the type of embroidery by which a hole pattern is welded and which is commonly used for the sewing of button holes), of a trademark or another mark or identification on suitable or preferred places." '638 patent, 4:33–38. Nike's expert further opined that there would have been "no motivation or other reason that would have prompted one of ordinary skill in the art at the time of the invention to modify Nishida to include this additional feature." J.A. 1613.

Based on this evidence, Nike urges us to find claim 49 patentable. We are unable to do so on this record because, as already explained, the Board has not made the requisite factual findings. Importantly, there are no findings from the Board about the scope and content of the passages from Nishida's written description on which Nike now relies. Further, there is no discussion about whether Nike's expert's statement was sufficient to demonstrate that there was no motivation to modify Nishida to arrive at lace holes formed by omitting stitches. Thus, we cannot, as Nike requests, reverse and find claim 49 patentable. Any resolution of this issue requires a factual analysis that must be done by the Board in the first instance.

III. Adidas's Alternative Grounds for Affirmance

Adidas also argues that, even if we cannot affirm the Board's obviousness conclusion, there are numerous alternative grounds on which we could affirm claim 49's unpatentability. First, Adidas argues that the Board's construction of "flat knit edges" is overly narrow and that, under the correct construction, Nishida anticipates all of the proposed substitute claims. Second, Adidas asserts

that, even under the Board's construction, Nishida alone renders the proposed substitute claims obvious. Finally, Adidas contends that we should affirm the outcome reached by the Board because, contrary to the Board's decision, Nike's proposed substitute claims are inadequately supported by the '011 patent's written description.

1.

We review the Board's ultimate claim construction de novo and any underlying factual determinations involving extrinsic evidence for substantial evidence. *Teva Pharm. U.S.A., Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841–42 (2015). When, as here, the intrinsic record fully determines the proper construction, we review the Board's claim construction de novo. *Id.* at 840–42; *see also Proxyconn*, 789 F.3d at 1297.

Each of Nike's proposed substitute claims is directed to a "flat knit textile element . . . having flat knit edges free of surrounding textile structure." Before the Board, Adidas argued that the broadest reasonable interpretation of "flat knit edges" should encompass not only flat-knit edges that are created when a flat knit textile element is knit to shape, but also edges created from cutting a textile element from a larger textile. The Board disagreed and determined that the broadest reasonable construction of the term "flat knit edges" is "an edge of a flat knit textile element, which is itself flat knit, e.g., which is not formed by cutting from a flat knit textile element." *Adidas*, 2014 WL 1713368, at *9. The Board arrived at this interpretation because any broader interpretation would be inconsistent with "the context of *this* claim (including surrounding claim language) and in the context of the Specification of *this* patent." *Id.* (emphasis in original).

On appeal, Adidas again argues that the Board erred because "flat knit edge" does not preclude edges formed by

cutting. We agree with the Board's construction. The language of proposed substitute claim 47 expressly recites that a "flat knit textile element, the flat knit textile element having flat knit edges *free of surrounding textile structure from which the textile element must be removed* . . . ." J.A. 1226 (emphasis added). This claim language demonstrates that the scope of this claim is limited to a flat-knit textile element where the flat knit edges have not been removed, or cut, from a surrounding textile structure. An interpretation that included a flat-knit textile element that has been cut from a larger textile web would contradict the express claim language.[7]

We therefore affirm the Board's conclusion that the broadest reasonable interpretation of "flat knit edge" is "an edge of a flat knit textile element, which is itself flat knit, e.g., which is not formed by cutting from a flat knit textile element." Because we affirm the Board's construction of the term "flat knit edges," we need not consider Adidas's argument that Nishida would anticipate under Adidas's proposed construction.

2.

Adidas next argues that, even if we affirm the Board's construction of "flat knit edges," we should nevertheless affirm the Board's conclusion that the proposed substitute claims are unpatentable because Nishida alone, without the Schuessler References, renders the claims obvious. This argument also fails.

A single-reference obviousness conclusion would avoid only the question of whether there existed a motivation to

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[7] Because Adidas is requesting an even broader construction than the broadest reasonable instruction, our conclusion that Adidas's construction is incorrect would not change under the standard used in district court proceedings.

combine the teachings of Nishida and the Schuessler References. We have already found the Board's finding on this question supported by substantial evidence. Adidas's single-reference obviousness argument does not, however, resolve the Board's failure to address Nike's evidence of secondary considerations. We therefore reject this argument as an alternative ground to affirm on the record before us.

3.

Adidas finally asserts that we should affirm the Board's conclusion that the proposed substitute claims are unpatentable because they lack adequate written description support. Whether a claim is supported by the patent's written description is a question of fact that we review for substantial evidence. *See Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1355 (Fed. Cir. 2010) (en banc); *In re Morsa*, 713 F.3d 104, 109 (Fed. Cir. 2013) (factual determinations by the Board are reviewed for substantial evidence).

To adequately support the claims, the written description "must clearly allow persons of ordinary skill in the art to recognize that the inventor invented what is claimed." *Ariad*, 598 F.3d at 1351 (internal quotation marks omitted). "Substantial evidence supports a finding that the specification satisfies the written description requirement when the essence of the original disclosure conveys the necessary information—regardless of *how* it conveys such information, and regardless of whether the disclosure's words are open to different interpretations." *Inphi Corp. v. Netlist, Inc.*, 805 F.3d 1350, 1354 (Fed. Cir. 2015) (internal quotation marks omitted); *see also In re Ruschig*, 379 F.2d 990, 995 (CCPA 1967) (the written description requirement serves the same function as "blaze marks on the trees" to help "find[] one's way through the woods").

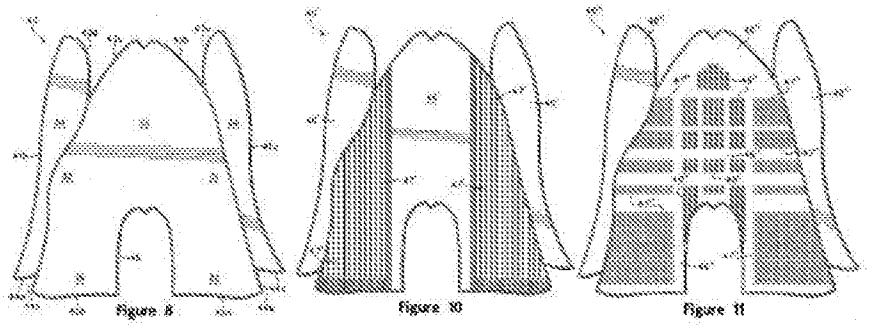
Adidas argued that the "flat knit edge" limitation was a negative limitation. Adidas further argued that negative limitations must satisfy a heightened written description requirement under our decision in *Santarus, Inc. v. Par Pharmaceutical, Inc.*, 694 F.3d 1344 (Fed. Cir. 2012). The Board disagreed and concluded that, even if the limitation was a negative limitation, it was "supported by the positive disclosure of the various forms of the textile element" shown in the '011 patent's written description. *Adidas*, 2014 WL 1713368, at *9.

On appeal, Adidas again argues that the term "flat knit edge" is a negative limitation and as such it must satisfy a "heightened requirement" of written description support. Appellant's Br. 51 (citing *Santarus*, 694 F.3d at 1351). It is worth noting that we doubt that the present limitation is properly characterized as a negative limitation. Negative limitations generally recite an express exclusion of material. For example, in *Inphi*, we addressed claim language that expressly excluded the use of certain signal types in a claim relating to computer system memory modules. *Inphi*, 805 F.3d at 1352–53 ("the chip selects of the first and second number of chip selects are DDR chip selects *that are not CAS, RAS, or bank address signals*" (emphasis added)). Similarly, in *Santarus*, we examined claim language that expressly excluded the use of sucralfate in a claim directed to the treatment of an acid-caused gastrointestinal disorder. *Santarus*, 694 F.3d at 1350 ("wherein the composition contains no sucralfate").

Even if we assume, as the Board did, that this claim limitation is a negative limitation, Adidas is incorrect that any sort of heightened standard applies. "Negative limitations are adequately supported when the specification describes a reason to exclude the relevant limitation." *Id.* at 1351. We recently explained in *Inphi* that, contrary to Adidas's argument, *Santarus* did not create a heightened

standard for written description support of negative limitations. *Inphi*, 805 F.3d at 1356. We further explained that "[w]hen viewed in its proper context, *Santarus* simply reflects the fact that the specification need only satisfy the requirements of § 112, paragraph 1 as described in this court's existing jurisprudence." *Id.* (citing MPEP § 2173.05(i) ("If alternative elements are positively recited in the specification, they may be explicitly excluded in the claims.")). Thus, we need only consider whether the disclosures of the '011 patent, using the customary standard for the written description requirement, allow persons of ordinary skill in the art to recognize that the inventor invented a flat-knit textile with flat-knit edges that are knit to shape rather than being cut from a larger textile web.

In reaching its conclusion that the proposed substitute claims were supported by the '011 patent's written description, the Board emphasized Figures 8, 10, and 11.



'011 patent, Figures 8, 10, 11. These figures illustrate the shape of textile element 40 before the formation of seams to create the general shape for receiving a foot. Even Adidas's expert agreed that the upper illustrated in Figure 8 "could be made on a flat knitting machine" and "then the edges that are shown in Figure 8 would be flat knitted." J.A. 1483; *see also* J.A. 1574 (Nike's expert

opining that "[t]he disclosure in the '011 patent that the textile elements in Figures 8, 10, and 11 can be made using flat knitting makes it clear that these textile elements can be knit to the shapes shown in these figures (*i.e.*, without surrounding textile structure) using flat knitting.").

These figures are in sharp contrast to Figure 9, which is formed using a "wide-tube circular knitting machine," as opposed to a flat-knitting machine. '011 patent, 6:66–7:8, 7:41–43; *see also id.* at 7:29–32 (explaining that a circular knitting machine "forms a generally cylindrical textile structure").

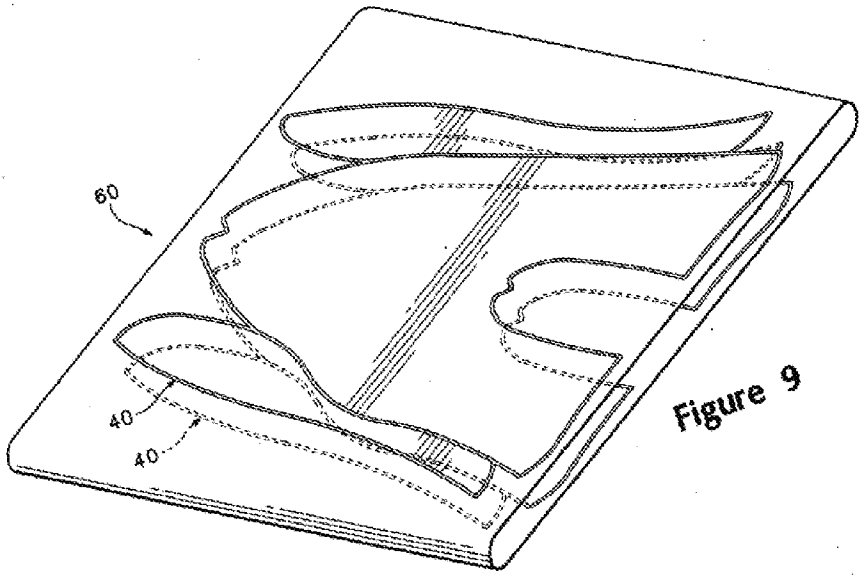


Figure 9

'011 patent, Figure 9. As shown in Figure 9, a circular knit upper, as distinguished from flat knit, must be removed from surrounding textile material by, for example, cutting. In addition, Nike's expert explained that the embodiment illustrated in Figure 9 is made "using a circular knitting process and requires that the textile element [40] be formed as part of a larger textile structure

[60]" and "requires additional processing to remove the textile element [40] from the textile structure [60]." J.A. 1571. The Board agreed with Nike that the language describing Figure 9 "does not limit the textile elements depicted in Figures 8, 10, and 11 to those manufactured according to the process of Figure 9." *Adidas*, 2014 WL 1713368, at *15.

In addition, the Board cited Nike's expert's declaration explaining that the textile upper shown in Figures 8, 10, and 11 "'illustrates multiple examples in which the textile element is shown in its final shape and is not described as being formed as part of a larger textile structure from which it must be removed.'" *Id.* (quoting J.A. 1587). The written description and the originally issued claims make a distinction between textile elements that are removed from a larger textile web and those that are not. For example, the patent discusses the textile element 40 as "a single material element that is formed to exhibit a unitary (i.e., one-piece) construction." '011 patent, 5:38–39. The patent then explains that "[t]extile element 40 *may be* formed as a part of a larger textile element," which would then require that "textile element 40 is . . . removed from the larger textile element." *Id.* at 5:43–45. In fact, only one of the originally issued, now cancelled, independent claims is expressly directed to an upper where "the textile element [is] removed from a textile structure." *Id.* at 13:47–14:6 (claim 36). Accordingly, based on the Figures in the '011 patent, the disclosures in the written description, and the expert testimony, we conclude that substantial evidence supports the Board's decision that the proposed substitute claims are adequately supported by the written description of the '011 patent.

IV. Establishing Patentability Over Prior Art Not of Record But Known to the Patent Owner

The Board's *Idle Free* decision explained that, under 37 C.F.R. § 42.20(c), a motion to amend will be successful only if the patent owner "persuade[s] the Board that the proposed substitute claim is patentable over the prior art of record, *and over prior art not of record but known to the patent owner*." 2013 WL 5947697, at *4 (emphasis added). Nike attempted to carry this burden in its motion to amend by simply stating that its proposed claims were patentable over prior art known to Nike, but not part of the record of the proceedings. *See* J.A. 1228. The Board denied Nike's request to enter proposed substitute claims 47–50 in part because Nike's motion failed to address any prior art reference that was not discussed in Adidas's petition for review or Adidas's opposition to Nike's motion to amend, i.e., any prior art not of record. *Adidas*, 2014 WL 1913368, at *17 (finding Nike's "conclusory statement" to be "facially inadequate" under the Board's understanding of *Idle Free*). As discussed above, as an alternative ground to deny Nike's motion, the Board went on to consider the patentability of Nike's proposed substitute claims on the merits. Because we must vacate and remand the Board's obviousness conclusion, we must now consider whether the Board's denial of Nike's motion to amend for failure to show patentable distinction over "prior art not of record but known to the patent owner" provides an adequate basis for affirmance. For the reasons explained below, we conclude that it is not.

After the Board's decision in this case, the Board issued *MasterImage 3D, Inc. v. RealD Inc.*, IPR2015-00040, 2015 WL 4383224 (PTAB July 15, 2015), which has been designated by the PTO as a Representative Decision on Motions to Amend. *See* Standard Operating Procedure 2, at 3 (¶ IV.A–B) (explaining that Board decisions labeled "representative" are "not binding authority," but provide "a representative sample of outcomes on a matter"). In

MasterImage 3D, the Board "ma[d]e three points of clarification regarding" *Idle Free*'s requirement that the patent owner show that its proposed substitute claims are patentable over the prior art of record and also other prior art known to the patent owner. Importantly, the Board explained that "[t]he reference to 'prior art known to the patent owner' . . . in *Idle Free*, should be understood as no more than the material prior art that Patent Owner makes of record in the current proceeding pursuant to its duty of candor and good faith to the Office under 37 C.F.R. § 42.11, in light of the Motion to Amend." *MasterImage 3D*, Slip. Op. at 3. At oral argument in the present case, the PTO confirmed this characterization of *MasterImage 3D*. *See* Oral Argument at 29:13–29:22 *available at* http://cafc.uscourts.gov/oral-argument-recordings/2014-1719/all ("[*MasterImage*] is not a change of *Idle Free*, it's more of a clarification of *Idle Free*."). The PTO further explained that, although the Board's denial of Nike's motion to amend was based on a reasonable reading of *Idle Free*, given the clarification in *MasterImage 3D*, the PTO acknowledged that the Board "read *Idle Free* too aggressively in this decision." *Id.* at 29:23–30:01.

We agree with the PTO. At the heart of *Idle Free*, as interpreted by *MasterImage 3D*, is the question of whether the patent owner has submitted the necessary information to comply with its duty of candor to the office. In this case, there is not, and there has never been, an allegation that Nike violated its duty of candor. Moreover, the PTO acknowledged that Nike's statement about the substitute claims' patentability over prior art not of record but known to Nike would satisfy the obligation as explained in *MasterImage 3D*. *Id.* at 35:50–36:06. After *MasterImage*'s explanation of *Idle Free*, we cannot see how the statement used by Nike would be inadequate, absent an allegation of conduct violating the duty of candor. We therefore conclude that this was an improper ground on which to deny Nike's motion to amend.

CONCLUSION

For the foregoing reasons, we vacate the Board's obviousness determination and remand for further proceedings consistent with this opinion.

AFFIRMED-IN-PART, VACATED-IN-PART, AND REMANDED

COSTS

No costs.

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

INFORMATION SHEET

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There is no automatic right of appeal to the Supreme Court of the United States from judgments of the Federal Circuit. You must file a petition for a writ of certiorari which the Supreme Court will grant only when there are compelling reasons. (See Rule 10 of the Rules of the Supreme Court of the United States, hereinafter called Rules.)

Time. The petition must be filed in the Supreme Court of the United States within 90 days of the entry of judgment in this Court or within 90 days of the denial of a timely petition for rehearing. The judgment is entered on the day the Federal Circuit issues a final decision in your case. [The time does not run from the issuance of the mandate, which has no effect on the right to petition.] (See Rule 13 of the Rules.)

Fees. Either the $300 docketing fee or a motion for leave to proceed in forma pauperis with an affidavit in support thereof must accompany the petition. (See Rules 38 and 39.)

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Washington, DC 20543
(202) 479-3000

No documents are filed at the Federal Circuit and the Federal Circuit provides no information to the Supreme Court unless the Supreme Court asks for the information.

Access to the Rules. The current rules can be found in Title 28 of the United States Code Annotated and other legal publications available in many public libraries.

Revised December 16, 1999

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

Questions and Answers

Petitions for Rehearing (Fed. Cir. R. 40)
and
Petitions for Hearing or Rehearing En Banc (Fed. Cir. R. 35)

Q. When is a petition for rehearing appropriate?

A. Petitions for rehearing are rarely considered meritorious. Consequently, it is easiest to first answer when a petition for rehearing is not appropriate. A petition for rehearing should not be used to reargue issues already briefed and orally argued. If a party failed to persuade the court on an issue in the first instance, they do not get a second chance. This is especially so when the court has entered a judgment of affirmance without opinion under Fed. Cir. R. 36, as a disposition of this nature is used only when the appellant has utterly failed to raise any issues in the appeal that require an opinion to be written in support of the court's judgment of affirmance.

Thus, as a usual prerequisite, the court must have filed an opinion in support of its judgment for a petition for rehearing to be appropriate. Counsel seeking rehearing must be able to identify in the court's opinion a material error of fact or law, the correction of which would require a different judgment on appeal.

Q. When is a petition for hearing or rehearing en banc appropriate?

A. En banc decisions are extraordinary occurrences. To properly answer the question, one must first understand the responsibility of a three-judge merits panel of the court. The panel is charged with deciding individual appeals according to the law of the circuit as established in the court's precedential opinions. While each merits panel is empowered to enter precedential opinions, the ultimate duty of the court en banc is to set forth the law of the Federal Circuit, which merit panels are obliged to follow.

Thus, as a usual prerequisite, a merits panel of the court must have entered a precedential opinion in support of its judgment for a suggestion for rehearing en banc to be appropriate. In addition, the party seeking rehearing en banc must show that either the merits panel has failed to follow identifiable decisions of the U.S. Supreme Court or Federal Circuit precedential opinions or that the merits panel has followed circuit precedent, which the party seeks to have overruled by the court en banc.

Q. How frequently are petitions for rehearing granted by merits panels or petitions for rehearing en banc accepted by the court?

A. The data regarding petitions for rehearing since 1982 shows that merits panels granted some relief in only three percent of the more than 1900 petitions filed. The relief granted usually involved only minor corrections of factual misstatements, rarely resulting in a change of outcome in the decision.

En banc petitions were accepted less frequently, in only 16 of more than 1100 requests. Historically, the court itself initiated en banc review in more than half (21 of 37) of the very few appeals decided en banc since 1982. This sua sponte, en banc review is a by-product of the court's practice of circulating every precedential panel decision to all the judges of the Federal Circuit before it is published. No count is kept of sua sponte, en banc polls that fail to carry enough judges, but one of the reasons that virtually all of the more than 1100 petitions made by the parties since 1982 have been declined is that the court itself has already implicitly approved the precedential opinions before they are filed by the merits panel.

Q. Is it necessary to have filed either of these petitions before filing a petition for certiorari in the U.S. Supreme Court?

A. No. All that is needed is a final judgment of the Court of Appeals. As a matter of interest, very few petitions for certiorari from Federal Circuit decisions are granted. Since 1982, the U.S. Supreme Court has granted certiorari in only 31 appeals heard in the Federal Circuit. Almost 1000 petitions for certiorari have been filed in that period.

July 21, 2008

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

14-1719

NIKE, INC.,
Appellant

v.

ADIDAS AG,
Appellee

Appeal from the United States Patent and Trademark Office in case no. IPR2013-00067

MANDATE

In accordance with the judgment of this Court, entered February 11, 2016, and pursuant to Rule 41(a) of the Federal Rules of Appellate Procedure, the formal mandate is hereby issued.

FOR THE COURT

/s/ Daniel E. O'Toole
Daniel E. O'Toole
Clerk of Court

Trials@uspto.gov
571-272-7822

Paper 62
Entered: August 10, 2016

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

adidas AG,
Petitioner,

v.

NIKE, Inc.,
Patent Owner.

Case IPR2013-00067
Patent 7,347,011 B2

Before JOSIAH C. COCKS, MICHAEL J. FITZPATRICK, and JAMES B. ARPIN, *Administrative Patent Judges.*

ARPIN, *Administrative Patent Judge.*

ORDER
Conduct of Remand Proceeding
37 C.F.R. § 42.5

On April 28, 2014, we issued a Final Written Decision in the above-captioned case. Paper 60 ("Final Dec."). We granted Patent Owner's request for the cancellation of original claims 1–46, but denied Patent Owner's request for entry of substitute claims 47–50. Final Dec. 42. In

particular, we concluded that Patent Owner failed to establish the patentability of substitute claims 47–50. Patent Owner appealed the Final Written Decision to the United States Court of Appeals for the Federal Circuit ("the Federal Circuit"). Paper 61. On February 11, 2016, the Federal Circuit issued a decision, affirming-in-part, vacating-in-part, and remanding the case to the Board. *Nike, Inc. v. adidas AG*, 812 F.3d 1326, 1329 (Fed. Cir. 2016). The Federal Circuit's mandate issued on April 4, 2016. Paper 1.

Since the issuance of the mandate over four months ago, neither party has sought authorization to submit additional argument or evidence relevant to any matters that must be reconsidered or reassessed before the Board on remand, e.g., the propriety of Patent Owner's proposal of multiple substitute claims for original claim 19 or the panel's failure to expressly consider Patent Owner's arguments and evidence of secondary considerations, or our guidance on the conduct of the remand proceeding. *See Nike*, 812 F.3d at 1339–42. Our determination of the issues on remand will be based solely on the arguments and evidence that were already in the record before us on April 28, 2014, the date of issuance of the Final Written Decision, without additional briefing by either party, and also without submission of additional evidence by either party. *See id.* at 1345 n.6 (citing *Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1367 (Fed. Cir. 2015) ("We do not direct the Board to take new evidence or, even, to accept new briefing. The Board may control its own proceedings, consistent with its governing statutes, regulations, and practice.")).

Skechers EX1013-p. 6081
Skechers v Nike

Given that the Final Written Decision was vacated and remanded only for specific errors, we need only address and correct on remand those errors as determined by our reviewing Court. Nothing more is required. Further proceeding in this case is closed to any issue that was not raised by any party for decision in the Final Written Decision.

ORDER

Accordingly, it is

ORDERED that the Parties may not submit further argument or evidence, regarding the issues to be considered on remand.

Skechers EX1013-p. 6082
Skechers v Nike

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Skechers EX1013-p. 6083
Skechers v Nike

Electronic Acknowledgement Receipt

EFS ID:	29873090
Application Number:	15610089
International Application Number:	
Confirmation Number:	4757
Title of Invention:	ARTICLE OF FOOTWEAR HAVING A TEXTILE UPPER
First Named Inventor/Applicant Name:	BHUPESH DUA
Customer Number:	78342
Filer:	Elizabeth Ashley Lucas
Filer Authorized By:	
Attorney Docket Number:	NIKE.276100/081313US82CON
Receipt Date:	24-JUL-2017
Filing Date:	31-MAY-2017
Time Stamp:	23:10:13
Application Type:	Utility under 35 USC 111(a)

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Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	276100_8_NPL_17_Motion_Nike_Extend_Time_to_File_Reply_Brief_04132015.pdf	1736297 dd9d6640c15fd7208cfc69033b38ba882e1b8292	no	8

Warnings:

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2	Non Patent Literature	276100_8_NPL_18_ORDER_Granting_Motion_to_Extend_Time_to_File_Reply_Brief_04142015.pdf	61624 5d896e801a5f85656acca232cef316554f8065e9	no	2
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Information:					
3	Non Patent Literature	276100_8_NPL_19_Nike_REPLY_BRIEF_05272015.pdf	14174834 cdd086a26702b029e21017f98fa888ae7accad8f	no	38
Warnings:					
Information:					
4	Non Patent Literature	276100_8_NPL_20_Nike_JOINT_APPENDIX_06082015.pdf	20513998 64854a62eba3c6934ae99c33faeec5ca99e70859	no	49
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Information:					
5	Non Patent Literature	276100_8_NPL_21_Statement_of_Compliance_for_Nike_Adidas_AG_Intervenor_Lee_06082015.pdf	511914 0c78c2ef317ea616a80eb4f5263a3e1531e5bff0	no	4
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Information:					
6	Non Patent Literature	276100_8_NPL_22A_Nike_Appendix_Filed_06082015.pdf	23875980 74cde1b74f2fe3c2fc110e11336debfa0a62b4a9	no	75
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7	Non Patent Literature	276100_8_NPL_22B_Nike_Appendix_filed_06082015.pdf	12858385 88bcf8ccf52d56f99fd38bb635605b440d89eaa4	no	76
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8	Non Patent Literature	276100_8_NPL_22C_Nike_Appendix_filed_06082015.pdf	13197659 a34bf4c7e8384362b4b35bbba45abf5ad063e2ca	no	76
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9	Non Patent Literature	276100_8_NPL_22E_Nike_Appendix_filed_06082015.pdf	24935157 406464fc892df39fb36a1d4fa340f367b3edad4f	no	76
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10	Non Patent Literature	276100_8_NPL_22F_Nike_Appendix_filed_06082015.pdf	6268739 b1bfcc1c7ad7e40fe46f5321a5374dd9369ed43f	no	76
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11	Non Patent Literature	276100_8_NPL_22G_Nike_Appendix_filed_06082015.pdf	9366580 f0ef4da1f98e1f7cf58734faa8bc59fc5092bc83	no	75
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12	Non Patent Literature	276100_8_NPL_22D_Nike_Appendix_filed_06082015.pdf	22335056 d137bf7d0981068e90f0660fe4f7f8a6543d97d5	no	76
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Information:					
13	Non Patent Literature	276100_8_NPL_23_Citation_of_Supplemental_Authority_Pursuant_to_Fed_R_P_280_08242015.pdf	2060120 21fa5ea9a6996f003023eacc8b3929fc79526e8b	no	37
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Information:					
14	Non Patent Literature	276100_8_NPL_24_Motion_of_Intervenor_Lee_for_Additional_Time_at_Oral_Argument_09032015.pdf	716435 c33ee06f042b25975d4ecf6eef32d7431cc2fbc1	no	3
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Information:					
15	Non Patent Literature	276100_8_NPL_25_ORDER_Filed_09082015_Granting_Lee_Motion_to_Seek_More_Time_for_Argument.pdf	62356 8a6ecc3095a0ebe41c80507f61a97e00004f04d9	no	2
Warnings:					
Information:					

16	Non Patent Literature	276100_8_NPL_26_OPINION_and_JUDGMENT_filed_02112016.pdf	783860 e2ee311e052b58e276a545b970ca6a62443745af	no	3
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17	Non Patent Literature	276100_8_NPL_27_Corrected_Opinion_and_Judgement_filed_02112016.pdf	838969 b45826f5da2e14677bef5af640ace5ef32fbf70d	no	44
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Information:					
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Warnings:					
Information:					
19	Non Patent Literature	276100_8_NPL_29_08102016_Order_Conduct_of_Remand_Proceeding_for_IPR201300067.pdf	1036846 b0c66232f48c445dfc6bcf5a40ef5ef38929c164	no	4
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New International Application Filed with the USPTO as a Receiving Office

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PTO/SB/08a (03-15)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15610089
Filing Date	2017-05-31
First Named Inventor	BHUPESH DUA
Art Unit	3765
Examiner Name	MARIE D. BAYS
Attorney Docket Number	NIKE.276100/081313US82CON

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	2178941		1939-11-07	Schuessler	
	2	2150730		1939-03-14	Schuessler	
	3	6984596		2006-01-10	Dickerson	
	4	4354318		1982-10-19	Frederick et al.	

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	1	20140150294		2014-06-05	Thomas et al.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15610089
	Filing Date	2017-05-31
	First Named Inventor	BHUPESH DUA
	Art Unit	3765
	Examiner Name	MARIE D. BAYS
	Attorney Docket Number	NIKE.276100/081313US82CON

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	1	Order Trial Hearing dated January 13, 2014, in IPR2013-00067.	
	2	Patent Owner Opposition to Motion to Exclude dated January 21, 2014, in IPR2013-00067.	
	3	Order Conduct of the Proceeding § 42.5 dated January 23, 2014, in IPR2013-00067.	
	4	Mandatory Notice Information (Addition of Back-Up Counsel) dated January 28, 2014, in IPR2013-00067.	
	5	Petitioner's Reply to Patent Owner's Opposition to Petitioner's Motion to Exclude Evidence dated January 28, 2014, in IPR2013-00067.	
	6	Petitioner's Exhibit List (As of February 6, 2014) dated February 6, 2014, in IPR2013-00067.	
	7	Submission of Patent Owner's Trial Hearing Demonstratives dated February 6, 2014, in IPR2013-00067.	
	8	Oral Hearing Transcript dated March 5, 2014, in IPR2013-00067.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15610089
	Filing Date	2017-05-31
	First Named Inventor	BHUPESH DUA
	Art Unit	3765
	Examiner Name	MARIE D. BAYS
	Attorney Docket Number	NIKE.276100/081313US82CON

	9	Final Written Decision dated April 28, 2014, in IPR2013-00067.	
	10	Notice of Appeal dated June 30, 2014, in IPR2013-00067.	
	11	Cross Examination Deposition of Raymond Tonkel dated November 12, 2013, in IPR2013-00067.	
	12	Declaration of Sabut Adanur Ph.D dated November 12, 2013, in IPR2013-00067.	
	13	Excerpt of Knitted Fabrics dated November 12, 2013, in IPR2013-00067.	
	14	Excerpt of Bharat J. Gaijar, Wrap Knit Fabrics Technologies dated November 12, 2013, in IPR2013-00067.	
	15	J. Watel, the Milanese Machine: Little Progress Made in Development of Milanese Fabric dated November 12, 2013, in IPR2013-00067.	
	16	Supplemental Declaration Edward C. Frederick, Ph.D. dated November 12, 2013, in IPR2013-00067.	
	17	Billy Hunter, Editor Viewpoint: Nike Flyknit: Quantum Leap for Flat Knitting dated November 12, 2013, in IPR2013-00067.	
	18	Billy Hunter, Editor Viewpoint: Nike Flyknit: Ready, Steady, Go dated November 12, 2013, in IPR2013-00067.	
	19	Petitioner's Oral Hearing Demonstratives dated February 6, 2014, in IPR2013-00067.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15610089
	Filing Date	2017-05-31
	First Named Inventor	BHUPESH DUA
	Art Unit	3765
	Examiner Name	MARIE D. BAYS
	Attorney Docket Number	NIKE.276100/081313US82CON

	20	Edward C. Frederick, Ph.D Declaration dated August 19, 2013, in IPR2013-00067.	
	21	Chapter 16 of Textiles in Sport dated August 19, 2013, in IPR2013-00067.	
	22	US Patent 2147197 with markings dated August 19, 2013, in IPR2013-00067.	
	23	US Patent 7347011 with markings dated August 19, 2013, dated August 19, 2013, in IPR2013-00067.	
	24	Decision on Appeal dated August 19, 2013, in IPR2013-00067.	
	25	Edward C. Frederick, Ph.D Deposition Transcript dated August 19, 2013, in IPR2013-00067.	
	26	Raymond F. Tonkel Declaration dated August 19, 2013, in IPR2013-00067.	
	27	Excerpts from Man-Made Fiber and Textile Dictionary dated August 19, 2013, in IPR2013-00067.	
	28	R-H Websters Dictionary Excerpt dated August 19, 2013, in IPR2013-00067.	
	29	Edward C. Frederick, Ph.D Deposition Errata Sheet dated August 29, 2013, in IPR2013-00067.	
	30	Exhibit 2015 dated December 11, 2013, in IPR2013-00067.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15610089
	Filing Date	2017-05-31
	First Named Inventor	BHUPESH DUA
	Art Unit	3765
	Examiner Name	MARIE D. BAYS
	Attorney Docket Number	NIKE.276100/081313US82CON

	31	Exhibit 2016 dated December 11, 2013, in IPR2013-00067.	
	32	Exhibit 2017 dated December 11, 2013, in IPR2013-00067.	
	33	Exhibit 2018 dated December 11, 2013, in IPR2013-00067.	
	34	Exhibit 2020 dated December 11, 2013, in IPR2013-00067.	
	35	Exhibit 2021 dated December 11, 2013, in IPR2013-00067.	
	36	Exhibit 2022 dated January 7, 2014, in IPR2013-00067.	
	37	Exhibit 2023 dated January 7, 2014, in IPR2013-00067.	
	38	Exhibit 3001 dated April 28, 2014, in IPR2013-00067.	
	39	Exhibit 3002 dated April 28, 2014, in IPR2013-00067.	
	40	Form PTO SB 42 dated November 28, 2012, in IPR2013-00067.	
	41	Form PTO SB 42 dated November 12, 2013, in IPR2013-00067.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15610089
	Filing Date	2017-05-31
	First Named Inventor	BHUPESH DUA
	Art Unit	3765
	Examiner Name	MARIE D. BAYS
	Attorney Docket Number	NIKE.276100/081313US82CON

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15610089
Filing Date	2017-05-31
First Named Inventor	BHUPESH DUA
Art Unit	3765
Examiner Name	MARIE D. BAYS
Attorney Docket Number	NIKE.276100/081313US82CON

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/ELIZABETH A. LUCAS/	Date (YYYY-MM-DD)	2017-07-24
Name/Print	Elizabeth A. Lucas	Registration Number	74247

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

adidas AG
Petitioner

v.

Nike, Inc.
Patent Owner

Patent No. 7,347,011
Filing Date: March 3, 2004
Issue Date: March 25, 2008
Title: ARTICLE OF FOOTWEAR HAVING A TEXTILE UPPER

Inter Partes Review No. 2013-00067

PETITIONER'S REPLY TO PATENT OWNER'S OPPOSITION TO PETITIONER'S MOTION TO EXCLUDE EVIDENCE

adidas AG ("Petitioner") filed a motion to exclude certain deposition testimony of Dr. Edward C. Frederick ("Dr. Frederick") because that testimony (elicited by Nike, Inc. ("Owner")) went beyond the scope of his direct (declaration) testimony, in violation of 37 C.F.R. § 42.53(d)(5)(ii). (Paper 49.) adidas now replies to the opposition brief of Owner. (Paper 51.)

At issue in Petitioner's motion is whether Dr. Frederick's testimony relating to "flat knit edges" that appears on page 116 of his deposition (Ex. 2009) should be excluded. Dr. Frederick's declaration did not address the term "flat knit edges," as this term did not appear in issued claims 1-46 of the '011 patent and was only introduced by Owner in its Motion to Amend, which was filed after Dr. Frederick's deposition. Owner nevertheless elicited such testimony from Dr. Frederick at the deposition. Petitioner's opening brief explained why that testimony went beyond the scope of direct testimony, and was relied on by Owner in support of its Motion to Amend. (Paper 49.)

Owner's opposition may be summarized as stating that the evidence should not be excluded because (1) Petitioner did not object quickly enough when Owner began the line of questioning related to flat knit edges and (2) the subject matter was within the scope of Dr. Frederick's direct testimony because (i) the term "flat knit edge" was not *explicitly* used in the questions, (ii) the issued claims recite "edges" of a textile element, and (iii) Owner was allowed to question Dr. Frederick about his "*direct testimony* and to his overall

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knowledge of *the patented technology*, a point which has a bearing on his credibility to provide expert testimony in this proceeding." (Paper 51. (emphasis added).)

I. Petitioner's Objections Were Timely and Sufficient

Owner asserts that the testimony elicited from Dr. Frederick on page 116 of his deposition is not subject to exclusion because Petitioner only made "a single objection to a single question at the bottom of the entire page of testimony." (Paper 51, p. 3.) Petitioner asserts that the objection was made as soon as the improper subject matter of Owner's line of questioning became clear.

As can be seen on page 115 of the deposition, the line of questioning regarding the treatment of the edges of the textile element shown in Figure 8 of the '011 patent commenced at the top of page 116 as a new line of questioning following a break, and Petitioner's objection was made immediately after the first question that explicitly identified the subject matter that was outside the scope of claims 1-46. This is because the '011 patent specification references flat knitting machines and makes reference to the edges of the textile element (see *e.g.* Claim 1), and it was not evident that the Owner's questions were exceeding the scope of the original patent claims until the issue of "processing" the edges of a flat knitted textile element was raised.

Thus, unless Petitioner were to object to *every* question raised by Owner (and therefore engage in obstructionist behavior in the deposition), there is no way that Petitioner could have voiced an objection any sooner to place Owner on notice that the line of

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questioning was outside the scope of acceptable subject matter for cross-examination of Dr. Frederick.

II. Questions Regarding "Flat Knit Edges" Cannot Be Within the Scope of Dr. Frederick's Direct Testimony Relating to the Original Claims, if the Addition of this Term to the Amended Claims is Supposed to Overcome the Prior Art.

As a preliminary matter, Owner claims that a question about "edges that are flat knitted" is not a question about "flat knit edges." (Paper 51, p. 4.) Specifically, Owner asked Dr. Frederick:

> Q. And *edges that are flat knitted*, would they require further processing before the edges where joined to form various seams?

(Ex. 2009, 116:21-23 (emphasis added).)

This argument is nonsensical because, in both phrases, "flat knit" (or "flat knitted" as worded in the question above) modifies the term "edges." Thus, it is clear that Owner's question referred to the treatment of flat knit edges.

Furthermore, Owner's expert has repeatedly stated that the construction of "flat knit edges" means edges that are completely formed in the flat knitting process (*i.e.,* "knit to shape" edges). (Paper 31, p. 4; Ex. 2010, ¶ 65; Ex. 1015, pp. 68-98.) This claim term is the only feature on which Owner's expert relies to distinguish proposed substitute claim 47 over Nishida (Ex. 1005). (Paper 3, pp. 6-8; Ex. 2010, ¶ 101; Ex. 1015, p. 68-98.) Thus, Owner's assertions that the term "flat knit edges" is within the scope of original claims 1-46 because the original claims included the terms "a textile element with edges" and "edges of a textile

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element," show that the term "flat knit edges" is not a true distinction over the prior art, namely Nishida. (Paper 51, pp. 3-4.) In short, Owner cannot have it both ways -- either the line of questioning was outside the scope of the original claims and any reliance on Dr. Frederick's testimony elicited on this topic should be excluded, or the proposed substitute claims add nothing new to patentability over claims 1-46.

This deficiency also cannot be cured by arguing that the questioning "relates to aspects of Mr. Frederick's direct testimony and to his overall knowledge of the patented technology." (Paper 51, p. 4. (emphasis added).) For purposes of determining the scope of testimony, the term "patented technology" must refer to the original 46 claims of the '011 patent. If the subject matter of "flat knit edges" falls within that scope, the addition of that term to the claims in Owner's Motion to Amend does not change the scope of the claims, and therefore does not distinguish over Nishida.

CONCLUSION

The Board should exclude evidence secured through improper cross-examination, which includes Dr. Frederick's answers to questions that were outside the scope of his direct testimony.

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Skechers v Nike

Respectfully submitted,

Dated: January 28, 2014

By: *s/Vaibhav P. Kadaba*

Vaibhav P. Kadaba
Reg. No. 45,865
Back-Up Counsel for Petitioner

Lead Counsel	Back-Up Counsel
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APPENDIX I

Exhibit 1002	U.S. Patent No. 7,347,011 to Dua et al. ("Dua" or "'011 patent")
Exhibit 1005	U.S. Patent No. 5,345,638 to Nishida ("Nishida")
Exhibit 1015	Copy of transcript of November 5, 2013, cross-examination deposition of Raymond F. Tonkel NOTE: adidas is still awaiting a copy of the deponent signature page. Upon receipt of that signature page adidas will file same as a separate exhibit.
Exhibit 2009	Transcript of July 23, 2013, cross-examination deposition of Edward C. Frederick
Exhibit 2010	Declaration of Raymond F. Tonkel

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Skechers v Nike

CERTIFICATE OF SERVICE

The undersigned certifies that on January 28, 2014, a complete and entire copy of this PETITIONER'S REPLY TO PATENT OWNER'S OPPOSITION TO PETITIONER'S MOTION TO EXCLUDE EVIDENCE was served on Patent Owner Nike, Inc. by emailing a copy to counsel at the email addresses listed below:

Joseph M. Skerpon
Email: jskerpon@bannerwitcoff.com

H. Wayne Porter
Email: wporter@bannerwitcoff.com

J. Pieter van Es
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Dated: January 28, 2014

By: *s/Vaibhav P. Kadaba*
Vaibhav P. Kadaba
Reg. No. 45,865
Back-Up Counsel for Petitioner

Skechers EX1013-p. 6103
Skechers v Nike

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

adidas AG
Petitioner

v.

Nike, Inc.
Patent Owner

Patent No. 7,347,011
Filing Date: March 3, 2004
Issue Date: March 25, 2008
Title: ARTICLE OF FOOTWEAR HAVING A TEXTILE UPPER

Inter Partes Review No. 2013-00067

PETITIONER'S EXHIBIT LIST
(AS OF FEBRUARY 6, 2014)

EXHIBITS

Exhibit 1001	Declaration of Edward C. (Ned) Frederick, Ph.D. ("Frederick Dec.")
Exhibit 1002	U.S. Patent No. 7,347,011 to Dua et al. ("'011 patent")
Exhibit 1003	The '011 patent file history
Exhibit 1004	Form PTO-SB/42
Exhibit 1005	U.S. Patent No. 5,345,638 to Nishida ("Nishida")
Exhibit 1006	JP Pub. No. H6-113905 to Osamu ("Osamu"), including a certified English translation thereof
Exhibit 1007	U.S. Patent No. 2,147,197 to Glidden ("Glidden")
Exhibit 1008	U.S. Patent No. 2,314,098 to McDonald ("McDonald")
Exhibit 1009	U.S. Patent No. 2,641,004 to Whiting et al. ("Whiting")
Exhibit 1010	International App. Pub. No. WO 90/03744 to Curley ("Curley")
Exhibit 1011	U.S. Patent No. 4,785,558 to Shiomura ("Shiomura")
Exhibit 1012	David J. Spencer, Knitting Technology: A Comprehensive Handbook and Practical Guide (Third ed., Woodhead Publishing Ltd. 2001)
Exhibit 1013	Excerpt of Hannelore Eberle et al., Clothing Technology (Third English ed., Beuth-Verlag GmbH 2002)
Exhibit 1014	U.S. Patent No. 7,347,011 to Dua et al., with markings made during November 5, 2013, cross-examination deposition

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Exhibit 1015 Copy of transcript of November 5, 2013, cross-examination deposition of Raymond F. Tonkel

NOTE: adidas is still awaiting a copy of the deponent signature page. Upon receipt of that signature page adidas will file same as a separate exhibit.

Exhibit 1016 Declaration of Sabut Adanur, Ph.D. ("Adanur Dec.")

Exhibit 1017 Excerpt of Knitted Fabrics (Ciba-Geigy 1976)

Exhibit 1018 Excerpt of Bharat J. Gajjar, Warp Knit Fabrics Technologies (Emerald Ink Publishing 2007)

Exhibit 1019 J. Watel, *The Milanese Machine: Little Progress Made in the Development of the Milanese Fabric*, 19(6) Textiles: A Monthly Technical Journal 43, 48 (December, 1921)

Exhibit 1020 U.S. Patent No. 2,178,941 to Schuessler ("Schuessler I")

Exhibit 1021 U.S. Patent No. 2,150,730 to Schuessler ("Schuessler II")

Exhibit 1022 U.S. Patent No. 6,984,596 to Dickerson ("Dickerson")

Exhibit 1023 Supplemental Declaration of Edward C. (Ned) Frederick, Ph.D. ("Frederick Dec. II")

Exhibit 1024 Billy Hunter, editor, *Editor's Viewpoint: Nike Flyknit: Quantum leap for flat knitting*, http://www.knittingindustry.com/nike-flyknit-quantum-leap-for-flat-knitting/ (last visited November 11, 2013)

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Exhibit 1025 Billy Hunter, editor, *Nike Flyknit: Ready, Steady, Go!,* http://www.knittingindustry.com/nike-flyknit-ready-steady-go/ (last visited November 11, 2013)

Exhibit 1026 Form PTO-SB/42

Exhibit 1027 Petitioner's Oral Hearing Demonstratives

Respectfully submitted,

Dated: February 6, 2014

By: /Vaibhav P. Kadaba/
Vaibhav P. Kadaba
Reg. No. 45,865
Back-Up Counsel for Petitioner

Lead Counsel	Back-Up Counsel
Mitchell G. Stockwell (Reg. No. 39,389) (mstockwell@kilpatricktownsend.com) Postal and Hand-Delivery Address: Kilpatrick Townsend & Stockton LLP 1100 Peachtree Street, Suite 2800 Atlanta, GA 30309-4528 T: 404 815 6046; F: 404 541 3213	Vaibhav P. Kadaba (Reg. No. 45,865) (wkadaba@kilpatricktownsend.com) T: 404 532 6959; F: 404 541 3258 Tiffany L. Williams (Reg. No. 59,549) (tiwilliams@kilpatricktownsend.com) T: 404 815 6608; F: 404 541 4698 Theodore G. Brown III (Reg. No. 31,741) (tbrown@kilpatricktownsend.com) T: (650) 324-6353; F: (650) 618-2029 Postal and Hand-Delivery Address: (Kadaba & Williams) Kilpatrick Townsend & Stockton LLP 1100 Peachtree Street, Suite 2800 Atlanta, GA 30309-4528 (Brown) Kilpatrick Townsend and Stockton, LLP 1080 Marsh Road Menlo Park, CA 94025

Skechers EX1013-p. 6107
Skechers v Nike

CERTIFICATE OF SERVICE

The undersigned certifies that on February 6, 2014, a complete and entire copy of this PETITIONER'S EXHIBIT LIST (AS OF FEBRUARY 6, 2014) was served, with a copy of the newly added exhibit, on Patent Owner Nike, Inc. by emailing a copy to counsel at the email addresses listed below:

Joseph M. Skerpon
Email: jskerpon@bannerwitcoff.com

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Dated: February 6, 2014

By: /Vaibhav P. Kadaba/
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Back-Up Counsel for Petitioner

Skechers EX1013-p. 6108
Skechers v Nike

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

adidas AG,
Petitioner

v.

NIKE, Inc.
Patent Owner

Patent No. 7,347,011

Inter Partes Review No. 2013-00067

SUBMISSION OF PATENT OWNER'S TRIAL HEARING DEMONSTRATIVE EXHIBITS

Pursuant to the January 13, 2014, Order (paper no. 50) granting a trial hearing in this IPR, which hearing is scheduled for February 10, 2014, beginning at 2:00 p.m. EDT, Patent Owner NIKE, Inc. hereby submits its demonstrative exhibits for use at the hearing. These submitted demonstrative exhibits were previously served on Petitioner.

Respectfully submitted,

Dated: February 6, 2014 By: /J. Pieter van Es /

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NIKE, Inc.

Skechers EX1013-p. 6110
Skechers v Nike

CERTIFICATE OF SERVICE

The undersigned certifies that on February 6, 2014, a copy of this SUBMISSION OF PATENT OWNER'S TRIAL HEARING DEMONSTRATIVE EXHIBITS and copies of the submitted demonstrative exhibits were served on the Petitioner by emailing a copies to mstockwell@kilpatricktownsend.com, wkadaba@kilpatricktownsend.com and tiwilliams@kilpatricktownsend.com.

/H. Wayne Porter /
H. Wayne Porter
Reg. No. 42,084
Back-Up Counsel for
Patent Owner

Skechers EX1013-p. 6111
Skechers v Nike

Paper 59
Entered: March 5, 2014

RECORD OF ORAL HEARING

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Inter partes NIKE, INC. and ADIDAS AG.

Case No. IPR 2013-00067
Patent 7,347,011

Oral Hearing Held: February 10, 2014

Before JOSIAH C. COCKS, MICHAEL J. FITZPATRICK, JAMES B. ARPIN, *Administrative Patent Judges.*

APPEARANCES:

ON BEHALF OF THE PATENT OWNER:

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The above-entitled matter came on for hearing on Monday, February 10, 2014, commencing at 2:00 p.m., at the U.S. Patent and Trademark Office, 600 Dulany Street, Alexandria, Virginia.

PROCEEDINGS

- - - - -

JUDGE COCKS: All right. Good afternoon and welcome to the Board. This is an oral hearing for Inter Partes Review 2013-00067.

We are getting a little feedback.

All right. Involving U.S. Patent 7,347,011.

Would counsel please introduce themselves for the record, starting with the Petitioner.

MR. STOCKWELL: Your Honor, Mitchell Stockwell, representing Adidas, the Petitioner in this matter.

MR. VAN ES: Good morning, Your Honor. I'm Pieter van Es, representing the Patent Owner, Nike, and with me is Joe Skerpon, my partner at Banner & Witcoff, and also Brian Fogarty, who is the director of Global IP Litigation for Nike.

JUDGE COCKS: Thank you.

Okay. As set forth in the trial hearing order, each party has 30 minutes to present arguments. Because we are not dealing with a Patent Owner response and just the Motion to Amend, the Patent Owner will start first and present their case and may reserve rebuttal time. Then the Petitioner will go and give their case all in one shot.

Okay. With that being said, Patent Owner, you may begin when you're ready.

MR. VAN ES: Your Honor, I have courtesy copies of the demonstratives that we filed. May I approach and provide those?

JUDGE COCKS: Yes.

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MR. VAN ES: I have three copies.

This would be for Judge Arpin.

Thank you.

JUDGE COCKS: And do you wish to reserve any rebuttal time?

MR. VAN ES: Yes, Your Honor. I'd like to reserve 10 minutes, please.

JUDGE COCKS: All right. You have 20 minutes then to present.

MR. VAN ES: Thank you.

May it please the Board, I actually have one quick housekeeping matter. We filed our demonstrative exhibits with the Board last week and Adidas did as well. Adidas labeled theirs as an exhibit, and we wanted to know if that was the proper procedure and we should be labeling our demonstratives as exhibits.

JUDGE COCKS: Preferably labeled as an exhibit. It's really a distinction without a difference, but preferably as an exhibit rather than paper.

MR. VAN ES: In any event, they are of record.

JUDGE COCKS: They're of record.

MR. VAN ES: All right. So pending before the Board is Nike's Motion to Amend to add Claims 47 through 50. I would like to touch today in my opening 20 minutes on issues of claim construction and, in particular, as they bear on issues of written description and the prior art.

I'm going to identify those slides for the record. I'll pull up Slide No. 2.

JUDGE COCKS: Yes. Thank you. Please.

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MR. VAN ES: Slide No. 2, where we have Claim 47 with Nike's proposed amendments to the claim language, we've highlighted in yellow the language that is proposed to be amended and, in particular, just to frame the issues -- and, again, I'll be talking about claim construction first, but I think to provide context to the Board, the issue of amending the language "weft-knitted" to "flat knit," we think the issues there relate to Adidas' position that that enlarges the scope of the claims.

And with respect to the claim language about flat-knit edges free of surrounding textile structure, we understand the issue there to be with respect to support, adequate written description for that and indefiniteness. So that provides context for these claim construction issues.

Let me then focus on claim construction. Turning to Slide 3, to the extent there was just -- at the outset with respect to construction of a flat-knit textile, to the extent there was a suggestion that Nike did not offer proposed construction that's set forth in page 3 of our motion, and this refers to Mr. Tonkel's declaration, our expert, our expert in footwear, and he discusses that in the second to the last sentence.

JUDGE COCKS: Counsel, which motion are you referring to?

MR. VAN ES: Excuse me. Nike's Motion to Amend.

JUDGE COCKS: Okay.

MR. VAN ES: Okay. So this is the construction that was set forth in those papers. Mr. Tonkel's declaration also includes -- I'm referring to Slide No. 4. Paragraphs 49 and 50 of his report discusses different types of knitting, weft knitting, circular knitting, flat knitting, and issues of those sort.

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So just to kind of, again, frame the issues, Your Honor, the construction dispute about flat-knit textile element revolves around this: Adidas' construction is that flat-knit textile element means any knit fabric so long as during the knitting process, it's laid flat or in a flat configuration, and our position is that that's inconsistent with the specification, with dictionary definitions, Petitioner Adidas' previous position, their expert, and the evidence, and let me develop that a little bit.

JUDGE COCKS: Counsel, may I ask a quick question?

MR. VAN ES: Yes, sir.

JUDGE COCKS: So is it your position it's a term of art, "flat knit"? "Flat-knit textile element," is that a term of art?

MR. VAN ES: Our position is that term when construed in light of what the specification teaches has an understood meaning.

JUDGE COCKS: From the specification?

MR. VAN ES: Yes. I think if we looked at the specification, and I'm on Slide No. 6 now, the specification explains with regard to weft knitting very specific types -- excuse me -- very specific subtypes that may be utilized to manufacture a textile includes circular knitting and flat knitting.

So the two subtypes of weft knitting identified are circular knitting and flat knitting, and the specification further describes -- and I'm on Slide No. 7, and this is in Column 11, lines 19 through 41 of the specification. Here, the specification talks about a distinction between a textile element that's simply in a flat configuration versus flat knitting, and let's look at that.

The specification discusses a variety of knitting processes may be utilized as discussed above, and immediately preceding this section of the

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specification is a discussion of the specific example of jacquard double needle-bar raschel knitting machine, and that is described in the specification as warp knitting, and the specification may be utilized to form -- I'm sorry. Did I hear something?

It said that that may be utilized to form a flat textile structure. So a variety of knitting processes may be utilized to form a flat textile structure, and the specification goes on to say that this textile structure will have a flat configuration.

So, and importantly, the spec then goes on to say other types of knitting such as flat knitting may be utilized. So the specification recognizes there is a distinction between something that is simply flat while it is knitted and flat knitting, and that is explained in this portion of the specification.

That is consistent entirely with the dictionary definitions. I'm on Slide No. 8, which shows the cover page of Exhibits 2011, 2017, and 2018. These are three versions of a dictionary definition of -- excuse me -- of the dictionary, the *Dictionary of Man-Made Fiber and Textile*, and the dictionary goes exactly to this issue.

I'm on Slide 9, and it discusses that a flat-knit textile element is a weft-knit textile element and not a warp-knit textile element. Again, the context of all of this is have the claims been broadened by amending weft knit to be flat knit.

This dictionary says a flat-knit fabric is a fabric made on a flat-knitting machine, and it goes on to say while tricot and milanese warp-knit fabrics are knit in flat form, flat configuration -- excuse me. The trade uses

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the term "flat-knit fabric" to refer to weft-knit fabrics made on a flat machine rather than warp-knit fabrics.

JUDGE COCKS: Counsel, just to be clear --

MR. VAN ES: Excuse me, Your Honor?

JUDGE COCKS: -- flat knit is exclusively a subset of weft knit; that's what you're telling us?

MR. VAN ES: In the context of this patent, yes, Your Honor.

JUDGE COCKS: Okay.

MR. VAN ES: And, Your Honor, if you recall the timing here, obviously Adidas submitted their petition and Nike filed its Motion to Amend. In Adidas' petition, we believe they set forth positions entirely consistent with this construction of the flat knitting being a subset of weft knitting. In particular, these are cited on Slide 10, and let me move along to the technical expert that Adidas relied on when it submitted its petition.

We submit that what he had to say in his original declaration agreed with this construction. Mr. Frederick, Nike footwear expert, said that common examples -- and I'm on Slide No. 11 now. He said that common examples of weft knits are circular knits and flat knits, and we asked him at a deposition that we took -- this was before we filed a Motion to Amend. We asked him what's your definition of the term "flat knitting," and at the time, the expert said flat knitting would be another type of weft knitting.

So that's what was said before Nike filed its Motion to Amend, and obviously, since then Adidas' position is that the definition of flat-knit textile element is something other than that, and we asked him at a second deposition that we took of Adidas' expert whether he knew of any dictionary

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or textbooks or publications or articles that would support his construction -- I'm on Slide 12 now -- and he did not.

We also asked on Slide 13 if the specification said that flat knitting was a subtype of warp knitting, and he agreed that it didn't.

Now, Adidas has brought out an expert in response to Nike's Motion to Amend, Dr. Adanur who Adidas says is an expert in textiles. His testimony is problematic for a number of reasons, Your Honor. We think it's irrelevant and not helpful.

He says he's a person of ordinary skill in the art. He's clearly not, and his testimony is unhelpful to the Board because Mr. Frederick, Dr. Frederick, Adidas' footwear expert, said it wasn't even necessary to talk to an expert.

JUDGE COCKS: Counsel, may I interrupt?

MR. VAN ES: Yes, sir.

JUDGE COCKS: You're saying he clearly is not. How do we know that?

MR. VAN ES: Let's take a look. Well, first of all, on Slide -- the definition of a person of ordinary of skill in the art is set forth on Slide 15, and the parties both talk about at least several years experience with all aspects of shoemaking from the conceptual stage through design, development, etc.

Slide 16 reflects that Dr. Adanur equivocally said he's a person of ordinary skill in the art. We asked him repeatedly. He said, yes, I'm a person of ordinary skill in the art.

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And on Slide 17 is pertinent testimony about whether he is a person of ordinary skill in the art or not, and he says -- we asked him about his years of experience. He says: "I've never worked in the shoe manufacturing industry." That's on Slide 17.

We asked him: "Have you ever, yourself, been involved in the conception through design stage of a shoe?

"Not for a shoe," he said.

On Slide 18, we asked him similar questions about his role in designing knitting machines used to make footwear, whether the fabric that he has been involved in was ever used to make a piece of footwear. The answer was no, not that he can recall.

I don't think there's any legitimate dispute that although Dr. Adanur say he's a person of ordinary skill in the art, he simply is not.

And, again, going to the usefulness of Dr. Adanur's testimony to this Board, the footwear expert that Adidas proffered said it wasn't even necessary to speak to a knitting expert. That's shown on Slide 19 where Dr. Frederick so stated.

But moving on to Slide 20 --

JUDGE COCKS: Counsel, one question: Say we agree with you that he's not a person of ordinary skill in the art. How do we treat his testimony?

MR. VAN ES: Well, we think his testimony is not relevant because he testified thinking he was a person of ordinary skill in the art, and he's not, and so whatever he had to say about a person of ordinary skill in the art would understand is not relevant to the Board, and I don't think under Federal Rule of Evidence 702 the testimony of -- the testimony that the

footwear expert admitted he didn't need to see is helpful to the Board in resolving these types of technical questions.

JUDGE ARPIN: Counselor, doesn't that go to weight, the weight that we give the testimony?

MR. VAN ES: It certainly does go to weight, yes, it does, but we think the testimony doesn't need to be considered at all. At a minimum, it goes to weight, and it should be given no weight, Your Honor.

JUDGE ARPIN: Assuming that we conclude that flat knitting in the context of this patent is a subtype of weft knitting and narrows the claim, I'd like to turn to the rest of your amendment, and can you tell me why this is not a product by process limitation?

MR. VAN ES: Sure. So let me -- so let me try to address that, Your Honor, and I'm going to refer to Slide 21 where we talk -- so I think what Your Honor is getting at is the amendment to the flat-knit edges and that language in Claim 47, and I think, as I explained the construction of flat-knit edges without surrounding textile structure, that it's going to help address that question.

So I don't know that there's a dispute about -- well, let me restate that.

So I'm on Slide 21. Mr. Tonkel described flat-knit edges, and he described a construction for that.

I'll just note, Your Honors, that in paragraph 64 and paragraph 65 of his expert report, he also described how flat-knit edges -- a flat-knit textile element having flat-knit edges free of surrounding textile structure would be edges that are knit to shape as shown in figures of the patent. Figure 8 of the

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patent, for example, in paragraph 65 of his declaration, he talks about how these edges are formed directly by the knitting machine.

With respect to Claim 47, and Your Honor is asking about -- and by the way, I'm on Slide 22. He explains, Mr. Tonkel explains, that flat-knit edges described in the claims have a particularly stable configuration that is in contrast to what's shown in the prior art. I think what this goes to is the structural differences between what's in Claim -- structural difference -- Claim 47 specifies structural differences. So I don't think it's a product by process claim.

And let me go back to Claim 2, Slide No. 1 and -- excuse me -- Slide No. 2, and it talks about flat-knit edges free of surrounding textile structures such that the flat-knit edges are not surrounded by a textile structure from which the textile element must be removed, and in particular, if I turn to Slide 40, Mr. Tonkel explained how there are structural differences.

Here, he did this in the context of the edge of the material shown in the sheet of prior art reference and the claimed flat-knit edge, and if we look at Slide No. 40, you can see I'm pointing -- I don't know, Judge Arpin, if you can see this, but I'm pointing with a pointer along the right side of the figure that's shown. There, you have a flat-knit edge that is as claimed, and it is structurally different from -- as a result of what is described in the claims, of it being formed -- referring to the language in the claim, as a result of it being free of surrounding textile structure from which it must be removed.

So this takes us back to --

JUDGE COCKS: Counsel, may I ask a question?

MR. VAN ES: Yes.

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JUDGE COCKS: I believe you referenced Figure 8 was the other one showing flat-knit edges. Is that right?

MR. VAN ES: Yes.

JUDGE COCKS: Is that the only edge shown in that figure?

MR. VAN ES: Is that the only edge shown?

JUDGE COCKS: Are there any other types of edges shown in that figure, or is that exclusively showing a flat-knit edge?

MR. VAN ES: Well, I believe the record reflects that Figure 8 shows a configuration of the textile element that could be made by flat knitting. It could be knit to shape by flat knitting. It also could be a cutout from Figure 9.

Now, Figure 8 appears before Figure 9, before the description in Figure 9 of the patent. It describes cutting out the textile from a web.

JUDGE ARPIN: Counselor, doesn't Figure 9 show circular knitting though, not flat knitting?

MR. VAN ES: Absolutely, it does, Your Honor.

JUDGE ARPIN: So it's a cutout of a different type of weft knitting; is that correct?

MR. VAN ES: It is a cutout of a different type of weft knitting, and I think Your Honor has made a very good point. I think if Your Honor asked Adidas if Figure 9 shows what they construe flat knitting to be, they would say that is flat knit because Figure 9 is in a flat configuration during the knitting process, which we submit is not a proper construction as illustrated by Figure 9.

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I think we've moved on to the issue of -- I'm going to kind of move ahead to the issue of -- hold on one second.

(Pause.)

MR. VAN ES: I'm going to move on to the issue of support and specification for a flat-knit edge, and I'm on Slide 31 right now where -- actually, I don't think I have discussed -- excuse me -- construction of flat-knit edge, which I think I have to touch on before I get to the support issue.

So flat-knit edge, it's our position and I'm referring now to Slide 23, a flat-knit edge is an edge that's knit by flat knitting, and knit modifies edge. I'm on Slide 23. So the claimed edge has to be a knit edge and not a cut edge, and flat modifies knit.

So the knitting of claimed knit edge must be by flat knitting. To illustrate the issue here, on Slide 24, we asked Adidas' expert if you had a material that was formed by knitting and that material was at some point flat and if an edge was subsequently cut out of that material, would that be a flat-knit edge, and Adidas' expert's position was yes, that would be a flat-knit edge.

Just to take a step back, so the position of Adidas is that if you have a material and the edge of that material is formed by cutting it, that that is a flat-knit edge so as long as the material was in flat configuration at some point, and we submit that that construction simply makes no sense, particularly in the context of this patent.

Referring to -- I'm going to skip ahead to Slide 27.

So we discussed the issue of whether weft knitting, amending the claim from weft knitting to flat knitting narrows the scope of the claims, and

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we submit it does and that the other structure that's specified in Proposed Amended Claim 47 also narrows the structure.

So referring now to support and hit more directly to the support for this claim amendment, again, I want to frame the issues that we understand the burden is on Nike to prove that, to establish that there's adequate support, but it's important that whether a specification supports a claim is a fact issue addressing the perspective of a person of ordinary skill.

We submitted a declaration of a person of ordinary skill, declaration of a person of ordinary skill in the art that explains why one with -- a person of ordinary skill would understand that the specification supports the claim. Adidas cited no testimony of either of its two experts on this issue and relied only on argument. The file history and specification, I should say, of the patent on Slides 29 and 30 talks about the different types of knitting.

I'm going to head to Slide 31, which discusses the particular limitations of the flat-knit edge free of surrounding textile structure. On Slide 31, we talk about how the expert that Nike relied on, Mr. Tonkel, explained how this feature was supported by the '011 application as filed. We cite in Slide 31 the various paragraphs of his declaration where he explained why one of ordinary skill would do this, and in particular, he looked at the figures. He looked at the text of the patent, and he looked at other claims in the originally filed application.

So Figures 8, 10, and 11 show the configuration for the claimed textile element that have flat-knit edges without surrounding textile structures.

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JUDGE ARPIN: Counselor, regarding those Figures 8, 10, and 11, could those figures be formed by cutting the template or the element out of a piece of flat-knit fabric?

MR. VAN ES: That is one way. That is one way it could be done, but the patent also -- one of ordinary skill in the art would understand that they could also be flat knit and knit to shape in that form.

JUDGE ARPIN: The terms "knit to shape" and "flat-knit edges" don't appear in the patent; is that correct?

MR. VAN ES: Those terms per se do not appear in the patent, Your Honor. We're talking about one of ordinary skill in the art would understand from reading the specifications, looking at the figures, and looking at the text, which if we -- again, I think we already talked about Figures 8 and 9.

Referring to Slide 34, Mr. Tonkel, in addition to looking at the figures and explaining what one of ordinary skill would understand from the figures, Mr. Tonkel explained in his declaration how the '011 application -- and I'm referring to the second sentence of the testimony, of the declaration where he said that the specification said the textile element may be formed as part of a larger textile element from which it's removed.

That's referring to Figure 9. That language in conjunction with Figure 8 and in conjunction with the claims that I'm just going to talk about, we believe one of ordinary skill in the art would understand that the article could be knit to shape.

Now, we don't have a slide on what the claims originally said in the applications originally filed, but let me just explain, Your Honor -- oh, I see that I'm into my rebuttal time.

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JUDGE COCKS: We've asked a few questions. So I'll give you a couple of minutes.

MR. VAN ES: Okay. Let me just briefly wrap up here.

So in the claims as originally filed, and this is in paragraph 65 of Mr. Tonkel's report, there was a Claim 41 that specified a textile element that is removed from a textile structure. So Claim 41 specified that, and you can contrast that to filed Claims 19, 38, and 65, which did not have that requirement.

And if we move on to Slide 35, although Adidas had the opportunity to have either one of its experts comment on the adequacy of the written description and neither of them did, we asked Mr. Frederick, the footwear expert, at his deposition and this was taken before Nike's Motion to Amend -- and by the way, Your Honor, this is the subject of the motion to exclude his testimony. So I'll note that.

We asked him if the structure shown in Figure 8 was made by a flat-knitting machine, then the edges that are shown in Figure 8 would be flat knitted. He said that's right.

Now, Mr. Frederick said more. He submitted in his second declaration on a -- he also commented on what Slide 36 shows is an actual commercial textile element that was flat knit to shape, and this is an actual Nike commercial product that Mr. Frederick made of record, and he described this actual flat knit -- this article shown in Slide 36 which has flat-knit edges. I don't think there's any dispute that under Nike's construction, that it has flat knit edges knit to shape.

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He said this is an upper made according to the methods described in the '011 patent. So we don't think there can be a reasonable dispute on the written description question.

So, Your Honors, I have more to say, but --

JUDGE COCKS: Please try to wrap up.

MR. VAN ES: So why don't I wrap up, then, on these particular points, and then I can address the additional issues in my rebuttal time.

JUDGE COCKS: Thank you.

MR. STOCKWELL: May it please the Board, as I said, I'm Mitch Stockwell. I represent Adidas.

I think the parties are in agreement as to what the issues are. The first issue is the broadening issue. We think that the change from weft-knitted to flat-knitted is an impermissible broadening.

The second issue has to deal with whether the negative limitation is sufficiently supported in the written description under the heightened standard applied by the Federal Circuit and this Board, and then the final issue and it kind of bleeds together is whether the proposed amendment creates some indefiniteness issues in construing the amendment and such that that amendment simply doesn't distinguish over Nishida or Nishida in combination with the Schuessler references.

Those are the issues as we see them. I think we are in agreement on that. I think we're also in agreement, if we just focus on the broadening issue, on a couple of basic points, listening to Nike's counsel.

One agreement is that the flat-knit textile element is not a term of art. We agree with Nike on that. That's not a term of art, and we would say

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there's also not an expressed lexicographal definition in the patent itself, but under the broadest reasonable interpretation standard, we can look at the specification and we can look at what skilled persons would understand that term to be.

With respect to the specification, I think we're in agreement with Nike that that term is not expressly defined. It's not expressly set forth in the specification, and the specification doesn't say flat knitting is an exclusive -- is only an exclusive subtype of weft knitting.

Nike is right. Before their amendment, we agreed and I agree today that the specification talks about flat knitting as a type of weft knitting. Of course, it does. Mr. Frederick testified, Dr. Frederick testified, to that. Their expert testified to that.

The issue is whether changing from weft knitting to flat knitting also ensnares other types of non-weft-knitted materials such as warp and milanese. That's where the parties are having a dispute.

JUDGE ARPIN: Counselor, if we construe that claim term "flat-knitted" to be weft flat-knitted, is that incorrect?

MR. STOCKWELL: I would argue that it is incorrect. Certainly, Nike was the master of what words they chose in their amendment, and they could certainly have amended the claim that way. They chose not to. In doing so, they ensnared more than just weft knitted.

Now, certainly, the Board could come back and construe that, but this is what they point to, and I want to look carefully at the language in this Nike Slide 7 that I have up on the screen because I think this, in our view, answers the question. This is the closest the specification comes to

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describing a flat-knit textile element, and it starts off -- it describes in Nike Slide 7, we know that the double needle raschel knitting machine is utilized, and we know it forms a flat textile structure. Right away, that's close to this flat-knit textile element.

It goes on in the portion that is highlighted here to talk about the textile structure will have a flat configuration. Right underneath of that, in the portion that is not highlighted, the text says: "An outline of a textile element may be imparted to the textile structure formed with the jacquard machine."

So not only is it saying there's a flat textile structure, it's in a flat configuration, it then says, oh, and we can pull a textile element out of that structure. It confirms that further down: "Accordingly, the textile element may be removed from the textile structure and incorporated into footwear 10."

So the skilled person comes to this term and looks at the specification and sees all of the elements of the phrase "flat-knit textile element" and they see that the machine that manufactures that is a jacquard machine. Now, Dr. Frederick confirmed that a jacquard machine is a warp knitting machine, but he didn't need to do that because the patent itself at Column 7, lines 2 through 5 says a jacquard double knitting machine is a warp machine.

So we think --

JUDGE ARPIN: Counselor, the following lines on Column 7 was with regard to weft knitting, very specific subtypes that may be utilized to manufacture textile include circular knitting and flat knitting, and in the

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paragraph that you've got on the screen now, the final highlighted portion says "similarly." Doesn't that qualify the language that comes before it?

MR. STOCKWELL: Your Honor, I think that's a great question, and it goes back to the question you asked earlier. You asked counsel for Nike why isn't this a product by process limitation, and they immediately said it's not.

Why is that important with respect to that point? Well, it's important because flat-knit textile element is not claiming flat knitting. It's claiming a structure. According to Nike, it's claiming a structure, and the reason it's claiming a structure is they're trying to avoid a product by process limitation because the Board in its decision instituting this case cited the *Thorp* case and pointed out that the patentability of a product does not depend on its method of production.

What we're seeing now is that they're trying to avoid the broadening. They're trying to say, oh, there's actually some kind of a process limitation within a structural element, and the only structural description of that structural element is something that uses a warp machine and, therefore, confirms the broadening. That's the problem that they run into with this element.

I would also say we have testimony -- they criticized Dr. Adanur's testimony and said he's not a person of ordinary skill in the art because he hasn't built shoes, he's only dealt with textiles. Accept for purposes of argument that for a moment. They acknowledge Dr. Frederick looked at this language, looked at the specification and testified, well, a flat-knit textile element to a person of skill in this art, they would understand that would

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include flat textile structures knitted through warped processes, which is different from they originally claimed and it's more broad than what they originally claimed.

If there was any dispute over that to the skilled footwear engineer, they would certainly turn to an expert in the field of textiles and say what about that. In fact, both parties rely on the definitions that were pulled out of Dr. Adanur's library, the definitions, the textbooks to argue whether this is a broadening.

So regardless of whether he's a person of ordinary skill or not, the evidence he submits is relevant. They didn't move to strike it, and I would submit it's highly persuasive as to this issue, particularly given that it's Nike's burden to show they didn't broaden. It's not our burden to show a broadening.

I want move on to talk a little bit about the new matter issue.

JUDGE COCKS: Counsel, before you do, one quick question: I think your opponent said if you look at Figure 9 of the patent, that you would say that shows flat knit. Is that accurate? I don't know if we have Figure 9 on display.

Since they said that's something you might say, I'm curious. What do you say yourself? Does Figure 9 show flat-knitted edges?

MR. STOCKWELL: Yes. I had made a note of that. So when you look at the specification, and I unfortunately don't have the particular cite right now, but I believe you'll see that when it talks about Figure 8, it talks about it in the context of an example such as through that jacquard double-knitting machine, which is a warp machine for circular textile structures, but

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-- so from our perspective, it is -- the particular description in the text of that is talking about a circular non-flat knitting process to get to what's shown.

Okay. But if you read the specification there, it says this is an example -- that the element itself, the structure of what's shown in the figure itself, one example of the process by which you get to that is through this jacquard machine that's circular in the circular knitting process.

So from our standpoint, Figure 9 is representative of a textile structural element that could either be reached through a warp process on a circular machine or through a weft process that also achieves that structure. I think the specification is very clear on that. It's both. Thank you.

Okay. So then -- oh, I'm sorry. The Figure 9 cite is Column 7, lines 41 through 48.

So I want to move to the new matter and the written description issues, and again, I think there are actually some agreements between the parties here.

JUDGE ARPIN: Counselor, before you move on, one more question about Figure 9. If Figure 9 is just one embodiment of how the textile element can be made, is it appropriate for us to limit the construction of the claim based on that single embodiment?

MR. STOCKWELL: I think I would answer that in the following way: I think the other embodiments, Figures 8, 11, and 12, the only mechanism that is used to produce those structural elements is one in which the textile material, the material surrounding the textile element is removed through the cutting process, and in that context, I think it's appropriate to limit the wording that Nike has chosen to that figure.

To put it another way, if you -- and I'll hit this again, Your Honor, when we get to the difference in the parties' constructions. We look at Nike's proposed amendment and their contraction and we say, well, they're trying to cover Figure 9, cutting out the shoe layout from the broader textile structure, and they're trying to cover the knit to shape element that they say exists in Figure 8.

We have a dispute over whether or not that exists in Figure 8. We don't think it does. Our construction says you have to at least cover Figure 9. We don't think you can go so far as to create through a construction process a knit to shape component that simply is not there under Section 112.

So that is the basis for our construction.

JUDGE ARPIN: Doesn't the specification, though, say it may be done as shown in the Figure 9?

MR. STOCKWELL: It does say it may be form, and I think that illustrates the problem we have with the new matter, Your Honor, because under the relevant case law, it's not enough for there to be silence or an implication to justify this negative claim limitation such that the flat-knit edges are not surrounded, and I think we're in agreement with Nike on this.

This is a negative claim limitation. The standard that controls is the *Santuras* standard as applied in the *Lazaridis* case and the *Miyashita* case. In those cases, you've got to have either explicit disclosure and/or an actual description of an advantage or a disadvantage.

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I would point out that with respect to those issues, nowhere has Nike pointed to a disadvantage or advantage in the specification of having this knit to shape component.

JUDGE COCKS: Judge Arpin, are you still with us? Judge Arpin?

(Videoconference interruption.)

MR. STOCKWELL: Your Honor, while we're doing that, I neglected to hand up the exhibits. (Presents documents.)

JUDGE COCKS: Sorry for the technical delay. We are a geographically diverse agency now.

MR. STOCKWELL: That's actually good.

JUDGE COCKS: It is.

(Off the record.)

(On the record.)

MR. STOCKWELL: So we were talking about the applicable standard for the new matter issue.

So Mr. Tonkel in his declaration at paragraph 66, he does point to a disadvantage of having to cut the element out of the bigger structure. He says you have to treat the frayed edge. He said that's a disadvantage, but all of the references he has for where that disadvantage is identified are to prior art references.

There's no disclosure in the '011 patent consistent with requirements of *Miyashita* and the other cases of the Board and the Federal Circuit of a disadvantage for cutting out or an advance for having this knit to shape structure that Nike says is somehow present in the disclosure. There is no description of that.

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So what that leaves us with is under the governing standard, Nike has to point to some express disclosure, and when you look at what they point to, I've summarized this on Slide 4. Generally, they point to Figure 8, 10, and 11, and if you look at the specification, it describes all of those textile elements, 40, 40', and 40", as exhibiting the general shape, not a knit-to shape or a specific knit-to shape, the general shape.

By the way, Column 7 was where it said that all of these textile elements, 40, could be made on either a weft machine or a warp machine. So it's clear the specific examples may be one type of a machine, but they made it clear these elements could be made on different machines, flat or otherwise knitted.

JUDGE COCKS: Counsel, just for my clarification, it's a slight tangent, but an edge made from a knit to shape structure, is that different than something that's cut? Is there a structural difference?

MR. STOCKWELL: No. No. I mean, I have a simple illustration. I have a piece of paper. This paper has paper edges. If I fold the paper, I still have an edge. I might add an adjective such as folded edge to describe it, but it's also a paper edge.

This structure, it's made out of paper. Flat-knit textile element or flat-knit edge, it's describing what it's made out of. "Edge" is simply the location. It's the geometry. If you cut something, if I cut this paper or tore this paper, I would still have an edge. So it's just a structural recitation of where the end of the element is.

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JUDGE ARPIN: Counselor, to use your example of a folded edge versus an edge of the paper, why isn't a folded edge more similar to the concept of a flat-knit edge?

MR. STOCKWELL: Because in the situation here, Your Honor, the flat knit is a description of the element that the edge is on. So if it just said edge and it didn't describe what it is, it's like saying paper edge.

JUDGE ARPIN: But we're talking about a folded edge which doesn't describe what it's on, and a flat knit edge which Nike would argue is a different type of edge as well.

MR. STOCKWELL: Well, I think, actually, Your Honor, Nike may argue that, but Nike's expert agrees with us that, in fact, a flat-knit edge is also an edge that can be cut if it's cut from a flat-knit textile element that has been created or made as a flat-knit textile element.

So I don't think there's any dispute about that.

JUDGE ARPIN: Is there a difference between a flat-knit edge and a circular knit edge such as is shown in Figure 9?

MR. STOCKWELL: The difference that I would identify, Your Honor, is that the circular knit edge would be the geographical or geometrical periphery of the element, the textile element, that was made on a circular warp machine, but that doesn't mean that edge couldn't have been created either from flat from shaping it or from cutting something from a larger textile structure.

JUDGE COCKS: Counsel, let me ask you a hypothetical. Say for purposes of argument, we disagree, we think that flat-knit edge describes a

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distinctive structure as compared to a cut edge. Where are we? What does that mean in terms of your petition?

MR. STOCKWELL: Well, I think you still have an issue here with respect to the written description.

JUDGE COCKS: Well, let me rephrase. It's not your petition.

MR. STOCKWELL: I think you're going to have two issues. So on a claim construction issue, if you resolve that claim construction dispute and say, well, a flat-knit edge is a cut edge, you've got two issues that come out of that: Number one, did Nike have sufficient description support under the heightened negative limitation standard? Because now you're saying it's a flat knit non-cut edge. Right? So you've got to say did they meet the express requirements. So we still have that issue.

And then, number two, you have the prior art issue, and we would agree that in that instance, if the claim -- if their proposed amendment, if you construed the construction Nike has offered and you adopted a construction that a flat-knit edge has to be non-cut and could never, ever have been surrounded by textile material, Nishida doesn't teach exactly that, but we would say it's obvious.

I think that's where we end up.

JUDGE COCKS: You would say or you have said?

MR. STOCKWELL: We have said, yes. That's exactly our position, that under our broadest reasonable interpretation construction, we think Nishida anticipates, and also under the construction that Nike's expert has articulated for that proposed amendment, under that construction of the

construction, what Your Honor just articulated as the non-cut flat-knit edge, it would still be obvious in light of Nishida or Schuessler.

So going back to this point on the new matter --

JUDGE ARPIN: Counselor, for a moment, let's stick with Nishida. You said that it would be obvious even if the hypothetical construction that Judge Cocks suggested was adopted by the Board. Would that involve modification of the teachings of Nishida?

MR. STOCKWELL: And just to be clear, Your Honor, you're talking about a hypothetical --

JUDGE ARPIN: Flat-knit edge being structurally different from a cut edge.

MR. STOCKWELL: Yes, and let me see if I can set this up a little bit so that we're all on the same page as to exactly what our position is.

So if you turn to Nike Slide 21, this is Nike's construction of the flat-knit edges, and what I understand the Board to be asking is -- because I think this is consistent with Nike's arguments. They're arguing that the way you should construe this is to say having flat knit, comma, not cut edges free of surrounding textile structure such that the flat-knit edges are never surrounded by textile structure. If you look at Slide 22 and 23, that is the thrust of their arguments. Okay? Under that construction, we would agree that Nishida does not anticipate because Nishida does not expressly disclose having the textile element, the flat-knit textile element, knit to shape with nothing ever surrounding it. We agree that Nishida does not anticipate.

Where we differ -- and let me get to the right slide here if you could bear with me for a moment.

So this is Adidas' Slide 13. Where we diverge and what we have argued is even under Nike's construction of the construction, construction of the amendment, the Nishida disclosure renders obvious this concept of a knit to shape, because Nishida comes along and tells the skilled artisan, hey, we're going to minimize cutting waste, and what we've got up here on the slide is one way to minimize cutting waste. We take the patterns and we squeeze them together so we make them adjacent to one another.

So it's kind of like telling your kindergartner, hey, don't make a big circle on one page and then make something else on another page; try to get as much of that on a single piece of paper as you can so we reduce wastage. So that's telling the skilled person, this is a concern, let's reduce wastage.

It also talks about having the web that holds the different patterns made out of cheaper material. So there is an express suggestion of the skilled artisan to take this into account.

Furthermore, Dr. Frederick testified that the web that they're talking about, that it's not even clear -- depending on the way the skilled artisan would implement it, the web could be hooked into the ends, and you cut -- what Nishida says is you cut the layout from the web.

Nike claims that's cutting the actual layout, but Dr. Frederick said no, it doesn't say that, and if you're going to use lighter material for the web, all you have to do is hook into the outer edge of those yarns. You then cut the strings around that.

So you would already have a textile structure that have edges, flat-knit edges, that are never cut.

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JUDGE COCKS: Maybe explain a little bit further, because how do you say never cut? You just spoke of cutting the edging, but they are nonetheless this knit edge in that scenario?

MR. STOCKWELL: Think of it like this: Think of a hammock. Okay? You have that structure of the hammock. You're laying in the hammock, and you have two ropes on the end tied around the tree.

The web connections that Dr. Frederick was talking about are like those ropes holding the structure of the hammock to the tree. If you cut the ropes, you cut the web around the layout. You're not cutting the edges of the layout. You're just cutting -- you have loop on the layout.

You have another loop coming through that. You're just cutting that loop. You're leaving the edge intact.

So by doing that, you're never having a situation whereby the edges are going to be cut and are going to be unraveled and have to treat. That's what Dr. Frederick said one of skill in the art would discern from Nishida, and given this suggestion, one of skill in the art would also discern that you don't have to have a situation where you're always cutting the edges themselves. You could just cut the loose material around it.

JUDGE ARPIN: Counselor, as far as Nishida is concerned, Nishida only shows, if I understand you correctly, cutting the elements out of a web. It seems to me that you're suggesting that knitting to shape, doing away with the web, is suggested by Nishida.

Can you explain that a little bit further, please?

MR. STOCKWELL: Your Honor, that's exactly right, because if you're telling the skilled artisan use a web, use lighter materials, then you cut

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the layout out of the web, you don't tell him to cut the layout itself. Right? And then you tell him to squeeze the materials closer together because we want to save material. What is the next logical step?

I mean, skilled artisans are KSR. These are not automatons. They have their own creativity. The next logical step is to not use the web.

We also know that the skilled artisans can look at -- and this is the other argument we made. They have the teaching not only of Nishida. They have the teaching of the Schuessler reference. The Schuessler reference, as I show here in Slide 14, teaches a knit to shape -- they don't use those words, but that's what it's teaching, a knit to shape helmet. The Schuessler reference teaches knitting it with a flat knitting machine.

So there's no dispute that this is a flat-knit textile structure, and the Schuessler reference, if you look at the figure I'm showing on Slide 15 now -- I think this is Figure 1 -- we've outlined in blue the flat-knit textile Element 1 having flat-knit edges.

This is the unitary construction that is knit to shape that Schuessler is going to use to make this helmet. Okay? So that's what he discloses. The edges are never cut. They're free of surrounding textile structure. That's the green, and you see it described in Schuessler 1.

The helmet is being completed from the swatches as knitted without requiring cutting, and he said all you've got to do is -- and if you don't require cutting, you have a situation where even under Nike's construction, the flat-knit edges are not surrounded by textile structure from which the textile element must be removed, and Schuessler says all you have to do after you do this, knit it to shape, is join the edges.

So you take a two-dimensional structure and you join the edges into a three-dimensional structure, in this case, a helmet.

Now, we know that like Schuessler, Nishida is taking a two-dimensional structure and forming it into a three-dimensional structure of a shoe upper. Schuessler takes a two-dimensional structure and forms it into a three-dimensional structure of a helmet, and it tells skilled persons why you would do this.

It says here, you would do this to skip the step and go right to joining the edges. You don't have to treat the edges. You don't have to finish the edges. All you have to do is do a knit to shape and then you just join them.

You also have Nishida already telling skilled people to save on waste. So the modification of Nishida to eliminate a step of treating the edges and simply having a knit to shape element where you create the upper in one place is amply suggested. I would also point out in terms of the motivation for that that Schuessler, by creating this three-dimensional project just joining edges, he's going to eliminate a manufacturing step.

This whole point of Nishida where you -- I mean, all we're really doing with this combination is Nishida says, well, I don't need to cut anything out of the web. It's already telling you to save.

So for this combination, Nike provided no expert testimony in response. This is the combination Dr. Frederick testified about. It's an obvious combination even under their construction of the language, and there's no rebuttal to this other than attorney argument that, well, you wouldn't do this.

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I think the only secondary consideration they identified was long-felt need, but this is so obvious given Nishida, I don't think that's sufficient, and I didn't see any nexus between the long-felt need that was identified in this argument.

I do want to --

JUDGE COCKS: Counsel, try and wrap up. I've given you a few extra minutes.

MR. STOCKWELL: I do want to point out just one thing, Your Honor. Let me jump to this, and it has to do with Your Honor asked about the construction issue.

So I have this on Slide 6. As I said, the difference in our constructions is Nike wants the construction to cover both the Figure 9, cutting the element out of the broader textile structure, and the proposed Figure 8, knit to shape.

Well, with respect to that issue, Mr. Tonkel admitted that the language they proposed would include a textile element after it had been removed from a larger textile structure. He said, first, I hadn't thought of that. But look what he says then: But I would think when everything was complete, ready to be removed from the machine, when this Figure 8 is an example of the flat knit to shape ready to be removed from the machine.

So as I said, we're not in disagreement about that. Moreover, if you look at his construction of the term, his last paragraph says that he construes the term and he construes the term in reference to his preceding paragraph. I think it's paragraph 63.

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If you go back in the same section, the support he identifies for his construction is the Figure 9 embodiment. If their language, as their own expert admits, covers the Figure 9 embodiment where you have to cut the layout from a surrounding textile structure, that is Nishida, and under a broadest reasonable interpretation, whether you accept Adidas' interpretation or you accept Nike's own expert's interpretation of the proposed amendment, the proposed claim is anticipated.

Thank you.

JUDGE COCKS: Thank you.

MR. VAN ES: One minute, Your Honor.

JUDGE COCKS: That's fine.

(Pause.)

MR. VAN ES: Your Honors, I would like to first touch upon a few points that were addressed in Adidas' argument.

I think one of the questions, I believe, Judge Cocks, you may have asked Adidas' counsel, does Figure 9 show -- I don't remember the exact question, but does it show a flat-knit textile element, and I think you got a long answer to that, and at the end of the answer was a yes, and we submit that this construction is not reasonable and the specification nowhere describes Figure 9 as showing a flat-knit textile element and that a person of ordinary skill in the art looking at the specification would not think that Figure 9 includes a flat-knit textile.

JUDGE COCKS: I think they said that it shows both, both a cut edge and a flat edge. I believe that was what --

Counsel, is that you said?

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MR. STOCKWELL: Yes, Your Honor. I said, referring to Column 7 as well, that it was also warp or weft.

MR. VAN ES: So, Your Honor, that's correct, I think he said both, but I think the point is to suggest that flat knit would embrace Figure 9, and that is not a construction that we're proposing, that flat knit would embrace Figure 9.

JUDGE COCKS: Counsel, I don't want to lead you, but let's say we agree. The other side is saying it's still obvious in light of Nishida and Schuessler. Do you have any comments on that?

MR. VAN ES: Sure, Your Honor.

So I think part of that discussion should be in the context of what Nishida discloses and doesn't disclose, and I'm on Slide 38. I think it's important to note that there are structural differences between a knit to shape edge and an edge cut from material, and I'm not sure exactly what I heard, but to the extent that there's any suggestion that Nike's expert agreed with that, that's just not the case.

I think his declaration is quite clear and Nike's position is clear, is that an edge that's knit to shape is not the same as an edge that's cut out of a web like what's shown in Nishida.

I think Judge Arpin asked about Nishida, does it require a modification to arrive at the claimed invention. I'm not sure exactly what the answer is, but fundamentally Nishida shows a web and cutting articles out of a web.

There was an example of a kindergartner drawing circles on a piece of paper, and to waste less paper, you draw the circles closer together.

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Again, this is the analogy that Adidas brought up, but I guess the point is from that, the conclusion would be, oh, just form the circles in the shape that they're in to begin with and don't even draw them on a piece of paper, and we submit under that analogy, it doesn't support the position that it would have been obvious to take Nishida which teaches -- fundamentally, it teaches creating the articles on a web, creating the elements on a web, and just because Nishida says it's possible to put them closer together to create less waste, which by the way shows that Nishida was directed to the exact issue here of creating less waste, to go from that solution to the problem of putting the articles closer together to knitting them to shape is a fundamental change in what Nishida describes and is classic hindsight.

The Schuessler reference, and we talk about this in Slides 39 and 40, about the structural differences between the edge of Nishida and the claimed flat-knit edge and why Nishida lacks this structure as claimed.

JUDGE FITZPATRICK: Counselor -- and I don't know if you can hear me, Judge Arpin -- counselor, what are all the structural differences that you allege between cut from flat-knit fabric and something that is flat knitted to that shape?

On your Slide 22, you, I think, rely on the Tonkel declaration that mentions unbroken stitches of yarn. Is that the only structural difference?

MR. VAN ES: Well, I think it's kind of a combination of things. If you can envision that you have a web of material and you cut something out of that web of material, you're going to have loose ends hanging off, and those loose ends are prone to fraying, unraveling, becoming loose, and not workable in terms of the ultimate goal of the product here.

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JUDGE FITZPATRICK: Is that the only structural difference, the loose --

MR. VAN ES: The loose frayed edges as described in Mr. Tonkel's report. It's an important structural difference, and that is the structural difference.

JUDGE FITZPATRICK: So is it possible to cut, to form flat knit edges through cutting? If you knit in this design in Nishida, you actually knit flat-knit edges on the perimeter that you're intending to cut out and then you cut out just on the outside of that border. I think Adidas was alluding to that with the hammock analogy.

MR. VAN ES: Yeah. I didn't entirely understand that analogy, to be honest, Your Honor. So the question is if you have the web of Nishida, would it be possible to create -- to flat knit the edges?

JUDGE FITZPATRICK: Well, looking at that picture --

MR. VAN ES: So we're looking at Slide 38?

JUDGE FITZPATRICK: Yes. Thank you. There's different sections of what would become that upper, and they're made of different knit densities or a different type of stitching. Correct?

MR. VAN ES: That's correct, Your Honor.

JUDGE FITZPATRICK: So isn't it also possible, then, on the very edge, the perimeter, that you could sew in or knit in an edge such that you can cut just on the outside of it? I'm not asking if Nishida teaches that. I'm asking if it's possible.

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MR. VAN ES: Certainly, Nishida doesn't teach that, and I would submit that if you have a material formed on the web and you cut that material out of the web, you're going to have those loose ends.

JUDGE FITZPATRICK: You're going to have some loose ends, certainly, but you might not be cutting the edge is what I'm suggesting, and I'm asking if that's possible.

MR. VAN ES: I think a person of ordinary skill in the art reading Nishida would not arrive at that viewpoint, and I think there's a section of Nishida that's been relied upon quite a bit here, and this is on Slide 42 again, that talks about how the individual patterns can be closer together and that results in less waste, and we submit that that does not teach or suggest that it would have been possible, that it would have been obvious then to knit to shape particular elements. And this particular section of Nishida on Slide 42 supports Nike's position that it would not have been obvious.

The Schuessler reference which is on Slide 43 -- let me just be clear. Nike's position is not that Nike invented knitting an article to shape. There is prior art that shows knitting an article to shape, and we don't contest that, but the Nishida reference which is the closest reference on Slide 41, to take Nishida and combine that with the concept that, oh, it was known to knit articles to shape flies in the face of what Nishida teaches to address the exact problem that we're talking about here, which is excess waste in terms of the manufacturing process.

JUDGE ARPIN: Counselor, going to Judge Fitzpatrick's question, what language in your proposed amendment excludes his example of a knit edge cut from material just beyond the knit edge?

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MR. VAN ES: So yeah. I'm thinking about the question.

The claim requires that the edge be knit to shape, and fundamentally what you're describing is not knitting the edge to shape.

JUDGE ARPIN: Knitting to shape does not appear in the claim language. So what language in the claim excludes his example?

MR. VAN ES: Okay. I understand, Your Honor.

I think the -- let me put the claim up.

Nishida -- excuse me. I have Slide 2 up, which has Proposed Amended Claim 47 and it talks about -- as the Board knows, it talks about flat-knit edges free of surrounding textile structure such that the flat-knit edges are not surrounded by textile structure from which the textile element must be removed.

That is not Nishida. Nishida has surrounding textile structures such that the flat-knit edges are surrounded by the textile structure from which the textile element must be removed.

JUDGE COCKS: So you're saying that this excludes the extra little bits in Judge Fitzpatrick's scenario that would still be left if you were to cut just beyond the knit edge? You're saying this excludes that?

MR. VAN ES: We are, Your Honor.

JUDGE COCKS: Okay.

MR. VAN ES: May I confer with co-counsel for one minute?

JUDGE COCKS: Sure, briefly.

(Mr. van Es confers with Mr. Skerpon.)

MR. VAN ES: I don't have anything else, Your Honor.

JUDGE COCKS: Thank you.

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All right. Thank you. The case is submitted. We are adjourned.

(Whereupon, the proceedings, at 3:13 p.m., were concluded.)

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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adidas AG,
Petitioner

v.

NIKE, Inc.
Patent Owner

Patent No. 7,347,011

Inter Partes Review No. 2013-00067

NOTICE OF APPEAL TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT BY PATENT OWNER NIKE, INC.

Director of the United States Patent and Trademark Office
c/o Office of the General Counsel
P.O. Box 1450
Alexandria, VA 22313-1450

Notice is hereby given, pursuant to 35 U.S.C. §§ 141-44 and 319, and pursuant and 37 C.F.R. §§ 90.2(a) and 90.3, that Patent Owner NIKE, Inc. ("NIKE") hereby appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision entered on April 28, 2014 (Paper 60) ("Final Written Decision"), and from all underlying findings, orders, decisions, rulings and opinions adverse to NIKE, including, without limitation, those within the Decision on Institution of *Inter Partes* Review entered on May 17, 2013 (Paper No. 18).

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), NIKE further indicates that the issues on appeal include all issues decided adversely to NIKE in any orders, decisions, rulings and opinions. This includes, but is not limited to:

1. The Board's denial of NIKE's Motion To Amend U.S. Patent 7,347,011 (Paper 31), in its Final Written Decision, including the legal standard applied by the Board, the burden of proof applied by the Board, the Board's conclusion that NIKE did not meet its burden to show that proposed claims 47-50 would not have been obvious over the Nishida reference and are otherwise

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patentable, and any other finding or determination (factual or legal) supporting or related to this decision, and the constraints imposed by the Board on the briefing.

Simultaneous with this submission, a copy of this Notice of Appeal is being filed with the Patent Trial and Appeal Board and the Clerk's Office for the United States Court of Appeals for the Federal Circuit.

Respectfully submitted,

Dated: June 30, 2014 By: / J. Pieter van Es/

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CERTIFICATES OF FILING AND SERVICE

I hereby certify that, in addition to being filed electronically through the Patent Trial and Appeal Board's Patent Review Processing System (PRPS), a true and correct original version of the foregoing NOTICE OF APPEAL TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT BY PATENT OWNER NIKE, INC. is being filed by Express Mail (Express Mail Label EI 975626858 US) on this 30th day of June, 2014, with the Director of the United States Patent and Trademark Office, at the following address:

Director of the United States Patent and Trademark Office
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United States Patent and Trademark Office
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I hereby certify that three (3) true and correct copies of the foregoing NOTICE OF APPEAL TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT BY PATENT OWNER NIKE, INC. are being filed by hand, on this 30th day of June, 2014, with the Clerk's Office of the United States Court of Appeals for the Federal Circuit, at the following address:

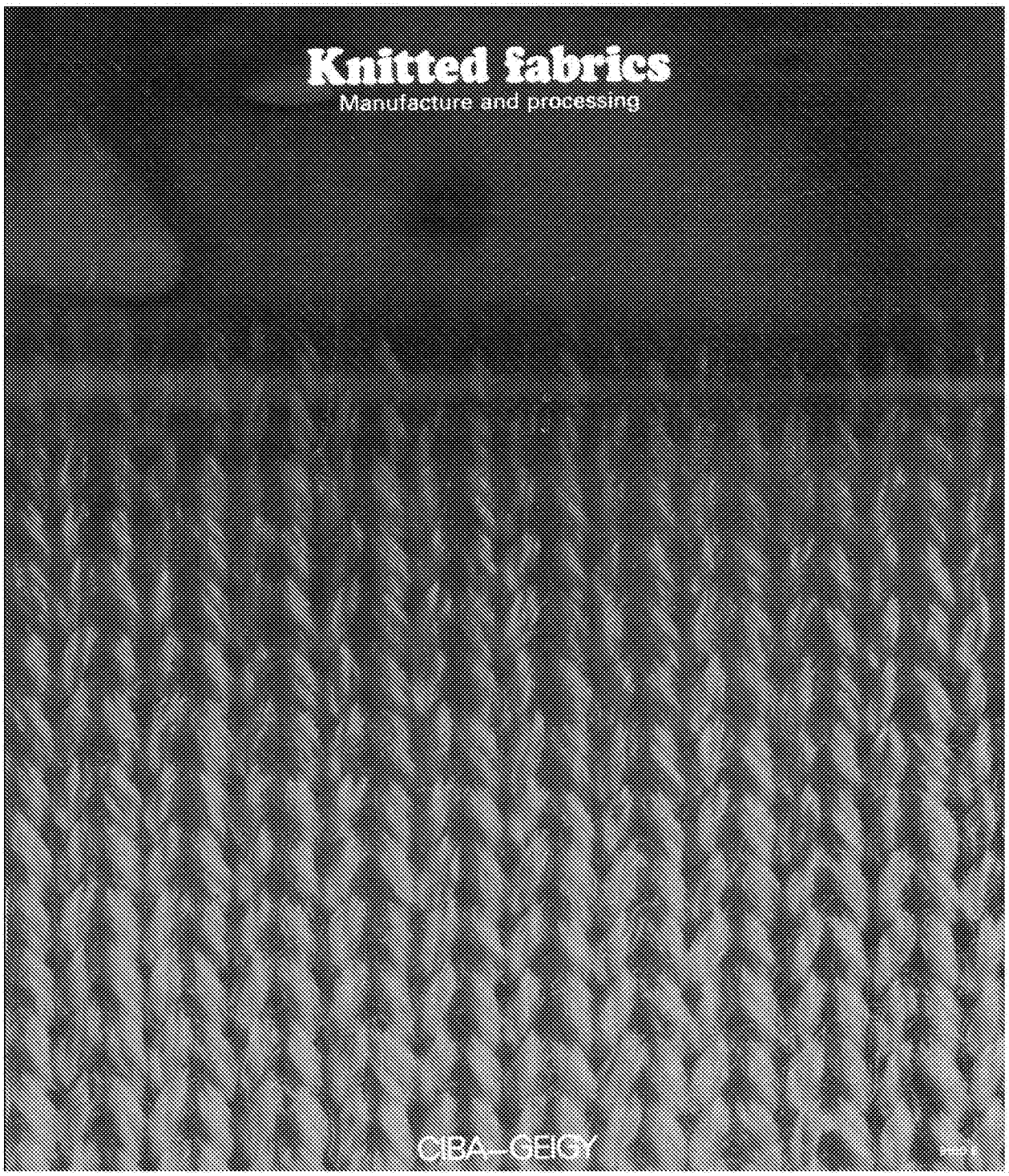
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I hereby certify that on June 30, 2014, a copy of this NOTICE OF APPEAL TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT BY PATENT OWNER NIKE, INC. was served on the Petitioner by emailing a copy to mstockwell@kilpatricktownsend.com, wkadaba@kilpatricktownsend.com and tiwilliams@kilpatricktownsend.com.

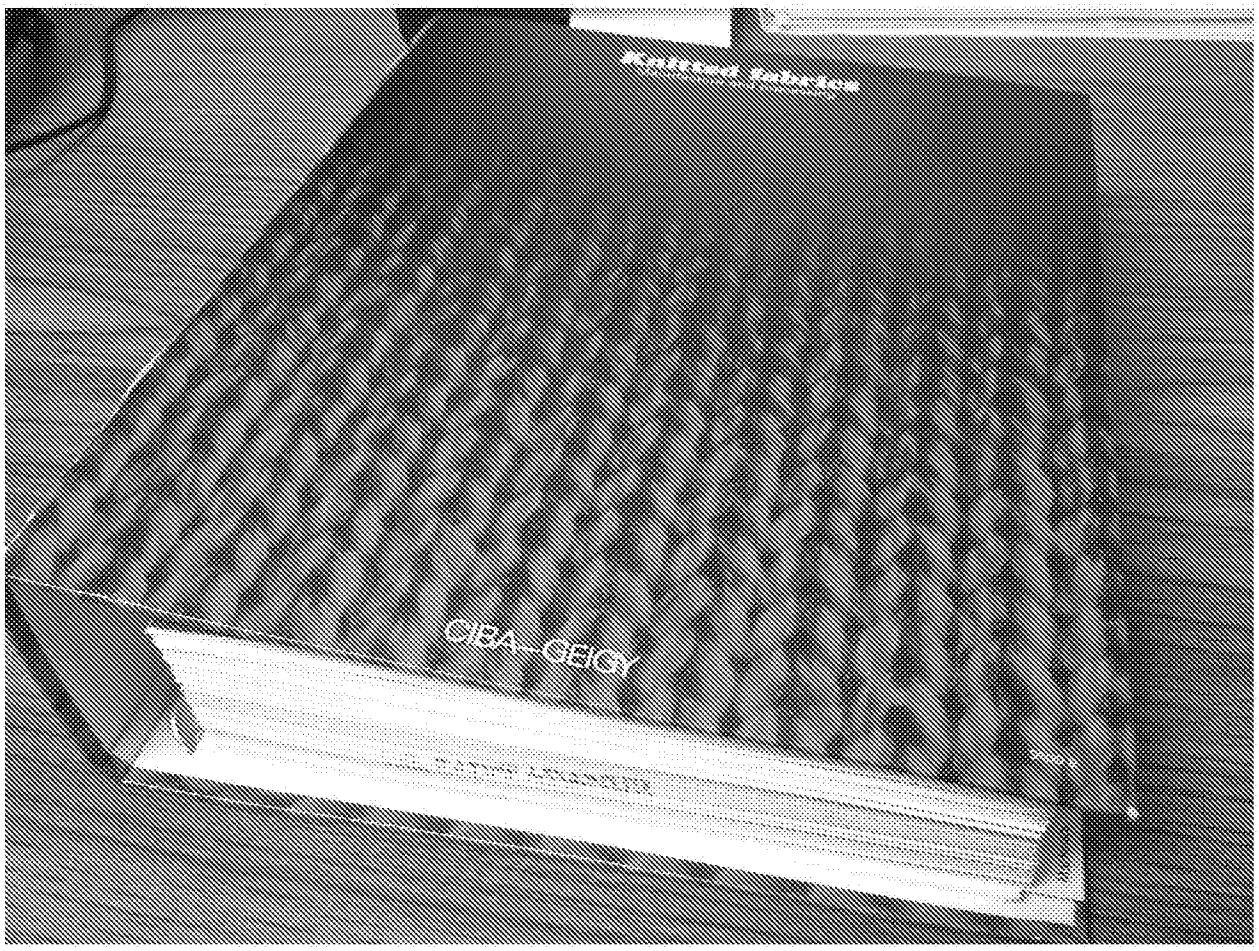
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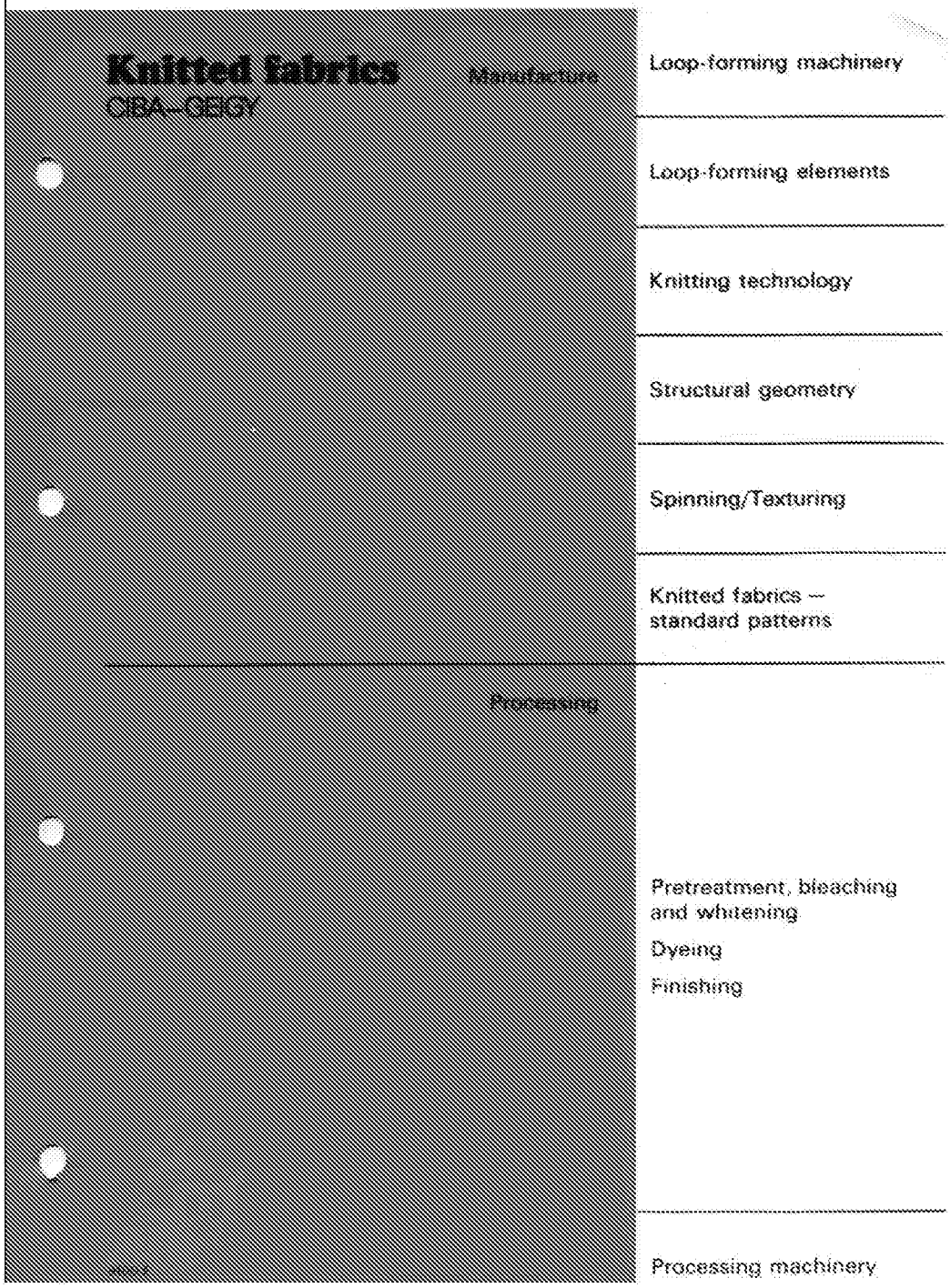
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CIBA-GEIGY


Knitted fabrics
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Manufacture
Loop-forming machinery
Loop-forming elements
Knitting technology
Structural geometry
Spinning/Texturing
Knitted fabrics –
standard patterns
Processing
Pretreatment, bleaching
and whitening
Dyeing
Finishing
Processing machinery

The articles contained in this binder tell the full story of knitgoods from the starting yarn to the finished goods. They have been compiled for the benefit of all who are either professionally engaged in knitting, or who are merely interested in this branch of technology and its products.

All mechanical operations on the production side are described together with the machines and elements encountered. Each individual processing routine, from pretreatment to finishing, is given full coverage in separate sections for the various types of fibre. Processing machinery forms the subject of a special section.

Contents

Manufacture

Knitting technology

Loop-forming machinery

Loop-forming elements

Structural geometry

Knitted fabrics - standard patterns

Finishing

Cellulosic fibres	pretreatment, bleaching, fluorescent whitening dyeing finishing
Polyamide	items, processing operations pretreatment, bleaching, fluorescent whitening dyeing finishing
Acrylic	pretreatment, bleaching, fluorescent whitening dyeing finishing
Polyester	pretreatment, bleaching, fluorescent whitening dyeing finisning
Blends Polyester/cellulose	pretreatment, bleaching, fluorescent whitening dyeing finishing
Polyamide/cotton	pretreatment, bleaching, fluorescent whitening dyeing

Processing machinery

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Issued in 1976

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Machinery

Loop-forming machines

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1. Survey of knitting machines

Machines forming loops in order to produce textile fabrics can be divided into knitting machines and stitch-bonding machines. The first group converts either one or several threads into loops, thereby producing a contiguous area of fabric, whilst the second group of machines uses a technique in which materials offered to the knitting elements are pierced, thereby pulling threads of fibres through for conversion into loops and the formation of fabric areas.

A further sub-division of the machines is based on a number of distinctive machine features and allows designations to be derived from them:

- The way in which the needles in knitting machines move

  On bearded-needle knitting machines, two-piece needle knitting machines and on latch-needle raschel knitting machines, the needles move collectively, i.e. the needles are fitted into a ring or bar. Weft-knitting machines using latch needles have individually moving needles which are housed in slots or tricks cut into a needle bed or needle cylinder. The difference between the various groups of knitting machines is thus confined to the manner of forming the loops. As far as the fabric structures themselves are concerned, it is frequently impossible to state with certainty the type of knitting machine on which the fabric has been knitted.

- The method of feeding the yarn, i.e. machines using a single thread or a set of threads

  Machines using a single thread for the production of loops at a workin point on the machine generally form loops from the yarn in a horizontal direction, whilst machines using one or more sets of threads, i.e. a multitude of threads, convert them into loops in a longitudinal direction. Apart from the raschel warp-knitting machine, modern latch-needle knitting machines are weft-knitting machines which work exclusively by converting a single thread into loops. With regard to knitting machines using bearded needles, some of these use a single thread for loop forming, whilst others use one or several sets of threads. Knitting machines using two-piece needles form loops only from sets of threads. In practice, it has been decided to omit the term "single-thread loop-forming machine" when discussing this type of knitting machine, whilst adding the term "warp" when talking about knitting machines using one or more sets of threads.

- Arrangement of the needles in the machine, i.e. flat or straight-bar machines or circular machines

  On flat or straight-bar knitting machines, the needles are arranged in a straight line and the fabrics knitted on these machines are produced in an "open width" or as flat fabrics. Circular knitting machines have their needles arranged in a circle and the fabric leaves such machines in tubular form.

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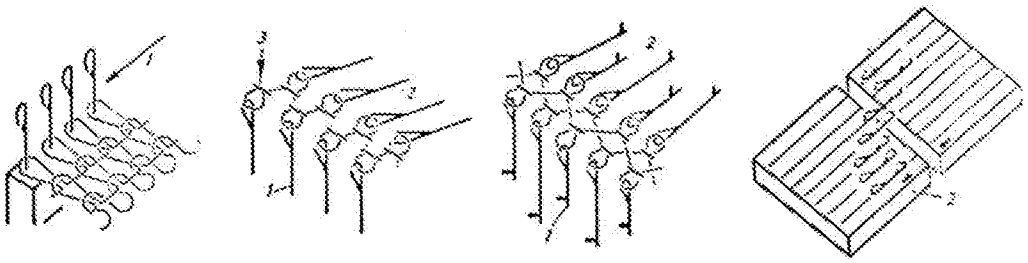
• Groups of fabric structures produced on knitting machines

Machines producing single-face fabrics use only one set of needles per knitting head, and the fabrics produced on such machines have a face side showing face loops and a reverse side showing reverse loops. (plain fabrics).

Double-face fabrics (rib fabrics) use two sets of needles at each knitting head and, on such fabrics, the face loops are prominent on both sides of the fabric.

Machines designed for knitting rib fabrics use two sets of needles, where the needles in one set operate in the gaps between the needles of the other set, the two sets of needles facing each other. Only when knitting interlock-type double-face structures are the needles in one set in alignment with the needles in the other set. Interlock is also known as cross-over 1 x 1 rib. Purl-knitting machines use one set of double-headed needles, which are thus able to knock over their old loops in two directions, thereby producing fabrics in which both sides display prominently courses of reverse loops or individual reverse-loop stitches.

Fig. 1.



plain fabric
1 line of needles

1 x 1 rib
2 sets of needles
with one set
operating in the
gaps between the
needles of the
other set

cross-over
1 x 1 rib
(interlock)
2 sets of needles
in alignment with
each other

purl machine
1 set of double-
headed needles
able to knock
over in two
directions

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Distinguishing features	Latch-needle knitting machines				Bearded and 2-piece-needle knitting machines			
	Loops formed from a single thread Weft-knitting machines		Loops formed from sets of threads Warp-knitting machines		Loops formed from a single thread Weft-knitting machines		Loops formed from sets of threads Warp-knitting machines	
Needle action	Needles move individually		Needles move collectively	Needles move individually	Needles move collectively			
Presentation of yarn	Yarn looped horizontally		Yarn looped vertically (sets of threads)		Yarn looped horizontally		Yarn looped vertically (sets of threads)	
Arrangement of needles	Needles 1 line, flat-bar machine	Needles in circle, circular machine	Needles in 1 line, rashel machine	Needles in circle, circular warp-knitting machine	Needles in 1 line, straight-bar machine	Needles in circle, bearded-needle circular machine		Needles in one line, flat warp-knitting machine
Groups of fabric structures								
single-face fabric 1 set of needles	x	x	x	x	x	x	x	x
rib fabric 2 sets of needles	x	x	x					
purl fabric 1 set of double-headed needles	x	x						
Machine construction	Rib, purl hand flat machines Rib, purl power flat machines Automatic rib and purl power flat machines	Small-diameter plain, rib and purl fabric circular machines Large-diameter plain, rib and purl fabric circular machines	Latch-needle warp-knitting machine (rashel machine with 1 or 2 sets of needles) Crochet machine	Large-diameter circular warp-knitting machine	Plain-fabric Cotton's patent frame	French sinker-wheel machine English loop-wheel machine		Automatic warp-knitting machine with one and two sets of needles

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- Flat knitting machines
  - Hand flat machines are driven by hand and have manual controls.
  - Power flat machines are motor driven and at least in part hand controlled. This group of machines includes hand flat knitting machines which have been motorized and machines designed to knit strappings and other trimmings.
  - Automatic power flat machines have a drive motor, fully automatic machine controls and fail-safe devices.

- Circular knitting machines

  These machines can be subdivided into small-diameter and large-diameter circular machines in accordance with the diameter of their cylinder:
  - Small-diameter circular machines have cylinders with a diameter up to 165 mm (automatic legwear machines) for knitted footwear.
  - Large-diameter circular machines have needle cylinders with diameters in excess of 165 mm (mostly 30 inch diameter cylinders) i.e. 762 mm, for knitting yard goods with a finished with of 1.5 metrres or body-width goods for underwear and pullovers.

- Circular warp-knitting machines

  Of little importance

- Bearded-needle straight-bar weft-knitting machines

  These are known as Cotton's patent frames after their inventor. (Knitting from one thread).

- Bearded-needle circular knitting machines

  These machines, which knit from a single thread, are of limited importance if they are of the French sinker-wheel machine type, with radially arranged needles. English loop-wheel machines with vertically arranged needles are only rarely used today.

- Straight-bar warp-knitting machines

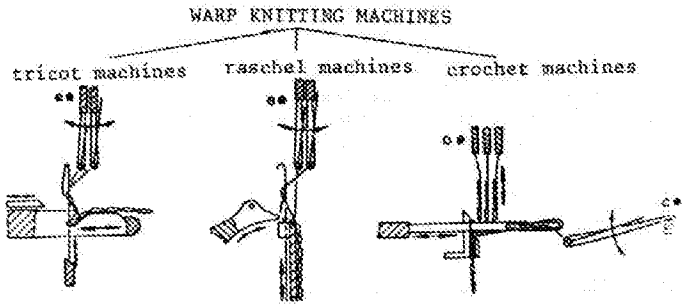
  These are sub-divided into tricot machines (automatic warp-knitting machines), raschel machines and crochet machines, in accordance with the type and arrangement of the needles and threads and the way in which the knitted fabric is drawn off from the knitting position.

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- automatic warp knitting machines: (tricot machines)	needles and threads form a rough right angle with the fabric as the latter is pulled away from the knitting elements.
- raschel machines:	needles and thread are roughly in the same vertical plane.
- crochet machines:	the horizontally arranged needles and ground threads form roughly a right angle with the fabric as the latter is pulled away from the fabric-forming point

Fig. 2



Uses

Tricot machines:	fabric for underwear (lingerie)
Raschel and crochet machines:	articles requiring a high degree of stability and stitches which are pulled together in a knot-like manner.

The uses of these three types of warp knitting machine overlap to some extent.

- Circular warp-knitting machines

These machines are of little significance and their main use today is in small diameters for the manufacture of net-like tubes.

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2. Construction, operation and special features of various types of knitting machine

2.1. Flat knitting machines

- Construction

The support for the needle beds is fitted to the base frame of the machine which can be called the bed-rock of the machine. The frame supports the two needle beds, which consist of steel plates into which tricks or slots have been milled to accommodate and guide the latch needles. One of the two needle beds can be let down, thus increasing the distance between the two beds, and it is also possible to move the bed sideways for patterning purposes and other reasons. In the case of the standard rib flat knitting machines, the two needle beds are positioned opposite each other to form an angle and the needles in each of the two beds face each other in such a way that the needles in one bed are in alignment with the centre of the gaps between two needles in the opposite bed. On purl flat knitting machines, the two needle beds are arranged in the same horizontal plane, with the tricks in one bed in alignment with the tricks in the other bed. The carrier for the two needle beds also supports the bearings for the cam-carriage guide rails and the rails for the yarn carriers. The cam carriage itself reciprocates across the two needle beds. On the underside of the two cam carriage plates are the cam races which are made up of cams shaped in such a way that they form a track for the butts of the needles and jacks which protrude from the needle beds. The cam tracks of the cam races are shaped in such a way that they raise the needles and take them down again. The reciprocating cam carriage engages at each knitting point or system with a yarn carrier to feed the yarn to the needles as these move downwards. Small brushes on the cam carriage prevent the latches on the needles from closing the needle hooks prematurely. The yarn carriers available on the flat knitting machine can be selected as and when required by the knitting programme. Machines equipped with jacquard installations have jacquard prisms or rollers supporting metal cards which have been punched out in accordance with a design. These prisms or rollers and their cards extend the entire length of the needle bed on the underside of the beds. The needle jacks and, through them, the needles, are selected afresh for each new carriage traverse by way of a lifting movement of the prism or roller during each cam carriage traverse.

Automatic power flat machines drive their cam carriage by means of an electric motor via an endless rotating chain. The machines have a control installation consisting of a set of punched cards or a punched tape, containing the information required to make changes in cam settings, such as, for instance, changes in fabric quality (stitch length), yarn carrier changes, sideways displacement of the needle bed or order to the jacquard installation. This information is transmitted via appropriate scanning mechanism to the relevant elements in the knitting machine as and when required. Most of these changes in

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machine settings occur at the point where the cam carriage reverses its direction of travel (i.e. the cams in the cam carriage are changed in their settings outside the needle beds.

Situated above the cam-carriage drive, at the back of the machine, is the yarn-package stand with the yarn-guide facilities. The yarn-package stand accommodates the yarn packages and the yarn-guide facilities hold the yarn-tensions and the yarn-stop-motion installations, which act in the event of yarn breakages, knots of a pre-determined size in the yarn, yarn drag and empty yarn packages. Further stop-motion installations are available on the machine which act in the event of loading-up of the needles, resistance to a smooth and light movement of the cam carriage during its traverse across the needle beds and in case of fabric press-offs. The latter stop motion operates in conjunction with the fabric-draw -off mechanism. The latter is fitted below the supports for the needle beds and consists of a main roller and sub-divided counter-pressure roller. After having passed through the nip formed by the take-down rollers, the fabric pieces,held together in a continuous chain by means of a draw-thread,can be deposited in whatever way required. Machines equipped with a holding-down element which pushes down the old loops on the needles as the latter rise during the knitting cycle, can dispense with a fabric take-down installation, and thus make it possible to eject each fabric piece singly from the machine, as soon as it is knitted.

- Operation and special features

The principal advantages of the flat knitting machine are connected with the wide range of uses to which the machine can be put. Furthermore, the machine has extensive patterning scope and the facility to knit shaped fabric pieces. In general, fabrics knitted on the flat machine are produced to the length and width required. Fabrics can be started with a firm non-roving rib end or tubular welt. Certain machines in this group are able to knit fabric pieces in which the width of the fabric can be increased gradually by a widening process and, in some cases, it is also possible to both widen and narrow the fabric piece and thus produce true fully fashioned garment pieces. Due to the relatively low number of knitting points or systems available on the flat knitting machine and the fact that the cam carriage during the knitting process has to perform a reciprocating movement which comes to a halt every time the end of a carriage traverse has been reached, to be restarted when the direction of carriage travel has been reversed, the knitting speed of the flat machine is fairly low. This is aggravated by the need for the carriage to travel the entire length of the needle beds in order to reach the automatic control points for the setting of the cams in the carriage, no matter how narrow the actual width of knitting.

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Hand flat knitting machines

In advanced industrialized countries, hand flat knitting machines are now mainly used for experimental work and sampling. In less advanced countries, however, these machines are still used for bulk production of knitted garment pieces.

Power flat machines

Power flat machines come into being by fitting a motor and mechanical drive to basically hand-operated flat machines. Included in this group are flat knitting machines specifically designed for the production of strapping and other trimmings.

Automatic power flat machines

The automatic power flat machine is available in a wide variety of machine types, depending on its patterning facilities and ability to knit shaped fabric pieces. The widest patterning scope is offered by machines equipped with jacquard needle-selection facilities, stitch-transfer mechanisms to transfer stitches from the needles in one bed to needles in the bed opposite, including needles which do not carry a stitch, and other advanced patterning units. The ability to transfer a stitch onto an empty needle is particularly useful for knitting cable-stitch patterns and shaped collars. The three-way technique available on some of these machines makes it possible to knit tuck-float and rib structures in the same course. Included in this group of automatic power flat machines are such special machines as flat machines with automatic running-on facilities for use with garment pieces knitted on Cottom's patent frame by the fully fashioned principle, and for fully fashioned collars and gloves.

2.2. Latch-needle circular machines

- Construction

On a large-diameter circular latch-needle machine, the machine frame usually consists of a tripod structure. The legs of the structure are usually designed in the form of boxes which house such machine elements as the electrical installations and the machine drive. The centre part of the machine frame supports the needle cylinder. Machines designed for knitting rib fabrics or crossed-rib fabrics (interlock) use a horizontally arranged dial for housing the second set of needles or dial needles, whilst machines designed for knitting primarily purl-fabric structures have a second needle cylinder arranged above a bottom cylinder. For knitting rib fabrics, the needles in the dial are arranged in such a way that they operate midway between every two cylinder needles, but when knitting interlock fabrics, the dial needles are in direct alignment with the needles in the cylinder. In the case of circular purl-knitting machines, the tricks for housing

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the double-headed latch needles in both cylinders are in direct alignment with each other, i.e. the tricks in the bottom cylinder are opposite those in the top cylinder. Surrounding the cylinder (or cylinders) are the cylinder-cam boxes, while the cams for the dial needles are arranged above the dial in a dial cam plate. The cams in both the cylinder and dial cam boxes are arranged so that they form one or more tracks for guiding the needles or needle jacks by their butts which protrude from the tricks of dial and cylinder, to enable the needles to reciprocate either vertically (cylinder needles) or horizontally (dial needles) for the loop-forming motions. Modern machines are equipped for automatic lubrication. When the needles move either downwards (cylinder needles) or rearwards (dial needles), new yarn is fed into the hooks of the needles. Certain machines equipped with striping units at the knitting points are able to change yarns, for instance from one colour to another colour, whilst knitting is in progress, thereby producing horizontally striped fabrics. The mechanically operating jacquard installations used on circular knitting machines are usually grouped round the needle cylinder. Against this, the electronic control installations for electronically operating jacquard facilities are usually at one side of the machine where they are housed in the box-shaped leg of the machine frame. Situated above the dial of the circular machine is the yarn-package stand, which contains the yarn-tensions and stop-motion installations which automatically stop the machine in the event of yarn drag, empty yarn packages, knots beyond a certain pre-determined size in the yarn and yarn breakages. Also situated on the yarn-package stand are the yarn-furnishing devices, which supply the yarn to the needles in a positive or non-positive manner. In order to save space and reduce weight at the top of the machine, machines with a large number of knitting points or feeders have replaced the overhead yarn-package stand with a yarn-package creel which is erected on the floor of the knitting room near the knitting machine. Modern machines also have automatic stopping devices which act in the event of fabric load-ups on the needles, closed needle latches, needle-head breakages (dropped stitches) and fabric press-offs. These devices are either fitted to the cam boxes along the cylinder or are at the fabric take-down unit for action in the event of fabric press-offs. The fabric tube is taken from the needle line of the machine over a flat fabric-width holder through a three-roller fabric take-down installation which draws the fabric tube downwards away from the needles of the machine, and this is followed by rolling-up on a fabric roller or deposition into a fabric container. Faulty adjustment of the fabric-width holder can lead to overstretching of the fabric tube and result in differing stitch densities along the fabric-tube circumference - frequently only spotted after the fabric has been dyed. Because of this, it is advisable to keep the take-down tension, exerted by the fabric take-down rollers, to a minimum in order to avoid longitudinal fabric distortion.

- Operation and special features

The main feature of the large-diameter circular knitting machine is its large production potential. This is based on the large number of

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knitting points or knitting feeders, and a continuous system of knitting. Both small-diameter circular machines and large-diameter machines can be divided into models for knitting stitch-shaped garment-length pieces and models for knitting fabric in the roll as yard goods.

Small-diameter circular latch-needle knitting machines

Small-diameter circular machines having a single cylinder and one set of latch needles are usually used for knitting fine-gauge ladies' legwear or, when equipped with two superimposed cylinders and one set of double-headed latch needles, for knitting socks, three-quarter hose and half-hose. Fine-gauge automatic single-cylinder machines in this range are able to knit complete ladies' tights, often with a toe closed on the knitting machine and with elasticated threads knitted into the waist section of the garment. After such tights have left the knitting machine, they are merely dyed and heat-set, when they are ready for packaging and sale. Double-cylinder legwear machines, too, are able, in some instances, to produce garments with the toe closed on the double-cylinder machine.

Large-diameter circular latch-needle knitting machines

Large-diameter circular knitting machines are used for producing fabric as yard goods for outerwear, sportswear and so on, and also for producing body-width garment lengths for, for instance, underwear garments without side seams. Large-diameter circular knitting machines with jacquard installations use a variety of jacquard mechanisms such as pattern levers, pattern wheels and pattern discs, steel tapes and drums, and such electronic pattern installations as film strips, magnetic tapes and magnetic plates for carrying the patterning data. The electronic patterning facilities frequently permit the production of almost unlimited pattern areas right up to the full circumference of the needle cylinder (about 1.5 m fabric width) and extending over the full length, of, for instance, a lady's dress. Connected to these electronic patterning installations are electronically operating pattern-preparation units where the design can be projected on a television screen and transferred very quickly to the knitting machine either manually or automatically. By exchanging yarn colours and cancelling a particular colour without having to change yarn packages, it is possible to develop mirror effects, extensions in the height and width of the pattern and other variations of the design, by just pressing a button.

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* Special machines

Large-diameter circular knitting machines with one set of latch needles

This includes a large-diameter circular knitting machine for producing imitation-fur fabrics. The machine has attachments for feeding slivers of fibres to the needles. The latest machines in this range are fitted with electronically operating needle-selection units, thus making it possible to produce complete imitation animal pelts.

Another machine in this group, which has a special inlay installation and makes economic use of pile yarn, can be used to produce floorcoverings.

On another machine in the same group, warp and weft threads supplied by packages on a special creel are incorporated into a plain weft-knitted fabric without being formed into loops.

Automatic circular knitting machines for knitting rib and purl fabrics

Automatic cylinder and dial machines for knitting rib fabrics and superimposed double-cylinder machines for knitting purl fabrics are available both in body-width diameters and in 33-inch diameters for knitting stitch-shaped garment lengths for ladies' underwear, pullovers and shirts with a firm non-roving rib bottom or tubular welt.

Circular knitting machines for producing flat pieces of fabric

These are special machines where knitting takes place only round roughly four-fifths of the circumference of the needle cylinder. This produces flat pieces of fabric, which are knitted both with regard to length and width in accordance with pre-determined dimensions. These semi-fashioned pieces of fabric resemble the product of the flat knitting machine.

Large-diameter circular warp-knitting machines

Only a few of these machines are in existence at the present time. The threads for forming the fabric are supplied from two concentrically arranged sets of sectional warp beams, with each circle of warp beams moving in opposite direction to the other. This arrangement of warp-beam movement produces thread-crossing over the latch needles in the machine for a milanese fabric with open laps (double atlas fabric without turn-round courses).

2.3. Straight-bar weft-knitting machines

* Construction

The long frame of the machine is sub-divided into sections by a number of dividing walls. The two outer sections of the machine, and on machines which have many knitting heads, the centre section, too, accommodate the central control installation of the machine. The latter is frequently in the form of a punched tape, and controls the movement of the yarn-carrier stops and sets of fashioning points as well

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as the various patterning facilities, if these are available on the machine, during the knitting programme. The other sections on the machine are filled by the knitting heads. The drive of the machine and the main camshaft which promotes the various movements of the knitting elements and fashioning elements are housed in the lower part of the machine frame. Since the fully fashioned straight-bar weft-knitting machine is able both to produce knitted stitches and transfer stitches sideways to other stitches, each cam on the main camshaft of the machine controlling the movement of knitting and fashioning elements is is two parts, one to control the movement of the element during knitting and, next to it, another to control the movement of the same element for fashioning.

The cams transmit their movements to the relevant knitting elements through rollers running on the cam profiles and a system of levers connecting the rollers to the appropriate knitting elements. Thus, when changing from knitting to fashioning movements or vice versa, the entire camshaft is moved sideways either to the right or left, depending on whether the change is from knitting to fashioning movements or vice versa. During the fashioning movements, the drive from the main camshaft to the reciprocating elements such as the yarn-carrier drive and the slur-cock drive (the former laying the yarn across the needles and the latter driving the sinkers forward to kink the yarn into loops round the needles) is interrupted, since these elements are not required during the fashioning or loop-transfer action. The installation for regulating the stitch length holds the needle bar at a predetermined distance from the bar in which the loop-forming sinkers are housed, and since the thrust forward of the sinkers is fixed, a change in needle position towards or away from the sinker bar will alter the stitch length. The modern fully fashioned straight-bar machine drives the slur cock which moves the sinkers forward for loop forming only across the part of the needle bar which is actually carrying loops, i.e. the actual knitting width, so that the traverse of the reciprocating slur cock is synchronized with that of the yarn carrier. The yarn carriers themselves are fixed to reciprocating carrier rods and this arrangement enables the yarn carriers to be changed after each reciprocation in accordance with the striping programme. The fixed bottom edge of the sinker bar serves as a presser edge against which the beards of the descending bearded needles are pressed, thus trapping the newly formed loops inside the closed needle beards. Situated below each loop-forming sinker is a knocking-over bit which assists the vertically and horizontally moving needles to cast off the old loops over the heads of the bearded needles and over the new loops which are inside the needle beards. In order to facilitate stitch transfer at the selvedges of the fabric, to widen or narrow the fabric width, or to transfer stitches anywhere in the fabric, to produce openwork designs, the bearded needles involved have to align themselves and mesh with the appropriate narrowing points which are arranged above those needles which carry the stitches that have to be transferred. These points have vertical and horizontal movement when in action, to pick up the stitches concerned and move them sideways upon the

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needles required by the knitting programme. Situated at the back of the machine and above the machine frame is the accommodation for the yarn packages and the yarn guides and yarn tensions which are interposed in the path of the yarn from the yarn package to the yarn carrier. The fabric draw-off mechanism is at the front of the machine. It draws the fabric forward away from the needles and winds it up on a roller. When a fabric piece has been completely knitted, it is pressed off, i.e. ejected from the knitting elements, ready for collection. The re-setting of the machine for the next piece of fabric is either manual or fully automatic as on most modern machines. Modern Cotton's patent frames have facilities to produce a double welt fully automatically and transfer rib ends fully automatically to the needles. Machines are also available with a second auxiliary needle bar for knitting the rib end on the Cotton's patent frame itself and for automatic switching over to plain-fabric knitting, when the knitting of the rib end has been completed.

- Operation and special features

Today, Cotton's patent frames are only used for the manufacture of fully fashioned outerwear, mainly in the pullover field. Formerly, they were used for the manufacture of fine-gauge fully fashioned ladies' hose and fully fashioned underwear. Modern Cotton's patent frames are available with 4, 8 or 12 knitting heads. The principal special feature of the machine is its ability to shape the fabric by the fully fashioned process which involves the transfer of stitches either into or out of the fabric at the selvedges, upon other needles. The pieces of fabric which are fully fashioned by widening or narrowing at the selvedges are generally knitted in plain fabric. The rib ends needed for pullover parts are knitted either on a flat knitting machine or, as already mentioned, directly on the Cotton's patent frame with an additional auxiliary needle bar. Jacquard installations for patterning and other pattern facilities including cable-stitch mechanisms are also available.

2.4. Bearded-needle circular machines

- Construction

In contrast to circular latch-needle knitting machines, French sinker-wheel machines do not have a machine frame which stands on the floor of the knitting room. Instead, the main body of the machine is suspended from girders by a central machine axis. This system of erection requires little space and provides maximum machine accessibility. The machine drive is mounted on the girders from which the machine is suspended and the drive is connected to the main knitting head by means of a driveshaft, which runs vertically, parallel to the central pillar which supports the knitting head. The fixed support pillar or central axis of the machine holds the machine-support plate, beneath which is the actual knitting head with the individual knitting

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feeders arranged round the rotating needle cylinder. A knitting feeder consists of the following main elements: a pushing-back element, which pushes the old fabric loops on the needles down the stems of the horizontally arranged bearded needles at the commencement of the knitting cycle; loop-forming sinkers arranged in a sinker wheel which is gear-driven from a gear track on the revolving needle cylinder. The sinker wheel rotates clockwise and causes the sinkers to be moved both vertically and horizontally. After a yarn feed has put the yarn across the stems of the bearded needles which radiate from the rotating needle cylinder, the sinkers penetrate the gaps between the needles and drive the yarn downwards between the needles into a loop formation; a presser wheel, situated below the axis of the sinker wheel, causes the beards of the needles to close; a suitably shaped knocking-over cam pushes forward the knocking-over sinkers situated between each two needles, thereby landing the old fabric loops on the needle stems upon the closed needle beards. After the rotating needles have left the underside of the presser wheel, the knocking-over sinkers are pushed further forward by the fixed knocking-over cam, thus causing the old fabric loops to be knocked over the heads of the needles and the needle loops inside the needle beards; a clearing wheel operating obliquely on top of the needle beards at this point ensures that the old fabric loops are properly cleared off the needle beards.

The yarn-package stands (usually one for each feeder) are mounted on the non-rotating machine-support plate already mentioned. Yarn-tensions, as well as yarn-guide units and yarn-furnishing installations are very similar to those used on circular latch-needle machines. However, in place of the roller take-down for the fabric as used on latch-needle circular machines, the French sinker-wheel machine uses sections of card wires which are arranged in a concentric circle below the needle cylinder and revolve with the latter. At the fabric take-down point, each of these card-wire sections performs a vertical up-and-down motion, which causes each wire section in turn to brush up against the inside of the fabric tube during the upward movement of the card-wire section, when the backs of the wires are against the fabric. After having moved upwards, a spring action forces each card-wire section downwards, when the points of the wires slightly engage the fabric and pull it down, due to the spring action exercised upon the card-wire section. The fabric tube is collected in a rotating fabric receptacle at the bottom of the machine just above floor level.

Operation and special features

Bearded-needle circular machines only have one set of needles and are thus only able to knit single-face fabrics. When compared with latch-needle circular machines, it is evident that a feeder on the French sinker-wheel machine requires considerably more space than a feeder on a latch-needle circular machine, so that the output of the French sinker-wheel machine is much lower than that of a circular latch-needle machine having the same diameter of cylinder. On the other hand, the

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textile material (the yarn) as on Cotton's patent frame, is treated with greater care during the loop-forming process. The incorporation into the fabric of plush yarns in order to produce plush fabrics is better than on the appropriate latch-needle circular machines, so that the French sinker-wheel machines are frequently preferred for knitting plush or pile fabrics, especially cut-pile fabrics. The so-called "Fairy Web" openwork structure which is primarily used for men's underwear garments, is a speciality of the French sinker-wheel machine. Special large-diameter circular bearded-needle machines have been developed for producing knitted floorcoverings.

2.3. Straight-bar warp-knitting machines

* Construction

The lower section of the machine frame on high-speed automatic warp-knitting machines is fully enclosed and accommodates the main drive shaft of the machine, either loaded with cam discs or in the form of a crankshaft running in an oil bath. On slower machines, both the main shaft and its cams are open to view and unenclosed. The actual machine drive is usually on the right-hand side of the machine, but on some models it can be found on the left-hand side. The main shaft transmits motion to the supports of the bars which hold the various knitting elements by means of levers. Whilst the needles of the machine move upwards, the old loops round the needle stems are held down by the holding-down and knock-over sinkers of the high-speed warp-knitting machine. On raschel machines, the same action is performed by a set of special holding-down sinkers only used on raschel machines. The guide bars both for knitting the ground structure and for patterning also receive their swinging movement from the main shaft of the machine. The sideways displacement of these bars, however, is promoted by pattern chains or pattern wheels which are accommodated at the side of the machine, above the machine drive. Certain automatic warp-knitting machines, both tricot and raschel machines, which have a large number of guide bars for, for instance, lace patterning, have counter-motion needle bars, i.e. when the guide bars swing in a particular direction, the needles make a movement against the guide bars in order to cut down the amount of guide-bar-swing movement needed to swing the mass of guide bars through the needle line. The guides in the guide bars lap the threads of the warps round the slightly inclined or horizontally positioned bearded needles, latch needles, compound needles, or carbine needles. On warp-knitting machines for knitting double-face fabrics, the needles in the two needle bars used for the work oppose each other in direct alignment.

The beards of bearded needles, if fitted, are closed by a horizontally moving presser bar. In the case of compound needles, the bar holding the tongue members for closing the hooks of the needles move independently of the bar holding the needle members. The casting-off of the old loops over the heads of the downward-moving needles is assisted

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by the rearward-moving holding-down and knock-over sinkers on automatic warp-knitting machines or by the vertically fixed knocking-over verge on the raschel machine operating in collaboration with the needle movement.

The warp-beam supports are mounted on the machine frame of the warp-knitting machine. Whilst the warp beams which carry only patterning threads normally operate by means of rope-tensioning devices and other slow-moving warp-knitting machines control warp tension by means of tension rails in combination with a warp-beam drive or without such combination, high-speed automatic warp-knitting machines usually operate with automatically controlled warp-let-off tension installations. With these installations, thanks to an automatically operating, infinitely variable warp-beam drive, tension on the warp threads remains constant throughout the full length of the warp upon the warp beam. The individual warp threads are separated from each other by means of a warp reed and kept under tension by a spring-loaded tension rail. The fabric-take-down unit is normally at the front of the machine and usually consists of a multi-roller unit. The fabric is drawn away from the needle line at a constant speed and under constant tension. After being drawn off away from the needle line, the fabric is rolled up upon a fabric beam roller.

Only a few raschel warp-knitting machines and crochet machines are equipped with warp-thread stop-motion attachments as a matter of basic machine equipment. However, optical warp-thread scanners are available on demand as optional extras. On warp-knitting machines, quality control of the fabric is mainly exercised today by instruments which measure yarn-input rates and by measuring the length of yarn over a certain number of courses which have been knitted into the fabric.

- Operation and special features

In recent years, after multifeeder circular knitting machines, it is the warp-knitting machine which has achieved the greatest progress with regard to increases in production speeds and patterning scope.

Automatic warp-knitting machines (tricot machines)

Today, automatic warp-knitting machines, thanks to their crankshaft drives and automatic warp-let-off motions, are able to knit at speeds of up to 1200 courses per minute using bearded needles. Against that, compound-needle machines can knit at speeds of up to 2000 courses per minute. Both types of machine are available at these speeds with a knitting width of 260 inches (6.6 metres). In addition to being fitted with a variety of patterning installations, there is the very popular laying-in range of units in which yarn can be laid in across the full width of the fabric as it is being knitted, thereby producing fabrics with a very high degree of horizontal stability. The inlay of threads in this way can be accomplished at speeds of up to 800 inlays per

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minute. Automatic warp knitting machines in the tricot field are mainly available with only one needle bar for producing single-face fabrics.

Raschel warp-knitting machines

Basically, raschel machine developments have a tendency to follow the developments of the tricot range of machines. However, a number of additional patterning installations have been developed for use specifically on raschel machines. Amongst these are jacquard installations and a number of systems for incorporating inlay threads into the fabric structure. Thus, in addition to developing through-inlay systems by way of yarn carriers, which also permit automatic change of inlay threads during knitting, three new systems for frontal thread inlay have been developed. These include a rotating chain, either with or without yarn packages, a reciprocating inlay-thread carriage (as on the Malimo machine) or a rotating inlay-thread layer, which inserts the inlay threads into the hooks of magazine chains or magazine rollers with reception flanges in the form of star wheels, followed by frontal presentation to the knitting elements for incorporation into the fabric.

The majority of raschel machines, too, have only one needle bar for single-face fabric manufacture. Some special groups of raschel machines have been designed for the manufacture of specific types of fabrics. Thus, there are raschel machines for knitting curtains, laces and fabrics for foundation garments. On the other hand, many raschel machines are built for general use. Raschel machines for knitting double-face fabrics, i.e. machines with two needle bars, are not very often used for that purpose, but rather for knitting tubular structures and as, for instance, seamless sacks, slips, and so on. This group of machines is also used for knitting cut-pile fabrics.

Crochet machines

These machines are mainly used in the manufacture of underwear for producing the trimmings. Lately, however, the machines have also been used for producing furnishing fabrics with a width of up to 3.6 metres.

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2.6. Stitch-bonding machines (nonwovens)

These machines, which have been developed in East Germany and Czechoslovakia, use textile materials which are converted into fabrics by a piercing action of needles or the pulling through of threads or fibres in accordance with loop-forming principles practiced in warp-knitting. The different types of process used in this field can be distinguished from each other mainly by the type of textile material that is being converted into the eventual fabric.

Feed material	Bonding material	Name of system
Fibre fleece	Loop-forming fibres from the fleece	Malivlies, Arabeva
Fibre fleece	Loop-forming warp threads	Maliwatt, Arachne
Fibre fleece and inlay-pile forming warp threads	Loop-forming warp threads	Araloop
Inlay threads with or without warp threads	Loop-forming wapr threads	Malimo
Textile fabric (scrim)	Warp threads forming pile loops	Malipol, Araloop I, Bicolor-Araloop (2 needle bars)
Textile fabric (scrim) and inlay warp-threads forming pile	Loop-forming warp threads	Schusspol, Araloop II, Bicolor-Araloop (2 needle bars)
Textile fabrics (scrim) and fibre fleece	Fibres from fleece forming pile loops	Voltex

Machines used in this technology, which is rich in variations, can produce fabric at speeds of up to 1200 stitches per minute, depending on stitch length and working width so that output of fabric is very high.

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3. Gauging systems for knitting machines

The gauge of a knitting machine indicates the number of needles in a given unit of length.

				Abbreviation
Flat knitting machines	gauge	No. of needles per 1 English inch	(25.4 mm)	E
Small-diameter circular knitting machines (diameter up to 165 mm)	"	" " 1 English inch	(25.4 mm)	E
Large-diameter circular knitting machines (diameter above 165 mm)	"	" " 1 English inch	(25.4 mm)	E
Straight-bar weft-knitting machine (Cotton's patent frame)	"	" " ½ English inches	(38.1 mm)	SK
French slider-wheel knitting machine up to 18 needles/French inch	coarse	" " ½ French inches	(41.57 mm)	Fg
from 19 needles/French inch upwards	fine	" " 1 French inch	(27.78 mm)	FF
Automatic warp-knitting machine (tricot)	gauge	" " 1 English inch	(25.4 mm)	E
Raschel warp-knitting machines	"	" " 2 English inches	(50.8 mm)	EK
Crochet machines	"	" 10 mm or 1 English inch	(25.4 mm)	E
Stitch-bonding machine - Malimo	"	" " 25 mm		
- Arachne	"	" " 100 mm		

Needle spacing on knitting machines is the distance from the centre of one needle to the centre of the next needle in the same needle set. It is generally given in millimetres to two decimal places.

3. Important areas for weft knitting machines

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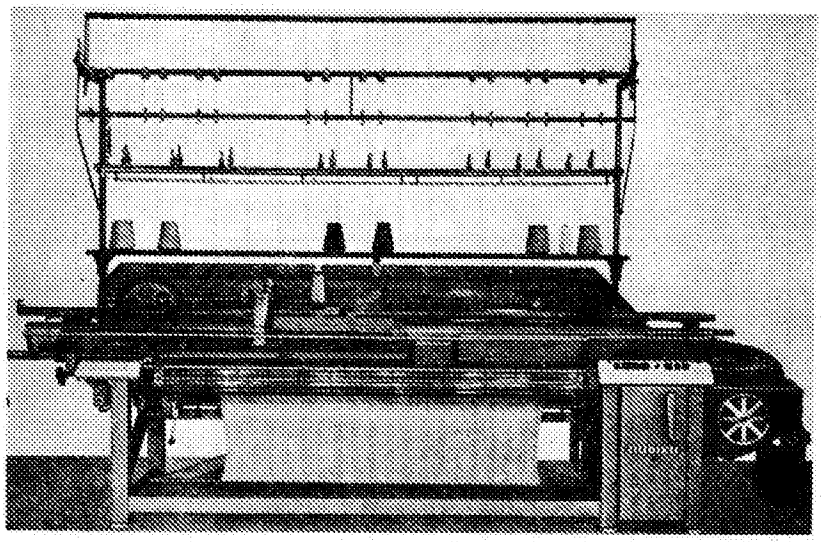
	Flat knitting machines		Circular knitting machines				Circular warp-knitting machines	Bearded-needle straight bar knitting machines (Cotton's patent frame)	Bearded-needle circular knitting machines	Straight-bar warp-knitting machines					Stitch-bonding machines
			Small-diameter circular knitting machines and automatic hosiery machines		Large-diameter circular knitting machines and automatic versions					Automatic warp-knitting machines (tricot)		Raschel machines		Crochet machines	
	Rib fabric	Purl fabric	Single cylinder	Double cylinder	Single jersey	Double jersey interlock	Purl fabric	Single-face fabric	Single-face fabric (double-face fabric)	Single-face fabric	Double-face fabric	Single-face fabric	Double-face fabric	Single-face fabric	Single-face fabric (double-face fabric)
Pullovers, waistcoats, medium-fine to coarse-gauge dresses	X	X			(X)	X	X		X	X		X			
Fabrics for skirts, dresses, light-weight dresses, combinations, lingerie					X	X		X	X	X		X			
Fabrics for ladies' outerwear and men's outerwear					X	X	X	X		X		X			X
Fabrics for outerwear, knitwear and sportswear					X	X				X		X			X
Fabrics for ladies' nightwear and housecoats					X	X		X		X		X			
Fabrics for underwear and sleepwear					X	X				X		X			
Ladies' base and panty hose			X												
Three-quarter-hose, half-hose and socks			X	X											
Garments for babies and toddlers	X	(X)			X		X		X						
Collars, trimmings and rib welt	X		X											X	
Scarves and headgear	X	X										X		X	
Gloves	X														
Fabrics for gloves e.g. Interlock weave										X	X				
Pile and raised fabrics					X	(X)			X	X	X	X		X	X
Terry fabrics					X	X			X	X		X			X
Fabrics for imitation garments						(X)				(X)		X			
Lace fabrics										X		X		X	
Furnishing fabrics										X		X		X	X
Upholstery fabrics						X				X		X			X
Floorcoverings and carpets					X				X			Z		X	X
Textile wallcoverings												X			X
Knitting caps, fishing nets, packaging, etc.									X	X		X		X	
Industrial fabrics e.g. filter cloths, sieve fabrics, backing fabrics for coated products					X	X			X	X		X		X	X

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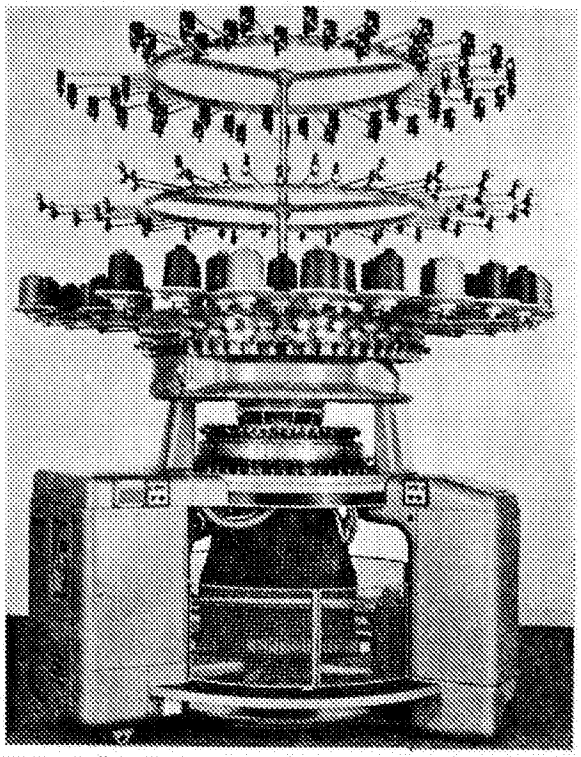
5. Typical machines

Fig. 3 Power flat knitting machine



(Edouard Dubied & Cie. S.A. 2001 Neuchâtel, Switzerland)

Fig. 4 Large-diameter circular knitting machine

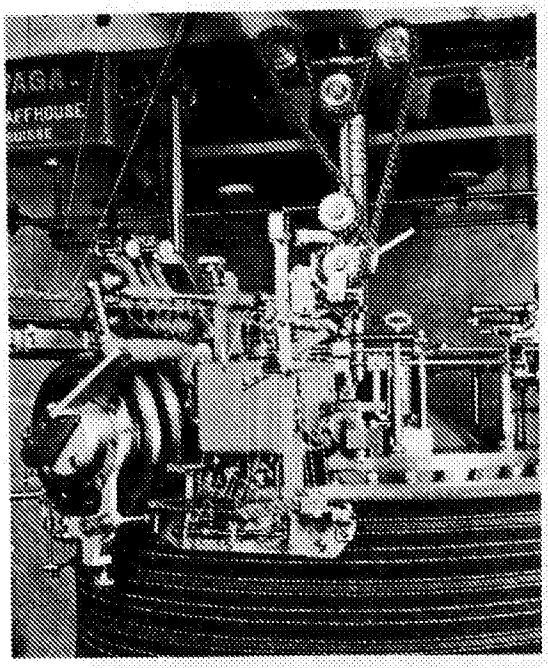


(Sulzer Morat GmbH,
7 Stuttgart 80)

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Fig. 5 French sinker-wheel machine



(Schaffhauser Strickmaschinenfabrik, 8201 Schaffhausen, Switzerland)

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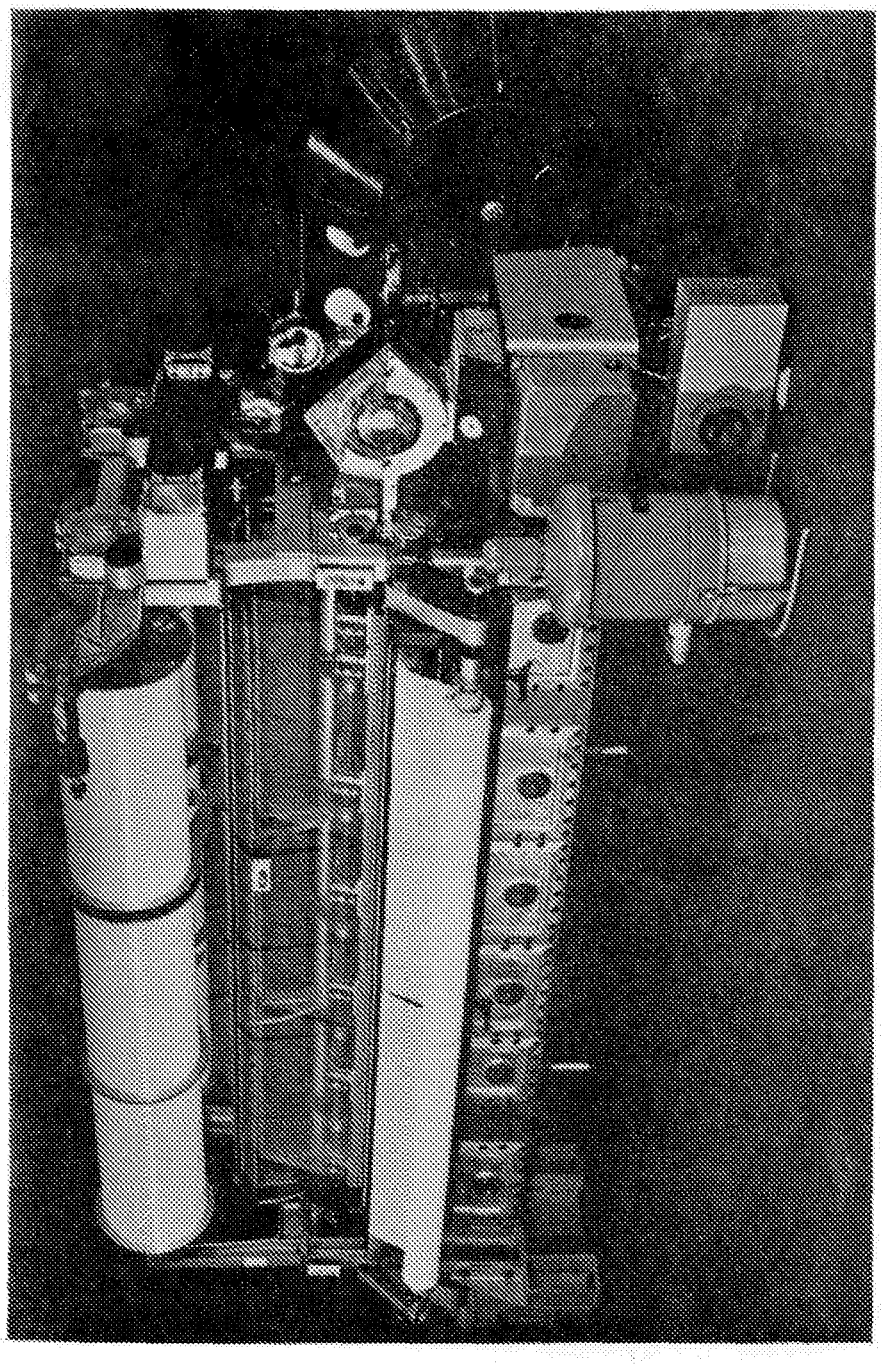
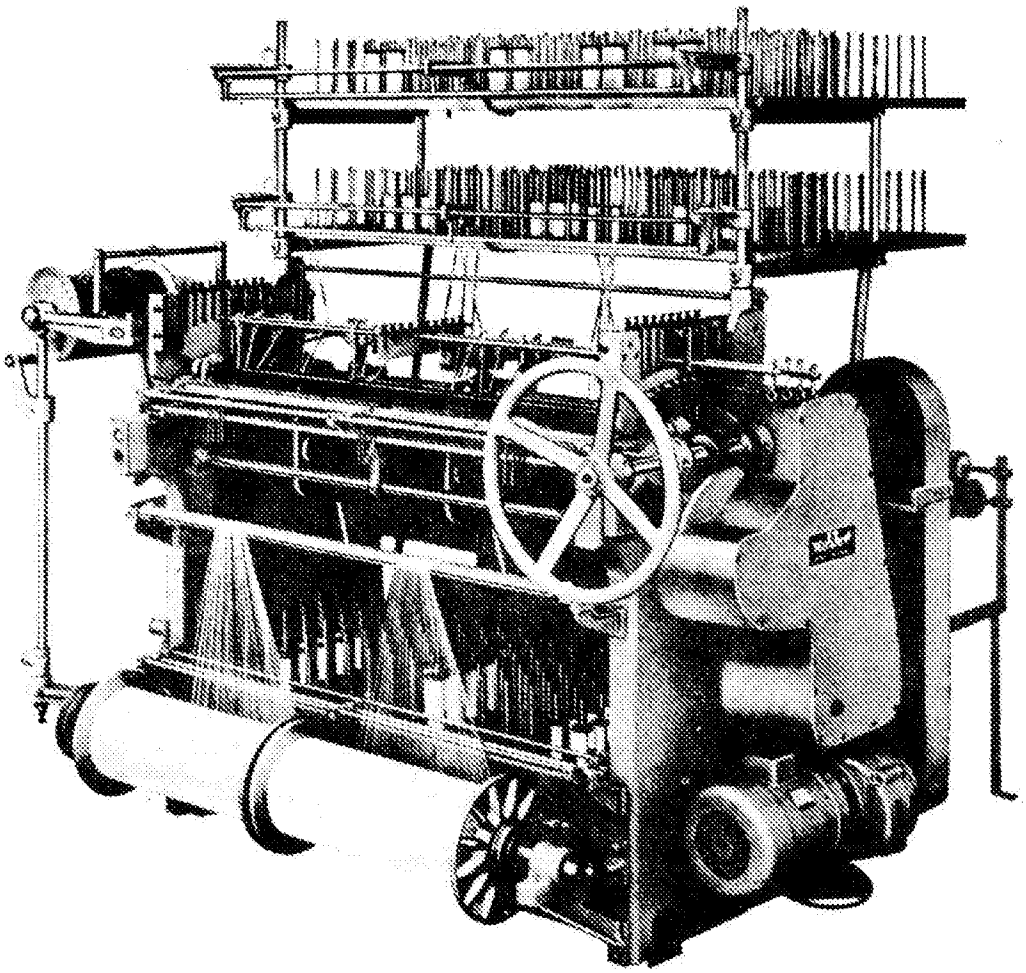


Fig. 6 Automatic warp knitting machine (tricot machine)
(Karl Mayer GmbH, 6053 Obertshausen)

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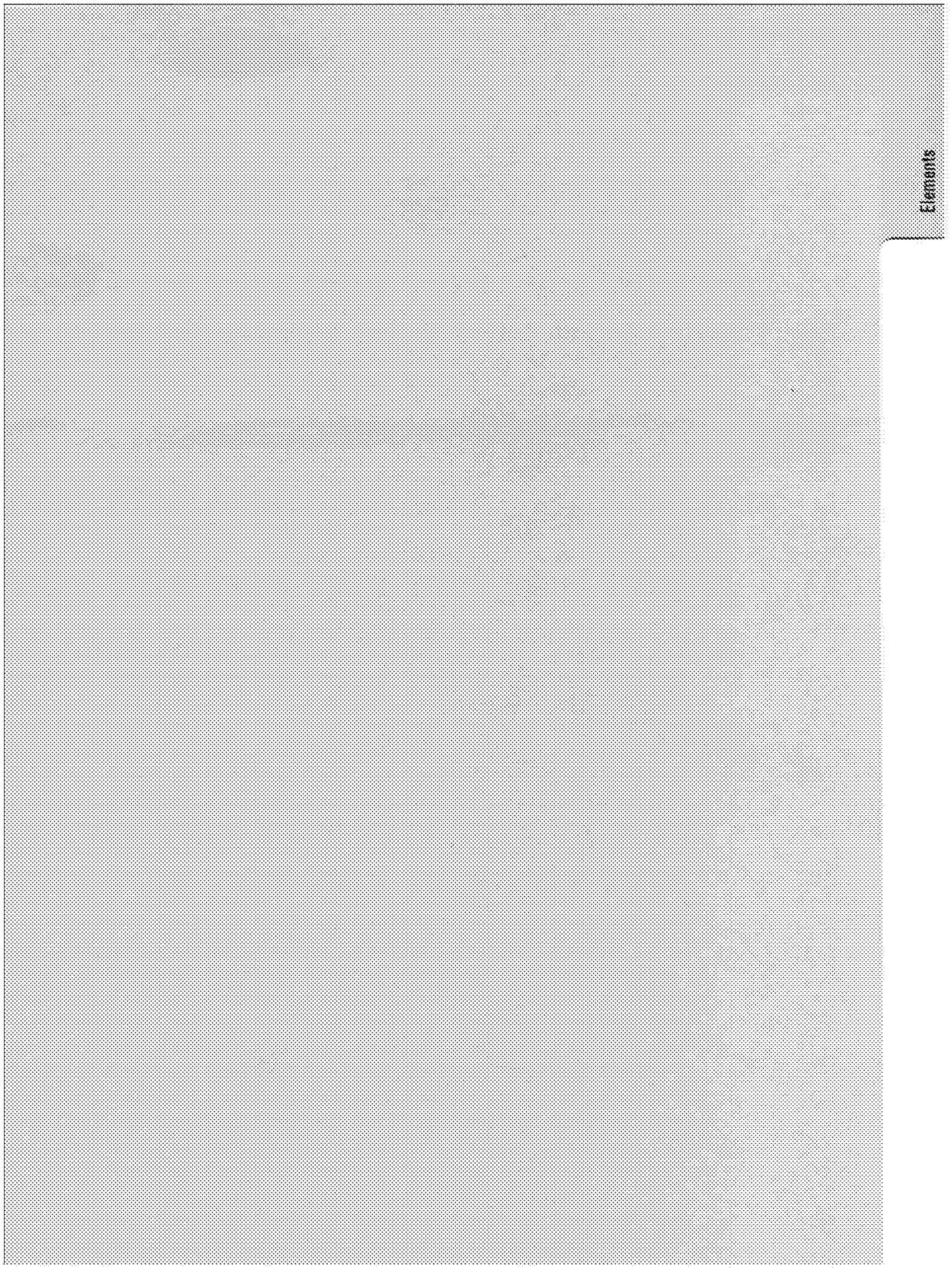
Fig. 7 Automatic crochet machine



(Kohler & Co. AG, 4858 Wynau, Switzerland)

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Elements

Loop-forming elements

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1. Loop-forming elements

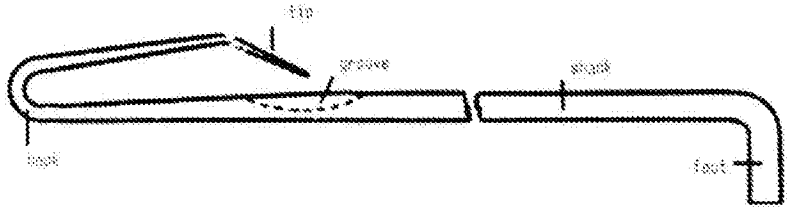
The primary loop-forming elements on knitting machines are needles, guides, pressers and sinkers.

1.1. Needles and guides

Needles essentially consist of a long straight part, known as the shank or stem, with a hook at one end and a foot or butt at the other (except in the case of double-ended latch needles). While the hook forms the loops, the foot directly controls the needle on weft knitting machines, and on warp knitting machines serves to anchor it in the needle bar, which in turn moves as a single unit.

• Bearded needles

Fig. 1

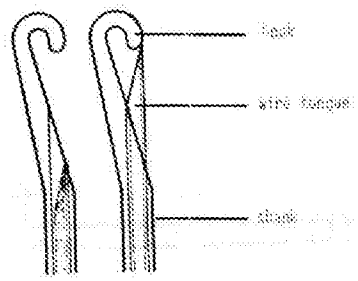


Bearded needles are made of steel wire and are both hard and springy. The hook is elongated and terminates in a springy tip. Below the tip, in the needle shank, is a groove in which the tip engages when pressed to enable the old loop to slip over it. The tip opens automatically under its own resilience.

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* Compound needle



Compound needles have a shank with a U-shaped profile and terminate in a hook. A wire tongue in the groove of the shank is pushed forward or retracted to close and open the hook respectively. Shank and hook are controlled separately from the wire tongue and the small movements entailed permit high working speeds. Compound needles are used on a few automatic warp knitting machines, raschel warp knitting machines and sew-knit machines to exploit this advantage.

* Patent head needle

These needles are similar to bearded needles in the pressing position, but the groove extends on one side over half the shank width. This means that the yarn can be laid in the needle from one direction only, but against this the old loop slides onto the tip without it being pressed.

Because these needles will form only one specific type of construction, their use is confined to a few crochet galloon and raschel warp knitting machines.

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- Plush needle

  Plush needles are straight or hooked rods used to hold plush loops on raschel warp knitting machines.

- Covering needle

  Depending on the type of machine they are fitted on, covering needles terminate at one end in a slightly curved tip with groove, an eye or a gripper-type hook. They are required mainly to transfer loops in shaping and to create openwork patterns.

The type of needle is not characteristic for a given kind of knitting machine. While in general weft knitting machines are fitted with latch needles and hosiery machines are fitted with bearded needles, bearded, latch, compound and patent head needles can be found on flat warp knitting machines.

- Guides

Fig. 5



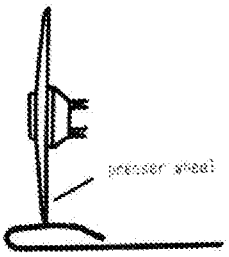
Guides are straight metal blades with an eye at one end through which the yarn runs. They are found on warp knitting machines.

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1.2. Presser

Fig. 6



Pressers are bars on flat knitting machines, and wheels on circular knitting machines. They serve to close the resilient tip of bearded needles.

1.3. Sinkers

Fig. 7 jack sinker

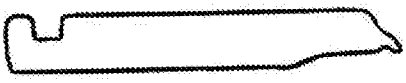
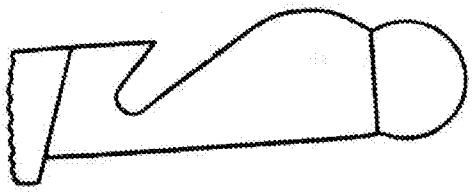


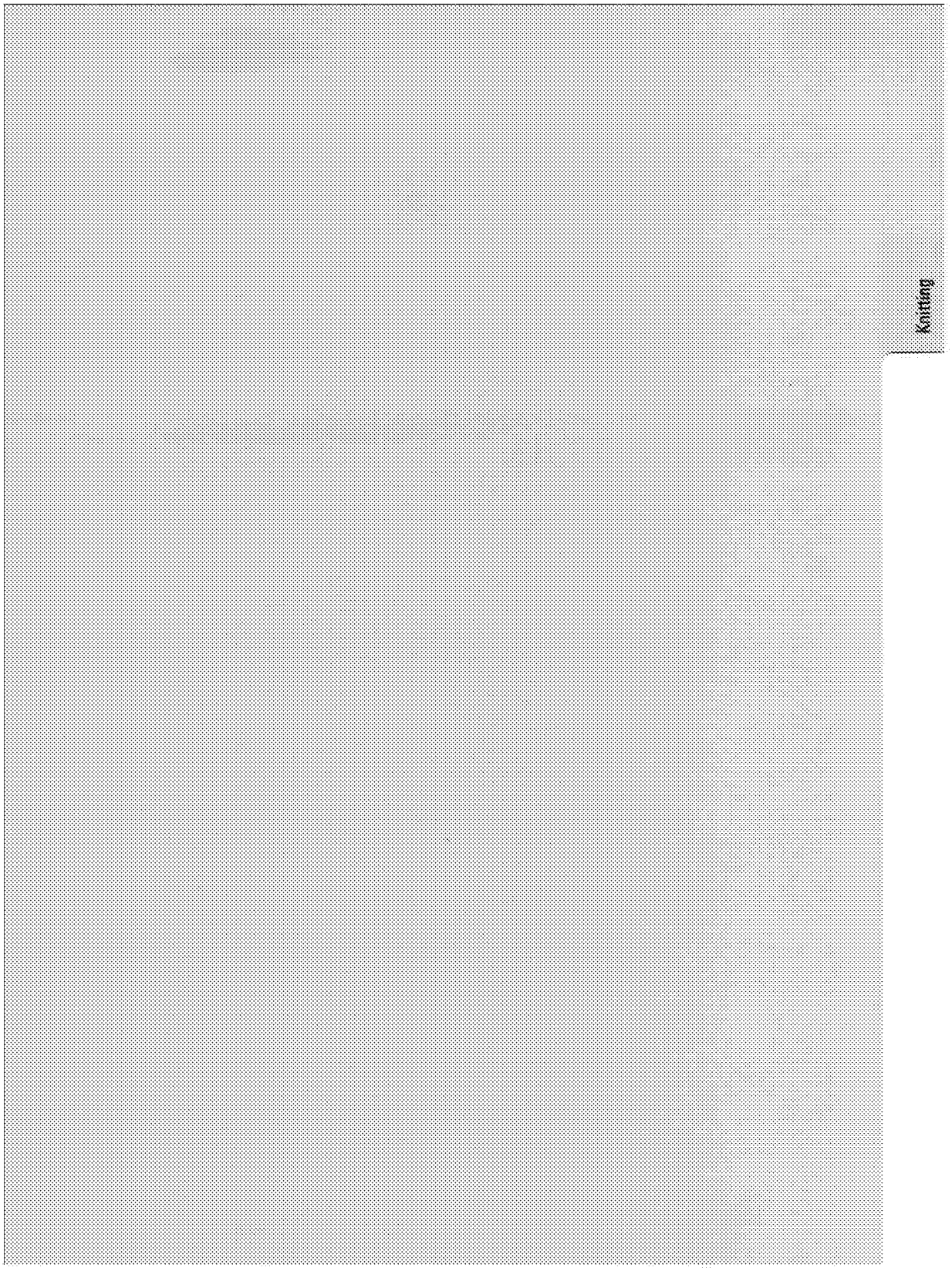
Fig. 8 holding down - knocking over bit



Sinkers are pressed from sheet steel. They assist the needles during loop formation by performing a variety of functions, and hold the fabric down against the rise of the needles. On hosiery machines, jack sinkers form the yarn into loops. Knocking over bits push the old loops over the closed tip, latch or wire tongue and provide a stop for the yarn. On open top circular knitting machines and automatic warp knitting machines, combined holding down and knocking over bits are used which perform both functions in one. In the trade some of the components involved in pattern selection and needle control are also referred to as sinkers.

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Knitting

Knitting technology

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1. Knitting Technology

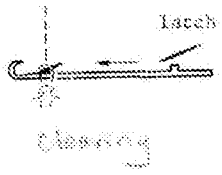
All the many types of knitting machines in use today and the new stitch-bonding machines for manufacturing nonwoven fabrics share certain actions in the formation of loops which are common to them all, in spite of their considerable differences in other directions. On all these machines there is an old fabric loop which rests in the head or hook of the needle when this is in the starting position for a knitting cycle. This old loop is first of all moved on to the stem of the needle (clearing), so emptying the needle hook or needle head and making it possible to insert a new yarn into the needle head or hook (yarn feeding). The needle hook of latch needles or two-piece compound needles and the beard of bearded needles is closed. The latch-needle hooks are closed by the needle latches, and the hooks of two-piece compound needles are closed by the tongue wires, whilst the beards of bearded needles are closed by pressing the needles against a presser edge.

While the new loops are trapped inside the needle hooks or beards, the old loops are landed upon the closed needle hooks or beards and eventually cast off over the heads of the needles and the new loops inside them, a process known as "knocking over".

1.1. Knitting on latch needle machines

On flat knitting machines for knitting rib fabrics, the latch needles are arranged in two sets, and each set of needles is housed in a needle bed which is positioned at an angle of about 90°C (∧) to the other needle bed. On circular machines for knitting plain or single-face fabric, the single set of needles is arranged in a circle in a needle cylinder, whilst on circular machines for knitting rib fabric two sets of needles are used. One of these is housed in a needle cylinder and the other one is positioned in a horizontal manner in the disc known as the machine dial, which is disposed slightly above the needle cylinder so that the needles in the cylinder work at right angles to the needles in the dial.

Fig. 1 Moving the needle to the clearing position

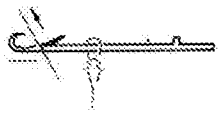


The latch needle is raised by its butt. The fabric take-down or the needles in the set opposite or the holding-down sinkers are used to prevent the old loop from rising or moving with the needle. This in turn forces the old loop to stay put as the needle rises, thus causing the loop to open the needle latch and slip over the open latch on to the needle stem to the clearing position.

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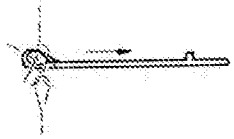
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Fig. 2 Yarn feeding



The yarn feeder puts the new yarn into the hook of the needle.

Fig. 3 Landing



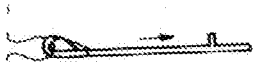
The needle is taken downwards by its butt. The old loop, held steady by the holding-down sinker or the knock-over verge, thus causes the latch on the needle to turn over and close the needle hook and this enables the old loop to slide on to the closed needle latch (landing) as the needle continues to move downards (or rearwards).

Fig. 4 Knocking-over



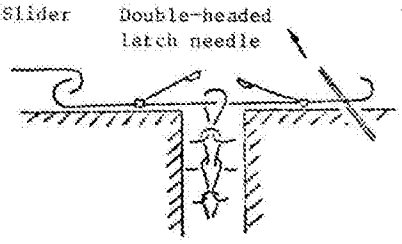
As the needle moves further downwards or rearwards, the previous old loop is cast off over the head of the needle and thus interlaces with the new loop inside the needle hook.

Fig. 5 Final loop forming



The new yarn is now elongated to the required loop length over the cylinder-verge bit or the belly of the holding-down sinker (loop forming)

Fig. 6



Purl knitting machines use double headed latch needles to form loops. This makes it possible to distribute a single set of these needles over two needle beds, opposed to each other in their position. In order to move the needles from one bed to the bed opposite it is necessary for the tricks or slots in the needle beds, which house the double-headed needles, to be opposite each other in direct alignment and in the same plane. Thus, on flat purl machines, the two needle beds face each other in the same horizontal plane, and on circular

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machines, where two cylinders are used, one needle cylinder is on top of the other one. When a needle knits in the front bed of a flat purl machine, it produces a face loop, whilst the bottom cylinder is used to accommodate the needle when it is required to produce a face loop on a circular double-cylinder purl machine. Conversely, if the needle knits in the back bed of a flat purl machine or the top cylinder of a circular double-cylinder purl machine, it produces a reverse loop on a circular double-cylinder purl machine. Conversely, if the needle knits in the back bed of a flat purl machine or the top cylinder of a circular double-cylinder machine, it produces a reverse loop. The double-headed latch needle is controlled, both for knitting and transferring the needle from one bed to the bed opposite, by sliders. When a needle is required to be transferred from one bed to the other, the sliders do this before the needle forms loops with the new yarn. And whilst the needle is being transferred, the old needle loop slides along the needle stem. The actual loop-forming itself, is much the same as on ordinary latch needles.

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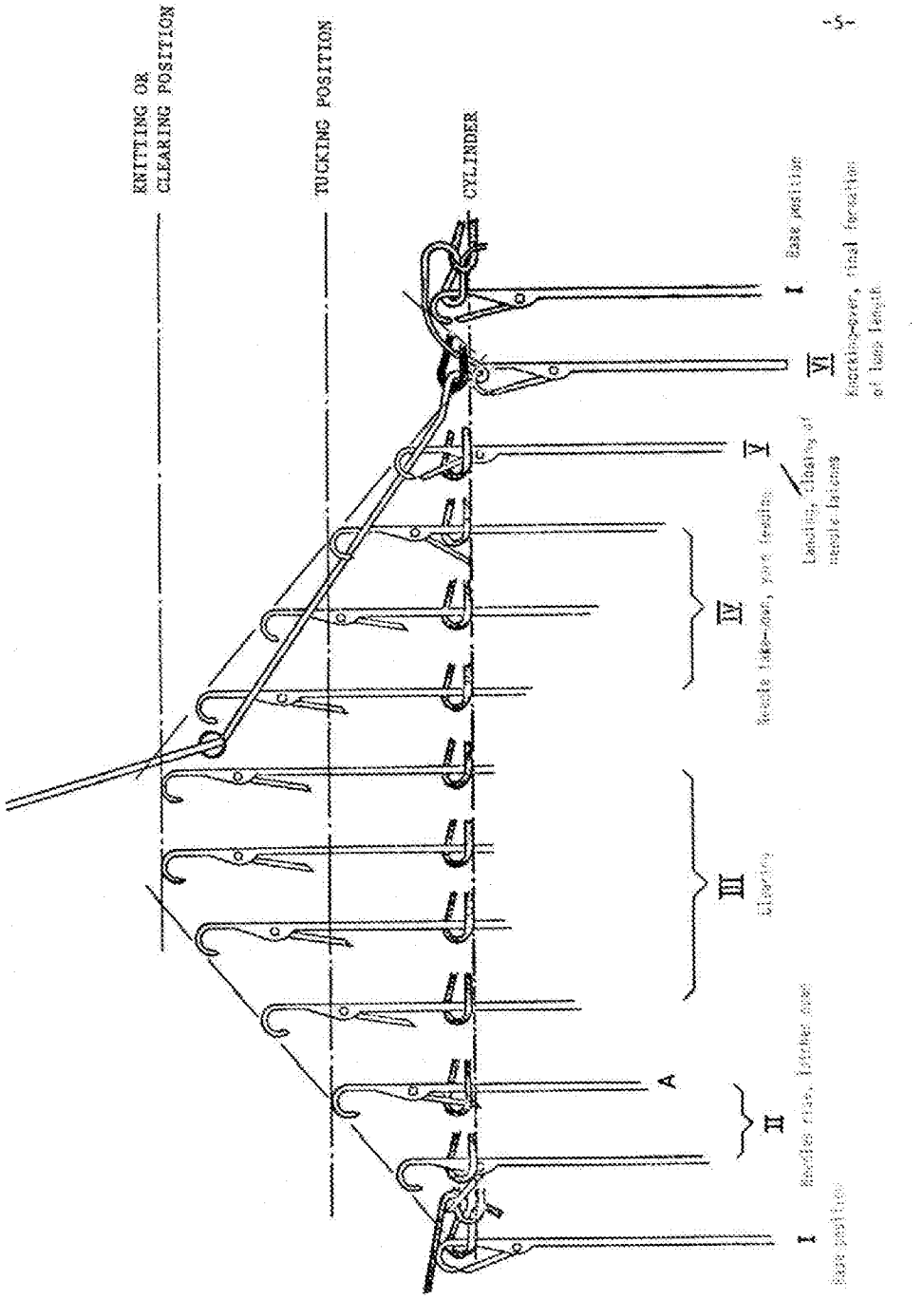


Fig. 1

* Knitting with one set of latch needles

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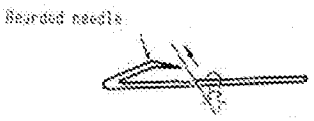
1.2. Knitting on bearded-needle machines

- Weft knitting

On straight-bar weft-knitting machines (Cotton's patent frames), the needles are arranged in a straight line in a needle bar. On bearded-needle circular machines they are arranged in a circle in a cylinder.

Bearded-needle circular machines

Fig. 8 Clearing and yarn feeding



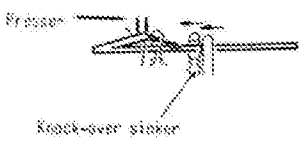
On straight-bar weft-knitting machines, while the bearded needle moves upwards, the loop made during the previous knitting cycle, which is round the needle stem, is held back by the loop-forming sinker. On the French sinker-wheel machine, the old loop is pushed back, down the stem of the horizontally positioned needle, by a push-back wheel (clearing). A yarn furnishing device then lays new yarn across the stems of the needles (yarn laying).

Fig. 9 Loop forming



Then on the French sinker-wheel machine as well as on the straight-bar weft-knitting machine, a loop-forming sinker kinks the new yarn into loops between each two needles. On the straight-bar machine, the loop-forming sinker moves forward to do this, whilst it moves downwards on the French sinker-wheel machine for the same purpose. Thus, the thrust of the loop-forming sinker determines the actual length of the loop.

Fig. 10 Moving the new loop forward into the beard of the needle
Pressing the needle beard
Landing the old loop



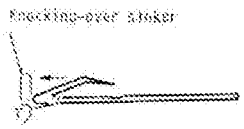
After a loop has been kinked by the loop-forming sinker, it is moved into the beard of the needle. On the straight-bar machine, this is done by the needles moving downwards, and on the circular French sinker-wheel machine the new loop is moved into the needle beard by the loop-forming sinker moving outwards, thus dragging the newly formed loop with it into the open needle beard. This is followed by pressing the tip of the needle beard into the eye of the needle. On

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the straight-bar machine, the needles are moved downwards and rearwards and pressed against a presser edge. On the French sinker-wheel machine, however, a wheel presses upon the beards of the needles and closes them. As the needles on the straight-bar weft-knitting machine move further downwards with their beards closed, the old loops are landed upon the beards with the new loops trapped inside them. The same action is obtained on the circular French sinker-wheel machine by a knocking-over sinker (there is one between each two needles) which moves forward and pushes the old loop upon the beard of the needle closed by the action of the presser wheel.

Fig. 11 Knocking-over



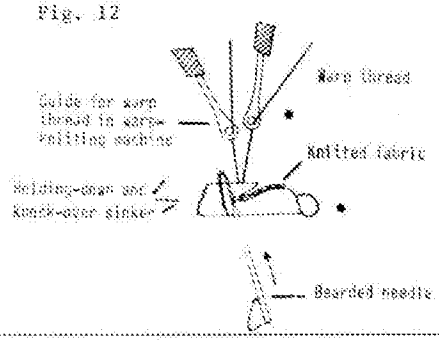
In the final stages of the knitting cycle, the old loop, which has previously been landed upon the closed beard of the needle, is cast-off and intermeshes with the new loop inside the needle beard.

• Warp knitting

For the arrangement of the knitting elements of automatic tricot warp-knitting machines, raschel warp-knitting machines and crochet machines, see section on "Loop-forming machines (straight-bar warp-knitting machines)" page 6, Fig. 2.

Automatic tricot warp-knitting machines using bearded needles and knitting single-face fabrics

Fig. 12

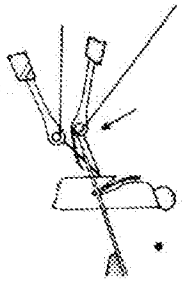


The bearded needle moves upwards, whilst the previously formed loop on the stem of the needle is prevented by the holding-down and knock-over sinker from moving up with the needle. This keeps the old loop on the stem of the needle (clearing).

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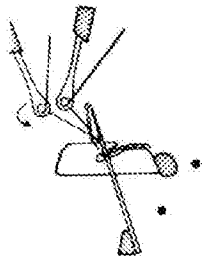
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Fig. 13



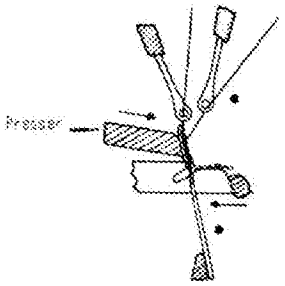
Whilst the needle moves upwards, the guides which carry the warp threads are displaced sideways at the side of the needles remote from the beards. After the sideways displacement, the guides swing through the needle line to the beard side of the needles (underlap and swing - back movement).

Fig. 14



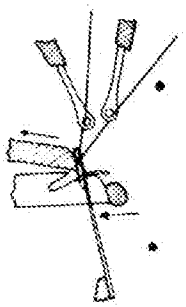
After the guides have swung through the needle line to the beard side of the needles, they are displaced sideways the distance of one needle space followed by a swinging movement of the guides through the needle line to the front of the needles, i.e. the side of the needles remote from the beards (overlap movement and swinging movement of the guides).

Fig. 15



After the guides have made their overlap movement and have swung through the needle line to the front of the machine, the needles move again a short distance upwards, thereby causing the newly formed loops or laps to slip upon the stem of the needles, below the needle beards. Thus, when the needles now move downwards, the new loops or laps slip safely inside the needle beards (taking into the needle beards). After this has been done, the presser bar moves forward and presses the tip of the needle beards into the needle grooves, thereby closing the needle beards (pressing).

Fig. 16

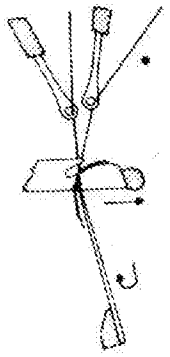


The holding-down and knock-over sinkers now move backwards and this causes the old loops on the stems of the needles to be landed on the closed needle beards.

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Fig. 17



During the continuing downward movement of the needles, the old loop from the previous knitting cycle is cast off (knocked over) over the head of the needle and interlaces with the new loop or lap inside the beard of the needles (knocking-over). The size of the lap or loop depends on how much or how little the lap or loop is drawn together and this in turn depends on the tension inserted in the warp threads and the amount of tension on the fabric provided by the fabric take-down installation.

- Stitch-bonding

Stitch-bonding is done with two-piece compound needles. In the Malimo stitch-bonding machine group the needles are arranged horizontally in a needle bar; on stitch-bonding machines of the Arachne type the needles are arranged in a vertically slanting manner in a needle bar or in two needle bars which are inclined at an angle (Λ) to each other.

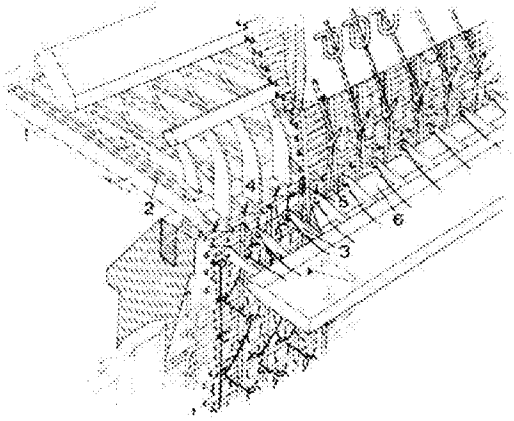
The loop-forming process on stitch-bonding machines is similar to that used on warp-knitting machines, although on stitch-bonding machines materials presented to the fabric-forming elements are first of all pierced, then yarns or fibres are drawn through them.

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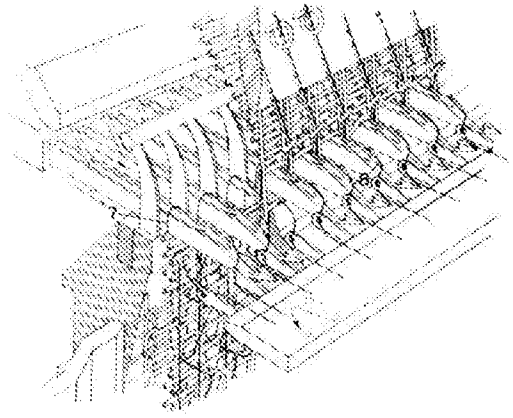
The fabric-forming process on the Malimo stitch-bonding machine

Fig. 18



The two-piece compound needles move forward and pierce the material presented to them (inlay threads and warp threads). At this point of the fabric-forming cycle, the previously formed loops or laps are held back by a counter-hold rail, thus bringing them on to the stem of the needles (clearing).

Fig. 19

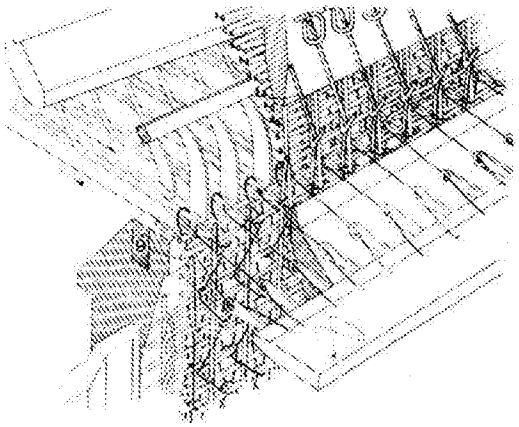


Whilst the needles move forward, the guides which carry the stitching threads are displaced sideways on the side remote from the needle hooks, followed by an upward swing through the needle line (underlap movement and swing movement). When the guides have arrived on the hook side of the needles, they are displaced sideways by one needle space, and this is followed by a downward swing of the guides to that side of the needles which is remote from their hook side (overlap movement of the guides and swing-back).

Key:

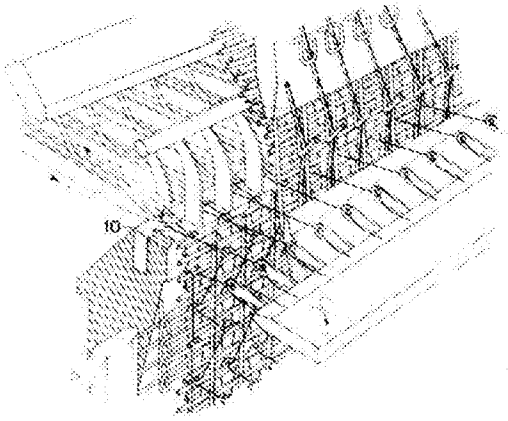
1. two-piece compound needle
2. tongue bars
3. guides which carry the stitching threads
4. knock-over sinkers
5. counter-hold needles
6. counter-hold rail
7. laps or loops from the previously formed course
8. newly fed stitching threads
9. inlay threads
10. new laps or loops

Fig. 20



After the overlaps have been made, the needles move backwards and the wires for closing the hooks of the two-piece needles move slightly forward, thus closing the needle hooks. The previously formed old loops on the stems of the needles which rest against a stop-surface thus move forward and slide on the tongue wires which have closed the needle hooks (landing).

Fig. 21



As the needles continue to move backwards together with the tongue wires which close the needle hooks, the old loops which have been formed at a previous knitting cycle drop off over the heads of the needles and interlace with the newly formed laps or loops inside the hooks of the needles (knocking-over). The stitch length in the fabric is determined by the fabric take-down motion.

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2. Producing shaped fabric pieces on bearded and latch-needle knitting machines

The arrangement of the needles on knitting machines divides these machines into flat-bar or straight-bar machines and circular machines. Machines where the needles are arranged in a straight line normally produce flat-selvedged pieces of fabric, although it is possible on these machines, if they are equipped with two sets or lines of needles for rib knitting, to knit on these sets of needles in an alternating manner, and thus produce circular or tubular seamless fabric. Machines where the needles are arranged in a circle produce fabric in tubular form. With the tubular fabric, the heavy rolling-in at the edges or selvedges of the flat piece of single-face fabric (knitted on one set of needles) cannot become effective whilst the fabric is in tubular form. Furthermore, any fabric distortion which occurs when the fabric tube is wet finished in rope form is likely to be more even than when the same treatment is applied to flat pieces of knitted fabric. The side of the fabric liable to be affected by treatment can be turned to the inside of the fabric tube for protection against mechanical damage.

Tubular knitted fabrics are particularly suitable for seamless-tube articles such as legwear, gloves, underwear, packaging sacks and so on.

Knitgoods can be shaped in three different ways:

cutting and sewing
partly knitting to shape
fully fashioning

- Goods produced by cutting and sewing

The parts of fabrics needed for assembly into knitted garments are cut out from tubular or open-width fabric. Efficient systems are available for laying the fabric in layers of a maximum height, and for drawing up the cutting pattern and the actual cutting process itself.

The main disadvantage in this method of manufacturer is the amount of cutting waste which occurs (between 5 and 15 % in the case of underwear and up to 30 % with high-fashion outerwear). To prevent the edge loops, which have been affected by cutting, from running down the fabric edge, they have to be made safe by seaming or sewing with, say, a double-chain-stitch machine making flat or over seams. Flat seams, because of their width, are only practical in connexion with sewing underwear goods and for outerwear, the rather bulky three-thread over seam which is made on the overlock machine is used. The bulky seam is on the inside of the fabric.

The cut-and-sew system, which is mainly practised with fine-gauge fabrics, is particularly useful for the manufacture of knitted underwear and outerwear. The machine on which these fabrics are produced are mainly latch and bearded-needle circular machines and straight-bar warp-knitting machines. These are particularly suitable because of their high output potential.

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- Fabric pieces partly knitted to shape

These include fabric pieces knitted in the shape of a rectangle and of a length and width which has been pre-determined in accordance with the requirements of the garment of which they form a part. In addition to this, such garment pieces normally have a firm non-roving start. After the garment piece has been knitted, its shape is completed by cutting. When compared with garments made by the cut-and-sew method, there is less cutting waste when using garment pieces which have been partly knitted to shape. As far as making-up is concerned, the firm non-roving start enables such garments to be rated at a somewhat high level than garments made up from fabric pieces which have been cut to shape completely. The cut edges of the partly shaped garment piece are made up in the same way as the method used for cut-and-sew garments.

A disadvantage that may be mentioned here is the fairly high cost of knitting caused by the rather low productivity of the knitting machines used in this system of manufacture. The disadvantage is only partly offset by a reduction in cutting waste. Thus, the system of manufacture using garment pieces already partly shaped during knitting and having a firm non-roving state is best used for producing such articles as pullovers, cardigans, waistcoats, dresses and children's wear, where the reduction in cutting waste is of maximum advantage. The machines used for knitting the fabric pieces are, in the main, flat knitting machines and some types of circular knitting machines.

- Fully fashioned fabric pieces

These garment pieces are knitted as flat pieces of fabric and their width is increased or reduced by processes known as widening and narrowing. Cutting waste is thus insignificant. At most, the neck portion of the garment piece, which has been traced out during the knitting process, is cut out along the tracing lines after knitting. Apart from the termination course in the fabric piece, all the other fabric edges are firm non-roving selvedges or starting courses, and such edges can be connected to other fabric edges of this type by means of seams which are far less bulky and less conspicuous than the seams used for cut-and-sew garment manufacture. The best type of join used in the making up of fully fashioned garment pieces is produced by the linking process, in which two pieces of fabric are joined together on a loop-for-loop basis, i.e. the needle loops in the terminal course of one piece of fabric are joined individually to the needle loops of the terminal course in the other piece of fabric. Before the fabric pieces are made up by linking or sewing, they can be unroven at any time. When widening or narrowing a fabric piece by transferring selvedge loops inwards for narrowing or outwards for widening, the transferred loops produce small raised effects on the fabric in wales which run close to and parallel with the fabric selvedge, indicating clearly and unmistakably that the garment has been produced by the fully fashioned method. Three-dimensionally knitted parts may also be included in this system of garment manufacture. Thus,

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for instance, the true three-dimensional heel pockets that are part of socks, half-hose and three-quarter hose knitted on double-cylinder machines and which can also be found in high-class fine-gauge ladies' legwear could also be labelled "knitted to shape".

A disadvantage of the fully fashioned system of manufacture is again the increased cost factor due to the lower productivity of the knitting machines used as compared to the output of multifeeder circular machines on which cut-and-sew garment parts are knitted. This disadvantage, however, is partly offset by the almost complete absence of cutting waste.

Because of the more attractive appearance of the joins produced during making up, fully fashioned systems of manufacture are mainly used for producing pullovers, waistcoats, cardigans and dresses knitted on coarse-gauge machines, gloves and three-dimensional legwear garments. For double-face fabrics (i.e. fabrics knitted in a rib structure) the flat knitting machine is the best manufacturing tool. The low capital costs entailed by the purchase of hand flat knitting machines are more than offset by the high wage costs involved in operating them, so that they can only be used economically for knitting certain specialised articles.

Automatic power flat machines have a very much lower wage cost factor, but high capital costs, in relation to the output potential of these machines. This is also the case with straight-bar weft-knitting machines (Cotton's patent frames) preferred for knitting fully fashioned fabric pieces in a single-face (plain fabric) structure. The rib ends for such pieces, however, are usually knitted on another machine. The legwear articles which may be included here are knitted on small diameter circular machines.

3. Comparing woven with knitted fabrics

Woven fabrics are produced from two sets of threads: a vertical set known as the warp threads, and a horizontal set known as the weft threads running at right angles to the vertical threads and interlacing with them. Both the warp and weft threads are incorporated into the woven structure in an extended and tensioned condition and packed closely against each other in both directions. In contrast, knitted fabrics consist of loops which have been kinked into threads and which are interlaced with each other. These two highly dissimilar systems of fabric construction produce textile structures which have very different properties. The comparison of the two groups of fabrics below is intended as a brief summary of these differences in properties. Effects associated with the type of raw material and the finishing process which may be applied to these fabrics after manufacture have purposely been omitted. Woven fabrics are distinguished by their stability, whilst knitted fabrics, in contrast, are much more elastic and extensible. This latter property is due to the loop structure of the knitted fabric, which enables it to be easily deformed in all directions. However, by incorporating straight, unkinked stretches of yarn into the

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knitted fabric in the horizontal direction, it is possible to improve considerably the horizontal stability of the knitted fabric. Similarly, by inserting straight, unkinked threads in the vertical direction, the stability of the knitted fabric in that direction can also be improved. Thus, such knitted fabric properties as elasticity and dimensional stability depend to a great extent on the type of fabric structure used in the manufacture of the fabric. Of course, dimensional stability in knitted fabrics is not always required or desirable. While it is necessary in such articles as ladies' dresses, men's suitings and overcoats, it is not desirable in such goods as legwear, underwear, swimwear and sports and leisurewear.

The excellent ability of knitted fabrics to return to their original shape after deformation, and their resistance to creasing when compared with such properties in woven fabrics, can be explained by the fact that the stitches of which they consist are elastic in themselves and deformable under stress and when the stress is removed, the knitted stitch structure has a tendency to return to its natural configuration. Woven fabrics generally display a high degree of fabric density even at low weight per unit area, whilst knitted fabrics are much more open in their construction. Garments exposed during wear to the vagaries of the weather normally require a high degree of fabric density, whilst such articles as knitted legwear, underwear, sports and leisurewear require a very high degree of porosity (air and moisture permeability) for physiological reasons. This is especially true if man-made fibre materials have been used in the construction of the fabric. When comparing woven and knitted fabrics having the same weight per unit area, it will be found that woven fabrics are less bulky than knitted fabrics. The latter type of fabric, due to the loop structure, is able to trap a large amount of air in its structure and thus provide good heat-retention properties which are especially useful in winter clothing.

Laboratory tests have shown that woven fabrics frequently provide better resistance to tearing than knitted fabrics.

It has been found that knitted fabrics are scarcely ever stressed in the longitudinal direction, in which most of the tenacity of the fabric resides. But this disadvantage is largely balanced out in practice by the greater elasticity of the fabric. Knitted fabrics extend readily, thus reducing demands made upon their tensile strength. A similar state of affairs exists as regards abrasion resistance. Although the surface structure of a knitted fabric, which is usually less smooth than that of a woven fabric, presents an easier target for abrasion forces, the loop structure is able to take evasive action thanks to its elasticity, thus reducing the danger of an immediate pull-out of the fibres. Woven fabrics show good structural stability when subjected to various treatments, although they may fray at the edges. Against this, some weft-knitted fabrics, especially those knitted in simple loop structures and low density from yarns with smooth surface, tend to drop stitches and form loop runs under tensile stress.

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Plain weft-knitted and warp-knitted fabrics

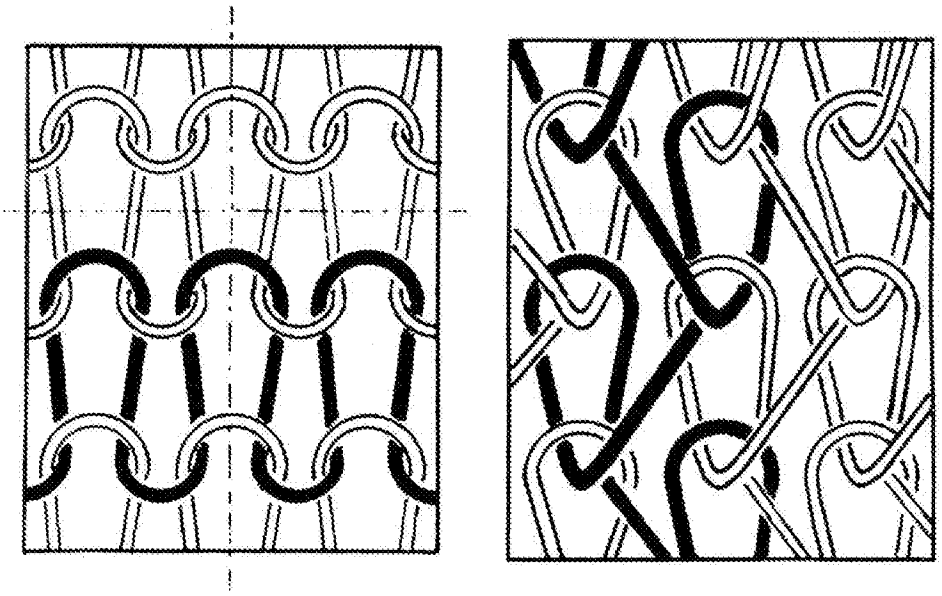


Fig. 22 Plain weft-knitted fabric Fig. 23 Warp-knitted fabric

Knitted fabrics are divided into warp-knitted and weft-knitted on the basis of fundamental differences in the construction of two groups. In weft-knitted fabrics, the yarn being kinked into loops at a knitting point runs horizontally across the fabric, whilst the threads being kinked into loops in the warp-knitting process run vertically in the fabric. Generally speaking, apart from certain types of ladies' and men's outerwear, weft-knitted fabrics are more elastic than warp-knitted fabrics, but they are not so resistant to the development of stitch runs as the warp-knitted structure. Furthermore, the latter are more dimensionally stable, with higher run-resist properties than the majority of weft-knitted fabrics.

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4. Properties required of textile materials for knitting

Practically every textile fibre is suitable for knitting. Some bast fibres are an exception, because they are too hard and brittle for use in the loop-forming process, and they are very rarely found in such fabrics. Whether a particular textile fibre is suitable for use in the knitting process depends primarily on its properties. High levels of tear strength and elasticity are desirable properties in this respect. When the suitability of a fibre is in question, elasticity is a more important property than tear strength, and this can be demonstrated by comparing the properties of wool with those of cotton. Because of the need to bend yarn into loops, one of the most important yarn properties needed for knitting yarns is their ability to bend easily. The degree of yarn bulkiness is determined by the properties and appearance of the finished product. Thus, soft and bulky yarns are required for such articles as pullovers, headgear, scarves and sports socks and many other articles besides. Softness and bulkiness are obtained by first of all selecting the right type of fibre and by having a relatively low amount of twist in the yarn, or, in the case of man-made filament yarns, by the process known as texturing.

Unlike the yarns in woven fabrics, those in knitted fabrics do not always cover each other. Yarn regularity is therefore a most important proviso for knitting fabrics with an attractive surface appearance. Yarns with an irregular surface appearance lead to the formation of horizontal stripes in weft-knitted fabrics, whilst they produce vertical stripiness in warp-knitted fabrics. In all fairness, however, it must be mentioned that an irregular yarn surface is not the only reason for the appearance of horizontal stripes in weft-knitted fabrics. These may also occur when the individual knitting positions are set inaccurately, or if the yarn from individual yarn packages is fed to the knitting points under different tension. Likewise, vertical stripes in warp-knitted fabrics can frequently be traced back to differences in yarn tension during the warping process or when the individual threads in a warp move from the warp beam to the knitting elements. The appearance of the knitted fabric will also depend on how free the yarn is from seed husks, neps, knots, etc., all of which can cause yarn breakages and damage to the knitting elements, especially the needles. Smooth fibrous material, because of its lower coefficient of friction and the lower amount of yarn tension which is applied to the yarn as it runs from the yarn package to the knitting elements, is easier to work on the knitting machine than material with a rougher surface. Treating the yarn with a substance to reduce its friction coefficient greatly improves the prospects of trouble-free knitting.

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5. Preparation of materials for use on knitting-machines

5.1. Yarn lubrication

Impregnating yarns with a suitable lubricant not only reduces the tension to which they are subjected during fabric manufacture, but also cuts down the degree of wear and tear on the knitting elements. Regenerated cellulose yarns and synthetic yarns in particular have a tendency to cut into the guides of guide bars on warp-knitting machines, as well as sinkers, yarn carriers and so on, thus damaging them so that they have to be replaced after a time. Electrostatic charges on yarns can be reduced by adding an antistat to the lubricant.

Yarn lubricants may be divided into two groups, namely dry lubricants e.g. paraffin wax, and wet lubricants, e.g. an emulsifiable oil. The first group is primarily used on staple-fibre yarns. The yarn is taken between two positively driven rolls of paraffin wax from which it picks up tiny particles of the wax on its surface. These wax particles make the yarn smooth and easier running. Wet lubricants are mainly used for filament yarns. In this case, the yarn to be treated is taken over an impregnation point, where the lubricant is applied to the yarn surface and forms a thin film upon it.

Yarn lubricants have to meet a variety of requirements. They must be capable of being completely removed from the yarn surface during the scouring process and, in view of later chemical treatment, react in a neutral manner. Furthermore, they must not attack either metals or textile materials. They must have good adhesive properties on the surface of the textile material, without sticking to it permanently, and must not strip off when the yarn passes through yarn guides and similar elements. Another important property which the yarn lubricant must possess is the ability to stand up well to ageing, so that lubricated yarn packages and warp beams can be stored for lengthy periods without trouble. Whilst the non-smelling and colourless dry lubricant remains on the goods which have been knitted from dyed yarn until the garment is washed for the first time by the customer, the wet lubricant on the other hand, because of its unpleasant smell and fatty nature, must be removed either by scouring or drycleaning before the garment is supplied to the customer.

5.2. Winding and warping

Almost the only operation required to prepare yarn for weft knitting is winding. For warp knitting, however, yarn winding is followed by warping, and the process of entering the warp threads into the guides of the guide bars on the warp-knitting machine.

Staple-fibre yarns generally leave the spinning machine in the form of cops. Since the amount of yarn on an individual cop is rather small, and the tension under which the yarn has been wound on the cop is irregular, it is necessary to re-wind the yarn onto another more suitable package. The yarn is cleaned and lubricated at the same time.

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Modern winding practice is to use cross-wound yarn cones, 8°15' or 5°55', and recently, for soft, bulky yarns, different types of cross-wound bottle (rocket) bobbins. Not being very economical, bottle bobbins are only rarely used nowadays. To ensure a soft, bulky handle combined with a uniform dye uptake, staple-fibre yarns, especially those for pullovers, scarves, headgear and so on, are normally hank dyed. In contrast, yarns which carry a heavier amount of twist, e.g. for dress fabrics, are usually package dyed. Of course, yarn dyeing is only used where dyeing in the piece is impossible, or where the small amount of dyeing required does not warrant the piece-dyeing process. In the knitting industry, it is customary to wind staple-fibre yarns either on the premises, or alternatively, purchase the yarn already wound from the spinner or dyer.

Synthetic yarn producers and throwsters normally supply yarn ready wound and lubricated for knitting. Regenerated cellulose filament yarns are normally supplied on 3°30', straight sided cones or, in the case of acetate rayon, on cops. For plain synthetic filament yarns, drawtwist packages or cheeses directly from the spinning machine are preferred. Textured yarns are frequently supplied on 3°30' pineapple cones (cross-wound cone packages with curved sides), or they are supplied directly from the texturing machine as twin-taper cones with sloping sides. For the manufacture of fine-gauge ladies' legwear, cops are also used. With the size and weight of packages and the number of feeders on circular knitting machines increasing constantly to improve efficiency and boost output, manufacturers using multi-feeder circular machines are frequently compelled to use the free-standing floor creel to accommodate the yarn packages instead of the overhead yarn-package stand on the machine itself. However, the use of the floor creel causes the yarns to travel different distances with different changes of direction as they travel from the package to the knitting point. This can lead to yarn tension variations which in turn indirectly affect stitch length: the greater the yarn tension, the smaller the stitch. However, such differences in yarn tension as well as the tension differences in the yarn which have been imparted during the yarn-winding process can be evened out by using certain yarn-furnishing devices known as positive yarn-feed installations and yarn-storage feed units. Where yarn consumption is uniform either on a course-for-course basis or where changes in yarn consumption occur in a regular pattern within a small number of courses (maximum usually 3 courses), the positive yarn-tape feed installation in which the yarn at each feeder of the circular machine is fed through a nip formed by a free-wheeling roller and the tape, is the most suitable installation. Where yarn consumption varies from course to course throughout a long knitting programme, the yarn storage feed unit is the most appropriate feeding facility. Here, a given yarn length is wound from the yarn package onto a storage element, from where it is taken to the knitting point under minimum tension.

Warping is perhaps the most important yarn-preparation process in warp-knitting. Since the placing of thousands of warp threads upon a full-length warp beam requires a large number of yarn packages and a great deal of space for the yarn creel, the direct beaming process is only rarely used. Thus, for man-made fibre filament yarns and frequently for staple-fibre yarns, too, direct beaming on warp-beam sections has been developed. In this process, a section of the complete warp is wound

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directly upon a detachable section of the full warp beam. The warped sections are then assembled together by placing them upon a core tube. This method of warping only came into widespread use with the advent of modern precision warping machines which ensure that each beam section is warped under completely equal and uniform conditions. Staple-fibre yarns, especially cotton yarns, are occasionally warped by the mill-warping system as used in the weaving industry. Here, a section of warp threads is first wound upon a drum or warping mill which has conically shaped end sections. Each group of warp threads is wound on the mill, side by side, until the full width of the warp has been wound. When this has been done, the threads of all the sections are wound together on the full-size warp beam. This process is known as beaming. A form of warping exclusively reserved for weaving is "section warping" in which sections of warp, each carried on a separate full-size beam, are united together to make up a full-size warp, usually during sizing.

Entering the warp threads into the guides of the guide bars of the warp-knitting machines is done manually using a threading comb set out with bearded needles. The needles are inclined and pushed through a group of guides in the guide bar. The guides concerned are equal in number to the bearded needles in the threading comb, namely enough to cover 4 or 5 inches of the length of the guide bar. After the needles in the threading comb have been pushed through the holes in the guides of the guide bar, a section of warp threads containing as many threads as there are bearded needles in the threading comb are hooked into the beards of the guide bar. When this has been done, the comb is withdrawn, thereby pulling the warp threads through the eyes of the guides in the guide bar. This operation is repeated until the complete guide bar has been threaded up.

The loop-forming elements on the warp-knitting machine require cleaning from time to time. Knots are rarely used for tying warp yarns together, especially staple fibre yarns, because they are likely to cause yarn breakages as the threads concerned passes through the eye of the guide. To achieve the best possible relationship between machine downtime caused by setting the machine up for a particular knitting programme, and actual machine running time, warp beams having flanges of 30" diameter, and even larger, are used which may enable the machine to run for two weeks without having to mount a fresh warp. Nowadays ready beamed warps of plain or textured man-made fibre yarns can often be bought direct from the fibre manufacture. This is of benefit especially to the smaller warp-knitting plants because then they do not have to purchase expensive warping equipment.

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Structural
Geometry

The structure of knitted fabrics

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1. Structure of knitted fabrics

Fig. 1

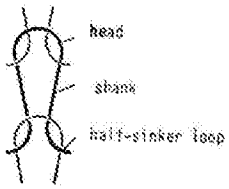
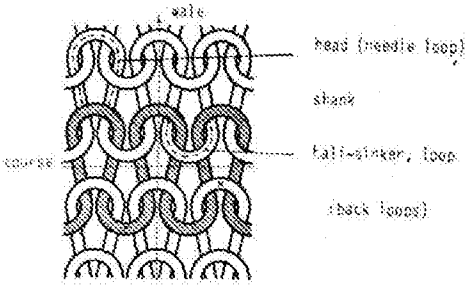


Fig. 2



Knitted fabrics consist of loops of yarn all interlaced with each other. Each loop has a semi-circular head, two inclined portions (shanks) and two half-sinker loops. The loop formed by the needles and comprising a semi-circular length of yarn and two shanks is known as the needle loop. The semi-circular lengths of yarn which are bent in the opposite direction to the needle loop are known as sinker loops, which are formed by sinkers or their substitutes.

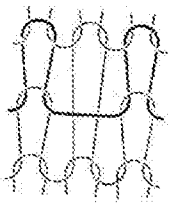
A stitch is interlaced with the preceding stitch at the sinker loops of the latter and at the head of the following stitch. It has two upper and two lower positions.

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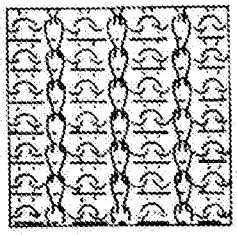
Pages 3 and 4 are missing in the original book (it is a 4 ring binder book, i.e. not bound).

Fig. 7 Float threads (back)



A float thread is a length of yarn running vertically, horizontally or diagonally and connecting other loops. Float threads lie on the back of the fabric. They are mainly formed by needles remaining inoperative for one or more courses.
By virtue of their alignment, horizontal float threads impart stability in the horizontal direction. Indirectly, because of their pull, they also give stability in the vertical direction.

Fig. 8 Weft-inlay threads



By weft-inlay is meant a length of yarn inlaid horizontally. It forms no loop of any sort and is bound only by parts of the other yarns. Weft is laid between the face and back loops of one course, and locked in by the following course. Ordinary weft yarns impart horizontal stability, elastic weft yarns horizontal elasticity.

2.1. Basic constructions and groups of constructions in weft knitted fabrics

Four basic constructions or groups of constructions can be distinguished here: plain jersey, rib, interlock and purl. The basic constructions themselves consist of loops only. The modified constructions formed by using additional elements can all be traced back to the respective basic constructions.

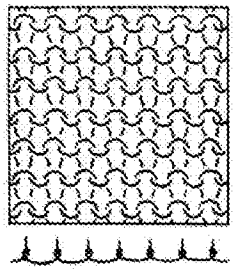
Weft knitted constructions are usually represented by a fabric notation which schematically reproduces the path of the yarn round the needles. Dots or strokes are the symbols for the needles; a row of dots represents a row of needles. For plain jersey and purl, a second row of dots over the first shows the same row of needles with the next course. For rib and interlock, two staggered or parallel rows of dots are required to symbolize one course.

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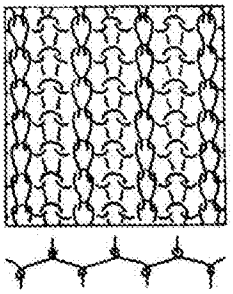
Basic constructions

Fig. 9



Plain jersey shows the face loops at one side of the fabric and the back loops at the other (fig. 9 shows the back of the fabric).

Fig. 10

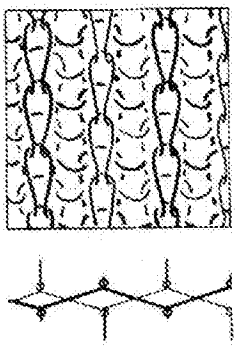


Rib fabric shows the face and back loops alternately in each course. Because of their high elasticity the face wales are drawn close together, so masking the back wales. In the relaxed state only front wales are visible on face and back.

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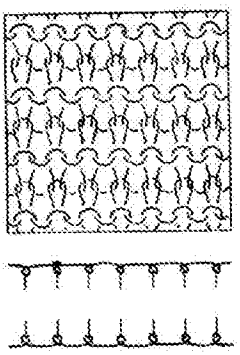
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Fig. 11



Interlock has face loops on both sides running in the wale direction with the loops in adjacent wales out of phase by half their height. This loop arrangement is produced by a special technique whereby 2 complementary rib courses knitted one after the other with half the number of available needles are intermeshed. Unlike the basic rib construction, where the front and back wales are in staggered formation, interlock has these wales one directly behind the other.

Fig. 12



Purl fabric (1x1 purl) has alternate courses of face and back loops on both sides of the fabric. Because of their elasticity the back loop courses pull tightly together and mask the face loop courses between them, so that in the relaxed goods only back loops are visible.

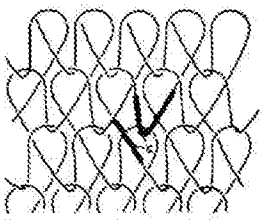
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3. Structural elements of warp knitted fabrics

In warp knitting, loops are known as laps and the fabrics are made up of laps, tuck laps, float threads, weft-inlay threads and vertical float threads. Laps can occur alone, as in the basic constructions; in contrast, tuck laps, float threads, weft-inlay threads and vertical float threads are encountered only in conjunction with laps.

Fig. 13 Open lap (back)



In warp knitted fabrics, too, the lap is a convoluted length of yarn held in two places at top and bottom, and having a face and a back. Although in weft knitted fabrics all loops are open, warp knitted fabrics can have either open or closed laps. "Open laps" are laps which are open at the bottom of the lap; "closed laps" are laps which are closed by threads crossing at the bottom of the lap. These differences are very difficult to distinguish in the finished fabric. Open laps give rather more extensibility than closed laps.

Fig. 14 Closed lap (back)

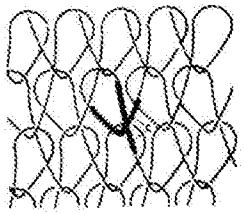
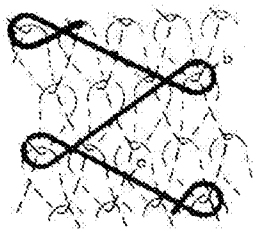


Fig. 15 Tuck lap (left back)

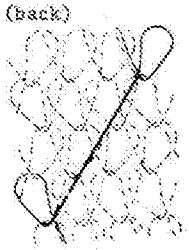


A tuck lap consists of a length of yarn running diagonally with only two binding positions at the top. It has both a face and a back. To make a tuck lap, the needle hook accepts new yarn and forms it into a lap which is knocked over together with the old lap and bound by the following lap forming the next course.
Tuck laps are used mainly to bind effect yarns on the back of the fabric for patterning purposes.

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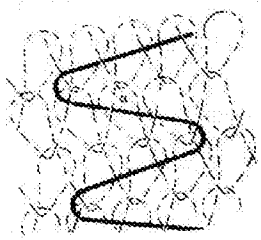
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Fig. 16 Float threads (back)



A float thread is a length of yarn extending freely across one or more courses and bound by laps, tuck laps or weft-inlay threads. Float threads are formed by suspending the lap, tuck lap or weft-inlay forming action of warp yarns for one or more courses, as in plissé or broché structures.

Fig. 17 Weft-inlay threads (back)

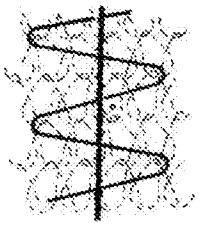


By weft-inlay is meant a length of yarn inlaid horizontally. It forms no laps of any sort and is bound only by parts of the other yarns. When weft is being knitted in, the relevant guide bars perform two underlap motions, including swinging back. But instead of moving in the overlap position they swing forward again in the same needle space. In this way the yarns are not fed into the needle hooks and so do not form laps. With selvedge-to-selvedge weft-inlay mechanisms, the weft yarns are either carried by guides which move across the full width or, after first hooking into a magazine, they are inserted in the spaces between the backs of the needles and the back warp yarns. Weft inlays extending across only a few wales reinforce the fabric horizontally, improve stability and can be used for patterning figures, particularly with net curtains and lace. Selvedge-to-selvedge weft is used to give optimum horizontal stability and as effect yarn for patterning.

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Fig. 18 Vertical float thread (back)



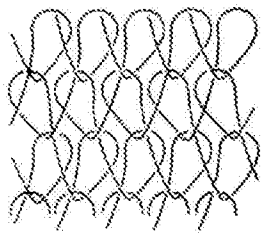
A vertical float thread is a length of yarn inlaid between two wales, i.e. in the vertical direction. It is bound in only by the binding elements of other yarns. Vertical float threads are inlaid as a warp which neither underlaps nor overlaps. They give fabrics which are completely stable lengthways.

3.1. Basic constructions and groups of constructions in warp knitted fabrics

In warp knitted fabrics we distinguish between the basic constructions of pillar stitch, tricot laps, satin laps, atlas laps and others. These basic constructions consist of only one system (sheet) of yarns which all form laps. The laps can be open or closed. Some basic constructions exist in theory only: they can only be formed in combination with a second structure, or with two sets of yarns and the bars moving in opposition.

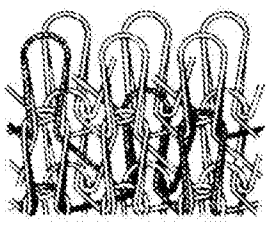
Like weft knitted fabrics, warp knitted fabrics fall into two classes: jersey (or flat stitch) and rib. (Purl is insignificant in warp knitting).

Fig. 19



The jersey class has the face laps on one side and the back laps on the other (fig. 19 shows the back of the fabric).

Fig. 20



The rib class has the face laps and back laps on both sides.

Jersey fabrics are also known as single face fabrics, knitted with one guide bar, and rib fabrics as double face fabrics, knitted with two needle bars.

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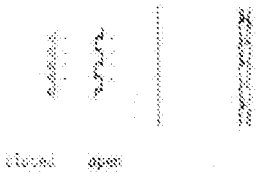
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Warp knitted constructions are generally represented by what is termed a notational drawing. This drawing shows schematically the path round the needles of the yarn running in from the guides. Dots or points symbolize needles; a row of dots corresponds to a row of needles. With the plain jersey class of constructions, an overlying row of dots shows the same row of needles carrying the next series of laps. With the rib class, two parallel rows of dots are necessary to represent a series of laps. Each semicircle of yarn marked over a dot forms one lap in actual fact, and this is interlinked with the previous and following laps produced on the same needle.

Basic constructions in the plain jersey class (single face fabrics, knitted with one guide bar)

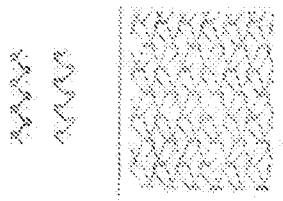
(The fabric notations drawn in bold lines correspond to the lap diagram)

Fig. 21 Pillar stitch



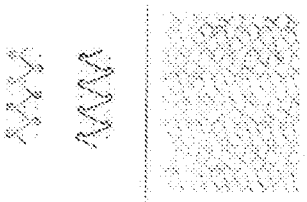
In this structure the yarns are always knitted with the same needle. The sinker lap runs on the back of the fabric vertically from course to course. As there is no lateral connexion between the individual wales, a textile sheet can only be made by inserting weft or adding other laps.

Fig. 22 Tricot laps



Here the yarns run from one needle to the next and back in alternate sequence. The sinker laps zigzag down the back of the fabric between adjacent wales, forming a lateral connexion. In other words, the tricot stitch is capable on its own of forming a textile sheet.

Fig. 23 Open or closed 2:1 laps

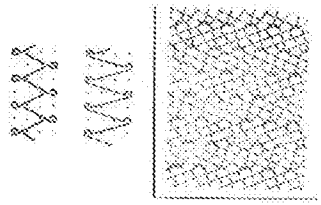


In this structure the yarns run from one needle to the next-but-one and back in alternate sequence. The sinker laps zigzag down the back, straddling one wale.

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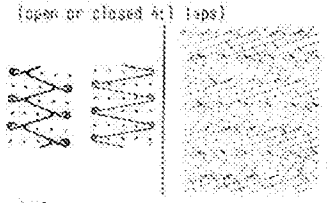
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Fig. 24 Satin
(1-0/3-4)
(open or closed 3:1 laps)



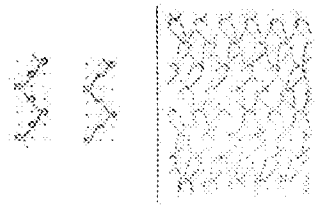
The term "satin" describes a 2 guide bar structure. The yarns run from one needle to the next-but-two and back in alternate sequence. The sinker laps zigzag down the back, straddling two wales.

Fig. 25 Satin
(1-0/4-5)
(open or closed 4:1 laps)



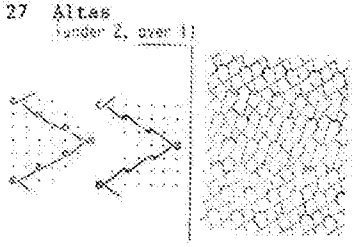
The yarns run from one needle to the next-but-three and back in alternate sequence. The sinker laps zigzag down the back, straddling three wales.

Fig. 26 Atlas



In the atlas construction, the yarns run from one needle to the next several times in the same direction before reversing direction and running back in the same way. The sinker laps on the back run diagonally from one wale to the next for several courses before changing direction.

Fig. 27 Atlas
(under 2, over 1)



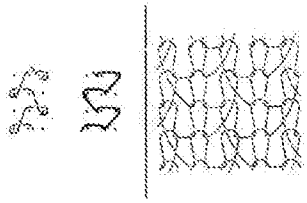
Here the yarns run from one needle to the next-but-one several times in the same direction, then reverse direction and run back in the same way. The sinker laps on the back run diagonally for several courses, straddling single wales, then reverse their direction.

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In addition to the two types of atlas described, there is also a variety in which the yarns do not reverse direction. But it can only be produced on the Milanese automatic warp knitting machine, circular warp knitting machine, and a special type of circular warp knitting machine no longer being manufactured.

Fig. 28 Twill
(twill tricot)
(2 needle overlap fabric)



The basic constructions shown differ by the underlaps, i.e. the shogging of the guide bars in front of the needles. In all these constructions, however, the overlaps extend only over one needle. Fabrics in which the overlaps extend over 2 needles are called twills or 2 needle overlap fabrics. All basic constructions can be knitted as twills, and they then carry the name twill in addition to their customary name. Overlaps over more than 2 needles are not feasible because the lengths of yarn laid are too short for the simultaneous formation of several laps from the same warp end.

3.2. Compound constructions in warp knitted fabrics

With any of the basic plain jersey constructions (single face fabrics knitted with one guide bar) described above - except pillar - a textile sheet can be formed using a single warp, but in actual fact it may scarcely be usable owing to poor stability. It is therefore customary practice to utilise two or more warps which are either knitted in the same construction but in opposite directions or, more frequently, in different constructions. If these are two or more basic plain jersey constructions, they are referred to as compound constructions. If warp knitted goods consist of one or more basic plain jersey construction in conjunction with tuck lap, float threads, weft-inlay threads and vertical float threads, the constructions are simple and compound.

The industrial notation of warp knitted fabrics indicates not only the class, plain jersey or rib, to which they belong, but also gives the construction of the individual warps from front to back. The sinker laps on the back of the fabric, which face upwards or to the front on the machine, are also shown one above the other in this same sequence. Note that the guide bars on automatic warp knitting machines are numbered from back to front, while on raschel machines they are numbered in the reverse order, namely from front to back. Closed laps are not shown, but open laps have to be.

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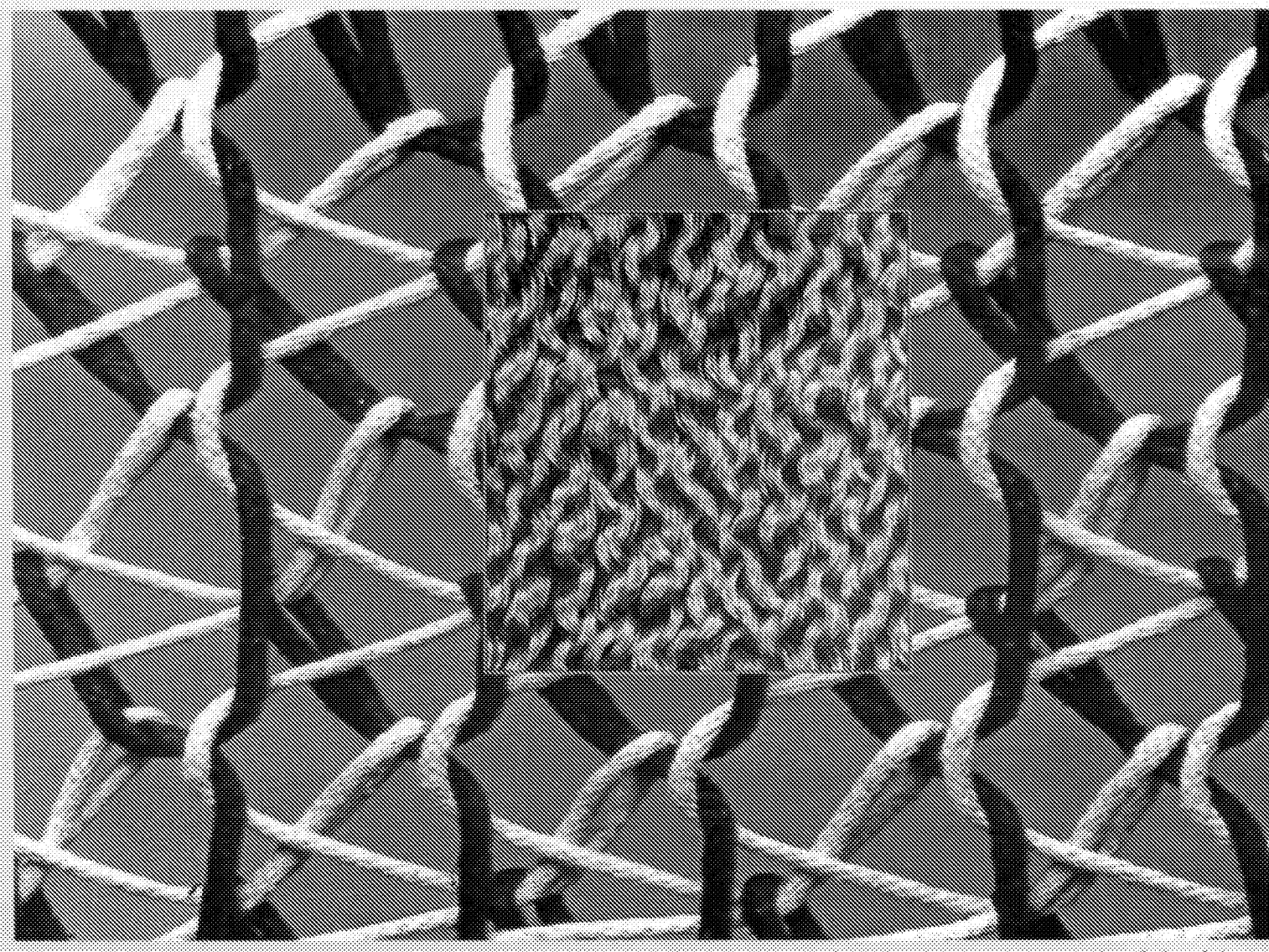
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The terms "bars moving together" or "bars moving in opposition" refer to the underlaps of the two warps concerned. When the bars are working together or in the same direction, all underlaps for one course are aligned in the same direction. As the open pillar in the underlap is not racked, the following overlap of the open pillar can be compared with the underlap of the other construction in the same course.

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WARP KNIT FABRICS TECHNOLOGIES



Crepe Americana Stitch Rope Model with photomicrograph of the fabric

Professor Bharat J. Gajjar

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3.3 Warp knit machines

Warp knit machines require a warp to knit. There are four basic types of warp knit machines: Tricot, Raschel, Simplex, and Milanese. These produce seven different warp knit machines (shown in Figure 3.6).

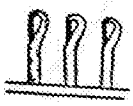
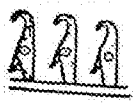
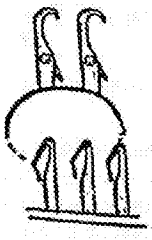
Needle bar	Type needles	Type machines
	Spring-bearded needles, flat	Tricot
	Compound needles, flat	Tricot Rashel
	Latch needles, flat	Raschel
	Two-bed latch needles, flat	Raschel
	Two-bed spring-bearded needles, flat	Simplex
	Latch needles, circular and flat	Milanese
	Spring-bearded needles, circular and flat	Milanese

Figure 3.6
Types of warp knit machines

The latest machines are not included in this list of warp knit machines. In these seven machines, three basic needles are used. They are spring bearded, compound, and latch needle (see Figure 3.7).

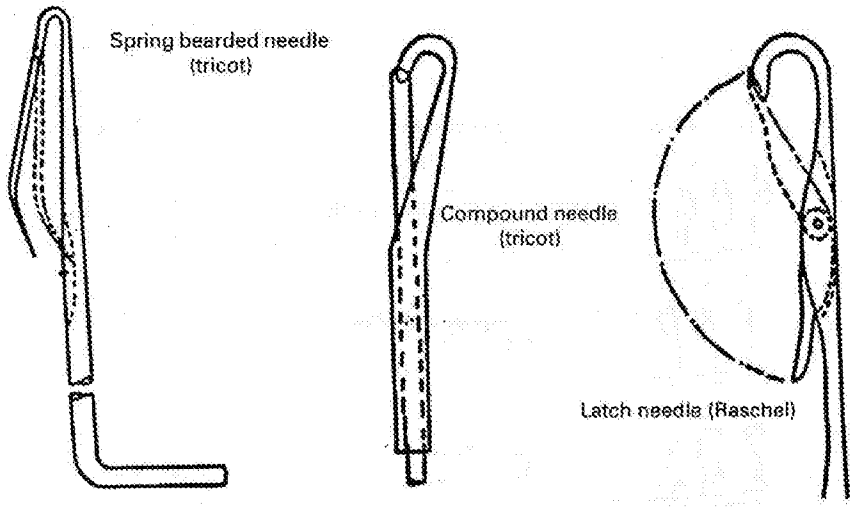


Figure 3.7
Types of warp knit needles

The basic characteristics of the four main machine types are:

Tricot machine - a warp knit machine with spring bearded or compound needles. The fabric is removed at about 90° to the horizontal plane.

Raschel machine - a warp knit machine with a latch and compound needles. The fabric is removed at about 150°, almost vertically downward.

Simplex machine - a warp knit machine with two needle bars containing spring-bearded needles. It produces a double-faced fabric.

Milanese machine - a flat circular spring bearded machine. These machines do not use a standard warp beam, but use a spool which is placed on the elliptical chain track so that it constantly traverses across the width of the machine, reversing direction at each selvage. The use of these machines is less frequent as they are slow and have limited styling possibilities.

3.3.1 Tricot versus Raschel

Tricot and Raschel are the two most often used warp knit machines. They are compared as follows:

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5.6.1 Ideal ratio of Jersey

To achieve a balanced knit structure with straight loops, 40 denier Jersey knitted on a 28 gauge tricot machine is best when knitting 9 inch quality and 64/44 inch FB//BB runners. The actual ratio is 1:1.46. A Jersey fabric theoretical ratio is 1:5.

- 2-3,1-0//1-0,1-2 is the stitch,
- Front bar 2-3,1-0 = 2-3,3-2,2-1,1-0,0-1,1-2 = 6 needle space,
- Back bar 1-0,1-2 = 1-0,0-1,1-2,2-1 = 4 needle space.

To determine the theoretical ratio, the front bar needle spacing is divided by the back bar needle spacing.

- 6:4 ratio,
- 6/4 = 1.5, the theoretical ratio.

As previously stated, the actual ratio is a little less than 1.5.

The best way to determine a good knit ratio is to knit the fabric and examine the greige fabric's loop right of the machine. An ideal ratio offers straight loops (see Figure 5.2). The loops of this 40-13 T680 nylon Jersey fabric are straight and the back bar yarn is hidden behind the front bar yarn.

5.6.2 Commercial nylon and silk warp knit

To study the aesthetics and fabric properties of commercial nylon and silk tricot and Milanese fabrics, six samples were bought commercially. Table 5.8 lists the six sample fabrics that were purchased and their properties are given in Table 5.9.

Table 5.8 Nylon and silk fabrics

Fabric number	Type of fabric	
1760-58DD	Tricot	30//30 Silk//nylon
1500-60	Tricot	100% 30 denier nylon
1760-58AA	Tricot	100% 30 denier silk
1890-40D	Tricot	100% 20 denier silk
1890-40A	Milanese	100% 20 denier silk
1760-58BB	Milanese	100% 30 denier silk

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Table 5.9 Fabric properties of 100% silk tricot, 100% nylon Milanese and bar-on-bar silk and nylon tricot fabrics

	1760-58DD	1500-60	1760-58AA	1890-40D	1890-40A	1760-58BB
Type of machine	Tricot	→			Milanese	→
Denier	30/30	30	30	20	20	30
Fiber	Silk//Antron®	Nylon	Silk	Silk	Silk	Silk
Machine needles per inch	28	28	28	28	28	28
Finished weight (oz/yd²)	2.1	2.3	1.5	1.0	1.1	1.5
Wales (inch)	45.5	52	45	52	55	52.5
Courses (inch)	72	58	57	55	47	41.0
Thickness (mils)	17.8	9.6	11.9	10.0	11.1	13.4
Bulk (cm³/g)	6.26	3.12	5.98	7.72	7.3	6.74
Air permeability (ft³/min/ft²)	536	515	679	961	935	744
Transmitted light cover % I_t	7.0	9.2	11.9	21.6	21	11
Reflected light cover % I_r	70	72	65	54	56	64
Grab strength (lb)	39	64.7	32.0	20	21.7	29.0
Elongation [b] (wale)	50.5	36.4	26.1	20.4	26	27
↓ (course)	54.5	92.8	56.3	60.1	90	66
↓ (average)	52.5	68.6	41.2	40.2	58	46.5
Bagginess (wale)	3.1	1.12	1.9	1.7	3.8%	1.7%
% UTS [a] (course)	10.2	0.76	8.5	13.9	16.0%	23.0%
% Crease recovery [c]						
Wrinkle recovery	91	95	82	86	93	78
A 30 65% RH (wale)						
70°F (course)	82	36	64	66	96	85
80% RH (wale)	--	96	--	--	71	85
80°F (course)	--	48	--	--	53	85
Wet (wales)	59	84	59	59	52	53
(course)	70	61	64	70	73	71
Hold melting 1st damage (°C)	325	310	320	325	330	320
Penetration (°C)	520	395	520	490	500	520

Table 5.9 Continued

		1760-58DD	1500-60	1760-58AA	1890-40D	1890-40A	1760-58BB
Static extension (2 lbs/in load A-2076-5 times)							
Wales	(% avail. stretch)	36 x 39	13 x 88	20 x 84	15 x 123	35 x 132	40 x 151
X	(% growth 30s)	4.7x 11	2 x 14	3.5x 15	2 x 23	4 x 35	4.7 x 29
Course	(% (inch) 1 hr)	1.0 x 7.2	1 x 4	3.0 x 11	1 x 15	1 x 22	2.5 x 27
Elastic properties:							
Stretch (Instron Test A-2080 2lb/in load – 3 times)							
Wales	(% Fabric stretch)	38 x 72	19 x 94	26 x 84	22 x 110	39 x 126	38 x 111
X	(% UTS*)	1.02 x 3.9	0.56 x 2.44	0.44 x 2.5	0.67 x 3.75	0.9 x 3.7	0.66 x 6.1
Course							
Liveliness (A-2049 modified 5 fabrics)							
	(Wales (%)	3.4	49.6	62.2	--	--	61.6
	(Course (%)	42.6	37.3	40.1	--	--	46.5
	(Average (%)	48.0	43.4	51.2	--	--	54.1
% Work recovery of fabric fold							
	(Wale (%)	61.1	47.8	62.0	61.7	64.1	52.4
	(Course (%)	78.3	53.0	88.9	79.7	73.0	92.0
	(Average (%)	71.3	50.4	75.5	70.7	68.8	72.5
Bending length (hanging heart (cm)		0.78	1.11	0.94	0.83	0.80	0.90
BJ loop	(Bend. stiffness (cm)	0.75	0.82	0.81	0.66	0.67	0.78
Test	(drape (cm)	2.3	0.72	2.2	1.73	1.82	2.1

* UTS = unrecovered tensile strength in Instron testing. [b] Elongation at the point of breakage. [c] Crease recovery in fabric.

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The following can be concluded:

- The visual aesthetics of the tricot and Milanese silk fabrics were excellent but the uniformity of the silk Milanese fabrics was better than the silk tricot fabrics. However, Milanese fabrics were more expensive than tricot as they were knitted on a slower machine.
- The bulk of the silk fabrics was far superior to the nylon fabrics as silk is a mix shrinkage yarn (see Figure 5.23). The covering power % I_t = transmitted light cover) of the silk fabrics was also far superior to the nylon fabrics (see Figure 5.24). The strength of the nylon fabrics was better than the silk fabrics and Milanese fabrics had more stretch than tricot fabrics.
- Compared to the hanging heart test, the B.J. Loop test (these are explained in chapter 21.3) is better as it not only gives the stiffness but also the drape of the fabric. Milanese fabrics have less stiffness and high drape (see Table 5.9).
- In order to achieve the aesthetics and fabric properties of silk more economically, *silk//nylon* Jersey is the best combination.

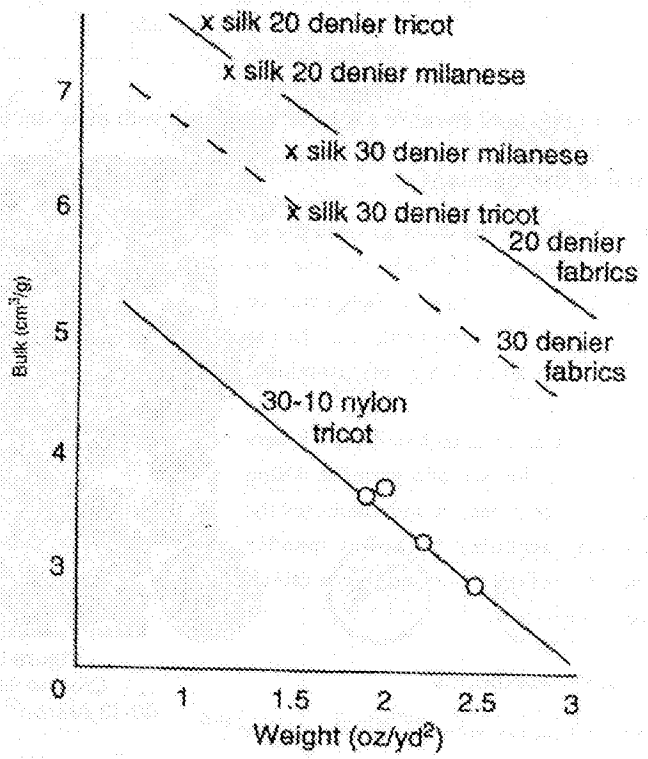


Figure 5.23
Bulk of 100% silk tricot and Milanese compared with 100% nylon tricot

19

OTHER TECHNIQUES FOR DEVELOPING SPECIAL WARP KNIT FABRICS

19.1 Milanese fabrics

In the industry, some people refer to weft knitting machines as flat machines and warp knit machines as circular machines, but in reality there are flat and circular warp as well as weft knit machines. Milanese machines have flat and circular machines in both warp knit and in weft knit. In warp knitting, warp ends are needed to knit a course and in weft knitting one end is needed.

In the warp knit industry, Milanese fabrics are in a class of their own. They are high quality and expensive fabrics. The basic structure of the Milanese fabric cannot be produced on the conventional tricot or Raschel warp knit machines. There are very few Milanese machines in the USA, but in Europe there are more. The main reason Milanese fabrics are used is because they offer better uniformity to non-uniform yarns such as silk and cotton than the counterpart tricot or Raschel fabrics.

19.1.1 Milanese structure

In order to understand Milanese fabrics, the workings of the tricot machine should also be understood. In tricot, a warp end could knit on the first needle course and on the second course; the end could knit on the same needle or a second or third needle or up to the eighth needle. After knitting one repeat of the stitch, the machine keeps repeating the same stitch. However it must be understood that a warp end must go back and forth between the eight needles, mostly between the first and the third needles.

In Milanese, one end of the warp knit knits one needle making the first course. In the second course, it knits the needle to its right and, in the third course, it knits the third needle and the end continually keeps going to the right (Figure 19.1). If the front bar goes in the right direction, the back bar keeps knitting in the left direction.

In weft knit, there are no warp ends, only one end that knits a course (Figure 19.1). In tricot, one could knit an open loop or closed loop but Milanese can knit only open stitches. In Figure 19.1, the tricot structure is shown with a closed loop and Milanese is shown with the open loop. Unlike tricot, Milanese has very limited design and stitch variation possibilities.

If a silk or cotton yarn that is not uniform is knitted, the non-uniformity in the yarn in tricot will show going in the wale or length direction and the non-uniformity of the weft Jersey will show going in the course or width direction. However, on Milanese machines the non-uniformity will be diffused

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as the yarn keeps going sideways at an angle and the second or back bar yarn will go in the opposite direction at an angle.

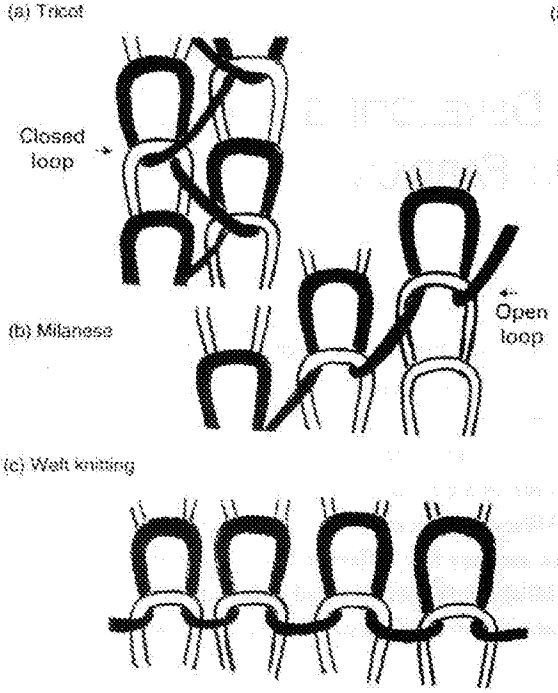


Figure 19.1
Loop diagram of Milanese fabric, compared with tricot and weft knitting

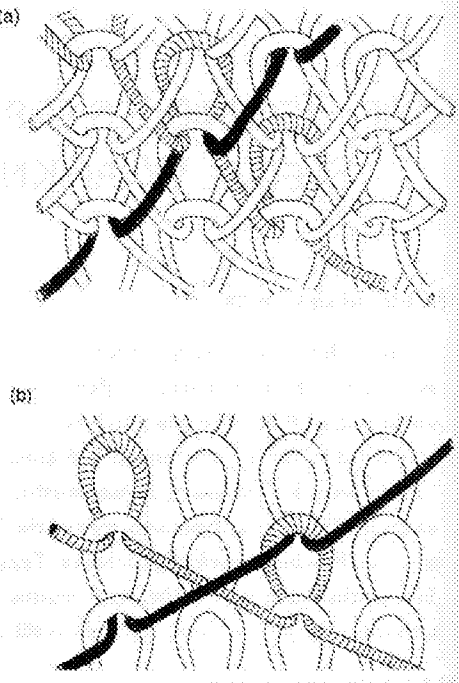


Figure 19.2
Loop diagram of (a) cotton lap and (b) silk lap knitted on a Milanese machine

19.2 Types of Milanese machines

There are three basic types of Milanese machines: continental flat bed with spring bearded needles and two guide bars, English flat bed, which is like the continental machine, except in place of the two guide bars it has a special mechanical device to control warp ends, and the circular Milanese machine with a latch needle.

The Continental and English flat bed Milanese machines produce Cotton Lap and Silk Lap Stitches (Figure 19.2), whereas the circular Milanese machine produces only the Cotton Lap Stitch.

In a flat bed machine, the bars move in opposite directions. Thus, any single warp end from the front bar will travel across the width of the machine from left to right and on reaching the last needle or selvage it will be transferred to the back bar. At this time, the warp thread on the back bar will start traveling in the opposite direction, now from right to left, moving at the same speed and going to the other selvage. After reaching the left selvage, the warp thread will be transferred back again to the

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original position completing a full repeat. In a circular Milanese machine, two bars move in the opposite direction at a continuous speed. It is important to note that, like tricot and Raschel, the circular Milanese machine will not mix front and back bar yarns. Since a flat bed Milanese machine transfers the front bar warp ends to the back bar and thus mixes the two bars, it does not produce commonly found sandwich-like structure (back bar yarn between the front bar yarn or the bar-on-bar fabrics) of the warp knit fabrics.

As mentioned earlier, Milanese machines produce only two basic types of stitches. One stitch is called the Open Cotton Lap (two needle float), where each warp end knits every consecutive needle (0-1, 2-1//2-1, 0-1). The other stitch is called Open Silk Lap (three needle float), where each warp end knits every other needle or alternate needles only (0-1, 3-2//3-2, 0-1) and, therefore, moves two needle spaces at each course, passing under one needle and over the next (see Figure 19.2, loop diagram of the technical back is shown). Spun yarns with staple fibers use Cotton Lap, whereas the Silk Lap is believed to be for continuous filament yarn - mostly silk yarns.

19.2.1 Continental Milanese

The continental flat bed Milanese machines are equipped with spring-bearded needles and two guide bars. These machines are built quite similarly to the tricot and Raschel machines, except for the guide bars and the warp beam setting. As warp traverses and transfers the warp end from one bar to the other, stationary beams are not used; instead, a movable set of small sectional beams are mounted on the top of the machine. The guide bars are also modified to suit the moving beams. The guides are in units of six, move sideways and have a combined swinging motion, but the needles stay stationary. A section guide is transferred from the front bar to the back bar at one end, and at the other end it is transferred from the back bar to the front bar.

19.2.2 English Milanese

This is a more complex machine than the continental Milanese. Instead of the guide bars, the English flat bed Milanese machine has a special warp control device that contains still points, traverse points, picker points, thread bar, and so on. The remaining knitting elements are, however, like the continental Milanese machine.

19.2.3 Circular Milanese

This is a circular machine that uses latch needles and therefore it is quite a simple machine. Two sets of 12 inch beams rotate in opposite directions and feed the warp ends to the needles mounted on a vertical cylinder. The needles have a vertical motion combined with a rocking motion. Unlike the flat bed Milanese (continental and English), the circular Milanese machine offers only Cotton Lap Stitch owing to the restricted beam movement.

Milanese machines can use only Open Lap Stitch due to the machine design. It is believed that better fabric quality partly results from the Open Lap Stitch.

All the Milanese machines in the United States are 168 inch wide and have 28 gauge (28 npi). These machines use a special type of 6 inch small spool (56 total spools/machine). Hence, a fully

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threaded spool or beam has a total of 168 ends per spool. The fringes of these spools are 2¼ inch high and it takes 7 to 8 hours to set or thread the machine. The Milanese machine knits 64 spm at the mill (8 racks/hr. or 48 inch/hr), whereas a tricot machine knits 2000 spm (250 racks/hr. or >2000 inch/hr).

It is important to note that all tricot and Milanese fabrics are produced from 20-22 and 30-32 denier only. As silk is not a uniform yarn, the denier of yarn count varies from 20 to 22 denier; hence yarn count is referred to as 20-22. Heavier silk tricot fabrics of 40 denier or more are not economically and aesthetically attractive. The selection of a 20-22 or 30-32 denier fabric depends upon the style and the market trend.

19.3 Manufacturing silk Milanese fabrics

Step 1: Remove skeins from a bale of silk and scour them in a pot (a bale of silk weighs around 136 -140 lb). Take 150 gallons of water and 42 quarts of Serasol® No.103 and 1 lb of potassium carbonate, raise the temperature of the bath to 120°F and scour for 12 - 15 hours.

Step 2: Whizz the skeins (technique to eliminated excess water).

Step 3: Dry in open air.

Step 4: Beat the skeins manually one at a time on a round wooden rod attached horizontally to a vertical pole 5 or 6 ft above the ground.

Step 5: Wind skeins on cones.

Step 6: Wrap the yarns on 6 inch spools (56 spools/machine), 168 ends per spool (28 gauge, fringe 2¼ inch).

Step 7: To produce 6.75 yd^2/lb yield of greige fabric, 30-32 denier fabrics are knitted to 6 inch quality (inches/rack, 480 courses), to produce 10 yd^2/lb yield greige fabric, 20-22 denier fabrics are knitted to 5 inch quality.

Step 8: Greige fabrics are beck scoured with 25-30% Merit Soap and 4-5% Soapamine of the weight of the goods and are boiled for one hour. Add fabrics in the beck at room temperature and raise the temperature gradually 3°F/min to boil.

Step 9: Whizz the fabrics.

Step 10: Scoured fabrics are dried on an old style of steam dryer. The fabrics are held horizontally on the pin tenter with the steam coils underneath and ceiling fans over the fabrics (drying temperature - 112-118°F). Tricot fabrics are finished similarly. Silk mills sell white or piece dyed finished fabrics.

The Milanese machine produces acceptable white, piece-dyed, and printed fabrics. Whereas only printed fabrics are produced satisfactorily by the tricot machine because tricot lacks the uniformity of Milanese. 100% silk, white, piece-dyed and printed Milanese fabrics are used in such applications as dresses, blouses, lingerie and glove lining, whereas 100% silk printed tricot is used only in dresses. As an exception, 100% white silk tricots, even though they are streaky fabrics, are used as glove lining because the fabrics are felt and not seen.

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19.3.1 Comparison of commercial tricot and Milanese fabrics

Answers to the following key questions were needed:

- Does 100% silk Milanese fabric have better uniformity than 100% silk tricot?
- What are the advantages and disadvantages of silk Milanese, silk tricot and silk//nylon tricot combination fabrics?

In order to answer the above questions, eight finished commercial fabrics were bought. They consisted of one nylon control, five silk tricot fabrics and two silk Milanese fabrics (see Table 19.1). Subsequently, the selected six commercial fabrics were submitted for physical testing. The fabric properties are reported in Table 19.2 and Figure 19.3.

Table 19.1 Outstanding styles of the commercial silk warp knits

Fabric No.	Fabric layout	Fabric type	Finished Width (inch)	Greige yield (yd^2/lb)
1	100% 30-10 nylon Jersey 2-3, 1-0//1-0, 1-2	Jersey tricot	92	5
2	Bar-on-bar 30-32 silk//30-10 Antron® Jersey 2-3, 1-0//1-0, 1-2	Jersey tricot	46	5.88
3	100% silk 30-32 Reversed Jersey 1-0, 1-2//2-3, 1-0	Tricot	92	7
4	100% silk 20-22 Jersey 2-3, 1-0//1-0, 1-2	Jersey tricot	92	10
5	100% silk 20-22 Two or Silk Lap	Milanese	84	10
6	100% silk 30-32 Two or Silk Lap	Milanese	84	6.75
7.	100% silk 30-32//30-32//20-22 2-3, 1-0//1-0, 2-3/1-2, 1-0	Three-bar tricot	92	5
8	Bar-on-bar 30-32 silk//30-1 Crepeset® nylon Jersey 2-3, 1-0//1-0, 1-2	Jersey tricot	46	6

See fabric properties in Table 19.2.

The results of the tests lead to the following conclusions.

Compared to nylon filament yarn, silk natural filament yarn has mixed denier and mixed shrinkage. Silk tricot fabrics compared to nylon tricot have a dryer hand, more fabric bulk, better percentage transmitted light cover, a little more liveliness and less drape. However, silk natural filament yarn offers less strength, and non-uniformity. But when Milanese is compared with tricot fabrics, Milanese offers significantly better fabric uniformity and also more fabric stretch. Individual comparisions of Milanese vs. tricot and silk vs. nylon are shown in Table 19.3.

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Table 19.2 Fabric properties of 100% silk tricot, 100% nylon Milanese and bar-on-bar silk and nylon tricot fabrics

Fabric No.	1	2	3	4	5	6
Type of machine	Tricot	→	→	→	Milanese	→
Denier	30	30//30	30	20	20	30
Fiber	Nylon	Silk// Antron®	Silk	Silk	Silk	Silk
Machine gauge (npi)	28	28	28	28	28	28
Finished weight (oz/yd²)	2.3	2.1	1.5	1.0	1.1	1.5
Wales (inch)	52	45.5	45	52	55	52.5
Courses (inch)	58	72	57	55	47	41.0
Thickness (mils)	9.6	17.8	11.9	10.0	11.1	13.4
Bulk (cm³/g)	3.12	6.26	5.98	7.72	7.3	6.74
Air permeability (ft³/min/ft²)	515	536	679	961	935	744
Transmitted light cover % I_t (lower number is better)	19.2	7.0	11.9	21.6	21	11
Grab strength (lb)	64.7	39	32.0	20	21.7	29.0
Static extension **(2 lb/in load A-2076-5 times)**						
Wales x Course — % Available stretch	13 x 88	36 x 39	20 x 84	15 x 123	35 x 132	40 x 151
Wales x Course — % Growth in 30s	2 x 14	4.7 x 11	3.5 x 15	2 x 23	4 x 35	4.7 x 29
Wales x Course — % Growth in 1 hr	1 x 4	1.0 x 7.2	3.0 x 11	1 x 15	1 x 22	2.5 x 17
Elastic Properties Stretch **(Instron test A-2080 2lb/in load – 3times)**						
Wales X Course — Fabric stretch	19 x 94	38 x 72	26 x 84	22 x 110	39 x 126	36 x 111
Wales X Course — % Unrecovered tensile strain (Instron)	0.67x 2.44	1.02x 3.9	0.44x 2.5	0.67x 3.75	0.9x 3.7	0.66x 6.1
Liveliness **(A-2049 modified 5 fabrics)**						
Wale	49.6	53.4	62.2	53.0	53.0	61.6
course	37.3	42.6	40.1	40.0	42.8	46.5
average %	43.4	48.0	51.2	46.5	47.9	54.1
% Work recovery of fabric fold						
Wale	47.8	61.1	62.0	61.7	64.1	52.4
Course	53.0	78.3	88.9	79.7	73.6	92.0
Average %	50.4	71.3	75.5	70.7	68.8	72.5
Bending length (hanging heart)	1.11	0.78	0.94	0.83	0.80	0.90
Drape (cm)	9	5	4	4	7	7

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Table 19.3 Comparison of Milanese with tricot and silk with nylon

	Comparison of Milanese vs. tricot	Comparison of silk vs. nylon
Bulk	Equal	40% better
Transmitted light cover % I_t	Equal	30% better
Strength	Equal	Less
Stretch	40% better	Equal
Liveliness: work recovery (%)	Equal	19% better
Liveliness: fabric fold (%)	Equal	50% better
Stiffness	Equal	Equal
Drape	Equal	More body (high drape)
Fabric uniformity	Better	Better

Specifically:

1. Silk tricot had 42% more bulk than nylon tricot (for 1.5 oz/yd² weight, the bulk of the silk was 5.98 cm^3/g and of nylon 4.2 cm^3/g), but the bulk of the silk tricot, silk Milanese and bar-on-bar silk//Antron® nylon tricots were all quite similar (Figure 19.3).
2. The transmitted light cover of the silk tricot was 33% better than the nylon tricot (1.5 oz/yd² weight gave 18% I_t for silk compared with 24% I_t for nylon) but the silk tricot and Milanese fabrics had about the same amount of cover. Note that because of the different shrinkage bar-on-bar// Antron® tricot was much better in cover than the nylon tricot (Figure 19.4).
3. The average stretch property (test A2080 elastic property) of silk tricot and nylon tricot was about the same (55 vs. 56.5%). However, silk Milanese had 46% more stretch in the wale and 32% more in course direction than the silk tricot. The Milanese had a total of 40% more stretch than tricot.
4. For outerwear applications such as dresses and blouses, good liveliness in a fabric is desired. The liveliness property of a silk tricot or Milanese fabric is generally considered to be better than a nylon tricot, but the Instron test (A-2049) available for measuring liveliness (% work recovery) property does not show any difference between silk, bar-on-bar silk//nylon, and nylon fabrics. This is because the fabrics were too light and had high stretch. The Instron liveliness test was carried out with the standard one sample and with modified testing using two, three, four and five samples together (see Figure 19.5). The Instron test using five samples together showed that liveliness of the silk tricot was 19% better than nylon tricot (51.2 silk vs 43.4% nylon work recovery, respectively) and bar-on-bar silk//Antron® tricot was 10% better than nylon (48% vs. 43.4% work recovery, respectively), whereas the liveliness of silk tricot and silk Milanese was about the same (51.2% compared with 54.1% work recovery).
5. The percentage work recovery of fabric fold is another Instron method for measuring fabric resilience. This test with one sample was found satisfactory and there was no need to modify it as one sample was better than two, three, four or five samples. The percentage work recovery of silk tricot was 50% better than the nylon tricot (Figure 19.6), whereas, the percentage work recovery for the silk tricot was about the same as silk Milanese. In a garment, the effect of this spread in

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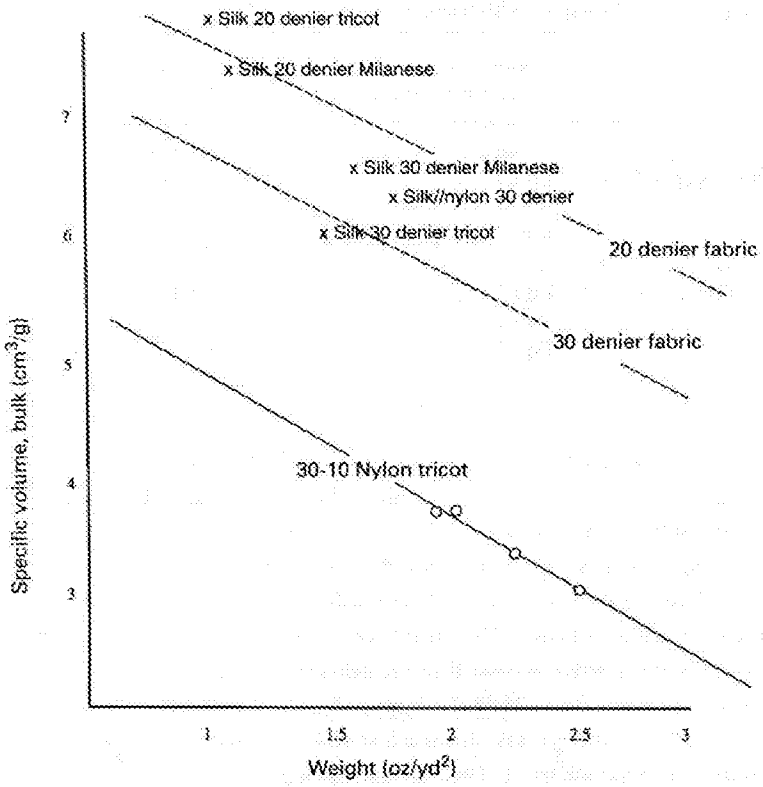


Figure 19.3
Bulk of 100% silk tricot and Milanese compared with nylon tricot

percentage work recovery of fabric fold of the Milanese fabrics could affect the drape and the suppleness of the fabrics during wear.

6. The bar-on-bar silk//Crepeset® nylon tricot (see Table 19.1, fabric 8) had attractive crepe aesthetics.
7. Three-bar silk fabric (Table 19.1, fabric 7) is an attractive heavier fabric.
8. In appearance, nylon tricot and Milanese fabrics look alike but silk Milanese is superior in uniformity and bulk.

19.4 Knit-de-knit elastic tapes

The definition of knit-de-knit is defined as elastic tape knitted using heavy spandex yarn. This tape is the supply package for the crochet knit machine to enable it to produce narrow elastic tapes. This supply package is provided in the form of a double face warp knit tape knitted on a two needle bed Raschel warp knit machine that uses heavy elastic yarns. After the elastic yarn is first knitted on a two needle bed Raschel machine, the elastic knitted tape is unraveled in the back of the crochet knit

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The Milanese Machine

Little Progress Made in the Development of the Milanese Fabric

By *J. WATEL*

ALTHOUGH the various types of knitting fabrics as a rule have been greatly developed in recent years and their uses greatly extended, there is one among them, the milanese fabric, which has remained practically stationary. In no country has this class of goods reached a leading position in the knitting industry. In some centers of Saxony, such as Limbach, and in Leicester, Eng., the production is absorbed mainly by the United States.

Before 1914, France imported a considerable quantity of milanese fabrics from Germany and during the war several French manufacturers, working under great difficulties succeeded in establishing this textile industry which is very little known in France and very difficult to carry on, being unknown up to the present time to a large number of even the most important manufacturers. With the exception of some fairly large installations at St. Chamond in the Lyons district and in the North, the number of milanese machines in France is very small. The causes for these conditions are fairly numerous, for anyone who has seen a milanese machine in operation must have been impressed by the wonderfully complicated motions of the different parts. The number of parts and the complexity of their movements are really surprising even for producing one course of loops similar to that produced on the ordinary warp knitting machine. The special control of the threads by a combination of various points is extremely interesting and calls for the attention of a very skilled operative who is thoroughly acquainted with their adjustment. The preparation of the warps and placing them on beams, as well as operating the loom, are operations that cannot be trusted to an operative of ordinary skill.

The ordinary fabrics made on a warp-knitting machine with a single or double needle-bar A, Fig. 1, are composed of two layers of warp threads of p and p', for example, coming from fixed rollers and being displaced laterally and parallel to the bar. For this purpose the warp threads are placed on the needles by special guides forming two bars for each layer of threads. This lateral movement of the warp threads is reversible at any required point, one bar moving to the right, and the other bar to the left. These movements are made to correspond exactly needle by needle, the rolls delivering the warp regularly without lateral displacement. At these points there is produced a line C B which is very distinct on the back of many glove fabrics and is called the "back line".

If we suppose now that the guides and the warp beams are divided, moving in a cycle T, Fig. 2, we have two layers of warp threads presented parallel to the needle-bar A, and obliterating the back lines of the warp fabric. This would give us the milanese fabric. Actually only the warp threads are divided, the bars being replaced by a group of special elements which are displaced continually in front of the same group of needles.

The warp-knitting machine and the milanese machine produce the satin knit fabric, Figs. 1 and 2, which illustrate the movement of the threads in the two cases. Attention is called to the zig-zag effects produced by the threads F F^1 in the warp-knit cloth, while the threads G G^1 of the milanese fabric are always arranged diagonally at an angle of 120° to 130°, hence the names given to this machine, "diagonal loom" in Germany, and "traverse warp machine" in England. The milanese fabrics of which the majority consist of silk on a fine gauge, have been used extensively for underclothing dressing jackets, gloves and lining, the latter increasing considerably the value of the garment. The uniform elasticity of the milanese fabric makes it well suited for corsets and bodices and has enabled certain manufacturers of corsets to build up a high reputation for their products. Until recently the milanese fabrics have not obtained the place that they should occupy in our industry, but nevertheless every knitting manufacturer will follow closely the evolution of these goods, for we believe that a great development is in store for them.

The ordinary milanese machine which is built in lengths up to 20 feet has but one needle-bar carrying spring needles a with the points very flat, Fig. 3, the stitch is regulated by the lock-bar p and the pressure by the bar p', the movements of which are controlled by a system of levers and cams driven from the shaft B.

The guiding of the threads is accomplished by three kinds of machine parts, e, d and f which are fastened on bars whose movements are regulated by levers and a system of cams specially keyed on the shaft B. The rows of points e, d and f when they are lowered and raised in the layers of threads have a slight see-saw movement, but the row f has a particularly pronounced movement which enables it to move away from the points d up to the needles a. The number of points on each bar is equal to the number of needles in the machine.

The points e and f are very slender and each has a small longitudinal groove face to face and in which the opposite point can slide when ascending or descending. The elements f, placed between the groups e d and the knitting needles, consist of steel plates very thin and so shaped that they are called "bayonets."

The warps, being divided, are supported on short shafts raised on brackets fastened to the plates M; this forming an endless warp, the constant delivery of which is provided by a ratchet R operated by levers. Fig. 3 shows the position of the warps b and c. Each roller is provided with a friction device that keeps the warp at a constant tension. The warps, b and c, are held constantly at the same distance apart by the guides l, m and n.

Fig. 4 shows the positions of the various parts during a cycle of movements of e, d and f.

(*Continued on page 48*)

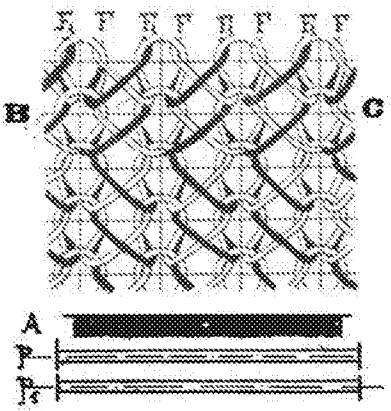


Fig. 1

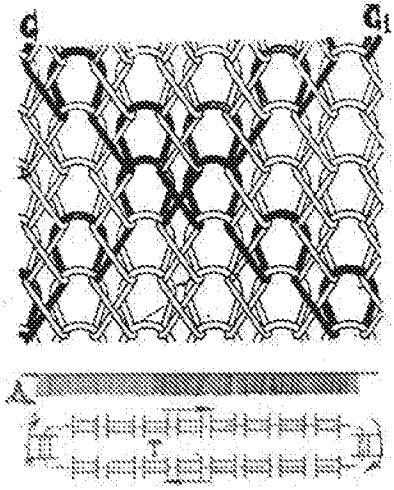


Fig. 2

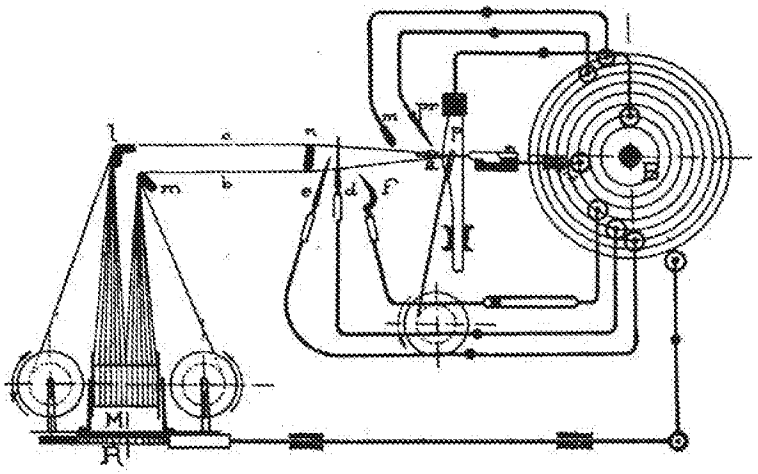


Fig. 3

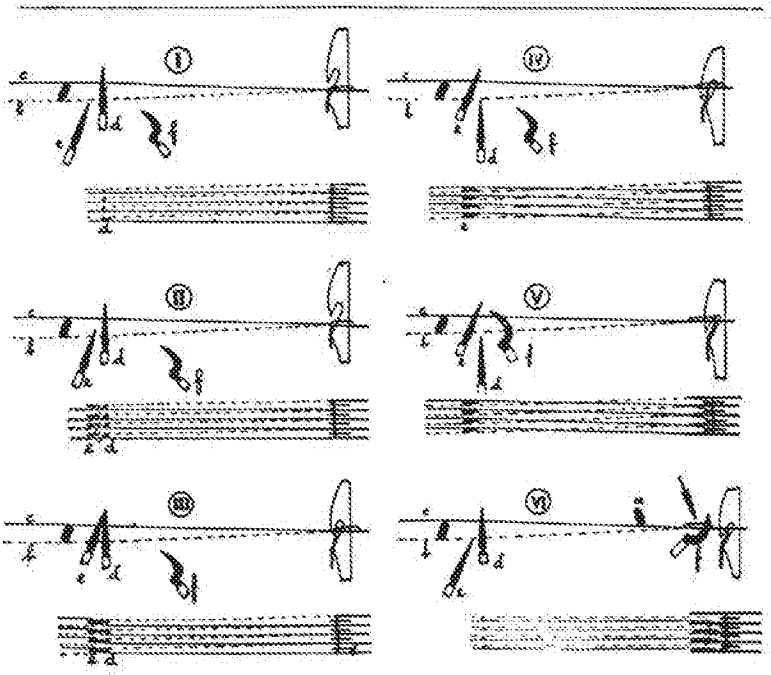


Fig. 4

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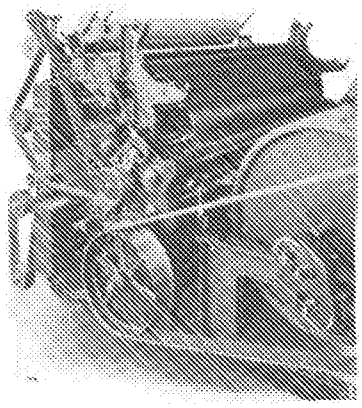
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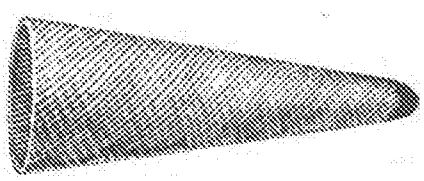
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The Milanese Machine

(*Continued from page 43*)

In No. 1, Fig. 4, the threads of the warp *b* are displaced at each row of loops one needle-space to the right and all the threads of warp *c* are displaced one needle-space to the left; the points *d* are raised above the warps in order to hold the threads in position.

In No. 2, Fig. 4, the points *e* are raised, sliding in the longitudinal grooves of the points *d* until they reach a point slightly above the level of the warp *b*, and immediately after this they displace the threads of the warp *b* for a distance of two needle-spaces to the right as one faces the machine.

In No. 3, Fig. 4, the points *e* continue their ascent, sliding in the grooves of the points *d* until they reach the extremity of the latter.

At this moment the bar *d* drops completely under the two warps *c* as shown at No. 4, Fig. 4, during which movement *e* moves sideways one needle-space to the left. The threads *b* are at this point displaced from their original position only one needle-space to the right, while the threads *c* have been drawn one needle-space to the left. A new relative position is thus established for the points and the needles.

The bar *f* is then moved sideways which enables the bayonets to enter the warp threads held in the new position by the bar *e*, No. 5, Fig. 4, during which movement the needles leave the locks.

The bayonets reversing their movement then place the warp on the needles while the bar *e* is lowered, No. 6, Fig. 4. The smooth bar *m* descends on the warp threads to keep them in regular position during the change. The stitches are formed by the ordinary operations, the needle-locks and press-bars operating at this moment. Immediately afterwards the point *d* rise traversing *b* and *c* ready for a new cycle of operations.

In order that the threads of the lower warp may always enter the upper row when they are displaced to the right, and that the threads of the upper row may enter the lower row when they are displaced to the left, a specially pointed arm is fastened to the press-bar, and when this press-bar is lowered it causes the transposition by means of a special form given to the extreme points *d* and by the addition of two small thread-guides of reverse forms. — *Le Moniteur de la Maille.*

Technology of Advancing Textile Manufacture (Technology der Textilveredelung); by Dr. Paul Heermann; 564 pages 6x9; illust. Verlag von Julius Springer, Berlin.

Before the war Germany had built up an extensive industry by admitting free of duty raw and partly manufactured products to be advanced in the process of manufacture and then exported. This treatment was known by the general term *Veredelung*, the business being called *Veredelung Verkehr*. This trade included a great variety of products and in his book Dr. Heermann has undertaken to describe in considerable detail the various processes to which materials have been subjected under this system of partial manufacture.

Petitioner adidas AG - Exhibit 1019 - Page 4
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Editor's Viewpoint

Knitting Industry's founder and Editor Billy Hunter is a chartered textile technologist with more than 30 years of experience in knitted textiles manufacturing, knitting machinery, research and development and textiles journalism.

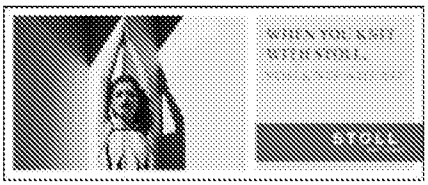
Nike Flyknit: Quantum leap for flat knitting

26th July 2012

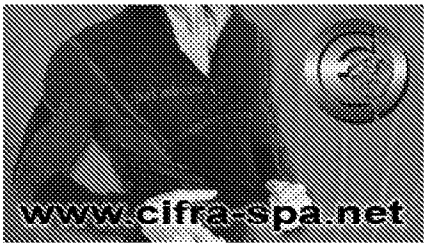
The knitting industry rumour mills have been running at warp speed (no puns intended) since we published an article on Nike's Flyknit integrally knitted running shoe upper in February - see Nike Flyknit – a seamlessly knitted running shoe!.

After taking a close look at images of the knitted upper, we can reveal that Flyknit is without any doubt made on an electronically controlled flat knitting machine - apologies to the flat knitters amongst you who probably think that was already very obvious.

Some have speculated that Flyknit is produced on circular knitting technology and although a version of Flyknit could be produced on a circular knitting machine, a substantial amount of post knit cutting would be required leaving 'raw edges' on the fabric. Flyknit has closed selvedges all around the upper.







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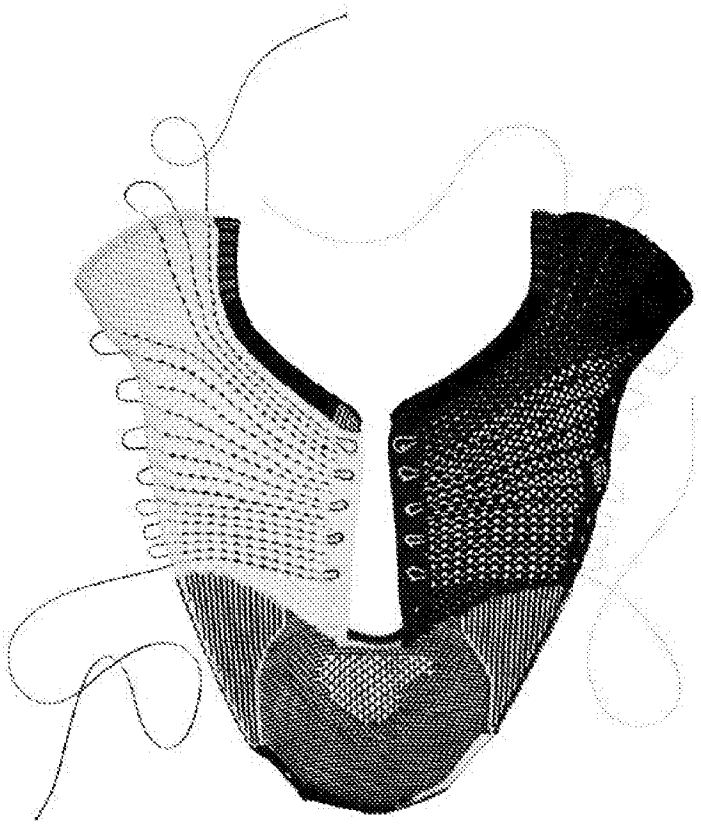
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- Knitting for a future King

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In addition, the Insertion of the support/lacing cables on the shoe side would not be possible as the machine would need to have a reciprocating movement to allow the laying in of the cables from side to side.

Others have speculated about warp knitting or double needle bar raschel technology being involved but again post knit cutting would be required. Raschel and warp knitting machines have continuous warps and 'seamless' items still need to be cut from the machine. Weft insertion is possible on some machines but Flyknit would require a hybrid machine which also has jacquard needle selection.

Only flat knitting technology can give the result achieved in the Flyknit uppers shown so far. A modern flat knitting machine has the ability to produce closed selvedges all around the upper whilst imparting complex shape and laying in the support/lacing cables. Having said that, this is a very complex piece of knitting which will have taken a lot of developing.

Quantum leap

Nike Flyknit represents a quantum leap for flat knitting technology and heralds a new era for integrally knitted non-apparel products which can be manufactured on a large scale to meet global demand. Make no mistake – this is flat knitting technology's finest hour.

Ever since researchers at Courtaulds in the UK in the 1960s and 1970s explored the potential of the mechanical jacquard flat knitting machine for producing integrally knitted garments and non-apparel items, there has been a quest amongst machine builders and producers to take flat knitting technology into mass market non-apparel items.

The revelation that Nike Flyknit is an integrally knitted running shoe upper made on a flat knitting machine, now confirms the potential of the technology for producing non-apparel items as well as apparel.

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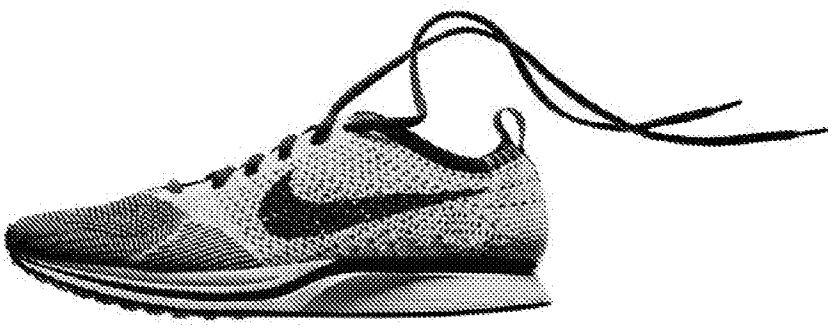
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Until recently flat knitting successes outside of traditional knitwear (sweater) manufacturing, which is what the technology is aimed at, have tended to be in niche markets. Even the General Motors foray into integrally knitted car seat covers in the 1990s, never really reached the anticipated volumes, although they are still being produced.

However, success for flat knitting technology in volume technical applications could now be imminent with Nike Flyknit. This could be the big one for the leading flat knitting machine builders.

Rumours have been circulating in the industry and on the social networks and there has been much speculation about which technology has been employed in Flyknit. Those looking a bit more carefully are asking – Shima or Stoll? Stoll or Shima?

Meeting market demand

As Nike Flyknit shoes were not scheduled to hit the shops until this month, we have had to speculate as to exactly how they are made and how long each upper takes to make. Nike has launched two Flyknit lines which use the same technology – the Nike Flyknit Racer for elite athletes and the Nike Flyknit Trainer+, a running shoe for the mass market.

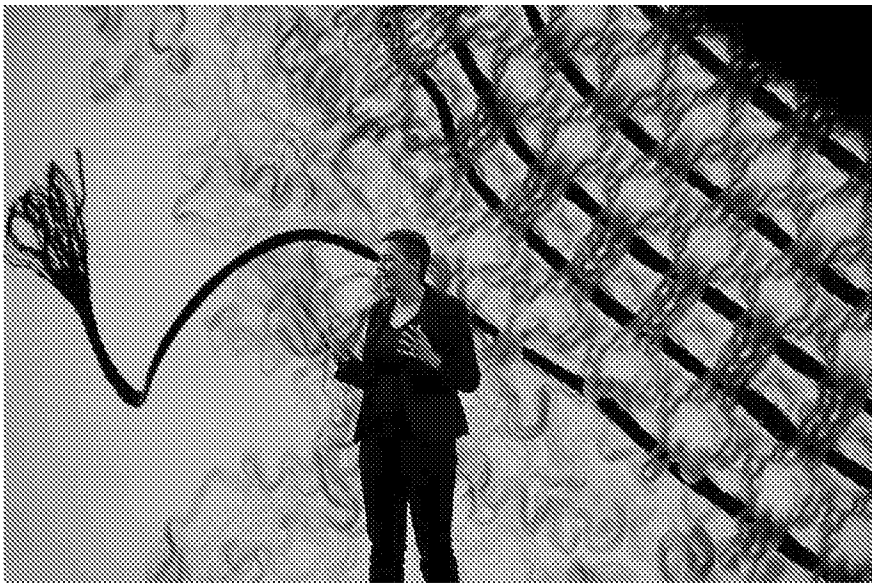
Based on information currently available and making some informed assumptions we calculate, not surprisingly, that very large numbers of flat knitting machines will be required to meet market demands, especially for the Nike Flyknit Trainer+ mass market product.

If we assume Flyknit is knitted in 10 or 12 gauge and estimate a production time of approximately 30 minutes per upper, then one machine working 24/7 might produce around 320 uppers per week. That's only enough for 160 pairs of Flyknit shoes and at that rate, 1000 machines would be required to produce 160,000 pairs per week.

The point is that these are small numbers by Nike standards and therefore huge numbers of flat knitting machines could be involved if Flyknit is as successful as Nike anticipates.

Production demands

Nike Flyknit Trainer+ is offered in a number of different styles which carry different patterns and a range of colours. Add to that the requirement to produce components for left and right feet (assuming the left and right uppers differ) and a full range of shoe sizes and the product developers, flat knitting technicians and production people amongst us will realise the complexity and immensity of getting such a range of integrally knitted styles ready for production.



This is a truly awesome project and we take our hats off to the product developers and technicians behind it.

Back in February we assumed that Nike would have set up a Flyknit development unit at their headquarters in Oregon, USA, sometime ago which may have developed into a sizeable production unit by the July launch. We also assumed that it would have hired some of the industry's best technicians to work on Flyknit because these are technically advanced products that require the highest level of skills available.

In the run up to the launch, Nike will have undoubtedly already made significant stocks of Flyknit uppers. It will also have in place the necessary production capabilities and capacities to ensure it meets what could be phenomenal market demand.

Nike discloses on its website, details of the more than 800 factories worldwide which manufacture all Nike Inc., products but where its flat knitting factories are located is not made clear.

Since writing this article we have been digging around a bit more and have contacted Nike with some questions. Tomorrow on Knitting Industry - on the opening day of the 2012 London Olympics and on the launch of Flyknit – we reveal more about Nike's revolutionary new product.

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Nike Flyknit: Ready, Steady, Go!

31st July 2012, London

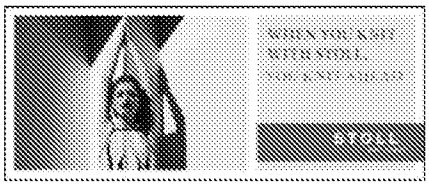
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When sportswear and sports shoe giant Nike announced in February the launch of a revolutionary new running shoe which uses state-of-the-art integral knitting techniques to create a one piece upper, we published the following article - Nike Flyknit a seamlessly knitted running shoe! .

The article explains how the shoe upper is made using state-of-the art flat knitting technology and was our most read article since we launched Knitting Industry website in 2008 – by a long way!

The story created a real buzz around the industry and the social networks were busy with comments and discussions about Flyknit, so we decided to contact Nike to see if we could find out a bit more about how this exciting new product was being made and of course where it was going to be made.





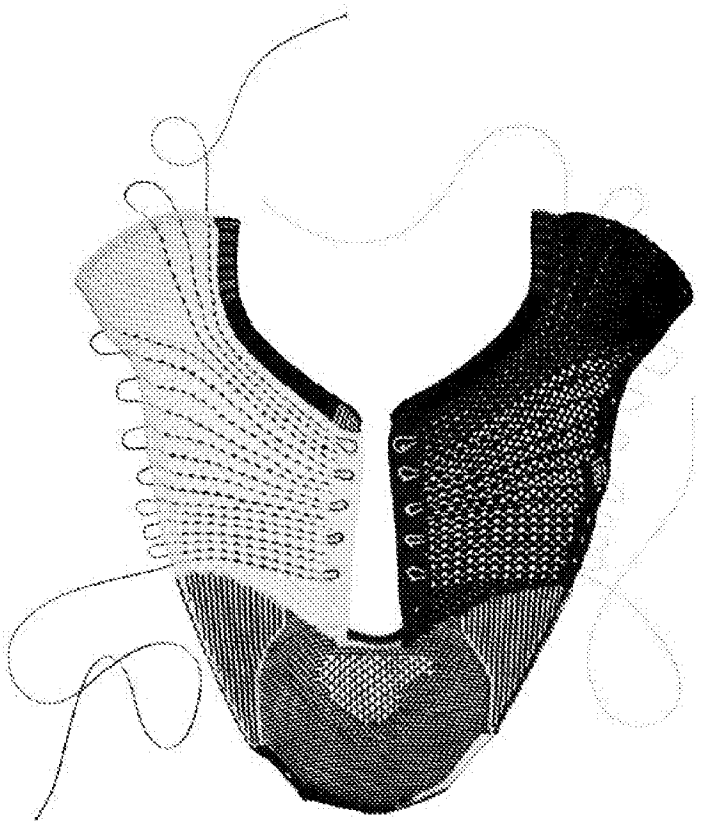


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Nike had announced that two versions of Flyknit would launch in July just in time for the London games, so we assumed that manufacturing would already be in place in order to meet anticipated demand.

We told Nike we had heard it had set up a manufacturing unit to produce the shoe uppers on Stoll flat knitting machines. We asked how many machines the company had or was planning to have. We also asked which model and gauge of machine the company was using and whether the unit was located at Nike's HQ in Oregon.

Mary Remuzzi, Director, Global Corporate Communications at Nike replied to us saying:

"We can't comment on specific details, but we do have a prototype machine at our headquarters in Oregon."

We wanted to know whether the shoe uppers were being made in the USA, as clearly knitting the upper in one piece can be considered to be environmentally friendly in terms of waste minimisation, logistics and energy savings.

We also wanted to know about raw materials and the other components in the shoe – what kind of yarns are being used and are they made in the USA? We also asked where the sole units were being made and whether the shoe was to be finally assembled in USA.

Nike responded, saying: "We can't comment on the sourcing for specific components. The final assembly for the shoe is in Asia."

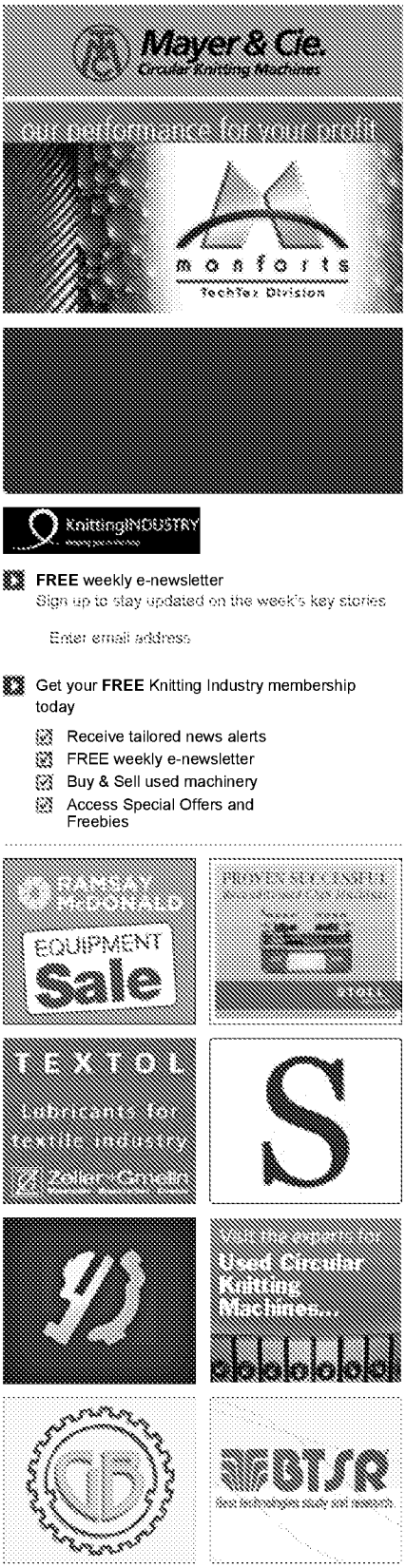
"With regards to the yarns, we do use multiple variations of polyester yarns in any one upper, depending on the specific needs for a particular area," Mary Remuzzi explained.

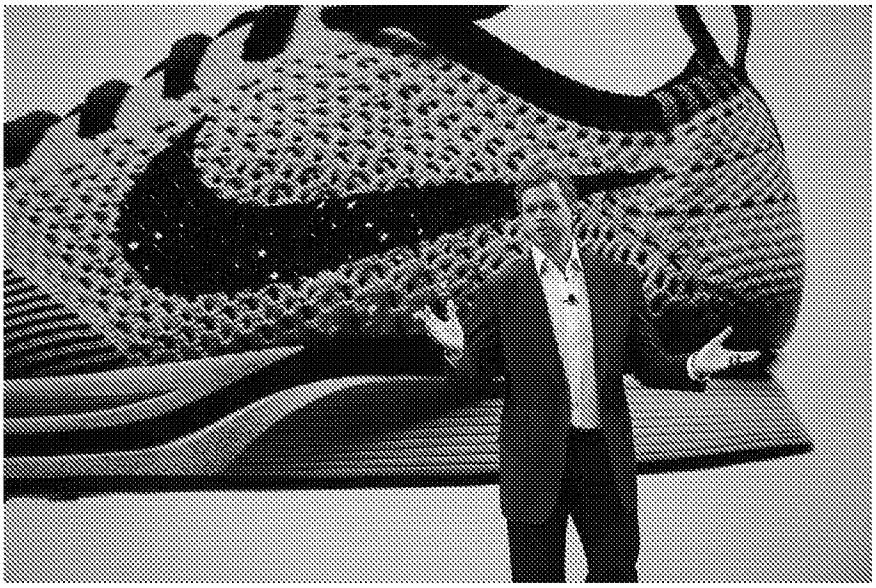
"For example, where we need stretch, you will find more elastic yarns. In areas for more support you may find multiple yarns of varying properties such as denier and strength," Mary clarified, adding:

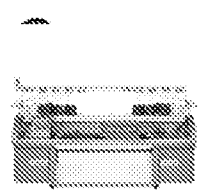
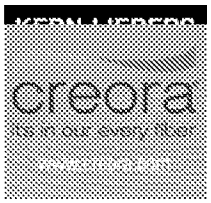
"Nike developed these yarns with a partner so they would meet the specific needs of high performance footwear."

We asked Nike if it had any data it could release on Flyknit manufacture versus conventional manufacture.

"We can't share specifics, but how the Nike Flyknit is manufactured gives us more flexibility in how product is made," Mary Remuzzi said.







Taking Nike's responses to our questions and adding information we have picked up from various discussions which have been taking place around the knitwear industry, we have made some educated guesses about how the whole Flyknit manufacturing set up might work.

Recruiters were working the social networks some time ago looking for skilled flat knitting machine programmers and Nike has since hired a number of skilled flat knitting technicians in the USA. A wide range of Flyknit uppers have been developed for limited edition shoes which have already been released into the market in different styles and colours utilising a range of yarns and in a range of sizes, which amounts to a colossal amount of sampling and development work on flat knitting machines.

Add to that, the fact that the Flyknit Racer is the marathon shoe that the world's best runners, including those from Kenya, Great Britain, Russia and the US were scheduled to wear in this spring's marathons and in London over the next few weeks - and the Nike Flyknit and Nike Flyknit Trainer+ are scheduled to be available for all runners from July.

Then add to that the fact that Nike released its third instalment of the HTM Flyknit collection last week. HTM is the ongoing collaboration between Fragment Design Founder Hiroshi Fujiwara, Nike design legend Tinker Hatfield and Nike Inc. CEO and designer Mark Parker. HTM is said to "celebrate the groundbreaking performance attributes of a new technology that changes the way footwear is constructed."



Now with the games in London fully underway it is therefore obvious that Nike now has a significant flat knitting technology based development unit and has access to fairly large number of flat knitting machines somewhere which must have been in production for sometime in order to make the numbers of Flyknit uppers required for the projects mentioned above.

If we assume Flyknit is knitted in 10 or 12 gauge and estimate a production time of approximately 30 minutes per upper, then one flat knitting machine such as a Stoll CMS 530 HP working 24/7 might produce around 320 uppers per week. That's only enough for 160 pairs of Flyknit shoes and at that rate, 1000 machines would be required to produce 160,000 pairs per week.

Given the buzz Nike have created around Flyknit and the link with the London games, 160,000 pairs sounds like small numbers.

We have heard about one supplier of running shoes to Nike that has invested in 80 Stoll machines to produce Flyknit uppers – which would give around 12,800 pairs per week based on our production assumptions above.

Still sounds like relatively small numbers – so what about scaling up production?

And adidas has just released its adizero Primeknit show which looks very similar to Flyknit (see link below) – where are all the uppers going to be made and by whom?

More to follow shortly..

Further reading

Adidas unveils adizero Primeknit running shoe

Nike Flyknit: A seamlessly knitted running shoe!

Nike Flyknit: Quantum leap for flat knitting

Author: Billy Hunter

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1 All

Ravi
28th September 2012 19:27PM

Why not Shima also develop a machine like this.... Amazing????

citra sps
2nd August 2012 15:48PM

the bast machine do do this is raschel double needle bar jacquard

Display Name
1st August 2012 12:53PM

perhaps Shima Seiki machines were just not good enouhg to produce such kind of goods. Stoll is the leader

Tilak Dias @ NTU
1st August 2012 12:34PM

Very interesting analysis, and I would like to congratulate the editor. With my very limited knowledge on this type of knitting I think one would need a computerised flat-bed knitting machine with sinkers and a good take-down system to produce the flyknit upper.

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Nijaz
31st July 2012 16:37PM

Hey what about shima seiki? They are the best flat knittting machines in thworld. They have wholegarment technology and this is ideal for seamless knitting. Has nike chosen the wrong machine or what?

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EXHIBIT 1027

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Paper 50
Date: January 13, 2014

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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adidas AG
Petitioner

v.

NIKE, Inc.
Patent Owner

Case IPR2013-00067
Patent 7,347,011 B2

Before JOSIAH C. COCKS, MICHAEL J. FITZPATRICK, and JAMES B. ARPIN, *Administrative Patent Judges.*

ARPIN, *Administrative Patent Judge.*

ORDER
Trial Hearing
37 C.F.R. § 42.70

On May 17, 2013, the instant *inter partes* review was instituted. Paper 18. Both parties requested a hearing pursuant to 37 C.F.R. § 42.70. Papers 47 and 48. The requests are *granted*.

Each party will have thirty (30) minutes of total time to present arguments. In an *inter partes* review, Petitioner bears the ultimate burden of proof that the challenged claims are unpatentable. In the present case, however, Patent Owner chose not to file a Patent Owner Response and, thus, waived any arguments for patentability. *See* Scheduling Order, Paper 19, 2-3. Further, in its Motion to Amend, Patent Owner moved to cancel claims 1-46. Motion to Amend, Paper 31, 1. Consequently, neither party shall present arguments regarding the patentability of claims 1-46 during the oral hearing. Therefore, with respect to Petitioner's request for oral hearing, we will not hear arguments regarding the first issue identified by Petitioner, namely,

> Whether original claims 1-46, if not canceled, are unpatentable based on the instituted rejections because Nike, Inc. ("Owner") has not defended the validity of any challenged original claim?

See Paper 48, 2.

The only remaining issues in this case relate to Patent Owner's Motion to Amend, and Patent Owner bears the burden of proof on its Motion to Amend. Patent Owner requests to argue first regarding its motion to amend (Paper 47, 2), and Petitioner does not object to this request (Paper 48). Therefore, at the hearing, Patent Owner shall present its arguments first in support of the Motion to Amend. Petitioner then may respond to Patent Owner's case as to the Motion to Amend. Patent Owner may reserve rebuttal time for its case as to the Motion to Amend.

Skechers EX1013-p. 6263
Skechers v Nike