AO 120 (Rev. 08/10)

TO:	**Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313–1450**	**REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK**

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. 1116, you are hereby advised that a court action has been filed in the U.S. District Court for the District of Oregon on the following

☐ Trademarks or ☑ Patents (☐ the patent action involves 35 U.S.C. § 292):

DOCKET NO. 3:21–cv–01780–YY	DATE FILED 12/8/2021	U.S. DISTRICT COURT District of Oregon
PLAINTIFF Nike, Inc.		DEFENDANT adidas AG, a foreign corporation

PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 7,814,598	10/19/2010	Nike
2 8,266,749	9/18/2012	Nike
3 8,898,932	12/2/2014	Nike
4 9,060,562	6/23/2015	Nike
5 9,510,636	12/6/2016	Nike

In the above–entitled case, the following patent(s)/trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 9,743,705	8/29/2017	Nike
2 9,907,350	3/18/2018	Nike
3 9,918,511	3/20/2018	Nike
4 9,924,758	3/27/2018	Nike
5		

In the above–entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT		
CLERK MARY L. MORAN	(BY) DEPUTY CLERK E. Potter	DATE 12/9/2021

Copy 1 Upon initiation of action, mail this copy to Director Copy 3 Upon termination of action, mail this copy to Director
Copy 2 Upon filing document adding patent(s), mail this copy to Director Copy 4 Case file copy

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/781,551	02/28/2013	Adrian Meir	15571/46

CONFIRMATION NO. 8567

POWER OF ATTORNEY NOTICE

133691
NIKE, Inc./BGL
P.O. Box 10395
Chicago, IL 60610

OC000000123671122

Date Mailed: 03/01/2021

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 02/22/2021.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/cnguyen/

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/781,551	02/28/2013	Adrian Meir	120188US03

CONFIRMATION NO. 8567

78342
Shook Hardy & Bacon LLP (NIKE, Inc.)
2555 Grand Boulevard
Kansas City, MO 64108

POA ACCEPTANCE LETTER

OC000000123671153

Date Mailed: 03/01/2021

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 02/22/2021.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/cnguyen/

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82A (07-13)
Approved for use through 03/31/2021. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	13/781551
Filing Date	2013-02-28
First Named Inventor	Adrian Meir
Title	Method Of Knitting A Knitted Component With An Integral Knit Tongue
Art Unit	
Examiner Name	
Attorney Docket Number	120188US03

SIGNATURE of Applicant or Patent Practitioner

Signature	/CORY W. FISHER/	Date (Optional)	
Name	Cory W. Fisher	Registration Number	59,366
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. 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 1.11 and 1.14. This collection is estimated to take 3 minutes 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.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82B (07-13)
Approved for use through 01/31/2018. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

[x] I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 78342

OR

[ ] I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

[x] The address associated with the above-mentioned Customer Number

OR

[ ] The address associated with Customer Number:

OR

[ ] Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

NIKE, Inc.

[ ] Inventor or Joint Inventor (title not required below)

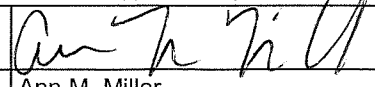
[ ] Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

[x] Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

[ ] Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature		Date (Optional)	
Name	Ann M. Miller		
Title	Secretary, NIKE, Inc.		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

[ ] Total of _____ forms are submitted.

Electronic Acknowledgement Receipt

EFS ID:	41988029
Application Number:	13781551
International Application Number:	
Confirmation Number:	8567
Title of Invention:	Method Of Knitting A Knitted Component With An Integral Knit Tongue
First Named Inventor/Applicant Name:	Adrian Meir
Customer Number:	133691
Filer:	Cory Wayne Fisher/Brandon Large
Filer Authorized By:	Cory Wayne Fisher
Attorney Docket Number:	15571/46
Receipt Date:	22-FEB-2021
Filing Date:	28-FEB-2013
Time Stamp:	17:31:23
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	120188US03.pdf	225689 2d09a5d22c34409311fe68a656d593865bd7e5a1	no	2

Warnings:

Information:	
Total Files Size (in bytes):	225689

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 9,060,562 B2
APPLICATION NO. : 13/781551
DATED : June 23, 2015
INVENTOR(S) : Adrian Meir et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the Title Page, item (72) Inventors:

"Adrain Meir" should read --Adrian Meir--

Signed and Sealed this
Eighth Day of December, 2015

Michelle K. Lee

Michelle K. Lee
Director of the United States Patent and Trademark Office

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/781,551	02/28/2013	Adrian Meir	15571/46

CONFIRMATION NO. 8567

133691
NIKE, Inc./BGL
P.O. Box 10395
Chicago, IL 60610

POA ACCEPTANCE LETTER

OC00000077356719

Date Mailed: 09/10/2015

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/02/2015.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/snguyen/

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/781,551	02/28/2013	Adrian Meir	51-3238

CONFIRMATION NO. 8567

POWER OF ATTORNEY NOTICE

57618
PLUMSEA LAW GROUP, LLC
6710 A Rockledge Drive
SUITE 400
BETHESDA, MD 20817

OC000000077356705

Date Mailed: 09/10/2015

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/02/2015.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/snguyen/

PTO/AIA/80 (07-12)
Approved for use through 11/30/2014. OMB 0651-0035
U.S. Patent and Trademark Office; U.S DEPARTMENT OF COMMERCE

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

■ Practitioners associated with Customer Number: 133691

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used).

Name	Registration Number	Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignments documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

■ The address associated with Customer Number: 133691

OR

☐

Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address: NIKE, Inc., One Bowerman Drive, Beaverton, Oregon 97005-6453

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be Filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of The practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature	Tim Crean	Date	8/11/15
Name	Timothy J. Crean	Telephone	
Title	Attorny-in-Fact, NIKE, Inc.		

Electronic Acknowledgement Receipt

EFS ID:	23372723
Application Number:	13781551
International Application Number:	
Confirmation Number:	8567
Title of Invention:	Method Of Knitting A Knitted Component With An Integral Knit Tongue
First Named Inventor/Applicant Name:	Adrian Meir
Customer Number:	57618
Filer:	Christopher J. Gerardot/Maggie Krause
Filer Authorized By:	Christopher J. Gerardot
Attorney Docket Number:	51-3238
Receipt Date:	02-SEP-2015
Filing Date:	28-FEB-2013
Time Stamp:	09:59:42
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	1557146tl.pdf	63579 cb1038b4093393b256989283409782ee89afb3dd	no	1

Warnings:	
Information:	

2	Assignee showing of ownership per 37 CFR 3.73	1557146373c.pdf	98413 f052e8cb56fe36c76cec3ce6a4688e090c73503a	no	3
Warnings:					
Information:					
3	Power of Attorney	Nike_POA.pdf	517925 4b877fcd40a6eae8b5a1449bb0e88efe2a6e2614	no	1
Warnings:					
Information:					
			Total Files Size (in bytes):	679917	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: September 2, 2015 Name: Christopher J. Gerardot, Reg. No. 73,644 Signature: /Christopher J. Gerardot/

BRINKS GILSON & LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Meir et al.		
Appln. No.:	13/781,551	Examiner:	Worrell, Jr., Larry D.
Filed:	February 28, 2013	Art Unit:	3765
For:	Method Of Knitting A Knitted Component With An Integral Knit Tongue	Conf. No.:	8567
Attorney Docket No.:	15571/46		

TRANSMITTAL

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached are:

☒ Power of Attorney (1 pg); Statement Under 37 C.F.R. §3.73(c) (3 pgs.).

Fee calculation:

☒ No additional fee is required.

☐ Per 37 CFR §1.27, ☐ Applicant is small entity ☐ Applicant is micro entity.

☐ An extension fee in an amount of $_____ for a _____-month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(_____).

☐ An additional filing fee has been calculated as shown below:

					Fee		Small Entity Fee		Micro Entity Fee	
	Claims Remaining After Amendment		Highest No. Previously Paid	Present Extra	Rate	Add'l Fee	Rate	Add'l Fee	Rate	Add'l Fee
Total		Minus			x $ 80 =	$	x $ 40 =	$	x $20 =	$
Independent		Minus			x $420 =	$	x $210 =	$	x $105 =	$
First Presentation of Multiple Dep. Claim					+ $780 =	$	+ $390 =	$	+ $195 =	$
					Total	$	Total	$	Total	$

Fee payment:

☐ Please charge Deposit Account No. 23-1925 in the amount of $_____ for _____.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).
WARNING: Information on this form may become public. **Credit card information should not be included on this form.**

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

September 2, 2015
Date

/Christopher J. Gerardot/
Christopher J. Gerardot (Reg. No. 73,644)

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office;U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of1995, no persons arerequired to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: NIKE, INC. 15571/46 (120188US03)

Application No./Patent No.: 13/781,551 Filed/Issue Date: February 28, 2013

Titled: METHOD OF KNITTING A KNITTED COMPONENT WITH AN INTEGRAL KNIT TONGUE

NIKE, INC., a Corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

A. ☑ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 030819, Frame 0063, or for which a copy thereof is attached.

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

   1. From: _____ To: _____

      The document was recorded in the United States Patent and Trademark Office at

      Reel _____, Frame _____, or for which a copy thereof is attached.

   2. From: _____ To: _____

      The document was recorded in the United States Patent and Trademark Office at

      Reel _____, Frame _____, or for which a copy thereof is attached.

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Christopher J. Gerardot/	September 2, 2015
Signature	Date
Christopher J. Gerardot	73,644
Printed or Typed Name	Title or Registration Number

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that yoube given certain informationin connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, pleasebe advised that: (1) the general authority forthe collection of thisinformation is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and(3) the principal purpose forwhich the information isused by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent applicationor patent. If you do not furnish the requested information,the U.S. Patent and Trademark Office may not be able to process and/or examineyour submission,which may result in termination of proceedings or abandonment of the applicationor expiration of the patent.

The informationprovided 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 disclosure of these records is required by the Freedom of Information Act.
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 informationin 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 InternationalApplication 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, arecord 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 inspection or an issued patent.
9. A record from thissystem 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.

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

Appln. No.	:	13/781,551	Confirmation No. 8567
Applicant	:	Adrian Meir et al.	
Filed	:	February 28, 2013	
Title	:	Method Of Knitting A Knitted Component With An Integral Knit Tongue	
TC/A.U.	:	3765	
Examiner	:	Larry D. Worrell, Jr.	
Attorney Docket No.:		51-3238	
Customer No.	:	57618	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR CERTIFICATE OF CORRECTION UNDER 37 C.F.R. § 1.322

Sir:

Attached is a Certificate of Correction, Form PTO/SB/44. This Request is filed to correct an error in the spelling of an inventor's name in field (72) of the title page of U.S. Patent No. 9,060,562. A Declaration indicating the correct spelling of the inventor's name (Adrian Meir) was filed on July 17, 2013. A copy of an Updated Official Filing Receipt mailed on June 12, 2013, reflecting the correct spelling of the inventor's name also is attached. Patentees request that the title page be reprinted with the correction. Because this Request only corrects an error made by the U.S. Patent & Trademark Office, no fee is required.

Please send the Certificate of Correction to Patentees' attorneys, Plumsea Law Group, LLC, 6710A Rockledge Drive, Suite 400, Bethesda, MD 20817.

Respectfully submitted,

PLUMSEA LAW GROUP, LLC

Date: August 21, 2015 By: /Eric M. Gibson/

Eric M. Gibson
Registration Number: 59,058
Telephone number: 301-365-9040

PTO/SB/44 (09-07)
Approved for use through 08/31/2013. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 9,060,562

APPLICATION NO.: 13/781,551

ISSUE DATE : June 23, 2015

INVENTOR(S) : Adrian Meir, et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the Title Page, item (72) Inventors:

"Adrain Meir" should read --Adrian Meir--

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Plumsea Law Group, LLC
6710A Rockledge Drive, Suite 400
Bethesda, MD 20817

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 disclosure of these records is required by the Freedom of Information Act.
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 inspection 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.

PTO/AIA/01 (06-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	Method Of Knitting A Knitted Component With An Integral Knit Tongue

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

■ United States application or PCT international application number 13/781,551 filed on February 28, 2013.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Adrian Meir Date (Optional): 06/14/13

Signature: Adrian Meir

Note: An application data sheet (PTO/AIA/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/SB/AIA01 form for each additional inventor.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/781,551 ✓	02/28/2013 ✓	3765	1980	51-3238 ✓	23	3

CONFIRMATION NO. 8567 ✓

UPDATED FILING RECEIPT

57618
PLUMSEA LAW GROUP, LLC
10411 MOTOR CITY DRIVE
SUITE 320
BETHESDA, MD 20817

DOCKETED
DOR SDR KS
JUN 17 2013
UPDATED OFR/GW/
Confirm #

RECEIVED
JUN 14 2013

Date Mailed: 06/12/2013

PLUMSEA LAW GROUP

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Adrian Meir, Portland, OR; ✓
Daniel A. Podhajny, Beaverton, OR; ✓
Daren P. Tatler, Hillsboro, OR; ✓

Applicant(s)

Nike, Inc., Beaverton, OR ✓

Assignment For Published Patent Application

Nike, Inc., Beaverton, OR

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CIP of 13/400,511 02/20/2012 PAT 8448474

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 03/25/2013
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/781,551**
Projected Publication Date: 09/19/2013

Non-Publication Request: No

Early Publication Request: No

Title

Method Of Knitting A Knitted Component With An Integral Knit Tongue

Preliminary Class

066

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

Electronic Acknowledgement Receipt

EFS ID:	23273728
Application Number:	13781551
International Application Number:	
Confirmation Number:	8567
Title of Invention:	Method Of Knitting A Knitted Component With An Integral Knit Tongue
First Named Inventor/Applicant Name:	Adrian Meir
Customer Number:	57618
Filer:	Eric M. Gibson/Jose Espejo
Filer Authorized By:	Eric M. Gibson
Attorney Docket Number:	51-3238
Receipt Date:	21-AUG-2015
Filing Date:	28-FEB-2013
Time Stamp:	11:19:59
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Certificate of Correction	2015-08-21_51-3238_Request_Cert_Correction.pdf	396657 2bb5d25427e5b357f6c3989849bf59014d551a2f	no	8

Warnings:	
Information:	

Total Files Size (in bytes):	396657

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/781,551	06/23/2015	9060562	51-3238	8567

57618 7590 06/03/2015

PLUMSEA LAW GROUP, LLC
6710 A Rockledge Drive
SUITE 400
BETHESDA, MD 20817

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 141 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Adrian Meir, Portland, OR;
Daniel A. Podhajny, Beaverton, OR;
Daren P. Tatler, Hillsboro, OR;
NIKE, INC., Beaverton, OR

Receipt date: 05/09/2013	Application Number	13781551	13781551 - GAU: 3765
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-02-28	
	First Named Inventor	Meir	
	Art Unit	3765	
	Examiner Name	TBD	
	Attorney Docket Number	51-3238	

	20	3972086		1976-08-03	Belli	
	21	4027402		1977-06-07	Liu	
	22	4031586		1977-06-28	Von den Benken	
	23	4211806	A	1980-07-08	Civardi	
	24	4255949	A	1981-03-17	Thorneburg	
	25	4317292	A	1982-03-02	Melton	
	26	4373361	A	1983-02-15	Thorneburg	
	27	4447967	A	1984-05-15	Zaino	
	28	4465448		1984-08-14	Aldridge	
	29	4499741	A	1985-02-19	Harris	
	30	4607439	A	1986-08-26	Sogabe et al. ~~Harada~~	

Change(s) applied to document
/A.E.M./
4/10/2015

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.W./

Receipt date: 09/30/2013	Application Number	13781551	13781551 - GAU: 3765
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-02-28	
	First Named Inventor	Adrian Meir	
	Art Unit	3765	
	Examiner Name	Larry D. Worrell Jr.	
	Attorney Docket Number	51-3238	

	9	6333105		2001-12-25	Tanaka et al.	
	10	3583081		1974-06-08	Hayashi	
Change(s) applied to document. /A.E.M./ 4/10/2015	11	4447967		1984-05-15	Zaino ~~Montara~~	
	12	4813158		1989-03-21	Brown	
	13	4756098		1988-07-12	Boggia	
	14	5345638		1994-09-13	Nishida	
	15	4785558		1988-11-22	Shiomura	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20020148258		2002-10-17	Cole et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.W./

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

57618 7590 02/26/2015
PLUMSEA LAW GROUP, LLC
6710 A Rockledge Drive
SUITE 400
BETHESDA, MD 20817

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/781,551	02/28/2013	Adrian Meir	51-3238	8567

TITLE OF INVENTION: Method Of Knitting A Knitted Component With An Integral Knit Tongue

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	05/26/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
WORRELL JR, LARRY D	3765	066-177000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 Plumsea Law Group, LLC
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: NIKE, Inc.

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Beaverton, Oregon

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☒ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
☐ A check is enclosed.
☒ Payment by credit card. Via EFS-WEB $960.00.
☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 502846 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
☐ Applicant certifying micro entity status. See 37 CFR 1.29
NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
☐ Applicant asserting small entity status. See 37 CFR 1.27
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
☐ Applicant changing to regular undiscounted fee status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature  Date May 13, 2015

Typed or printed name Eric M. Gibson Registration No. 59,058

PTOL-85 Part B (10-13) Approved for use through 10/31/2013 OMB 0651-0033 U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Electronic Patent Application Fee Transmittal

Application Number:	13781551
Filing Date:	28-Feb-2013
Title of Invention:	Method Of Knitting A Knitted Component With An Integral Knit Tongue
First Named Inventor/Applicant Name:	Adrian Meir
Filer:	Eric M. Gibson/Jose Espejo
Attorney Docket Number:	51-3238

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Utility Appl Issue Fee	1501	1	960	960
Publ. Fee- Early, Voluntary, or Normal	1504	1	0	0
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**960**

Electronic Acknowledgement Receipt

EFS ID:	22331653
Application Number:	13781551
International Application Number:	
Confirmation Number:	8567
Title of Invention:	Method Of Knitting A Knitted Component With An Integral Knit Tongue
First Named Inventor/Applicant Name:	Adrian Meir
Customer Number:	57618
Filer:	Eric M. Gibson/Jose Espejo
Filer Authorized By:	Eric M. Gibson
Attorney Docket Number:	51-3238
Receipt Date:	13-MAY-2015
Filing Date:	28-FEB-2013
Time Stamp:	11:19:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$960
RAM confirmation Number	8548
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	2015-05-13_51-3238_IF_Transmittal.pdf	157338 c02ba9efec741f272d1cc535d641f4e02081de29	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32298 1374465b46e4119bb9ba42d38adf4155d3e92c24	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	189636		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/781,551	02/28/2013	Adrian Meir	51-3238	8567

57618 7590 04/08/2015

PLUMSEA LAW GROUP, LLC
6710 A Rockledge Drive
SUITE 400
BETHESDA, MD 20817

EXAMINER	
WORRELL JR, LARRY D	

ART UNIT	PAPER NUMBER
3765	

MAIL DATE	DELIVERY MODE
04/08/2015	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Office
Address : COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
13/781,551	28 February, 2013	MEIR ET AL.	51-3238

PLUMSEA LAW GROUP, LLC
6710 A Rockledge Drive
SUITE 400
BETHESDA, MD 20817

EXAMINER	
Danny Worrell	
ART UNIT	PAPER
3765	20150404

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner for Patents

Attached hereto is a signed and initialed copy of the IDS filed 7/7/14.

/Danny Worrell/
Primary Examiner, Art Unit 3765

PTO-90C (Rev.04-03)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(**Not for submission under 37 CFR 1.99)**

Application Number	13781551
Filing Date	2013-02-28
First Named Inventor	Adrian Meir
Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3238

U.S.PATENTS

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					

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050193592		2005-09-08	Dua et al.	
	2	20050115284		2005-06-02	Dua	
	3	20040118018		2004-06-24	Dua	

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2013126313	WO		2013-08-29	NIKE INTERNATIONAL LTD		☐

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.W./

Receipt date: 07/07/2014	Application Number	13781551	13781551 - GAU: 3765
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-02-28	
	First Named Inventor	Adrian Meir	
	Art Unit	3765	
	Examiner Name	Larry D. Worrell Jr.	
	Attorney Docket Number	51-3238	

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	International Search Report and Written Opinion mailed June 20, 2014 in International Application Number PCT/US2014/018852.	☐

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature	/Danny Worrell/ (04/04/2015)	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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.W./

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

57618 7590 02/26/2015

PLUMSEA LAW GROUP, LLC
6710 A Rockledge Drive
SUITE 400
BETHESDA, MD 20817

EXAMINER
WORRELL JR, LARRY D

ART UNIT	PAPER NUMBER
3765	

DATE MAILED: 02/26/2015

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/781,551	02/28/2013	Adrian Meir	51-3238	8567

TITLE OF INVENTION: Method Of Knitting A Knitted Component With An Integral Knit Tongue

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	05/26/2015

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

57618 7590 02/26/2015
PLUMSEA LAW GROUP, LLC
6710 A Rockledge Drive
SUITE 400
BETHESDA, MD 20817

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/781,551	02/28/2013	Adrian Meir	51-3238	8567

TITLE OF INVENTION: Method Of Knitting A Knitted Component With An Integral Knit Tongue

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	05/26/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
WORRELL JR, LARRY D	3765	066-177000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/781,551	02/28/2013	Adrian Meir	51-3238	8567

57618 7590 02/26/2015

PLUMSEA LAW GROUP, LLC
6710 A Rockledge Drive
SUITE 400
BETHESDA, MD 20817

EXAMINER	
WORRELL JR, LARRY D	

ART UNIT	PAPER NUMBER
3765	

DATE MAILED: 02/26/2015

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. 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 12 minutes 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, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

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 disclosure of these records is required by the Freedom of Information Act.
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 inspection 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.

Notice of Allowability	Application No. 13/781,551	Applicant(s) MEIR ET AL.	
	Examiner DANNY WORRELL	Art Unit 3765	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *amendment filed 12/15/14*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-23*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 12/2/14
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/DANNY WORRELL/
Primary Examiner, Art Unit 3765

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13781551	MEIR ET AL.
	Examiner	**Art Unit**
	LARRY WORRELL JR	3765

CPC							
Symbol						**Type**	**Version**
A43B		1	/	04		F	2013-01-01
D04B		1	/	24		I	2013-01-01
A43B		23	/	0245		I	2013-01-01
A43B		23	/	0265		I	2013-01-01
A43B		23	/	26		I	2013-01-01
D04B		1	/	22		I	2013-01-01
D04B		15	/	56		I	2013-01-01
D10B		2403	/	02411		A	2013-01-01
D10B		2403	/	032		A	2013-01-01
D10B		2501	/	043		A	2013-01-01
A43B		23	/	0205		I	2013-01-01
D04B		7	/	28		I	2013-01-01
D10B		2403	/	0113		A	2013-01-01
			/				
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CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	23	
/DANNY WORRELL/ Primary Examiner.Art Unit 3765	02/23/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	9, 24

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13781551	MEIR ET AL.
	Examiner	**Art Unit**
	LARRY WORRELL JR	3765

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
66	177	D	0	4	B	7 / 30 (2006.01.01)						

CROSS REFERENCE(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	23	
/DANNY WORRELL/ Primary Examiner.Art Unit 3765	02/23/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	9, 24

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13781551	MEIR ET AL.
	Examiner	**Art Unit**
	LARRY WORRELL JR	3765

☒ **Claims renumbered in the same order as presented by applicant** ☐ **CPA** ☐ **T.D.** ☐ **R.1.47**

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	23	
/DANNY WORRELL/ Primary Examiner.Art Unit 3765	02/23/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	9, 24

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(**Not for submission under 37 CFR 1.99)**

Application Number	13781551
Filing Date	2013-02-28
First Named Inventor	Adrian Meir
Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3238

U.S.PATENTS

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	6321574		2001-11-27	Marker et al.	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2005160697	JP		2005-06-23	ASICS CORP		☐
	2	1782156	CN		2006-06-07	NIPPON MAYER LTD		☐
	3	102271548	CN		2011-12-07	NIKE INTERNATIONAL LTD		☐

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.W./

Receipt date: 12/02/2014	Application Number	13781551	13781551 - GAU: 3765
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-02-28	
	First Named Inventor	Adrian Meir	
	Art Unit	3765	
	Examiner Name	Larry D. Worrell Jr.	
	Attorney Docket Number	51-3238	

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Taiwanese Office Action dated November 14, 2014 in Taiwanese Patent Application Number 102105769.	☐

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature	/Danny Worrell/ (02/23/2015)	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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.W./

UNITED STATES PATENT AND TRADEMARK OFFICE

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BIB DATA SHEET

CONFIRMATION NO. 8567

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/781,551	02/28/2013	066	3765	51-3238

APPLICANTS

NIKE, INC., Beaverton, OR

INVENTORS

Adrian Meir, Portland, OR;
Daniel A. Podhajny, Beaverton, OR;
Daren P. Tatler, Hillsboro, OR;

**** CONTINUING DATA ***************************

This application is a CIP of 13/400,511 02/20/2012 PAT 8448474

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

03/25/2013

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /LARRY D WORRELL JR/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		OR	28	23	3

ADDRESS

PLUMSEA LAW GROUP, LLC
6710 A Rockledge Drive
SUITE 400
BETHESDA, MD 20817
UNITED STATES

TITLE

Method Of Knitting A Knitted Component With An Integral Knit Tongue

FILING FEE RECEIVED		
1980	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13781551	MEIR ET AL.
	Examiner	Art Unit
	LARRY WORRELL JR	3765

CPC- SEARCHED		
Symbol	Date	Examiner
D04B 1/24	2/23/2015	/dw/
A43B 1/04, 23/0245, 23/26	2/23/2015	/dw/
D10B 2401/043, 2403/032	2/23/2015	/dw/

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
66	169R, 170, 171, 177	9/12/2014	/dw/
2	3R, 3A, 84, 114, 47	9/12/2014	/dw/
	update search	2/23/2015	/dw/

SEARCH NOTES		
Search Notes	Date	Examiner
Review related applications	9/12/2014	/dw/
inventor search	9/12/2014	/dw/

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	PGPUBS search	2/23/2015	/dw/

	/L.W./ Primary Examiner.Art Unit 3765

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

Appln. No.	:	13/781,551	Confirmation No. 8567
Applicant	:	Adrian Meir	
Filed	:	2/28/2013	
Title	:	Method Of Knitting A Knitted Component With An Integral Knit Tongue	
TC/A.U.	:	3765	
Examiner	:	Larry D. Worrell, Jr.	
Attorney Docket No.:		51-3238	
Customer No.	:	57618	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT

In response to the Office Action of September 16, 2014 please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 12 of this paper.

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A method of manufacturing a knitted component for an article of footwear, the method comprising:

knitting a portion of the knitted component defining an upper with a knitting machine, the upper including a portion of at least one of an exterior surface of the knitted component and an opposite interior surface of the knitted component; and

knitting an integral knit tongue that is of unitary knit construction with the upper with the knitting machine, the integral knit tongue extending through a throat area of the knitted component; and

wherein the integral knit tongue is joined by knitting with the knitting machine to: (1) a forward portion of the throat area, and (2) at least along a portion of both of a lateral side and a medial side of the throat area of the knitted component extending through a portion of a length of the throat area in a longitudinal direction from the forward portion to an ankle opening of the upper.

2. (original) The method recited in claim 1, further including a step of selecting the knitting machine to be a flat knitting machine.

3. (original) The method recited in claim 1, wherein the step of knitting the integral knit tongue includes forming a course of the integral knit tongue to include at least one common yarn with the upper.

4. (original) The method recited in claim 1, wherein the step of joining the integral knit tongue by knitting includes forming a course with the knitting machine that joins the integral knit tongue to the upper.

5. (currently amended) The method recited in claim 1, wherein the integral knit tongue comprises a partially integral portion and a free portion, the method further comprising:

knitting the partially integral portion with the knitting machine of unitary knit construction with the upper at the forward portion of the throat area and at least along the portion of both of the lateral side and the medial side of the throat area of the knitted component extending through the portion of the length of the throat area in the longitudinal direction; and

knitting the free portion with the knitting machines of unitary knit construction with the partially integral portion at a rearward portion of the integral knit tongue and remaining unattached to the remaining portions of the knitted component.

6. (original) The method recited in claim 5, wherein the step of knitting the free portion further comprises:

knitting the free portion of the integral knit tongue with the knitting machine;

holding the free portion on needles of the knitting machine;

knitting a first portion of the upper with the knitting machine while the free portion is held on the needles, the first portion of the upper including at least the rearward portion of the integral knit tongue;

joining the free portion to the integral knit tongue at the rearward portion; and

knitting a second portion of the upper with the knitting machine.

7. (original) The method recited in claim 6, wherein the step of knitting the first portion further comprises holding the free portion stationary with respect to a needle bed of the knitting machine during knitting of the first portion of the upper, and the first portion of the upper moving with respect to the free portion during knitting of the first portion of the upper;

wherein the step of joining the free portion includes forming a course with the knitting machine that joins the free portion to the integral knit tongue; and

wherein the step of knitting the second portion further comprises moving the free portion and the upper together during knitting of the second portion of the upper.

8. (currently amended) A method of manufacturing a knitted component for an article of footwear, the method comprising:

knitting a first portion of the knitted component defining an upper with a first feeder of a knitting machine, the upper including a portion of at least one of an exterior surface of the knitted component and an opposite interior surface of the knitted component;

knitting a second portion of the knitted component defining the upper with a second feeder of the knitting machine; and

knitting an integral knit tongue that is of unitary knit construction with the upper with at least one of the first feeder and the second feeder of the knitting machine, the integral knit tongue extending through a throat area of the knitted component; and

wherein the integral knit tongue is joined by knitting with the knitting machine to: (1) a forward portion of the throat area, and (2) at least along a portion of both of a lateral side and a medial side of the throat area of the knitted component extending through a portion of a length of the throat area in a longitudinal direction from the forward portion to an ankle opening of the upper.

9. (original) The method recited in claim 8, wherein the step of knitting the first portion further comprises:

knitting the exterior surface of the first portion of the upper with the first feeder;

knitting the opposite interior surface of the first portion of the upper with the first feeder; and

knitting at least a portion of the integral knit tongue with the first feeder.

10. (original) The method recited in claim 9, wherein the step of knitting the second portion further comprises:

knitting the exterior surface of the first portion of the upper with the second feeder;

knitting the opposite interior surface of the second portion of the upper with the second feeder; and

knitting at least a portion of the integral knit tongue with the second feeder.

11. (original) The method recited in claim 8, wherein the first portion of the upper is one of a medial side and a lateral side of the knitted component.

12. (original) The method recited in claim 8, wherein the step of knitting the integral knit tongue includes forming a course of the integral knit tongue to include at least one common yarn with the upper.

13. (original) The method recited in claim 12, further comprising forming at least one course of the first portion of the upper or the second portion of the upper with the knitting machine that is substantially continuous with at least one course of the integral knit tongue at the forward portion of the throat area of the upper.

14. (original) The method recited in claim 12, further comprising:

forming at least one course of the first portion of the upper that is substantially continuous with at least one course of the integral knit tongue along the lateral side of the throat area of the upper; and

forming at least one course of the second portion of the upper that is substantially continuous with at least one course of the integral knit tongue along the medial side of the throat area of the upper.

15. (original) The method recited in claim 8, wherein the integral knit tongue comprises a partially integral portion and a free portion, the method further comprising:

knitting the free portion of the integral knit tongue with at least one feeder of the knitting machine;

holding the free portion on needles of the knitting machine;

knitting the first portion of the upper with the first feeder of the knitting machine and knitting the second portion of the upper with the second feeder while the free portion is held on the needles, the first portion of the upper and the second portion of the upper including at least a rearward portion of the integral knit tongue;

joining the free portion to the integral knit tongue at the rearward portion; and

resuming knitting the first portion of the upper with the first feeder of the knitting machine and resuming knitting the second portion of the upper with the second feeder of the knitting machine.

16. (currently amended) A method of manufacturing a knitted component for an article of footwear, the method comprising:

knitting a first portion of the knitted component defining an upper with a first feeder of a knitting machine, the upper including a portion of at least one of an exterior surface of the knitted component and an opposite interior surface of the knitted component;

knitting a second portion of the knitted component defining the upper with a second feeder of the knitting machine; and

knitting an integral knit tongue that is of unitary knit construction with the upper with a third feeder of the knitting machine, the integral knit tongue extending through a throat area of the knitted component; and

wherein the integral knit tongue is joined by knitting with the knitting machine to: (1) a forward portion of the throat area, and (2) at least along a portion of both of a lateral side and a medial side of the throat area of the knitted component extending through a portion of a length of the throat area in a longitudinal direction from the forward portion to an ankle opening of the upper.

17. (original) The method recited in claim 16, wherein the upper comprises a first type of yarn; and

wherein the integral knit tongue comprises a second type of yarn, the second type of yarn being different from the first type of yarn.

18. (original) The method recited in claim 17, wherein the second type of yarn is an elastic yarn.

19. (original) The method recited in claim 16, wherein the step of knitting the integral knit tongue includes forming a course of the integral knit tongue to include at least one common yarn with the upper.

20. (original) The method recited in claim 19, further comprising forming at least one course of the first portion of the upper or the second portion of the upper with the knitting machine that is substantially continuous with at least one course of the integral knit tongue at the forward portion of the throat area of the upper.

21. (original) The method recited in claim 19, further comprising:

forming at least one course of the first portion of the upper that is substantially continuous with at least one course of the integral knit tongue along the lateral side of the throat area of the upper; and

forming at least one course of the second portion of the upper that is substantially continuous with at least one course of the integral knit tongue along the medial side of the throat area of the upper.

22. (original) The method recited in claim 16, wherein the step of knitting the first portion further comprises:

knitting the exterior surface of the first portion of the upper with the first feeder; and

knitting the opposite interior surface of the first portion of the upper with the first feeder.

23. (original) The method recited in claim 22, wherein the step of knitting the second portion further comprises:

knitting the exterior surface of the first portion of the upper with the second feeder;

knitting the opposite interior surface of the second portion of the upper with the second feeder.

REMARKS

This Amendment is submitted in response to the Office Action mailed on September 16, 2014. Claims 1, 5, 8, and 16 have been amended. Upon entry of this Amendment, claims 1-23 will be pending in this application. No new matter has been added.

Response to Double Patenting Rejections

Claims 1-23 are rejected under 35 U.S.C. § 101 for statutory double patenting over claims 1-23 of commonly-owned and co-pending U.S. Serial No. 14/273,683.

Independent claims 1, 8, and 16 have been amended in the present application, and independent claim 1 will be amended in a different manner in co-pending U.S. Serial No. 14/273,683 upon filing of an amendment in that application. Accordingly, upon entry of both Amendments, the claims in the current application and the claims in co-pending U.S. Serial No. 14/273,683 will no longer be identical.

Thus, Applicant respectfully submits that the statutory double-patenting rejection has been overcome.

Response to Claim Rejections

Claims 1-4 are rejected under 35 U.S.C. § 102(b) as being anticipated by Dua et al. (US 2008/0110048).

Independent claim 1 has been amended to clarify the invention. In particular, independent claim 1 has been amended to more clearly recite the features of the integral tongue and the method of being joined to the throat area. Specifically, as amended, claim 1 now recites that the integral

knit tongue is joined by knitting to: (1) a forward portion of the throat area, and (2) at least along a portion of ***both of a lateral side and a medial side*** of the throat area of the knitted component ***extending through a portion of a length of the throat area in a longitudinal direction from the forward portion to an ankle opening of the upper***. (emphasis added)

This feature of Applicant's claimed invention may be seen at least in reference to one or more of FIGS. 5 through 15. For example, with reference to FIGS. 8 and 9, integral knit tongue can be seen as being joined ***by knitting*** at the forward portion of throat area 820, as well as along each of the medial and lateral sides extending along a length of the throat area and towards the collar and ankle opening.

Dua '048 does not disclose this configuration of the integral knit tongue of amended independent claim 1. Figures 8B and 8C show a central textile element 60 that is "stitched" to each of lateral textile element 40 and medial textile element 50. See paragraph [51] of Dua '048. Thus, Dua '048 fails to disclose the recited method that includes joining by knitting as recited in amended independent claim 1.

Therefore, as amended, independent claim 1 is not anticipated by Dua '048. Because claims 2-7 depend from and include all of the limitations of independent claim 1, claims 2-7 are also believed to be patentable over Dua '048.

Conclusion

In view of the foregoing, all of the pending claims in this application are believed to be in condition for allowance. No fee is believed due. Should the Examiner have any questions or determine that any further

action is desirable to place this application in even better condition for allowance, the Examiner is encouraged to contact the Applicant's representative at the number listed below.

Since this Amendment is being filed within the three-month shortened statutory period for response, which expires on December 16, 2014, no extension of time or other fees are believed to be due, except as detailed in the attached documents or herein. However, any extension of time necessary to prevent abandonment is hereby requested, and any fee necessary for consideration of this response is hereby authorized to be charged to Deposit Account Number 502846.

Respectfully submitted,

PLUMSEA LAW GROUP, LLC

Date: December 15, 2014 By: /Eric M. Gibson/

Eric M. Gibson
Registration Number: 59,058
Telephone number: 301-365-9040

Electronic Acknowledgement Receipt

EFS ID:	20957911
Application Number:	13781551
International Application Number:	
Confirmation Number:	8567
Title of Invention:	Method Of Knitting A Knitted Component With An Integral Knit Tongue
First Named Inventor/Applicant Name:	Adrian Meir
Customer Number:	57618
Filer:	Eric M. Gibson/Jose Espejo
Filer Authorized By:	Eric M. Gibson
Attorney Docket Number:	51-3238
Receipt Date:	15-DEC-2014
Filing Date:	28-FEB-2013
Time Stamp:	11:44:26
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Arguments/Remarks Made in an Amendment	2014-12-15_51-3238_Amendment.pdf	108623 d7ed520bc76eb14ac50eeda460564aff619c29a0	no	14

Warnings:	
Information:	

Total Files Size (in bytes):	108623

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/781,551	Filing Date 02/28/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)		
AMENDMENT	12/15/2014	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 23	Minus	** 23	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)		
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/SULONDA D. STEVENSON/

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13781551
Filing Date	2013-02-28
First Named Inventor	Adrian Meir
Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3238

U.S.PATENTS

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	6321574		2001-11-27	Marker et al.	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2005160697	JP		2005-06-23	ASICS CORP		☐
	2	1782156	CN		2006-06-07	NIPPON MAYER LTD		☐
	3	102271548	CN		2011-12-07	NIKE INTERNATIONAL LTD		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	13781551
	Filing Date	2013-02-28
	First Named Inventor	Adrian Meir
	Art Unit	3765
	Examiner Name	Larry D. Worrell Jr.
	Attorney Docket Number	51-3238

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Taiwanese Office Action dated November 14, 2014 in Taiwanese Patent Application Number 102105769.	☐

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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	/Eric M. Gibson/	Date (YYYY-MM-DD)	2014-12-02
Name/Print	Eric M. Gibson	Registration Number	59,058

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Bibliographic data: JP2005160697 (A) — 2005-06-23

SHOES FOR LONG DISTANCE RUNNING

Inventor(s): TAMURA HISAYOSHI; FUJITA HISANORI; NISHIWAKI TAKASHI; NAKABE NOBORU ± (TAMURA HISAYOSHI, ; FUJITA HISANORI, ; NISHIWAKI TAKASHI, ; NAKABE NOBORU)

Applicant(s): ASICS CORP ± (ASICS CORP)

Classification: **- international:** ***A43B23/02; A43B5/06;*** (IPC1-7): A43B23/02; A43B5/06

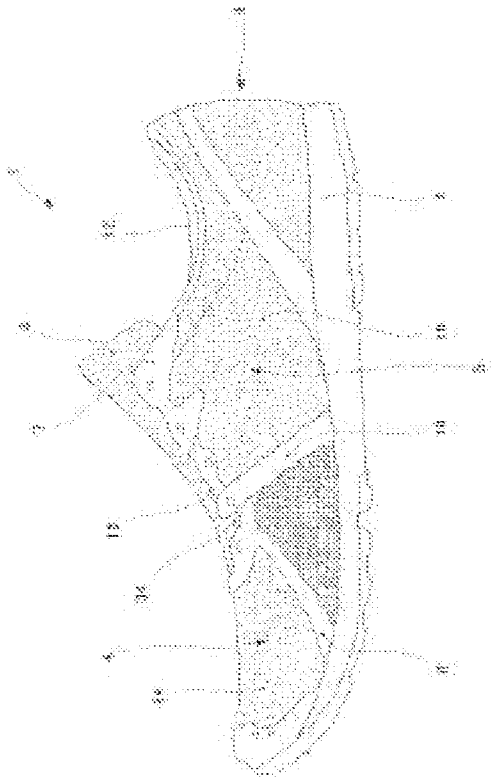
- cooperative: **A43B1/04**

Application number: JP20030403009 20031202

Priority number(s): JP20030403009 20031202

Abstract of JP2005160697 (A)

PROBLEM TO BE SOLVED: To solve the problem that the weight reduction in shoes is limited in a conventional constitution since sport shoes such as shoes for a long distance running need a light weight, permeability and constitution of bearing traveling of the long distance. ;SOLUTION: The upper 3 of the shoe for the long distance running is formed of a mesh cloth consisting of a Russell knit. An outer reinforcing material and an inner reinforcing material are provided at a part where a fifth metatarsophalangeal joint makes contact with a first metatarsophalangeal joint. A plurality of vent holes are provided through the outer reinforcing material and the inner reinforcing material. ;COPYRIGHT: (C)2005,JPO&NCIPI



(19)日本国特許庁(JP)　(12)公開特許公報(A)　(11)特許出願公開番号
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(43)公開日　平成17年6月23日(2005.6.23)

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審査請求 有　請求項の数 8　OL　（全 10 頁）

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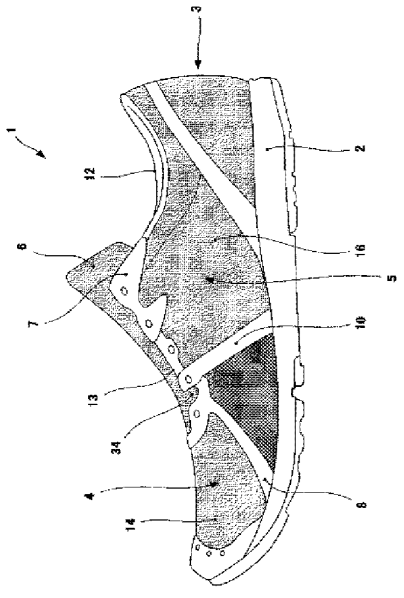
最終頁に続く

(54)【発明の名称】長距離用シューズ

(57)【要約】
【課題】　長距離用シューズのような運動靴においては、軽量で通気性がよく、長距離の走行に耐えうる構成が必要となってくるため、従来のような構成では軽量化に限界がある。
【解決手段】　甲被３をラッセル編からなるメッシュ生地で形成し、第５中足趾節関節及び第１中足趾節関節とが接する部分に外補強材及び内補強材を設け、この外補強材及び内補強材に複数の通気孔を設ける。
【選択図】　図１（ａ）



【特許請求の範囲】
【請求項1】
靴底と甲被とを有し、該甲被は前甲被部と後甲被部と舌片とを有し、該前甲被部に前方開口部を形成し、該後甲被部に後方開口部を形成した長距離用シューズにおいて、
該前甲被部と該後甲被部と該舌片の生地をラッセル編からなるメッシュ生地で形成し、
該前甲被部の外側甲部において、足の第５中足趾節関節相当部に接する部分と、該前甲被部の内側甲部において、足の第１中足趾節関節相当部に接する部分とに外補強材及び内補強材を設け、
該外補強材及び該内補強材に複数の孔を形成したことを特徴とする長距離用シューズ。
【請求項2】
前記外補強材及び前記内補強材の装着部を除く前記甲被の内側に内装を設けていない請求項１に記載の長距離用シューズ。
【請求項3】
前記甲被における、前記内外補強材、爪先補強材、及び踵補強材の各装着部、並びに前方及び後方開口部の周縁部を除く領域をラッセル編からなるメッシュ生地のみで形成したことを特徴とする請求項１乃至２のいずれか一の項に記載の長距離用シューズ。
【請求項4】
前記後甲被部の通気性を前記前甲被部の通気性より良くした請求項１乃至３のいずれか一の項に記載の長距離用シューズ。
【請求項5】
前記前甲被部のラッセル編からなるメッシュ生地の強度を前記後甲被部のラッセル編からなるメッシュ生地の強度より強くした請求項１乃至４のいずれか一の項に記載の長距離用シューズ。
【請求項6】
前記前甲被部の外側甲部における、前記前方開口部から後下方向に向って略Ｕ字形状に外切欠を形成し、前記後甲被部の内側甲片における、前記前方開口部から後下方向に向って略Ｕ字形状に内切欠を形成した請求項１乃至５のいずれか一の項に記載の長距離用シューズ。
【請求項7】
前記外切欠を前記内切欠より前側に形成した請求項６に記載の長距離用シューズ。
【請求項8】
前記外補強部材は第１外補強部と第２外補強部とで囲まれた領域内に形成され、前記内補強部材は第１内補強及び第２内補強部で囲まれた領域内に形成されるとともに、前記外補強部材及び前記内補強部材は、末広がり状の略三角形に形成された請求項１に記載の長距離用シューズ。

【発明の詳細な説明】
【技術分野】
【0001】

本願発明は軽量で通気性がよく、耐久性のある長距離用シューズに関する。

【背景技術】

【0002】

従来より運動靴の構成は、大きくアッパー部とソール部とで構成され、アッパー部は前甲被と、後甲被とから構成されており、アッパー部には通常内装（例えば、フィット感を必要とする場合はスポンジのようなクッション性を有する）を有する構成になっている。ここで、従来より運動靴には足の発汗などによる不快感が問題となっていたため、様々な対策が行われてきた。例えば、足の発汗による不快感を、アッパー部に穴を開けて通気性をよくしたものや、内装以外のアッパー部の全て、または一部をメッシュ布を用いて通気性をよくしたものが考案されていた。（例えば、特許文献１、２参照。）

【特許文献1】実用新案第２６００８８５号公報

【特許文献2】実開昭５５－１５７４０３

【発明の開示】

【発明が解決しようとする課題】

【0003】

しかしながら、長距離用シューズのような運動靴においては、出来る限り足への負担を軽減させるために、軽量で、且つマメの発生を防止するために通気性が良く、長距離の走行に耐え得る構成が必要である。殊にマラソン競技のように、４２、１９５ｋｍの距離を走行する場合には、軽量性、通気性、耐久性、更には足とのフィット性、の全ての要素が求められる。したがって、前述したように、これら長距離用の靴の甲被には、軽量性、通気性に優れたメッシュ生地等で構成されたものがあるが、メッシュ生地の伸縮性が強過ぎるため、靴の保形性を維持できない場合があり、これを抑制し補強するために、靴の内面の略全体、或は適宜箇所に裏地、補強部材等を内装していたが、いずれも長距離用のシューズとしては決して満足し得るものではなかった。

【0004】

即ち理想とする長距離用シューズとしては、最も負荷がかかり易く、足の屈曲の支点となる部分で、且つ着地時に左右の横ブレを阻止して、ランニングフォームを維持し、エネルギーロスを最小限に止めることができる、中足趾節関節相当部のみに補強部材を重点的に施し、その他の部分をメッシュ材（ラッセル生地）が有する特性を最大限に生かせるような構成を有するシューズにある。

【0005】

本願発明は係る課題に鑑み、必要最小限の領域に補強部材を装着し、通気性は勿論、軽量性、耐久性にも満足し得る長距離用シューズを提供することを目的としている。

【課題を解決するための手段】

【0006】

上記課題を解決するため、本願発明の長距離用シューズは、靴底と甲被とを有し、該甲被は前甲被部と後甲被部と舌片とを有し、該前甲被部に前方開口部を形成し、該後甲被部に後方開口部を形成した長距離用シューズにおいて、該前甲被部と該後甲被部と該舌片の生地をラッセル編からなるメッシュ生地で形成し、該前甲被部の外側甲部において、足の第５中足趾節関節相当部に接する部分と、該前甲被部の内側甲部において、足の第１中足趾節関節相当部に接する部分とに外補強材及び内補強材を設け、該外補強材及び該内補強材に複数の孔を形成したことで、軽量で通気性が良く、耐久性に優れた靴が形成される。

【0007】

また、前記外補強材及び前記内補強材の装着部を除く前記甲被の内側に内装を設けていないことで、さらに軽量にすることができる。

【0008】

また、前記甲被における、前記内外補強材、爪先補強材、及び踵補強材の各装着部、並びに前方及び後方開口部の周縁部を除く領域をラッセル編からなるメッシュ生地のみで形成することもできる。

【0009】

また、前記後甲被部の通気性を前記前甲被部の通気性より良くしたことで、通気性必要なところを効率よく通気させることができると共に、耐久性も増すことができる。

【0010】

また、前記前甲被部のラッセル編からなるメッシュ生地の強度を前記後甲被部のラッセル編からなるメッシュ生地の強度より強くしたことで、強度が必要なところは残し、それ以外のところを軽量にすることができる。

【0011】

また、前記前甲被部の外側甲部における、前記前方開口部から後下方向に向って略Ｕ字形状に外切欠を形成し、前記後甲被部の内側甲片における、前記前方開口部から後下方向に向って略Ｕ字形状に内切欠を形成したことで、前記甲被部の伸縮力による生地の変形を抑えることができる。

【0012】

また、前記外切欠を前記内切欠より前側に形成したことで、最もよく生地の変形を抑えることができる。

【0013】

また、前記外補強部材は第１外補強部と第２外補強部とで囲まれた領域内に形成され、前記内補強部材は第１内補強及び第２内補強部で囲まれた領域内に形成されるとともに、前記外補強部材及び前記内補強部材は、末広がり状の略三角形に形成することもできる。

【発明の効果】

【0014】

単に軽量で、通気性にすぐれているだけでなく、長距離用シューズをできるだけ軽量化にすると共に、必要な箇所だけに補強材を設けることで、靴の耐久性を向上させることができる。

【発明を実施するための最良の形態】

【0015】

本願発明の長距離用シューズの一実施形態を図面を参照しつつ説明する。

【0016】

図１は本願発明の長距離用シューズ左足側の図であり、（ａ）は左側面図、（ｂ）は右側面図、（ｃ）は平面図である。

【0017】

図１に示すように、長距離用シューズ１（以下「靴」という。）は、靴底２と、甲被３とから構成されており、靴底２と甲被３とは接着剤で貼り付けた構成になっている。靴底２は軽量であることが必要なため、合成樹脂等が主に使われている。また、甲被３は、全体に亘って軽量で、通気性のよいラッセル編からなるメッシュ生地を用いられており、足の発汗作用による水分を靴外に放出することができる。そして、この甲被３は主に３つの部分で構成されている。甲被３は、靴１の左側面の略中間位置に取付られた帯状の第２外補強部１０と、靴１の右側面の略中間位置に取付られた帯状の第２内補強部１１とを境目に、前甲被部４と、後甲被部５とに分けられる。そして、靴１の足を挿入する履口部１２の前側の前方開口部１３の前端部では、前方開口部１３を覆うための舌片６が、前甲被部４の内側より取付られている。この前甲被部４、後甲被部５、及び舌片６は、後述するようにそれぞれのラッセル編からなるメッシュ生地構造が異なっている。また、前甲被部４は靴１の内側の内側甲部１５と、靴１の外側の外側甲部１４とから形成されている。また、後甲被部５は靴１の内側の内側甲片１７と、靴１の外側の外側甲片１６とから形成されている。

【0018】

図２は足の骨格の図であり、（ａ）は側面図、（ｂ）は平面図である。

【0019】

図２に示すように、足の骨格は、指骨２０、中足骨２１を有する構成になっており、人が歩くまたは走るときは、指骨２０と中足骨２１の間の中足趾節関節２５を軸にして、中足骨２１が図２（ａ）の矢印Ａ方向に揺動することで、足を前に蹴り出すことができる。

この際、指骨２０に含まれる末節骨２２、中節骨２３、及び基節骨２４は、それぞれの趾節関節において、矢印Ａ方向にほとんど揺動することができないので、人が足を蹴り出す場合、足は中足趾節関節２５の近傍の変位が最も大きくなる。このことから、人が靴１を履いて歩くまたは走る状態においては、中足趾節関節２５の近傍である第１外補強部８から第２外補強部１０に至る範囲、及び第１内補強部９から第２内補強部１０に至る範囲（図１参照）が靴１に対して最も負荷が掛かる部分となる。

【0020】

図３は左足の斜視図である。

【0021】

図３に示すように、土踏まず近傍から足の甲に亘る帯状の土踏まず帯部２６、及び小指球近傍から足の甲に亘る帯状の小球帯部２７では、歩くまたは走る場合、土踏まず帯部２６と小球帯部２７とを境界に、蹴り上げる後足と着地する前足とでは、挙動が大きく異なる。よって、靴１を履いた状態で歩くまたは走ると、靴１の土踏まず帯部２６が当たる部分、及び靴１の小球帯部２７が当たる部分では、靴１に掛かる伸縮力が大きくなる。そこで、後述するように、土踏まず帯部２６及び小球帯部２７が、靴１の前部開口部１３と交差するところにそれぞれ内切欠３５及び外切欠３４（図１（ｃ）参照）を設けて、靴１の伸縮力を吸収し、靴１の耐久性を向上させることができるように構成されている。

【0022】

図４は靴１の分解図である。

【0023】

図４に示すように、靴１は主に靴底２と、前甲被部４と、後甲被部５とを有する構成になっている。前甲被部４の生地は略Ｕ字型状で形成されており、その外側甲部１４上部には伸縮力を吸収するための外切欠３４が前方開口部１３から靴１外側の後下方向に向って略Ｕ字形状に形成されている。そして、前甲被部４は第１中足趾節関節４７から第５中足趾節関節４６に至る範囲で、足の前側を覆うように形成されている。また、中足趾節関節を軸として基節骨２４と中足骨２１が揺動するので、第１中足趾節関節４７及び第５中足趾節関節４６の近傍には、末広がり状の略三角形に形成された外補強材２９及び内補強材３０が前甲被部４に取付られ、耐久性を向上させている。

【0024】

後甲被部５の生地は略帯形状で形成されており、その内側甲片１７上部には伸縮力を吸収するための内切欠３５が前方開口部１３から靴１内側の後下方向に向って略Ｕ字形状に形成されている。そして、後甲被部５は第１中足趾節関節４７から第５中足趾節関節４６に至る範囲で、足の側面及び後側を覆うように形成されている。また、靴１の耐久性を増加させ、靴１と足のフィット性を向上させるために、踵周辺には踵補強材３３が後甲被部５に取付けられている。そして、このように構成された前甲被部４と後甲被部５とを組合わせて、靴底２に取付られ、靴１の前部開口部１３を覆う鳩目部７と、第１外補強部８と、第１内補強部９と、第２外補強部１０と、第２内補強部１１と、爪先部３７とを有する中間補強材３６が、靴１の先端及び側面を補強するように取付られている。そして、履口部１２（図１（ａ）参照）には弾性素材を有するＴ字形状の履口補強材３２が靴１の内面から設けられており、靴を履くときや脱ぐときに足と接触して後甲被部５が破損しないように形成されている。また、靴１は出来る限り軽量にするために、後述する網目組織の拡大部４４を複数設けられている。よって、後甲被部５は前甲被部４に比べて軽くなるように形成されている。

【0025】

次に図５を用いてラッセル編からなるメッシュ生地と、外補強材及び内補強材との構成を説明する。

【0026】

図５はラッセル編からなるメッシュ生地の拡大図であり、（ａ）は外補強材または内補強材における斜視図、（ｂ）は外補強材または内補強材における断面図、（ｃ）は後甲被部５における斜視図である。

【0027】
図５に示すように、靴１のラッセル編からなるメッシュ生地は表面繊維３８と、表面と裏面を連結する連結繊維３９と、裏面繊維４０とを有する構成になっている。図５（ａ）に示すように、表面繊維３８は略六角形状に編まれており、表通気孔４２を有する構成になっている。また、裏面繊維４０は網目形状に編まれて、表面繊維３８と裏面繊維４０とを連結繊維３９で複数箇所連結することで通気性及び耐久性を向上することができるように構成されている。また、図５（ｂ）に示すように、裏面繊維４０の紙面下方（靴１の内側）に外補強材２９または内補強材３０を取付けることで、耐久性をさらに向上させることができる。この外補強材２９または内補強材３０には複数の孔４５が形成されており、外補強材２９または内補強材３０によって通気性が悪くなることを防止することができる。一方、通気性及び耐久性を主目的として形成された前甲被部４に比べて、後甲被部５は通気性及び軽量化を主目的として形成されているので、図５（ｃ）に示すように、裏面繊維４０にさらに網目組織の拡大部４４を可能な限り複数個設けられている。また、前甲被部４は後甲被部５に比べ靴１の構成上耐久性を必要とするため、裏面繊維４０の網目部４３は後甲被部５に比べ前甲被部４の網目部４３は間隔が狭くなるように形成されており、走るまたは歩くときの前甲被部４に加わる伸縮力に耐えることができるように構成されている。そして、前記甲被における、前記内外補強材、爪先補強材、及び踵補強材の各装着部、並びに前方及び後方開口部の周縁部を除く領域をラッセル編からなるメッシュ生地のみで形成することもできる。

【0028】
上記のような構成により形成された靴１は、単に軽量で通気性にすぐれているだけでなく、ラッセル編のメッシュ生地の伸縮特性が活かされ、靴着用者の足とのフィット性が好適に維持される。また、補強材が中足趾節関節相当部のみに重点的に内装されていることにより、ランニングにおいて足の屈曲の支点となる部分で、最も負荷がかかり、着地時に左右の横ブレが生じ易い部分が補強されることとなり、ランニングフォームを崩すことなく、エネルギーロスを最小限に止めることができる理想的な長距離用専用のシューズを構成することができる。

【産業上の利用可能性】

【0029】
マラソンシューズ等の長距離を走るための靴に用いることができる。

【図面の簡単な説明】

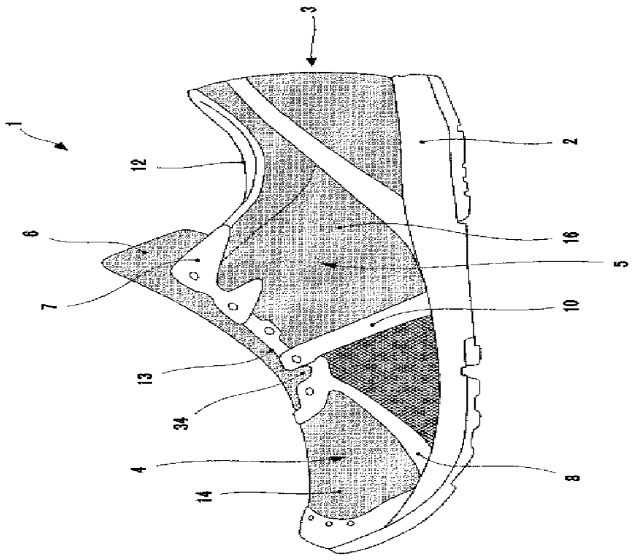
【0030】
【図1(a)】本願発明の長距離用シューズ左足側の図であり、左側面図である。
【図1(b)】本願発明の長距離用シューズ左足側の図であり、右側面図である。
【図1(c)】本願発明の長距離用シューズ左足側の図であり、平面図である。
【図2】骨格の図であり、（ａ）は側面図、（ｂ）は平面図である。
【図3】左足の斜視図である。
【図4】本願発明の長距離用シューズ左足側の分解図である。
【図5】本願発明の長距離用シューズのラッセル編からなるメッシュ生地の拡大図であり、（ａ）は外補強材または内補強材における斜視図、（ｂ）は外補強材または内補強材における断面図、（ｃ）は後甲被部５における斜視図である。

【符号の説明】

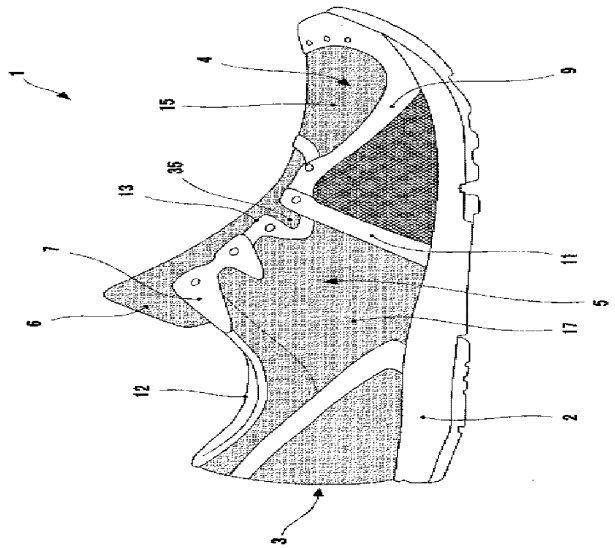
【0031】
１　長距離用シューズ
２　靴底
３　甲被
４　前甲被部（ラッセル編からなるメッシュ生地）
５　後甲被部（ラッセル編からなるメッシュ生地）
６　舌片（ラッセル編からなるメッシュ生地）
７　鳩目部

８　第１外補強部
９　第１内補強部
１０　第２外補強部
１１　第２内補強部
１４　外側甲部
１５　内側甲部
１６　外側甲片
１７　内側甲片
２９　外補強材
３０　内補強材
３４　外切欠
３５　内切欠
３７　爪先補強材
４３　網目部
４４　網目組織の拡大部
４６　第５中足趾節関節
４７　第１中足趾節関節

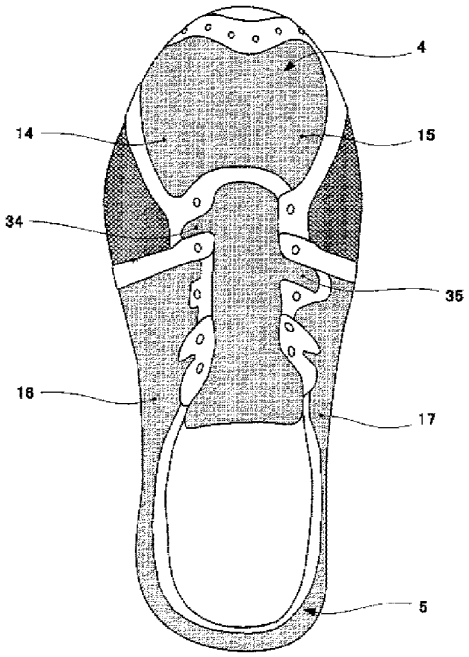
【図1（a）】



【図1（b）】



【図1(c)】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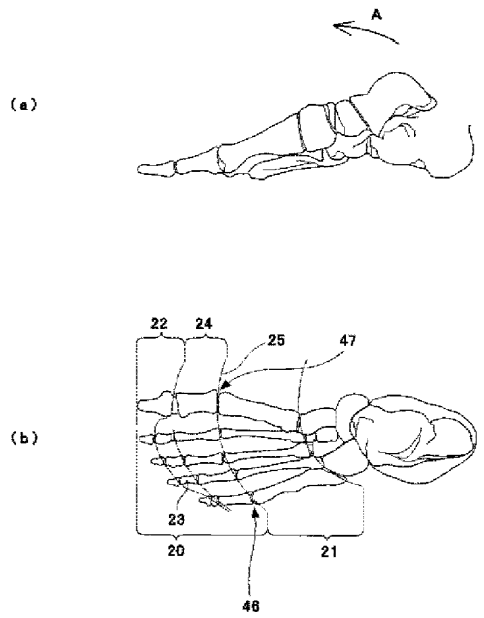
【図2】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(a)
(b)
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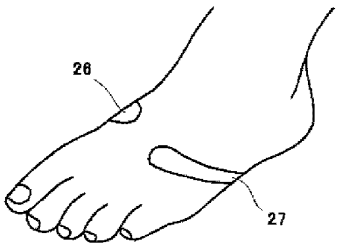
【図3】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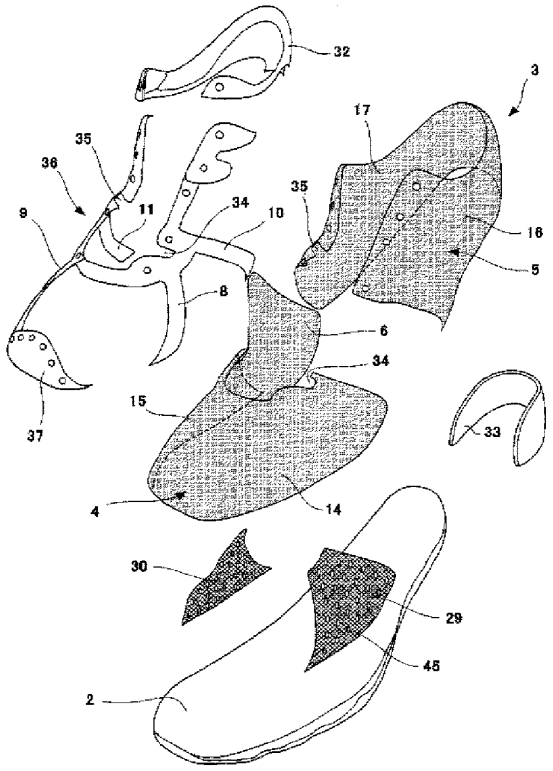
【図4】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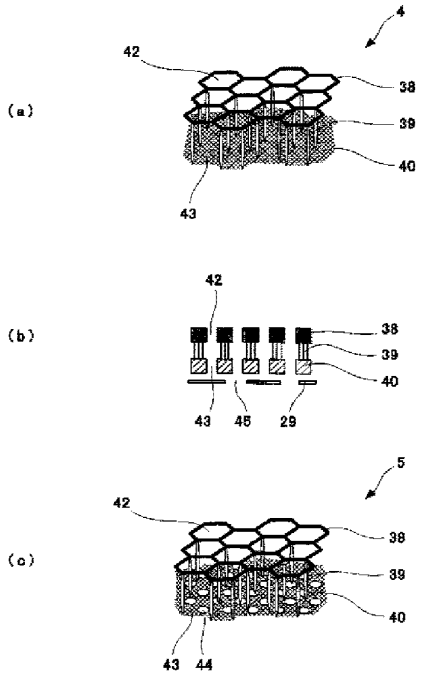
【図5】



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Method for producing space fabric and space fabric

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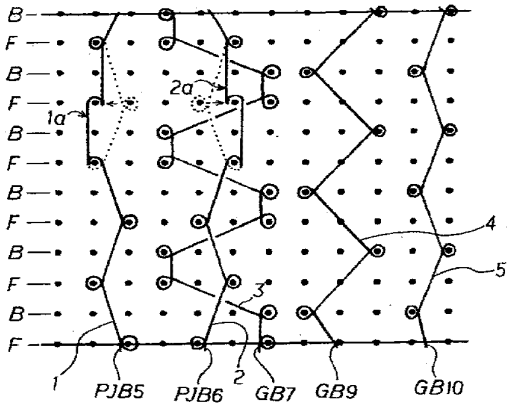
权利要求书 1 页 说明书 10 页 附图 13 页

[54] 发明名称

间隔织物的制法及间隔织物

[57] 摘要

本发明的目的是提供间隔织物，在由连接线将两片底布连接而成的立体经编布地形成的间隔织物中，至少一方的底布由网眼构成，可以明了地表现网眼，同时，网眼可以取得均衡，并可以考虑立体经编布地的物性进行设计。采用两列的提花导纱梳节进行至少一方的底布的形成，被提花导纱梳节引纱的两种提花线形成网眼地纹组织，使其沉降弧相互向相反方向针背垫纱，织成网眼粗度不同的多个网眼部混杂的形式，使均衡的网眼排列在所要的位置上形成间隔织物。



1. 一种间隔织物的制法，采用至少设有两列提花导纱梳节的具有两列针床的经编机，制造由前后部底布及用于将所述前后部底布连接的连接线构成的间隔织物；其特征在于：

在形成前后部至少一方的底布时，使在两列的提花导纱梳节中引纱而成的提花线针前垫纱形成针编弧，同时，使该提花线的针背垫纱相互呈相反方向，形成网眼大小不同的多个网眼部混杂的网眼地纹组织的主体部。

2. 如权利要求 1 所述的间隔织物的制法，其特征在于：作为所述网眼地纹组织，设置不小于 3 层的多层的网眼大小不同的网眼部。

3. 如权利要求 1 或 2 所述的间隔织物的制法，其特征在于：在所述网眼地纹组织中混杂平针地纹组织，同时，由该两地纹组织的至少一方构成花纹。

4. 如权利要求 1 或 2 所述的间隔织物的制法，其特征在于：前后部的一方的底布为所述提花线形成的所述网眼地纹组织，同时，在形成前后部的另一方的底布时，由在地纹导纱梳节中引纱而成的地纹线形成网眼地纹组织。

5. 如权利要求 3 所述的间隔织物的制法，其特征在于：前后部的一方的底布为所述提花线形成的所述网眼地纹组织，同时，在形成前后部的另一方的底布时，由在地纹导纱梳节中引纱而成的地纹线形成网眼地纹组织。

6. 一种间隔织物，其特征在于：所述间隔织物由权利要求 1～5 中的任一项所述的间隔织物的制法制造而成。

间隔织物的制法及间隔织物

技术领域

本发明涉及间隔织物的制法及由该制法制造的间隔织物。该间隔织物的制法是，在由连接线将两片经编底布连接而成的立体经编布地构成的、通称为经编间隔织物（スペーサファブリック）中，对至少一方的底布，构成由提花线形成的网眼的地纹组织。

背景技术

现有技术中，上述间隔织物被广泛应用于寝具及其附属用品领域、衣料领域、车辆相关用品、医疗用品等的各种工业资材领域。其形态为，对一方的底布采用平针织物，而另一方的底布采用网状的织物，或两底布都采用网眼大小相同的或网眼大小不同的织物等，提供有各种各样的样式。其中，为了特别提高外观上的装饰效果，提出了在平纹状的底布中混杂网眼组织，或为了谋求用途上的功能性，而考虑了将若干种网眼组织进行组合的方案。

例如，在日本实用新型注册第 2548713 号公报中，公开了由前后部的底布，和为了确保设于这两底布之间的空隙而由连接线形成的三层构造经编布地，由至少构成前后部的一方侧的底布的线圈列形成的各个线圈纵行，借助对提花线进行导丝的提花引导件的个别控制，使提花线对线圈列的作用位置变化，例如，形成大的网眼（孔部）和小的网眼（孔部），将这些进行组合而形成模样的技术，并公开了作为使用所形成的经编布地的一个用途、用于鞋的状态。

上述现有技术中，构成孔部即网眼的织物组织构造，是通过对由一列提花导纱梳节导丝的提花线进行控制而形成的，为了构成网眼，通过连续设置仅仅作用在一根编针列上的线圈横列，进行基本上相邻的两根编针交互作用而形成针编弧的针织纱，在该线圈横列上未由另一方的编针编织的针编弧，当然是在全部编针中补充以形成编链组织

的方式送纱的由另外的地纹导纱梳节导纱的编链组织纱。

为此，所形成的网眼由针织纱形成双重针编弧的线圈纵行，和形成单一针编弧的线圈纵行形成，其结果，织物坯布整体上网眼的挤拧度松弛，由此而无法鲜明表现网眼的大小。而且，织物坯布的强度方面也因网眼不均衡而难以获得所需的物性，特别是，不能算是适合用于鞋的鞋面材料等的材料。

专利文献 1　日本实用新型注册第 2548713 号公报

发明内容

本发明提供间隔织物的制造方法及由该制造方法制造的间隔织物。该间隔织物的制法是，对由连接线将两片经编底布连接而成的间隔织物的至少一方的底布，由提花机控制的提花线形成网眼的地纹组织，所形成的网眼被明了地予以表现，同时，由于网眼的大小混杂而取得网眼的均衡，并可以考虑物性进行设计。

本发明为解决上述课题而提出，提供一种间隔织物的制法，采用至少设有两列提花导纱梳节的具有两列针床的经编机，制造由前后部底布及用于将所述前后部底布连接的连接线构成的间隔织物；其特征在于：在形成前后部至少一方的底布时，使在两列的提花导纱梳节中引纱而成的提花线针前垫纱（オーバラッピング）形成针编弧，同时，使该提花线的针背垫纱（アンダラッピング）相互呈相反方向，形成网眼大小不同的多个网眼部混杂的网眼地纹组织的主体部。

而且，本发明提供一种间隔织物，在由前后部底布及用于将所述前后部底布连接的连接线构成的间隔织物的至少一方的底布上，使在两列的提花导纱梳节中引纱而成的提花线向相互相反的方向针背垫纱，形成网眼大小不同的多个网眼部混杂的网眼地纹组织的主体部。

根据本发明的制法及由该制法获得的间隔织物，在形成至少一方的底布的网眼地纹组织时，所形成的底纱是在两列的提花导纱梳节中引纱而成的提花线，通过提花控制使承担网眼地纹组织的主体部的提花线向相互相反的方向针背垫纱进行编织，因而，使得提花线通常拉向相反方向，相互的提花线将线圈孔勒紧。为此，可以获得明了的网

眼形态，同时，所得到的间隔织物，其形成网眼地纹组织的底纱仅仅是被提花控制的提花线，不需要补充的编链组织，使针织组织为均衡的网眼底布，而且，配置多个网眼部并考虑网眼大小进行设计，因此具备所期望的物性。

附图说明

图 1 是具有本发明的间隔织物的制造中使用的设有两列的提花导纱梳节的两列针床的经编机中的主要编织部分的概略侧面图。

图 2 是用于制造本发明的一个实施例的间隔织物的针织组织图。

图 3 是表示提花针织组织的变型例的说明图。

图 4 是间隔织物的一个实施例中包含网眼的底布的针织组织图。

图 5 是间隔织物的一个实施例中包含网眼的底布的从外侧观察的外观图。

图 6 是间隔织物的一个实施例中包含网眼的底布的从内侧观察的俯视图。

图 7 是间隔织物的另一个实施例中包含网眼的底布的针织组织图。

图 8 是间隔织物的又一个实施例中包含网眼的底布的针织组织图。

图 9 是表示提花针织组织的另一变型例的说明图。

图 10 是表示本发明的间隔织物的一例的轴测图。

图 11 是表示将本发明的间隔织物用作鞋的鞋面材料的应用例的轴测图。

图 12 是表示将本发明的间隔织物用于无袖上衣的应用例的轴测图。

图 13 是表示将本发明的间隔织物用于背心的应用例的轴测图。

图 14 是表示将本发明的间隔织物用于座套的应用例的轴测图。

图 15 是表示将本发明的间隔织物用于帽子的应用例的轴测图。

具体实施方式

说明书本发明的实施例。本发明的间隔织物的制法中，作为基于

提花线的至少一方的底布的所述网眼地纹组织，设置不小于3层的多层的网眼大小不同的网眼部，由此，可以具有透气性等功能，而且可以提高网眼状态外观的装饰性。

可以在所述网眼地纹组织中混杂平针地纹组织，同时，由该两地纹组织的至少一方，例如由平针地纹组织构成花纹。由此，可保持作为网眼地纹组织的功能性，而且由平针地纹组织构成提花花纹，可以进一步提高装饰性。而且，采用所述平针地纹组织还可以引入标识，可以进一步发挥商品效果。

在形成前后部的一方的底布时，使在两列的提花导纱梳节中引纱而成的提花线向相互相反的方向针背垫纱，形成网眼大小不同的多个网眼部混杂的网眼地纹组织的主体部，同时，在形成前后部的另一方的底布时，由在地纹导纱梳节引纱而成的底纱形成网眼地纹组织，由此，对于所制造的间隔织物，因由提花线构成网眼部分的一方侧底布的面而可以提高装饰性，同时，可由另一方侧底布的面的网眼部分更有效地提高功能性。

下面根据附图说明本发明的实施例。

（实施例1）

图1是用于制造本发明的间隔织物的经编机，是具有两列的提花导纱梳节的两列针床的经编机的主要编织部分的概略侧面图。F为前方的编针列，B为后方的编针列，GB1、GB2、GB3是前方侧的地纹导纱梳节，PJB5、PJB6为两列提花导纱梳节，GB7、GB9、GB10为后方侧的地纹导纱梳节。本经编机中，替换地纹导纱梳节GB3设置花筘（未图示），而且，替换地纹导纱梳节GB7设置花筘（未图示）。针织时序（タイミング）分别设定成：地纹导纱梳节GB1、GB2、GB3、提花导纱梳节PJB5、PJB6、地纹导纱梳节GB7可以在前方的编针列F针前垫纱，同时，地纹导纱梳节GB3、提花导纱梳节PJB5、PJB6、地纹导纱梳节GB7也可以在后方的编针列B针前垫纱，而且，地纹导纱梳节GB9、GB10可以仅在后方的编针列B针前垫纱。

接着根据图2所示针织组织的一例说明本发明的间隔织物的一个

实施例。1是提花导纱梳节PJB5中引纱而成的提花线，2是在提花导纱梳节PJB6引纱而成的提花线，是将84dtex聚酯加工纱分别按照织机机号（ゲージ）的条数分全部穿筘地进行引纱而成的。由这些提花线1、2织成前部底布。4是在地纹导纱梳节GB9引纱而成的底纱，5是在地纹导纱梳节GB10引纱而成的底纱，是将84dtex聚酯多纤维人造丝分别按照织机机号的条数份全部穿筘地进行引纱而成的。由这些底纱4、5织成后部底布，例如将后部底布形成网眼地纹组织。3是用于将所述前部底布和后部底布连接编织、在两底布之间设置间隔的连接线，是在地纹导纱梳节GB7按照织机机号的条数分全部穿筘地进行引纱而成的。在该针织组织的例子中不使用地纹导纱梳节GB1、GB2、GB3。

用于织成这些间隔织物的基本组织的链编号为：PJB5：1-2/1-1/1-0/1-1//、PJB6：1-0/1-1/1-2/1-1//、GB7：1-0/1-0/3-4/3-4//、GB9：2-2/2-3/1-1/1-0//、GB10：1-1/1-2/1-1/1-0//。

图2中，在提花导纱梳节PJB5以及提花导纱梳节PJB6的针织组织线图中，对于以点划线表示的部位，通过提花控制使提花线1或提花线2的作用位置分别以编针1针份向箭头方向变化，由此，如图中提花线1a和提花线2a那样形成一根线圈纵行状态，在该线圈横列部分中形成网眼。该网眼的粗度或大小，可以根据由提花控制而形成一根线圈纵行状态的线圈横列数适当设定。

根据附图3详细说明上述提花控制组织的变型例。图3（1）表示作为不进行作用到前方的编针列F的提花线1、2的提花控制的基本组织，对相邻的编针交互地作用的薄地针织组织，图中所示附图标记H，是表示在提花导纱梳节的针背垫纱位置以及针前垫纱位置不进行提花控制。而且，图3（2）表示提花线1、2被织成一根线圈纵行状的孔地针织组织的变化组织，图中以附图标记T表示的是，提花导纱梳节在针背垫纱位置以及针前垫纱位置的两个位置，被提花控制而改变对编针的作用位置。图中点划线表示在原薄地针织组织变化1a、2a后的提花线的孔地针织组织。图3（3）表示提花线2向箭头的线圈横

列以及纸面上的右方被提花控制而变化成 2b 那样的针织组织的例子，图 3（4）表示提花线 1 向箭头的线圈横列以及纸面上的左方被提花控制而变化成 1b 那样的针织组织。所述针织组织 1b、2b，都形成了与所述孔地针织组织 1a、2a 相反地针背垫纱部相对于以点划线表示的原薄地组织形成得长出 1 针份的厚地针织组织。

本发明基本上采用上述的针织组织，即，将薄地组织、孔地组织以及厚地组织适当组合而成的针织组织用作前后部的一方侧的底布的结构，构成网眼粗度不同的多个网眼部混杂的网眼地纹组织的主体部。所述网眼的粗度还可以构成为不少于三层的多层。对于所述网眼部的网眼粗度的构成，以下的实施例中也同样实施。

图 4 是具有采用提花线 1、2 织成的网眼部的一个实施例的间隔织物的一方侧的底布，例如前部底布的针织组织图。由该针织组织图进行编织时，构成网眼 M1、M2 的缘部的线圈纵行，使提花线 1、2 变为孔地针织组织 1a、2a，网眼 M1、M2 的主体部 S1、S2，提花线 1、2 的沉降弧 SL1、SL2 向相互相反方向被针背垫纱。

图 5 是由上述针织组织织成的间隔织物的所述一方侧的底布的从外方侧观察的外观俯视图，图 6 是对同样的一方侧的底布从内侧观察的俯视图。这些图中，为了便于视图而省略了基于连接线 3 的针编弧。如图所示，为了构成各个网眼 M1、M2...而形成的主体部 S1、S2...，提花线 1 的沉降弧 SL1 群和提花线 2 的沉降弧 SL2 群，从相互相反方向构成后针背垫纱部，由此，主体部 S1、S2...，它们的针编弧 NL1、NL2 紧密缔结而相互拉拽，网眼 M1、M2...的轮廓更为鲜明地得以表现，而且，底布整体上以相同数量构成提花线 1、2 的针编弧 NL（NL1、NL2）和沉降弧 SL（SL1、SL2）。为此，构成底布整体的各个线圈可以形成均衡状态，物性方面也可以使强力平均化，可以获得对外力负载的适当强度。

图 7 是具有采用提花线 1、2 织成的网眼部的另一实施例的间隔织物的一方侧的底布的针织组织图。在以该针织组织图编织时，网眼 M3、M4 的主体部 S3、S4，提花线 1、2 的沉降弧 SL3、SL4 向相互

相反方向被针背垫纱，同时，两沉降弧 SL3、SL4 都形成具有三针间的针背垫纱部（过渡到两针相邻的编针的针背垫纱）的厚地针织组织 1b、2b。而且，构成网眼 M3、M4 的缘部的线圈纵行，作为薄地针织组织，提花线 1、2 向相互相反方向在相邻的两针之间被针背垫纱。这样制造成的间隔织物，在具有网眼部侧的底布外方侧的表面产生凹凸，例如在将其用于车座等的座椅材料时，可改善落座时的肌肤触感。

图 8 是具有采用提花线 1、2 织成的网眼部的又一实施例的间隔织物的一方侧的底布的针织组织图。在以该针织组织图编织时，对于网眼 M5、M6、M7 的主体部 S5、S6、S7，与图 4 所示实施例同样地，提花线 1a、2a 的沉降弧 SL1、SL2 向相互相反方向被针背垫纱，同时，形成具有相邻两针之间的针背垫纱部的薄地针织组织。构成网眼 M5、M6、M7 的缘部的线圈纵行，提花线 1、2 也被变为孔地针织组织 1a、2a。在此情况下，网眼 M5、M6、M7 在底布内被花样式配置在适当位置，由此可以提高底布面的外观性。

（实施例 2）

图 9（1）是用于制造本发明的间隔织物的提花导纱梳节 PJB5、PJB6 中另一实施例的针织组织图，该实施例中，对于作为如图 2、图 3 所示的不进行提花控制的基本针织组织的相邻两针之间的薄地针织组织，基本针织组织是在一针上织成的链式组织的孔地针织组织 1a、2a。1c、2c 是孔地针织组织 1a、2a 在箭头方向上被提花控制而变成薄地针织组织的。图 9（2）～图 9（7）是表示提花控制（T、H）的各编织线圈处的变化组织的作用状态的说明图。图 9（2）表示将提花线 1 从孔地针织组织 1a 的基本组织变成闭口线圈的薄地针织组织 1c 的例子的场合，图 9（3）表示提花线 1 的基本组织的孔地针织组织 1a 不变化的场合，图 9（4）表示将提花线 1 的基本组织的孔地针织组织 1a 的基本组织变成开口线圈的薄地针织组织 1d 的场合。图 9（5）表示将提花线 2 从孔地针织组织 2a 的基本组织变成闭口线圈的薄地针织组织 2c 的例子的场合，图 9（6）表示提花线 2 的基本组织的孔地针织组织 2a 不变化的场合，图 9（7）表示将提花线 2 的基本组织的孔

地针织组织 2a 的基本组织变成开口线圈的薄地针织组织 2d 的场合。

采用上述针织组织的实施例的话，对于薄地针织组织，由于作成了闭口线圈和开口线圈的两种，显出网眼时提花线 1、2 造成的收拢状态改变的结果是，即使是相同的编织线圈，也可以形成外观不同的网眼形状，扩展了网眼构成中的变型性。而且，虽然在上述实施例的针织组织中，提花导纱梳节 PJB5、PJB6 的针前垫纱的方向是相反的，不用说，即使两提花导纱梳节 PJB5、PJB6 的针前垫纱的方向是同方向地进行编织，当然也是属于本发明的制法的。

图 10 是表示由本发明的制法制成的间隔织物的一例的轴测图，由前部底布 FF、后部底布 RF、将这些底布 FF、RF 连接的连接线 3 形成，在前部底布 FF 中构成了网眼粗度不同的多种，例如两种网眼部混杂的网眼地纹组织。M1 是所述网眼地纹组织中网眼细小的网眼部，M2 是网眼粗的网眼部，所述网眼部 M2 构成四个网眼以接近状态配置的花纹样式。P1 是混杂在网眼地纹组织中的平针地纹组织，由图 9 所示的提花线 1、2 形成的薄地针织组织 1c、2c 形成。P2 是平针地纹组织，由图 3（3）、图 3（4）所示的提花线 1、2 形成的厚地针织组织 1b、2b 形成，由平针地纹组织 P2 进行花纹花样的构成。

虽然在图中未图示，但是本发明在前后部双方的底布中，也可以与上述实施例同样地实施编织，构成由分别在两列提花导纱梳节引纱的提花线形成的网眼地纹组织。在此情况下，作为经编机，使用在前方侧和后方侧分别设有两列（合计四列）提花导纱梳节的经编机进行编织。

（使用例）

图 11 是表示将本发明的间隔织物用于鞋的鞋面材料的至少一部分的使用例的轴测图。鞋面材料由构成左右侧部分的壁部件 10、11，和覆盖胛部的鞋舌件 12、覆盖脚趾的脚趾部件 13、构成后跟的后跟部件 14 等各部件构成，各部件被缝制成一体，连接在鞋底部件 15 上。在壁部件 10、11 上，配置着包含由一方的提花线形成的薄地针织组织的平针地纹组织 16 中的大、中、小三种网眼 17、18、19，同时，设

置着包含由一方的提花线形成的厚地针织组织的线条 20。在鞋舌部件 12 上，在包含由一方的提花线形成的薄地针织组织的平针地纹组织 21 中细细地有规则地排列着网眼 22。脚趾部件 13 由包含两种提花线的两侧的厚地针织组织构成的侧片 23、(24)，和具有与其相接连在一起的网眼的脚趾片 25 构成。后跟部件 14 由包含两种提花线形成的厚地织物的后跟片 6，和包含由一方的提花线形成的厚地织物的根部缘片 26 构成。在所述壁部件 10、11 以外的各部件上也可以使用本发明的间隔织物。

如上所述构成的鞋的鞋面材料，适当实施了在每个部位考虑通气等功能性的网眼构成，以及考虑强度的厚薄三种编织方法形成的平针地纹组织的配置，和基于提花控制的线条等的花样结构。当然，在本实施例中的花样构成的一个线条之外，还可以自由地加入生产厂家的标识商标等。

图 12 是表示将本发明的间隔织物用于无袖上衣的使用例的轴测图。27、28 是与后身大片 29 和右身前片 30 及前身大片 31 连接的缝制部位。在制造时，通过结合部位 32、33 对后身大片 29、右前身大片 30 以及左前身大片 31 进行连接编织，是与最终形状相吻合地将袖缘 34、35 以及前部缘 36、37 剪切成所要的形状后，折成两折进行缝制的。后身大片 29、一部分的右前身大片 30 以及左前身大片 31 是由两种提花线形成的薄地织物构成的，同时，线条 38、38 是包含一方的提花线的厚地织物的构成，线条 41、41 也是包含一方的提花线形成的厚地织物的构成。而且，兜，是在包含两方的提花线的薄地织物的平针地纹组织上有点状的网眼 39 的兜片 40、40 连接成的。这些构成无袖上衣的所述各前后身大片或兜片等的部件中，可以使用本发明的间隔织物。

图 13 是以与上述实施例相同的方法制造的背心。在制造时，可以将设有包含一方的提花线形成的厚地织物的线条 46 的前身大片 45、具有两种网眼尺寸的网眼 47、48，以及具有包含两种提花线形成的厚地织物的襟部 49 的后身大片 44，分别与最终状态吻合地从织成的物

件剪切袖缘 52、53 以及前部缘 54 而剪切成所要的形状，然后，将该前后身大片以缝制部位 42、50、43、51 进行缝制，或将缝制部位 50、51 作为结合部位织成一体，然后将前身大片 45 与后身大片 44 两折折叠，为了制作肩线而将织成一体的部分斜向切断，然后，对切断的部位进行缝制。在所述后身大片 44 之外，在前身大片 45 上也可以使用本发明的间隔织物。

图 14 表示本发明的间隔织物作为构成沙发的座套的一部分的片部件 55 使用的使用例。片部件 55 是将靠背部分 56、落座部分 57 和搭脚部分 58 这三部分编织成一体的部件，从靠背部分 56 到搭脚部分 58，呈阶梯状地连续设置了大大小小的网眼，具有作为沙发用片部件所需要的弹性或通气性的同时，外观上也具备优异的网眼的美丽外观设计。

图 15 是表示在帽子的一部分使用了本发明的间隔织物的使用例的轴测图。盖部件 59，对于切分成圆形的间隔织物、对于分为八部分的各部片 60、61...、对于各个平针地纹组织 68，网眼 69 以各种尺寸、配置构成，通过将各部片 60、61...之间设置的扇形的舍去部分切掉，而构成碗状的盖部。然后，通过缝制帽檐部 70 和帽顶部 71 而制成产品。

工业上的可利用性

本发明的间隔织物在上述鞋面材料、无袖上衣、背心、沙发的座套、帽子等的用途之外，还可以发挥其功能性、外观设计性而广泛用于室内装饰用品、包具材料、体育服装材料等各种工业领域。

图1

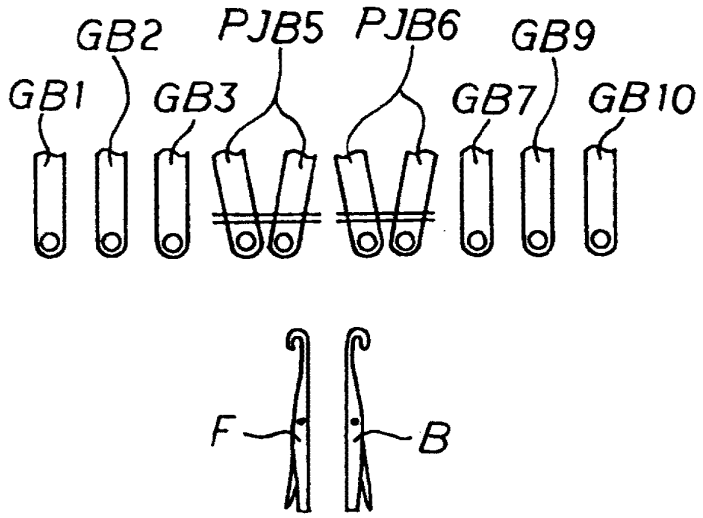


图2

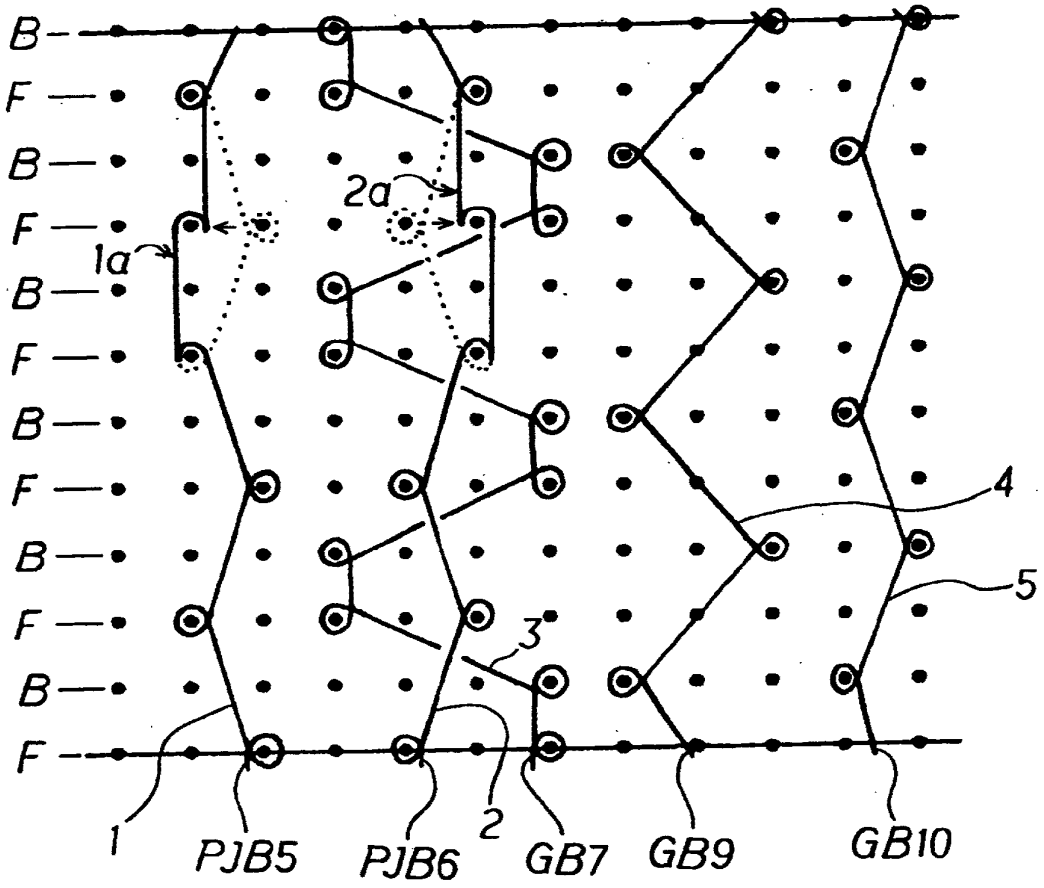


图 3

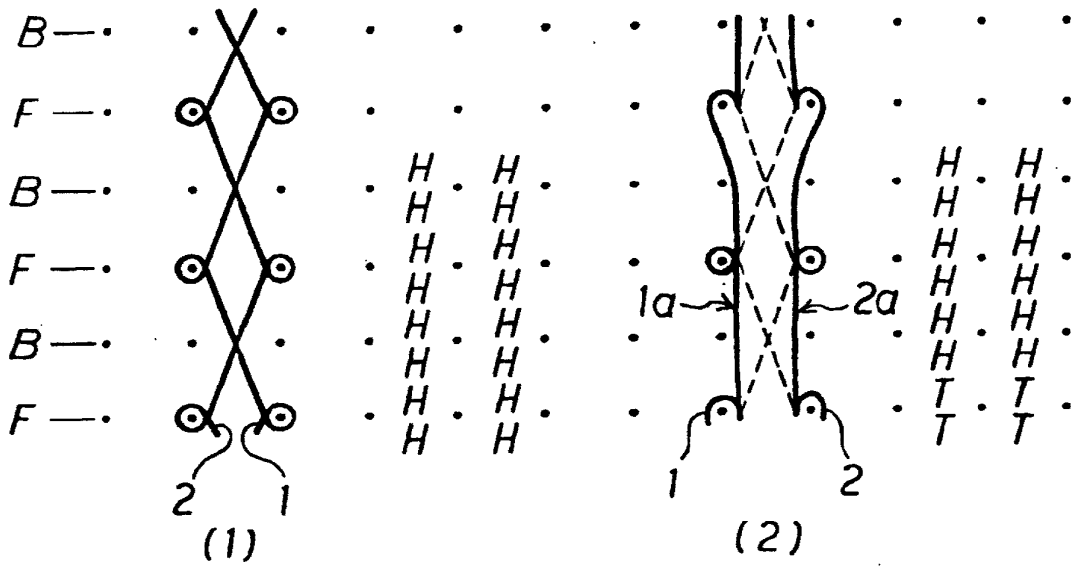


图4

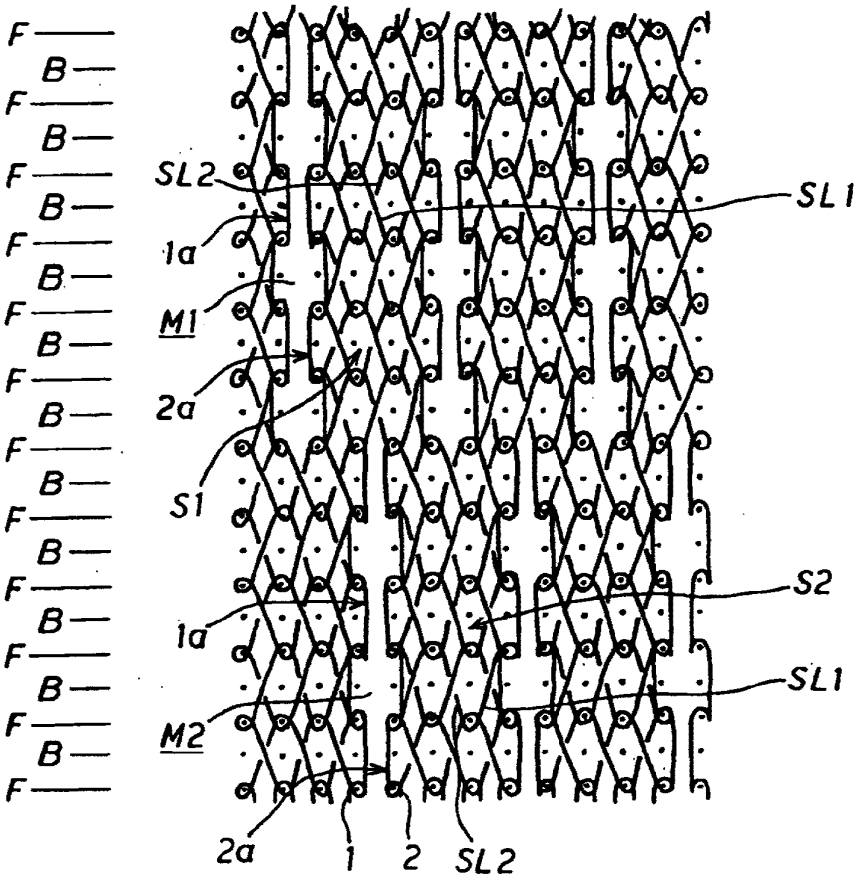


图 5

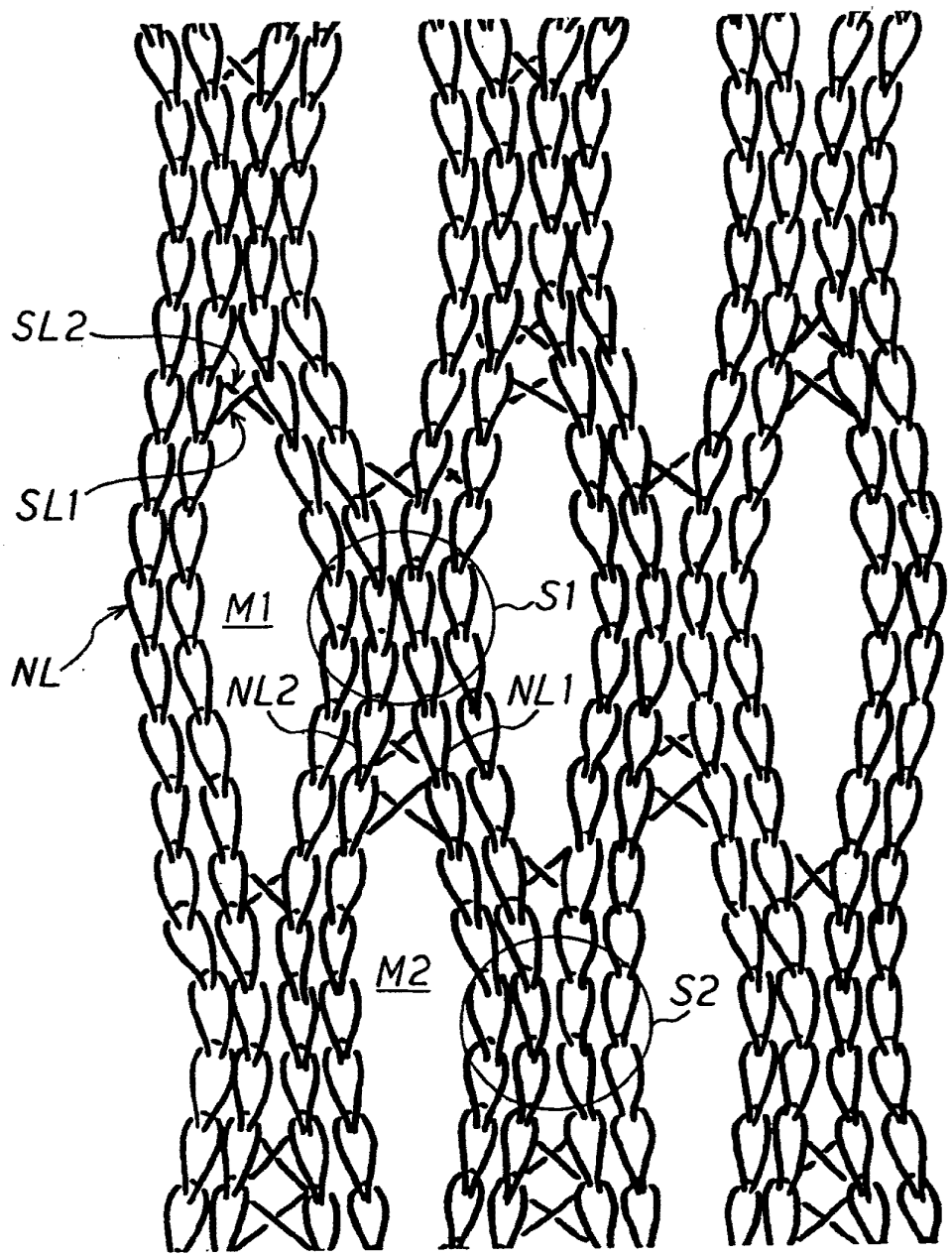


图 6

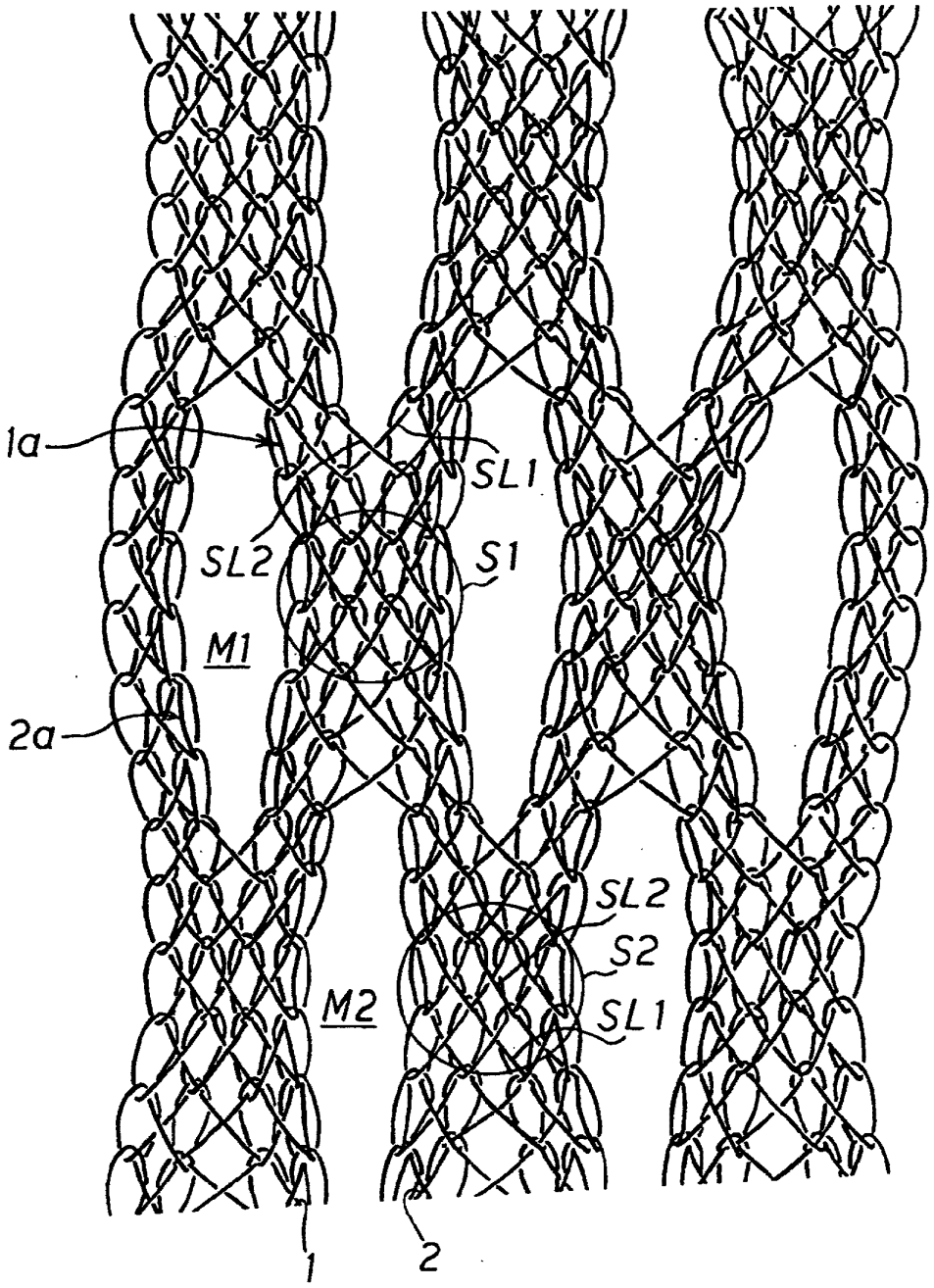


图7

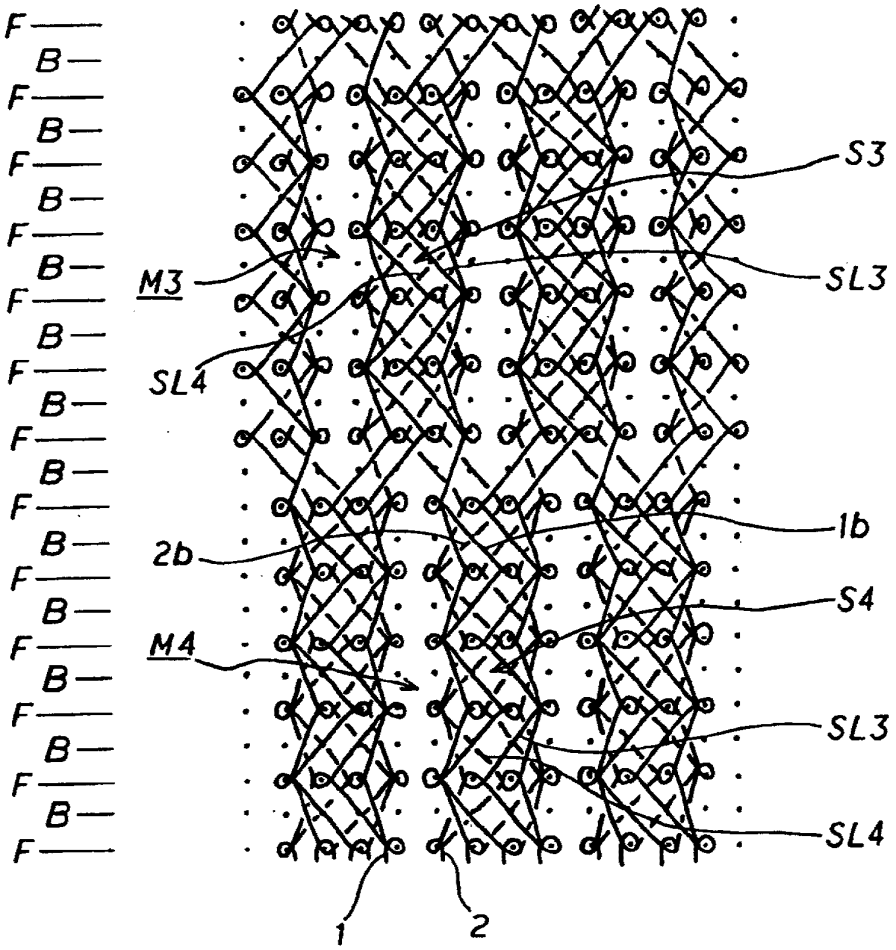


图8

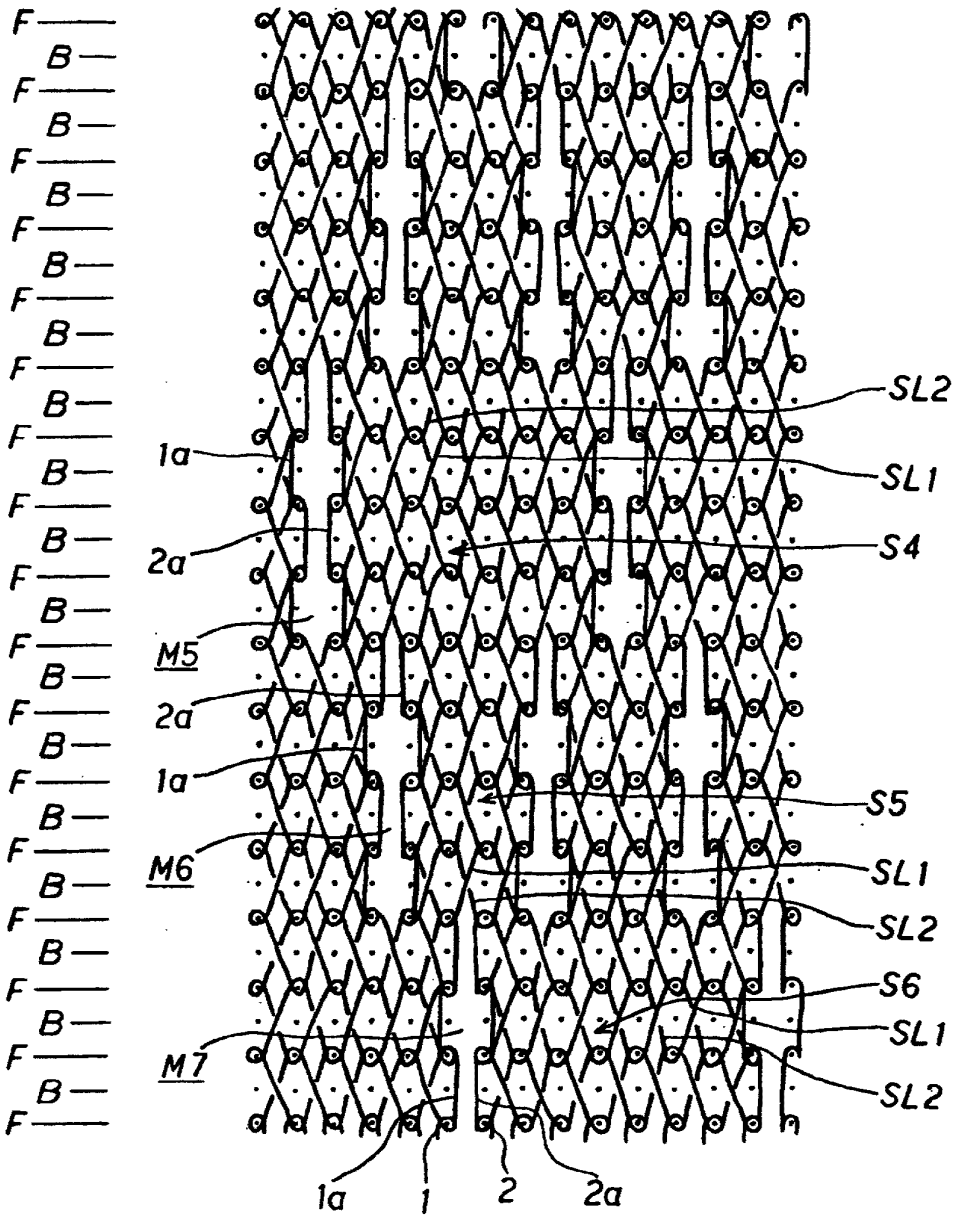


图9

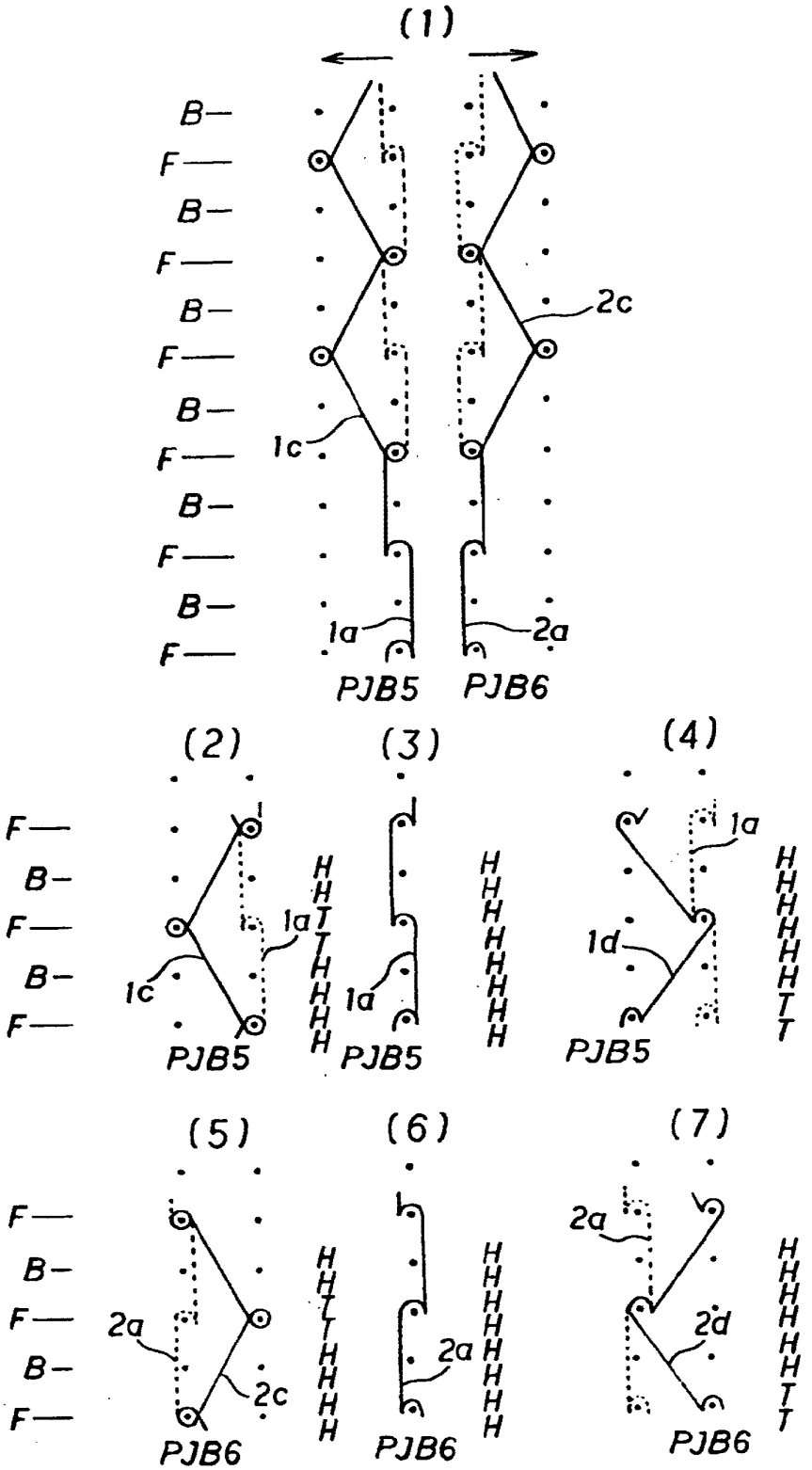


图10

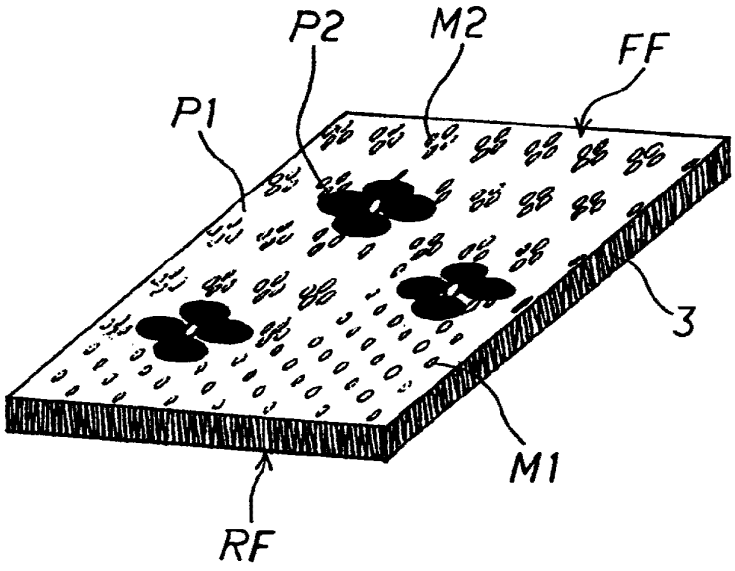


图11

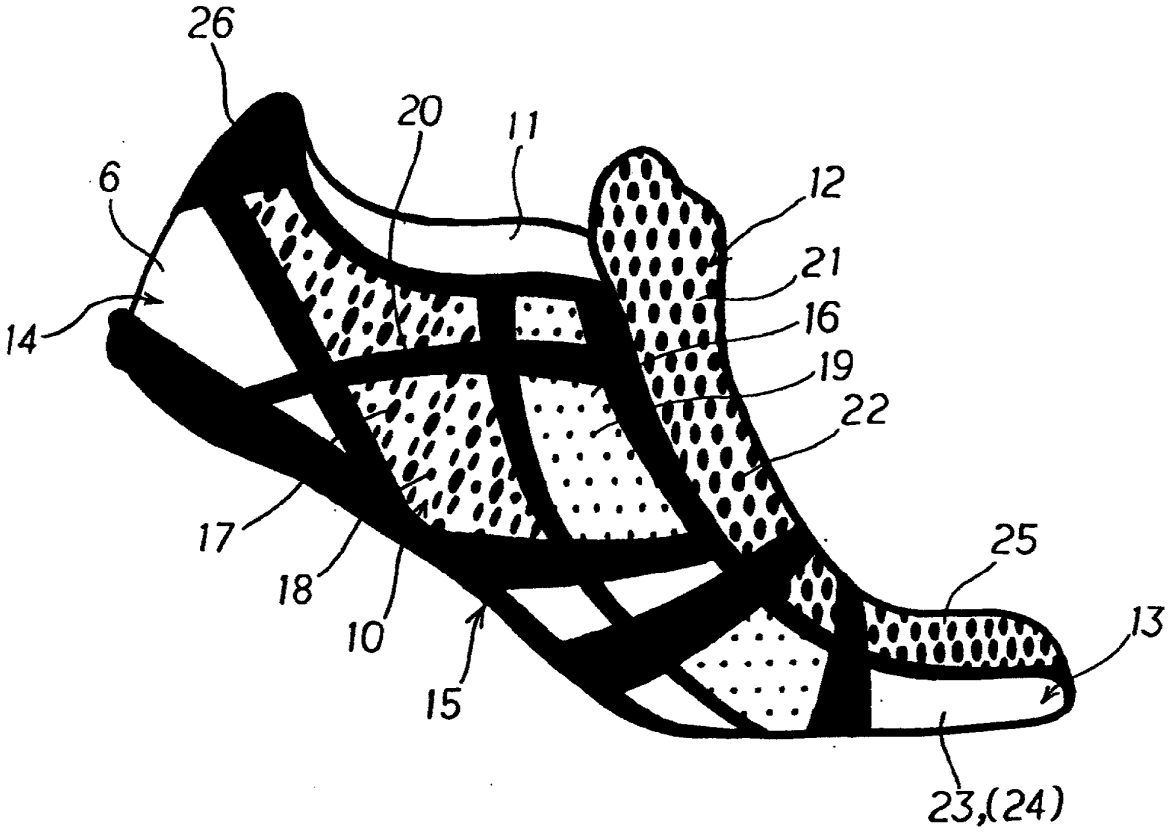


图12

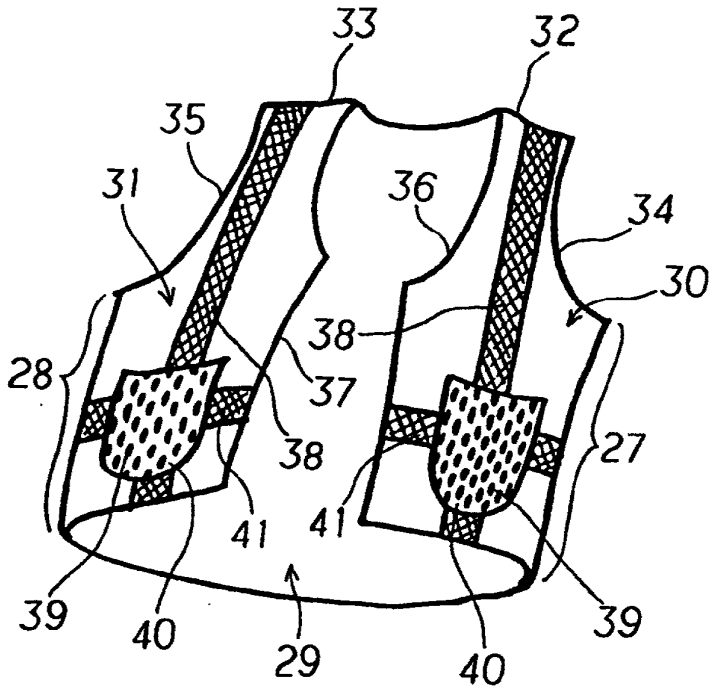


图13

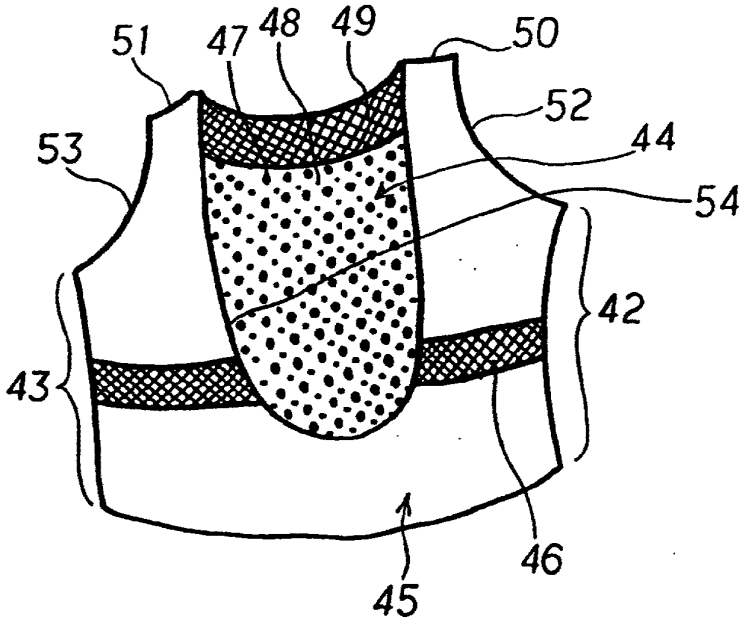


图14

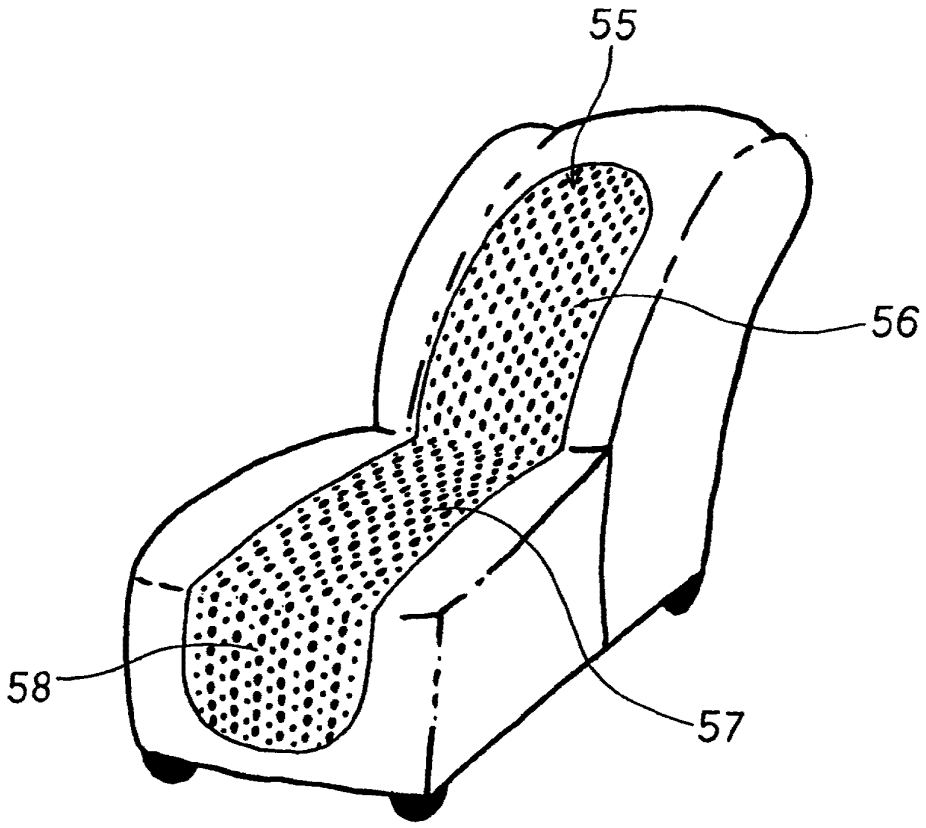
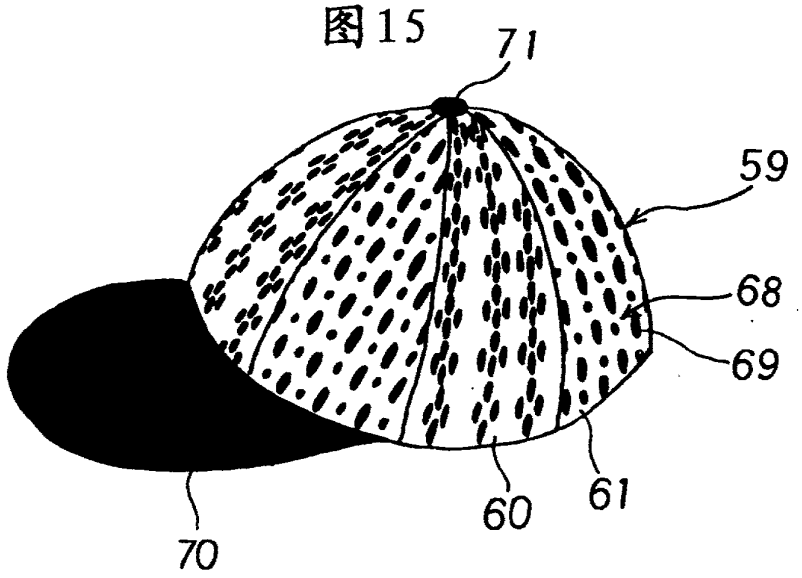


图15



Espacenet

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Article Of Footwear Having An Upper Incorporating A Knitted Component

Inventor(s):

Applicant(s):

Classification: **- international:** ***A43B23/02; A43B7/20; A43C1/04***
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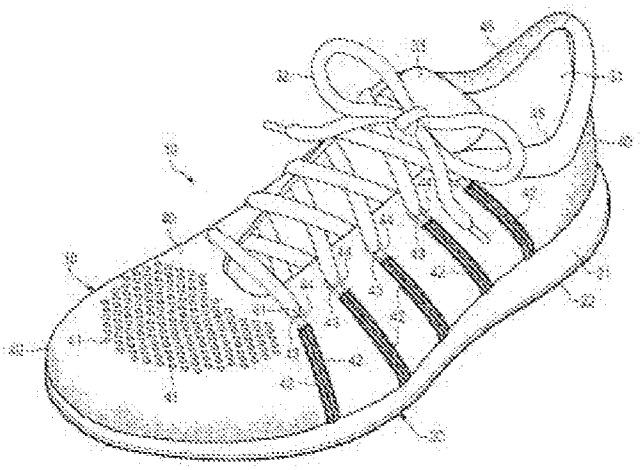
An article of footwear has an upper that includes a knitted component and a sole structure secured to the upper. The knitted component may define a tube formed of unitary knit construction, and a strand may extend through a length of the tube. As another example, the knitted component may have a pair of at least partially coextensive knitted layers formed of unitary knit construction, and a plurality of floating yarns may extend between the knitted layers. In some configurations, the knit type or yarn type may vary in different regions of the knitted component to impart different properties. Additionally, the knitted component may incorporate a thermoplastic yarn that is fused in different regions of the knitted component to impart different properties. A flat knitting process or a variety of other knitting processes may be utilized to form the knitted component.



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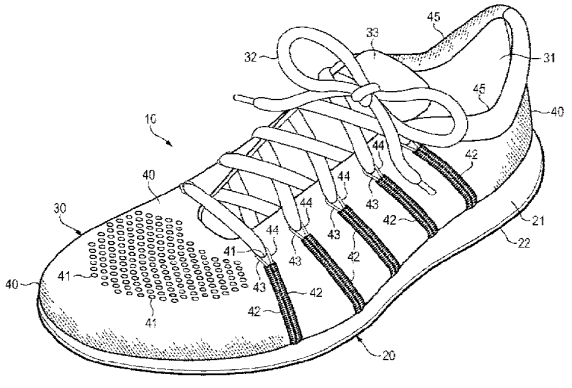
权利要求书 4 页 说明书 9 页 附图 15 页

(54)发明名称

具有结合了编织部件的鞋面的鞋类物品

(57)摘要

一种鞋类物品(10),其具有包括编织部件的鞋面(30)和固定至所述鞋面的鞋底结构(20)。所述编织部件可以限定由整体编织构造形成的管(42),并且股状物(43)可以延伸穿过一定长度的所述管。作为另一个示例,所述编织部件可以具有由整体编织构造形成的一对至少部分地共同延伸的编织层,且多根浮纱可以在所述编织层之间延伸。在一些构造中,编织类型或纱线类型可以在所述编织部件的不同区域中改变以赋予不同的特性。此外,所述编织部件可以结合热塑性纱,所述热塑性纱在所述编织部件的不同区域中被熔合以赋予不同的特性。可以使用平编织工艺或各种其它编织工艺以形成所述编织部件。



CN 102271548 A

1. 一种鞋类物品，其具有鞋面和固定到所述鞋面的鞋底结构，所述鞋面包括：

编织部件，其限定由整体编织构造形成的管状结构；以及

纱线，其具有一维材料的构造，所述纱线延伸穿过一定长度的所述管的至少一部分。

2. 如权利要求 1 所述的鞋类物品，其中所述编织部件沿着所述鞋面的外侧面、沿着所述鞋面的内侧面、在所述鞋面的鞋前部区域上，以及围绕所述鞋面的鞋跟区域延伸。

3. 如权利要求 2 所述的鞋类物品，其中所述管状结构安置在所述鞋面的外侧面上并定向为从接近所述鞋底结构的区域向上延伸，且所述纱线从所述管状结构的端部向外延伸以形成容纳鞋带的环。

4. 如权利要求 2 所述的鞋类物品，其中所述管状结构安置在所述鞋跟区域中并围绕所述鞋面的脚踝开口的至少一部分，且所述纱线和多根额外的纱线安置在所述管状结构内。

5. 一种鞋类物品，其具有鞋面和固定到所述鞋面的鞋底结构，所述鞋面包括：

第一编织层，其形成所述鞋面的外表面的至少一部分；

第二编织层，其与所述第一编织层由整体编织构造形成，所述第二编织层安置为邻近所述第一编织层并与所述第一编织层至少部分地共同延伸以在所述第一编织层与所述第二编织层之间限定管；以及

股状物，其具有一维材料的构造，所述股状物延伸穿过所述管并在所述第一编织层与所述第二编织层之间延伸。

6. 如权利要求 5 所述的鞋类物品，其中所述第一编织层沿着所述鞋面的外侧面、沿着所述鞋面的内侧面、在所述鞋面的鞋前部区域上，以及围绕所述鞋面的鞋跟区域延伸。

7. 如权利要求 5 所述的鞋类物品，其中所述管定向为从接近所述鞋底结构的区域向上延伸，所述股状物的一部分从所述管的端部向外延伸并形成容纳鞋带的环。

8. 如权利要求 7 所述的鞋类物品，其中所述第一编织层限定邻近所述管的所述端部的孔，且所述鞋带延伸穿过所述孔。

9. 如权利要求 7 所述的鞋类物品，其中所述股状物延伸至由所述第一编织层和所述第二编织层形成的另一个管中。

10. 一种鞋类物品，其具有鞋面和固定到所述鞋面的鞋底结构，所述鞋面包括：

编织部件，其限定第一管和第二管，所述第一管和所述第二管每个由整体编织构造形成，所述第一管和所述第二管从接近所述鞋底结构的区域以向上的方向延伸，且所述第一管和所述第二管的端部安置在所述鞋面的上部区域中；

股状物，其延伸穿过所述第一管和所述第二管，所述股状物的一部分从所述第一管和所述第二管的所述端部向外延伸以形成环；以及

鞋带，其延伸穿过所述环。

11. 如权利要求 10 所述的鞋类物品，其中所述第一管和所述第二管相互接近且平行。

12. 如权利要求 10 所述的鞋类物品，其中所述编织部件限定邻近所述第一管和所述第二管的所述端部的孔，且所述鞋带延伸穿过所述孔。

13. 如权利要求 10 所述的鞋类物品，其中所述编织部件包括：

一对至少部分地共同延伸的编织层，其由整体编织构造形成；以及

多根浮纱，其在所述编织层之间延伸。

14. 如权利要求 13 所述的鞋类物品，其中所述编织层和所述浮纱安置为邻近所述鞋面

的脚踝开口。

15. 一种鞋类物品，其具有鞋面和固定到所述鞋面的鞋底结构，所述鞋面包括：

编织部件，其限定由整体编织构造形成的多个管，所述管的第一部分安置在所述鞋类的外侧面上，且所述管的第二部分安置在所述鞋类的内侧面上；

至少一根股状物，其延伸穿过所述管并从管的端部向外延伸以形成多个环，所述股状物具有一维材料的构造；以及

鞋带，其延伸穿过所述环。

16. 如权利要求 15 所述的鞋类物品，其中所述编织部件限定邻近所述管的所述端部的孔，且所述鞋带延伸穿过所述孔。

17. 如权利要求 15 所述的鞋类物品，其中所述管中的至少两个相互接近且平行。

18. 如权利要求 15 所述的鞋类物品，其中所述编织部件形成所述鞋面的外表面的大部分。

19. 如权利要求 15 所述的鞋类物品，其中所述编织部件包括：

一对至少部分地共同延伸的编织层，其由整体编织构造形成；以及

多根浮纱，其安置在所述编织层之间并在基本上平行于所述编织层的方向上延伸，

所述编织层和所述浮纱安置为邻近所述鞋面的脚踝开口。

20. 如权利要求 15 所述的鞋类物品，其中所述编织部件的第一区具有第一编织类型，而所述编织部件的第二区具有第二编织类型，所述第一编织类型不同于所述第二编织类型。

21. 如权利要求 15 所述的鞋类物品，其中所述编织部件的第一区具有第一纱线类型，而所述编织部件的第二区具有第二纱线类型，所述第一纱线类型不同于所述第二纱线类型。

22. 一种鞋类物品，其具有包括鞋带系统的鞋面，所述鞋带系统包括：

编织部件，其限定 (a) 由整体编织构造形成的管和 (b) 邻近所述管的端部安置的孔；

股状物，其延伸穿过所述管并形成环；以及

鞋带，其延伸穿过所述环和所述孔。

23. 一种鞋类物品，其具有鞋面和固定到所述鞋面的鞋底结构，所述鞋面包括编织部件，所述编织部件包括：

第一编织层和第二编织层，所述第一编织层和第二编织层相互之间至少部分地共同延伸且由整体编织构造形成；以及

多根浮纱，其安置在所述第一编织层和所述第二编织层之间并在基本上平行于所述第一编织层和所述第二编织层的方向上延伸。

24. 如权利要求 23 所述的鞋类物品，其中所述鞋面限定内部空腔以及脚踝开口，所述内部空腔用于容纳足部，所述脚踝开口提供所述空腔的入口，所述第一编织层、所述第二编织层以及所述浮纱安置为邻近所述脚踝开口。

25. 如权利要求 24 所述的鞋类物品，其中所述第一编织层、所述第二编织层以及所述浮纱安置在所述鞋面的内侧面上和所述鞋面的外侧面上。

26. 如权利要求 23 所述的鞋类物品，其中所述编织部件限定由整体编织构造形成的管，且股状物延伸穿过一定长度的所述管。

27. 如权利要求 23 所述的鞋类物品，其中所述编织部件的第一区具有第一编织类型，且所述编织部件的第二区具有第二编织类型，所述第一编织类型不同于所述第二编织类型。

28. 如权利要求 23 所述的鞋类物品，其中所述编织部件的第一区具有第一纱线类型，且所述编织部件的第二区具有第二纱线类型，所述第一纱线类型不同于所述第二纱线类型。

29. 一种鞋类物品，其具有鞋面和固定到所述鞋面的鞋底结构，所述鞋面包括编织部件，所述编织部件包括：

第一编织层和第二编织层，所述第一编织层和第二编织层由整体编织构造形成，所述第一编织层与所述第二编织层至少部分地共同延伸以限定在所述第一编织层与所述第二编织层之间的内部容积；以及

多根浮纱，其安置于所述内部容积内并在所述第一编织层与所述第二编织层之间延伸。

30. 如权利要求 29 所述的鞋类物品，其中所述鞋面限定内部空腔和脚踝开口，所述内部空腔用于容纳足部，所述脚踝开口提供所述空腔的入口，所述第一编织层、所述第二编织层以及所述浮纱安置为邻近所述脚踝开口。

31. 如权利要求 30 所述的鞋类物品，其中所述第一编织层、所述第二编织层以及所述浮纱安置在所述鞋面的内侧面上、安置在所述鞋面的外侧面上，以及围绕所述鞋面的鞋跟区域延伸。

32. 一种鞋类物品，其具有鞋面和固定到所述鞋面的鞋底结构，所述鞋面限定用于容纳穿用者的足部的内部空腔，且所述鞋面具有提供所述空腔的入口的脚踝开口，所述鞋面包括编织部件，所述编织部件包括：

第一编织层，其形成所述鞋面的外表面的邻近所述脚踝开口的至少一部分；

第二编织层，其形成所述鞋面的内表面的邻近所述脚踝开口的至少一部分；以及

多根浮纱，其安置在所述第一编织层与所述第二编织层之间，

其中所述第一编织层和所述第二编织层在所述脚踝开口处和在与所述脚踝开口隔开的位置处相互连接以在所述第一编织层和所述第二编织层之间限定隔开的区域，且所述浮纱安置于所述隔开的区域中。

33. 如权利要求 32 所述的鞋类物品，其中所述编织部件沿着所述鞋面的外侧面、沿着所述鞋面的内侧面、在所述鞋面的鞋前部区域上，以及围绕所述鞋面的鞋跟区域延伸。

34. 如权利要求 32 所述的鞋类物品，其中所述浮纱基本上平行于所述第一编织层和所述第二编织层。

35. 如权利要求 32 所述的鞋类物品，其中所述编织部件的安置在所述鞋类的鞋中部区域中的一部分限定由整体编织构造形成的管，且股状物延伸穿过一定长度的所述管。

36. 一种制造鞋类物品的方法，所述方法包括：

使用平编织工艺来形成编织部件，所述编织部件包括结合了热塑性聚合物材料的至少一根纱线；

加热至少所述编织部件的区域以熔合结合了所述热塑性聚合物材料的所述纱线；以及

将所述编织部件结合到所述鞋类物品的鞋面中。

37. 如权利要求 36 所述的方法，其中使用平编织工艺的步骤包括在整个所述编织部件中安置结合了所述热塑性聚合物材料的所述纱线。

38. 如权利要求 36 所述的方法，其中使用平编织工艺的步骤包括在仅仅所述编织部件的所述区域中安置结合了所述热塑性聚合物的所述纱线。

39. 如权利要求 36 所述的方法，其中结合的步骤包括在所述鞋类的鞋跟区域中安置所述编织部件的所述区域。

40. 如权利要求 36 所述的方法，其中结合的步骤包括在所述鞋类的鞋前部区域中安置所述编织部件的所述区域。

41. 一种制造鞋类物品的方法，所述方法包括：

使用平编织工艺来形成编织部件，所述编织部件包括第一编织层、第二编织层以及固定到所述第一编织层和所述第二编织层并从所述第一编织层延伸至所述第二编织层的多根纱线；以及

将所述编织部件结合到所述鞋类物品的鞋面中。

42. 如权利要求 41 所述的方法，还包括步骤：将所述纱线选择为单丝纱。

具有结合了编织部件的鞋面的鞋类物品

[0001] 背景

[0002] 常规的鞋类物品通常包括鞋面和鞋底结构两个主要组成部分。鞋面固定到鞋底结构并形成用于舒适而稳妥地容纳足部的鞋类内部的空腔。鞋底结构固定到鞋面的下表面以便置于鞋面和地面之间的位置。例如，在一些运动鞋类物品中，鞋底结构可以包括鞋底夹层和鞋外底。鞋底夹层可以由聚合物泡沫材料形成，聚合物泡沫材料衰减地面反作用力以减轻在行走、跑步、和其它步行活动中足部和腿部上的压力。鞋外底固定到鞋底夹层的下表面并形成鞋底结构的地面接触部分，所述鞋底结构由耐用且耐磨的材料形成。鞋底结构还可以包括置于空腔内并最接近足部的下表面以增强鞋类舒适性的鞋垫 (sockliner)。

[0003] 鞋面通常在足部的脚背和脚趾区域上、沿着足部的内侧面和外侧面、以及围绕足部的足跟区域延伸。在一些鞋类物品中，例如篮球鞋和靴子，鞋面可以向上并围绕脚踝延伸以提供对脚踝的支撑或保护。鞋面内部空腔的入口通常由鞋类的鞋跟区域中的脚踝开口提供。鞋带系统通常结合到鞋面中以调节鞋面的贴合性，从而允许足部从鞋面内的空腔进入和移出。鞋带系统还允许穿用者改变鞋面的某些尺寸（特别是围长）以适应不同尺寸的足部。此外，鞋面可以包括在鞋带系统下方延伸的鞋舌以增强鞋类的可调节性，并且鞋面可以结合足跟稳定器 (heel counter) 以限制足跟的移动。

[0004] 在鞋面制造中通常使用各种材料。例如，运动鞋类的鞋面可以由多个材料元件形成。材料可以根据包括例如抗拉伸性、耐磨性、柔韧性、透气性、压缩性和水分芯吸性 (moisture-wicking) 的各种特性来选择。就鞋面的外层 (exterior) 而言，脚趾区域和鞋跟区域可以由皮革、合成皮革或橡胶材料形成以赋予相对高程度的耐磨性。皮革、合成皮革和橡胶材料可以不呈现用于外层的其它不同区域的期望程度的柔韧性和透气性。因此，外层的其它区域例如可以由合成织物形成。因此，鞋面的外层可以由多个材料元件形成，每个材料元件为鞋面赋予不同的特性。鞋面的中间层或中心层可以由提供缓冲并增强舒适性的轻质聚合物泡沫材料形成。类似地，鞋面的内层 (interior) 可以由舒适的和水分芯吸性的织物形成，其从直接围绕足部的区域排汗。各种材料元件和其它部件可以使用粘合剂或缝合来连接。相应地，常规的鞋面由各种材料元件形成，每个材料元件为鞋类的不同区域赋予不同的特性。

[0005] 发明概述

[0006] 可以使用平编织工艺 (flat knitting process) 或许多其它编织工艺来形成鞋类物品的鞋面的编织部件 (knitted component)。各种特征可以结合到编织部件中。例如，编织部件可以限定由整体编织构造 (unitary knit construction) 形成的管，且股状物可以延伸穿过一定长度的管。作为另一个示例，编织部件可以具有由整体编织构造形成的一对至少部分地共同延伸的编织层，且多根浮纱 (floating yarn) 可以在编织层之间延伸。在一些构造中，编织类型或纱线类型可以在编织部件的不同区域中变化以赋予不同的特性。此外，编织部件可以结合热塑性纱，该热塑性纱在编织部件的不同区域中被熔合以赋予不同的特性。

[0007] 所附权利要求详细指出了表征本发明各方面的优势和新颖特征。然而，为了获得

对优势和新颖特征更好地理解，可以参考描述和说明与本发明有关的各种构造和概念的以下描述性内容和附图。

附图说明

[0008] 当结合附图阅读时，将更好地理解前述的概述以及下面的详述。

[0009] 图 1 是鞋类物品的透视图。

[0010] 图 2 是鞋类物品的外侧视图。

[0011] 图 3 是鞋类物品的内侧视图。

[0012] 图 4 是鞋类物品的顶部平面图。

[0013] 图 5A-5D 是鞋类物品的剖面图，如分别由图 2 中的剖面线 5A-5D 所界定的。

[0014] 图 6 是形成鞋类物品的鞋面的一部分的编织部件的顶部平面图。

[0015] 图 7A-7G 是与图 2 相对应并描述了鞋类物品的进一步构造的侧视图。

[0016] 图 8A 和 8B 是与图 5D 相对应并描述了鞋类物品的进一步构造的剖面图。

[0017] 详述

[0018] 下面的讨论和附图公开了具有包括编织部件的鞋面的鞋类物品。鞋类物品公开为具有适合于行走或跑步的一般构造。与鞋类相关的概念（包括鞋面）也可以应用于各种其它运动鞋类型式，例如包括棒球鞋、篮球鞋、多用途训练鞋、骑行鞋 (cycling shoe)、橄榄球鞋、网球鞋、足球鞋和远足鞋。这些概念还可以应用于通常被认为是非运动型的鞋类型式，包括礼服鞋、便鞋 (loafer)、凉鞋和工作靴。因此，本文所公开的这些概念适用各种各样的鞋类型式。

[0019] 常规鞋类结构

[0020] 鞋类物品 10 在图 1-5D 中描述成包括鞋底结构 20 和鞋面 30。为了参考的目的，鞋类 10 可以分成三个大致区域：鞋前部区域 11、鞋中部区域 12 和鞋跟区域 13，如图 2 和图 3 中所显示的。鞋类 10 还包括外侧面 14 和内侧面 15。鞋前部区域 11 通常包括鞋类 10 的对应于脚趾和连接跖骨和趾骨的关节的部分。鞋中部区域 12 通常包括鞋类 10 的对应于足部的足弓区域的部分，而鞋跟区域 13 对应于足部的后部部分，包括跟骨。外侧面 14 和内侧面 15 延伸穿过区域 11-13 中的每一个区域并对应于鞋类 10 的相对侧面。区域 11-13 和侧面 14-15 并不是要精确地划分鞋类 10 的区域。而是，区域 11-13 和侧面 14-15 用来表示鞋类 10 的大致区域以便帮助下面的论述。除了鞋类 10 之外，区域 11-13 和侧面 14-15 还可以应用到鞋底结构 20、鞋面 30 及其单个元件。

[0021] 鞋底结构 20 固定到鞋面 30 并当穿着鞋类 10 时在足部和地面之间延伸。鞋底结构 20 的主要组成部分是鞋底夹层 21、鞋外底 22 以及鞋垫 23。鞋底夹层 21 固定到鞋面 30 的下表面并可以由可压缩的聚合物泡沫元件（例如，聚氨基甲酸酯或乙烯醋酸乙烯酯泡沫）形成，可压缩的聚合物泡沫元件当在行走、跑步、或其它步行活动期间在足部和地面之间被压缩时衰减地面反作用力（即，提供缓冲）。在进一步的构造中，鞋底夹层 21 可以结合补充地面反作用力衰减特性的填充流体的囊，或鞋底夹层 21 可以主要由填充流体的囊形成。鞋外底 22 固定到鞋底夹层 21 的下表面并可以由具有某种结构以赋予附着摩擦力的耐磨橡胶材料形成。鞋垫 23 位于鞋面 30 内并安置为在足部下表面之下延伸。虽然鞋底结构 20 的此构造提供了可以与鞋面 30 一起使用的鞋底结构的实例，但也可以使用用于鞋底结构 20

的各种其它的常规或非常规构造。相应地，鞋底结构 20 或任何与鞋面 30 一起使用的鞋底结构的结构和特征可以显著地改变。

[0022] 鞋面 30 限定了鞋类 10 内的用于相对于鞋底结构 20 容纳和固定足部的空腔。所述空腔成形为容纳足部并沿着足部的外侧面、沿着足部的内侧面、在足部上方、围绕足跟、以及在足部下方延伸。通过位于至少鞋跟区域 13 中的脚踝开口 31 来提供空腔的入口。如在下面更详细地描述的，鞋带 32 延伸穿过鞋面 30 的部分，并允许穿用者改变鞋面 30 的尺寸以适应足部的大小。更具体地，鞋带 32 允许穿用者绷紧围绕足部的鞋面 30，且鞋带 32 允许穿用者松弛鞋面 30 以方便足部从空腔中（即，通过脚踝开口 31）进入和移出。此外，鞋面 30 包括在鞋带 32 下方延伸的鞋舌 33。

[0023] 鞋面 30 的大部分由编织部件 40 形成，编织部件 40 例如可以通过平编织工艺来制造。编织部件 40 穿过区域 11-13 中的每个区域、沿着外侧面 14 和内侧面 15、在鞋前部区域 11 上、以及围绕鞋跟区域 13 延伸。此外，编织部件 40 形成鞋面 30 的内表面和相对的外表面。就这点而论，编织部件 40 限定鞋面 30 内空腔的至少一部分，且编织部件 40 还限定脚踝开口 31 以提供空腔的入口。在一些构造中，编织部件 40 还可以在足部下方延伸。然而，为了各个图中的示例的目的，士多宝鞋内衬底 (strobel sock)34 固定到编织部件 40 并形成鞋面 30 的在足部下方延伸的部分的大部分。在此构造中，鞋垫 23 在士多宝鞋内衬底 34 上方延伸并形成其上搁放足部的表面。

[0024] 编织部件的构造

[0025] 编织部件 40 结合了为鞋面 30 的不同区域 (separate area) 赋予不同特性的各种编织类型。如图 1、图 4 和图 5A 中所描述的示例，编织部件 40 形成多个孔 41，多个孔 41 延伸穿过鞋前部区域 11 中的鞋面 30，而鞋面 30 的许多其它区域具有更连续的构造或具有很少孔的构造。除了赋予更高的渗透性（其允许空气在鞋面 30 内流通）之外，孔 41 可以增加鞋前部区域 11 中的鞋面 30 的柔韧性和伸展性。如进一步的示例，可以通过为编织部件 40 的特定区域选择特定的编织类型来改变的其它特性包括液体渗透性、编织部件 40 伸展或抗伸展的方向、编织部件 40 的刚度、以及编织部件 40 的压缩性。具有用于鞋类鞋面的含不同编织类型以赋予不同特性的区域的编织部件的另外的实例可以在 Dua 的美国专利第 6,931,762 号和 Dua 等人的美国专利第 7,347,011 号中找到，这两篇专利通过引用整体并入本文。作为相关内容，编织部件 40 内的编织密度可以在鞋面 30 的不同的区域中变化以例如制作低渗透性或更硬的部分。相应地，编织部件 40 可以在不同的区域中呈现不同的特性，依赖于为这些区域所选择的特定编织类型。

[0026] 编织部件 40 还可以结合为鞋面 30 的不同区域赋予不同特性的各种纱线类型。此外，通过将各种纱线类型与不同缝合类型组合，编织部件 40 可以为鞋面 30 的不同区域赋予一系列不同的特性。特定的纱线类型将为编织部件 40 的区域赋予的特性部分地依赖于形成纱线内各种细丝 (filament) 和纤维的材料。例如，棉提供柔软的手感、天然的美感和生物降解性。弹性 (elastane) 和弹力聚酯 (stretch polyester) 各自提供基本的伸展性和可恢复性，弹力聚酯还提供可再利用性 (recycleability)。人造丝 (rayon) 提供高光泽和吸湿性。羊毛状物除了绝缘特性之外，还提供高吸湿性。尼龙是具有高强度的耐用和耐磨材料。聚酯是也提供相对高的耐用性的疏水材料。除了材料以外，与纱线有关的其它方面可以影响鞋面 30 的特性。例如，纱线可以是单丝纱或复丝纱。纱线还可以包括不同的细

丝，每根细丝由不同材料形成。纱线还可以包括细丝，每根细丝由两种或更多种材料形成，例如具有皮芯（sheath-core）构造的细丝的双组分纱或具有由不同材料形成的两半的双组分纱。不同捻度和卷曲度、以及不同的旦尼尔（denier）可以影响放置纱线的鞋面 30 的特性。相应地，可以选择形成纱线的材料以及纱线的其它方面以便为鞋面 30 的不同区域赋予各种特性。

[0027] 除了编织类型和纱线类型之外，编织部件 40 可以结合各种编织结构。例如，参考图 2 和图 3，编织部件 40 包括其中放置股状物 43 的多个管 42。管 42 通常是由两个重叠的且至少部分地共同延伸的编织材料层形成的空心结构，如图 5B 和 5C 中所描述的。虽然形成管 42 的编织材料的一层的侧面或边缘可以固定到另一层，但是中间区域通常是未固定的，使得另一元件（例如，股状物 43）可以放置在编织材料的两层之间并穿过管 42。用于鞋类鞋面的具有重叠的或至少部分地共同延伸的层的编织部件的另外的实例可以在 Dua 等人的美国专利申请公布 2008/0110048 中找到，该专利申请公布通过引用并入本文。

[0028] 管 42 沿着外侧面 14 和内侧面 15 向上延伸。每个管 42 邻近至少一个另外的管 42 以形成管对（tube pair）。一般来说，股状物 43 中的一根穿过管对中的第一管 42，从第一管 42 的上端向外延伸，形成鞋面 30 外层上的环 44，延伸进入该管对中的第二管 42 的上端，并穿过第二管 42。即，每根股状物 43 穿过至少两个管 42，且股状物 43 的外露部分形成环 44。

[0029] 单根股状物 43 可以只穿过两个相邻的管 42（即，单个管对）使得股状物 43 形成单个环 44。在此构造中，股状物 43 的端部离开两个相邻的管 42 的下端，并例如可以在士多宝鞋内衬底 34 下方固定到鞋底结构 20 以防止端部部分从管 42 中的一个管中被拉出。在另一个构造中，单根股状物 43 可以穿过每个管 42，由此穿过多个管对并形成多个环 44。在另一个构造中，一根股状物 43 可以穿过位于外侧面 14 上的每个管 42，而另一根股状物 43 可以穿过位于内侧面 15 上的每个管 42。因此，一般来说，单根股状物 43 穿过至少一个管对以形成至少一个环 44，但可以穿过多个管对以形成多个环 44。

[0030] 参考图 1-4，鞋带 32 延伸穿过每个环 44 并还穿过在编织部件 40 中邻近每个环 44 形成的多个孔 41。鞋带 32、孔 41（鞋带 32 延伸穿过该孔）、外侧面 14 和内侧面 15 上的各个管 42、股状物 43 和环 44 的组合为鞋面 30 提供有效的鞋带系统。当拉紧鞋带 32 时（即，当穿用者系鞋带 32 时），拉力还可以被引入到股状物 43 中。在没有股状物 43 的情况下，编织部件 40 的其它部分将承受拉力和系鞋带 32 产生的应力。然而，股状物 43 的存在提供了承受拉力和应力的单独的元件。此外，编织部件 40 的大部分通常可以通过选择编织类型和纱线类型来形成以便在拉紧时伸展，由此允许鞋面 30 与足部的轮廓相符合。然而，与鞋面 30 相比，股状物 43 通常可以是非伸展性的。

[0031] 股状物 43 可以由各种材料形成，且可以具有例如绳、线、带状物、缆绳、纱线、细丝或链的构造。在一些构造中，在形成编织部件 40 的编织过程中股状物位于管 42 内。就这点而论，股状物 43 可以由可在形成编织部件 40 的编织机或其它设备中使用的任何常规的一维材料形成。如关于本发明所使用的，术语“一维材料”或其变体旨在涵盖呈现出远远大于宽度和厚度的长度的常规的长形材料。相应地，用于股状物 43 的合适材料包括各种细丝、纤维和纱线，其由人造丝、尼龙、聚酯、聚丙烯酸（polyacrylic）、蚕丝、棉、碳、玻璃、芳族聚酰胺（例如，对位芳族聚酰胺纤维和间位芳族聚酰胺纤维）、超高分子量聚乙烯、以及液

晶聚合物形成。除了细丝和纱线之外，其它一维材料可以用于股状物 43。虽然一维材料经常将具有宽度和厚度基本上相等的横截面（例如，圆形或正方形横截面），但是某些一维材料可以具有稍微大于厚度的宽度（例如，矩形、椭圆形、或其它长形的横截面）。如果材料的长度远远大于材料的宽度和厚度，那么尽管有较大的宽度，也可以认为材料是一维的。

[0032] 由编织部件 40 形成的另一种结构是至少部分地围绕脚踝开口 31 延伸的装填垫料的鞋领 (padded collar)45。参考图 1-3，鞋领 45 显示出比编织部件 40 的许多其它部分更大的厚度。一般说来，鞋领 45 由两个重叠且至少部分地共同延伸的编织材料层（即，管状结构）和在所述层之间延伸的多根浮纱 46 形成，如图 5D 中所描述的。虽然形成鞋领 45 的编织材料的一层的侧面或边缘可以固定到编织材料的另一层，但是中间区域通常是未固定的。就这点而论，编织材料层有效地形成类似管 42 的管或管状结构，且浮纱 46 可以位于或放置于编织材料的两层之间以穿过管。即，浮纱 46 在编织材料层之间延伸，通常平行于编织材料的表面，而且还穿过并填充所述层之间的内部容积。然而，编织部件 40 的大部分是由被机械操纵以形成编织部件的纱线形成的，浮纱 46 通常是自由的或另外放置于形成鞋领 45 的外层的编织材料层之间的内部容积中。

[0033] 然而，管 42 包括单根股状物 43，鞋领 45 包括延伸穿过编织材料层之间的区域的多根浮纱 46。相应地，编织部件 40 可以形成常规的管状结构，其在所述管状结构内具有一根或多根纱线。此外，浮纱 46 可以由各种材料形成且可以在形成编织部件 40 的编织过程中放置在鞋领 45 中。就这点而论，浮纱 46 可以由可在形成编织部件 40 的编织机或其他设备中使用的任何常规的一维材料来形成。

[0034] 浮纱 46 的存在为鞋领 45 赋予了可压缩的方面，由此增强了脚踝开口 31 的区域中的鞋类 10 舒适度。许多常规的鞋类物品将聚合物泡沫元件或其它可压缩材料结合到鞋领区域中。与常规的鞋类物品不同，鞋领 45 使用浮纱 46 来提供可压缩结构。

[0035] 管 42 和股状物 43 的组合为鞋面 30 提供了例如在鞋带系统中抗伸展的结构元件。类似地，鞋领 45 和浮纱 46 的组合为鞋面 30 提供了例如压缩以赋予围绕脚踝开口 31 的更大舒适度的结构元件。虽然这些编织结构为鞋面 30 提供了不同的益处，但这些编织结构在以下方面是类似的：每个包括：(a) 管状结构，其是由整体编织构造所形成的两个重叠的且至少部分地共同延伸的编织材料层形成，以及 (b) 至少一根纱线、股状物或其它一维材料，其放置于或以其他方式位于管状结构中并延伸穿过一定长度的所述管状结构的至少一部分。

[0036] 平编织工艺

[0037] 可以使用平编织工艺来制造编织部件 40。平编织是制备编织材料的方法，该编织材料被周期性地转向（即，从交替的侧面编织所述材料）。材料的两个侧面（另外称为面）通常命名为正面（即，面向外、朝向观察者的侧面）和反面（即，面向内、背离观察者的侧面）。虽然平编织提供了形成编织部件 40 的合适的方法，但其它编织工艺也可以使用，这取决于结合到编织部件 40 中的特征。可以使用的其它编织工艺的示例包括宽管圆筒型编织 (wide tube circular knitting)、窄管提花圆筒型编织 (narrow tube circular knit jacquard)、单面提花圆筒型编织 (single knit circular knit jacquard)、双面提花圆筒型编织、特里柯型经编 (warp knit tricot)、拉舍尔型经编 (warp knit raschel)、以及双针床拉舍尔经编 (double needle bar raschel)。

[0038] 使用平编织工艺来制造编织部件 40 的一个优势是通过平编织工艺可以将上述特

征的每一个赋予到编织部件 40。即，平编织工艺可以形成编织部件 40 以具有例如 (a) 为鞋面 30 的不同区域赋予不同特性的各种编织类型，(b) 为鞋面 30 的不同区域赋予不同特性的各种纱线类型，(c) 在管 42 中具有重叠的编织层的构造的编织部件，(d) 放置于管 42 中的诸如股状物 43 的材料，(e) 在鞋领 45 中具有重叠的编织层的构造的编织部件，以及 (f) 在鞋领 45 中的编织材料层之间的浮纱。此外，这些特征中的每一个以及其它特征可以通过单一的平编织工艺结合到编织部件 40 中。就这点而论，可以使用平编织工艺来基本上形成鞋面 30 以具有对鞋类 10 有利的各种特性和结构特征。

[0039] 虽然可以由单个个体机械地操纵一根或多根纱线以形成编织部件 40（即，可以通过手来形成编织部件 40），但横机可以提供形成相对大量的编织部件 40 的有效方式。还可以使用横机来改变编织部件 40 的尺寸以形成适于具有基于足部的长度和宽度中的一个或两个的不同尺寸的鞋类的鞋面 30。此外，可以使用横机来改变编织部件 40 的构造以形成适于左脚和右脚的鞋面 30。还可以改变编织部件 40 的各个方面来提供对于个体的量身定做。相应地，使用机械的横机可以提供形成具有不同尺寸和构造的多个编织部件 40 的有效方式。

[0040] 编织部件 40 结合了由整体编织构造形成的许多特征和结构。一般来说，当特征和结构通过平编织工艺、而不是在平编织工艺之后所进行的其它工艺（例如，缝合、粘合、成形）被结合到编织部件 40 中时，该特征和结构由整体编织构造形成。作为一个示例，管 42 和鞋领 45 的部分是由重叠的且至少部分地共同延伸的编织材料层形成的，且一层的侧面或边缘可以固定到另一层。编织材料的两个层通常是在平编织工艺过程中形成的且不包括补充的缝合、粘合或成形工艺。因此，重叠的层是经过平编织工艺由整体编织构造形成的。作为另一个示例，从编织类型形成的编织部件 40 的限定孔 41 的区域是经过平编织工艺由整体编织构造形成的。作为另一个示例，浮纱 46 是由整体编织构造形成的。

[0041] 使用平编织工艺形成编织部件 40 的进一步的优势是可以将三维外观 (aspect) 结合到鞋面 30 中。鞋面 30 具有围绕足部延伸并符合足部形状的曲线的或其它的三维结构。例如，平编织工艺可以形成具有某种曲率的编织部件 40 的区域以便补充足部的形状。用于鞋类鞋面的具有三维外观的编织部件的示例可以在 Dua 等人的美国专利申请公布 2008/0110048 中找到，该专利申请公布通过引用并入本文。

[0042] 在图 6 中，将编织部件 40 从鞋类 10 中分离出来并遵照平编织工艺来描述。虽然许多织物材料的边缘被切割而显露出形成织物材料的纱线的端部，但是编织部件 40 可以形成为具有经修整的构造 (finished configuration)。即，可以使用平编织或其它编织技术来形成编织部件 40，使得编织部件 40 内的纱线的端部基本上不存在于编织部件 40 的边缘处。通过平编织形成的经修整的构造的一个优势是形成编织部件 40 的边缘的纱线不太可能拆散，这是纬编材料所固有的问题。通过形成经修整的边缘，编织部件 40 的整体性被加强，且需要很少的后处理步骤或不需要后处理步骤来防止拆散。此外，松散的纱线也不太可能妨碍鞋面 30 的美学外观。换言之，当增加制造效率时，编织部件 40 的经修整的构造可以增强鞋面 20 的耐久性和美学质量。

[0043] 编织部件 40 提供适于鞋类 10 的鞋面 30 的构造的一个示例。例如，根据鞋类物品的预期用途、鞋类物品的所期望的特性、以及鞋类物品的有利的结构属性，可以通过平编织形成类似于编织部件 40 的编织部件以具有所期望的特征。即，可以使用平编织来 (a) 在所

期望的编织部件的区域中设置特定编织类型，(b) 在所期望的编织部件的区域中设置特定纱线类型，(c) 在所期望的编织部件的区域中形成类似于管 42 和鞋领 45 的重叠的编织层，(d) 在编织层之间放置类似于股状物 43 和浮纱 46 的股状物或浮纱，(e) 在编织部件中形成三维外观，以及 (f) 赋予经修整的边缘。更具体地，例如，任何上述特征可以在编织部件内混合和匹配以形成鞋类鞋面的特定的特性或结构属性。

[0044] 进一步的构造

[0045] 上述鞋面 30 的特征提供用于鞋类 10 的合适构造的一个示例。也可以使用许多其它构造。作为一个示例，在鞋类 10 的某些构造中的编织部件 40 中可以不存在上述特征中的一些。参考图 7A，编织部件 40 中不存在鞋领 45，使得单个编织材料层形成围绕脚踝开口 31 延伸的区域。类似地，图 7B 中不存在管 42 和股状物 43。例如，通过仅使用有益于特定体育运动的结构或特征，鞋类 10 可以具有仅仅带有必要的或有利的元件的最小构造。

[0046] 如上所述，由于在鞋面 30 的不同区域中使用不同的编织类型或纱线类型，那些区域可以具有不同特性。改变特定区域的特性的另一方式涉及熔合来自那些区域中的纱线的热塑性材料。即，特定区域可以由结合热塑性聚合物材料的纱线形成。通过加热热塑性聚合物材料，相邻的纱线、细丝或纤维可以在那些区域中彼此熔合以将编织环锁定在一起，由此增加刚度或耐磨性。在一些构造中，编织部件 40 的单个层（例如，管 42 或鞋领 45 的外层或内层）或编织部件 40 中放置的纱线（即，股状物 43 或浮纱 46）可以由结合热塑性聚合物材料的纱线形成。作为替代，整个编织部件 40 也可以由结合热塑性聚合物材料的纱线形成，且只有对应于熔合区 47 的部分可以被加热以改变特性。参考图 7C，编织部件 40 包括两个熔合区 47。一个熔合区 47 在鞋跟区域 13 中且可以赋予更大的刚度以便为鞋类 10 有效地提供足跟稳定器。具有熔合区的鞋类鞋面的实例可以在 Dua 的美国专利第 6,910,288 号中找到，该专利通过引用并入本文。另一个熔合区 47 在鞋前部区域 11 中且可以为鞋前部区域赋予更大的耐磨性。还可以利用熔合来增强孔 41，提供减小弯曲的区域，或减小渗透性。

[0047] 虽然编织部件 40 的熔合区可以为这些区域赋予更大的刚度和耐磨性，但另一种方法可以是增加特定区域中的编织密度。参考图 7D，编织部件 40 包括两个致密区 48。一个致密区 48 在鞋跟区域 13 中且可以赋予更大的刚度以便为鞋类 10 有效地提供足跟稳定器。另一个致密区 48 在鞋前部区域 11 中且可以为鞋前部区域赋予更大的耐磨性。与形成熔合区 47 一样，形成更致密的编织物 (denser knit) 也可以用来增强孔 41，提供减小弯曲的区域，或减小渗透性。

[0048] 编织部件 40 形成鞋面 30 的内表面和相对的外表面。在鞋类 10 的一些构造中，可以将其它元件与编织部件 40 结合使用，且其它元件可以形成内表面或外表面中的一个的一部分或全部。参考图 7E，足跟稳定器 35 在鞋跟区域 13 中固定到编织部件 40，且可以由相对刚性的聚合物材料形成。可以使用粘结工艺来将足跟稳定器 35 连接到编织部件 40。在其它构造中，衬里可以在内表面上延伸，由此形成鞋面 30 内空腔的一部分。其它材料可以熔接、粘附、或结合到外表面上以保护编织部件 40 的编织结构或为鞋类 10 提供其它益处。

[0049] 管 42 在图 2 和图 3 中被描述成紧邻至少一个其他的管 42。然而，管 42 的相对位置可以显著改变。参考图 7F，管 42 相互分开并形成 V 形结构。虽然可以使用管 42 作为鞋带系统的一部分，但也可以使用管 42 或类似结构来赋予纵向抗伸展性。参考图 7G，管 42 纵

向延伸，而管 42 内的股状物 43 可以对抗贯穿区域 11-13 中的每个区域的伸展。

[0050] 纱线 46 结合到鞋领 45 中的方式可以显著改变。在上述构造中，当通过管状结构时，浮纱 46 通常平行于形成鞋领 45 的编织材料层。参考图 8A，纱线 46 从一个编织材料层延伸至另一个编织材料层并通常垂直于层，由此赋予类似于在平编织过程中形成的间隔编织材料 (spacer-knit material) 的结构。如在图 8A 的放大区域中所描述的，纱线 46 可以围绕形成编织层的纱线延伸。在一个构造中，纱线 46 可以是与形成编织层相同的纱线。即，纱线 46 可以是形成编织层的纱线的拆散部分。在另一个构造中，纱线 46 可以是未固定的或以其它方式与形成编织层的纱线分开的（即，不围绕形成编织层的纱线延伸）。相应地，纱线 46 可以以各种方式结合到编织部件 40 中。作为进一步的情况，鞋面 30 的某些构造可以包括聚合物泡沫材料，所述聚合物泡沫材料在制造编织部件 40 之后放置在编织材料层之间。

[0051] 如上所述，鞋领 45 可以具有类似于间隔编织材料的结构，其中纱线 46 从一个编织材料层延伸至另一编织材料层且以通常垂直于层的方向延伸。虽然鞋领 45 是具有此结构的合适区域，但可以使用平编织工艺来为编织部件 40 的任何区域赋予间隔编织材料的结构。例如，间隔编织构造可以安置于鞋前部区域 11 或鞋中部区域 12 中的侧面 14 和 15 中任一个，以便为鞋面 20 赋予缓冲或可压缩方面。士多宝鞋内衬底 23 或鞋舌 33 的部分也可以通过平编织工艺来形成以具有间隔编织构造。此外，各种纱线类型可以用于具有间隔编织构造的编织部件 40 的区域，包括单丝纱或变形纱 (textured yarn)。

[0052] 在上述各种构造中，鞋垫 23 是位于鞋面 20 中的空腔内的独立元件，而士多宝鞋内衬底 34 是与编织部件 40 的边缘连接的独立元件。也可以使用平编织工艺来形成整体编织构造的鞋垫 23 和士多宝鞋内衬底 34，如图 8B 中所描述的。与鞋领 45 一样，可以形成整体编织构造的鞋垫 23 以包括赋予可压缩构造的浮纱。还可以使用平编织工艺来形成整体编织构造的其它元件，例如鞋舌 33。

[0053] 制造效率

[0054] 如在上面背景部分所讨论的，例如，运动鞋类的鞋面可以由多个材料元件形成，每个材料元件为鞋类的不同区域赋予不同的特性。为了制造常规的鞋面，将材料元件切割成所期望的形状并随后连接在一起，通常使用缝合或粘性结合。当结合到鞋面中的材料元件的数量和类型增加时，与输送、储存、切割和连接材料元件相关联的时间和费用也可能增加。随着结合到鞋面中的材料元件的数量和类型增加，来自切割和缝合过程的废料也积累至较大的程度。此外，具有较大量的材料、材料元件和其它部件的鞋类可能比由少量元件和材料形成的鞋面更难再利用。因此，通过减少鞋面中使用的元件和材料的数量，可以减少浪费同时提高制造效率和可再利用性。

[0055] 虽然常规的鞋面需要涉及很多材料元件的多个制造步骤，但是编织部件 40 可以通过单一的平编织工艺形成。在该平编织工艺之后，需要相对少的步骤数来将编织部件 40 结合到鞋类 10 中。更具体地，将士多宝鞋内衬底 34 连接到编织部件 40 的边缘，连接鞋跟区域 13 中的两个边缘，结合鞋带 32，以及将基本上完整的鞋面 30 与鞋底结构 20 固定。与常规制造工艺相比，使用编织部件 40 可以减少总的制造步骤数。此外，可以减少浪费同时增加可再利用性。

[0056] 在上面和附图中参考各种构造公开了本发明。然而，所公开内容的目的是提供关

于本发明的各种特征和概念的示例，并不限制本发明的范围。相关领域的技术人员将认识到可以对上述构造做出许多改变和变更而不背离本发明的如所附权利要求限定的范围。

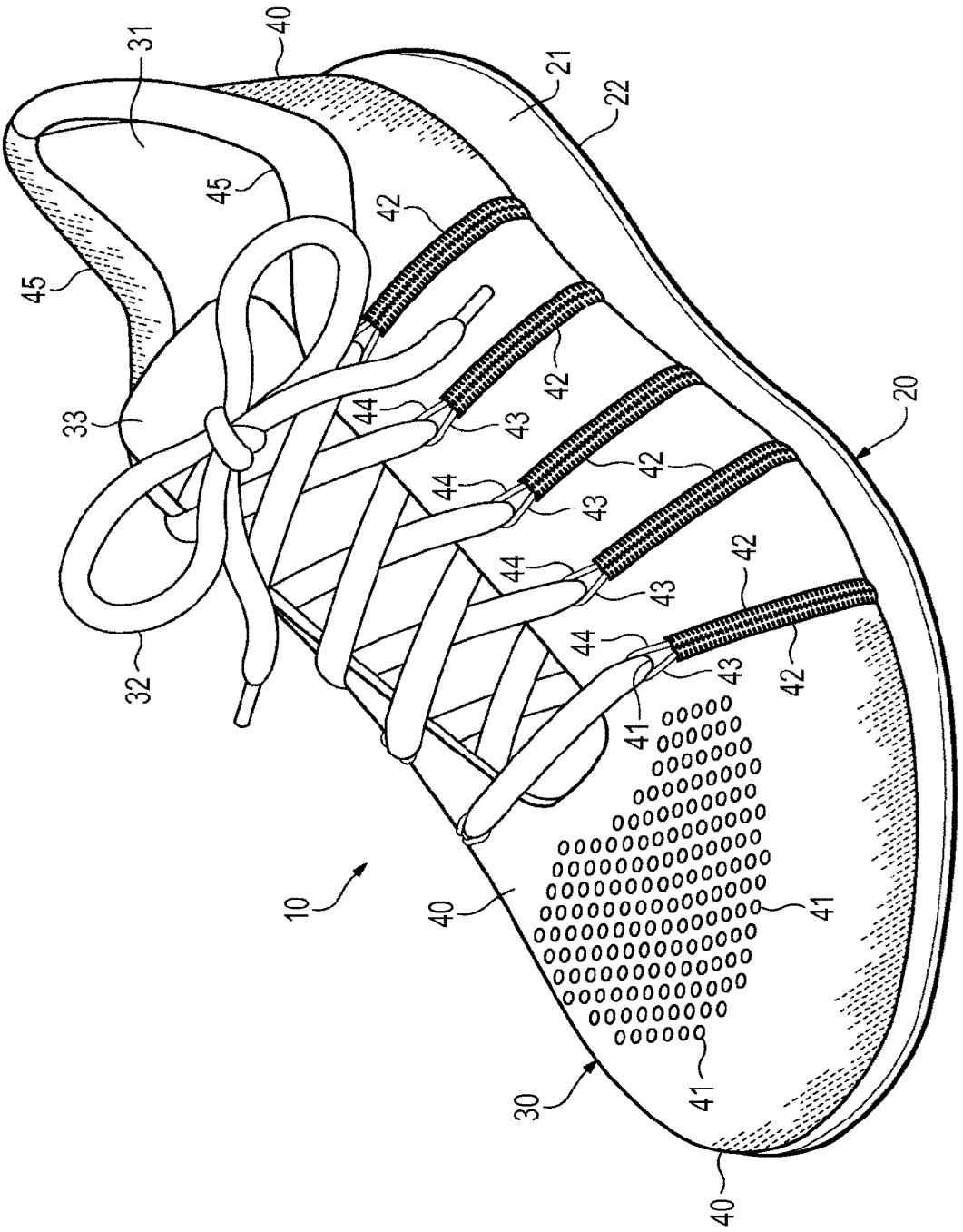


图 1

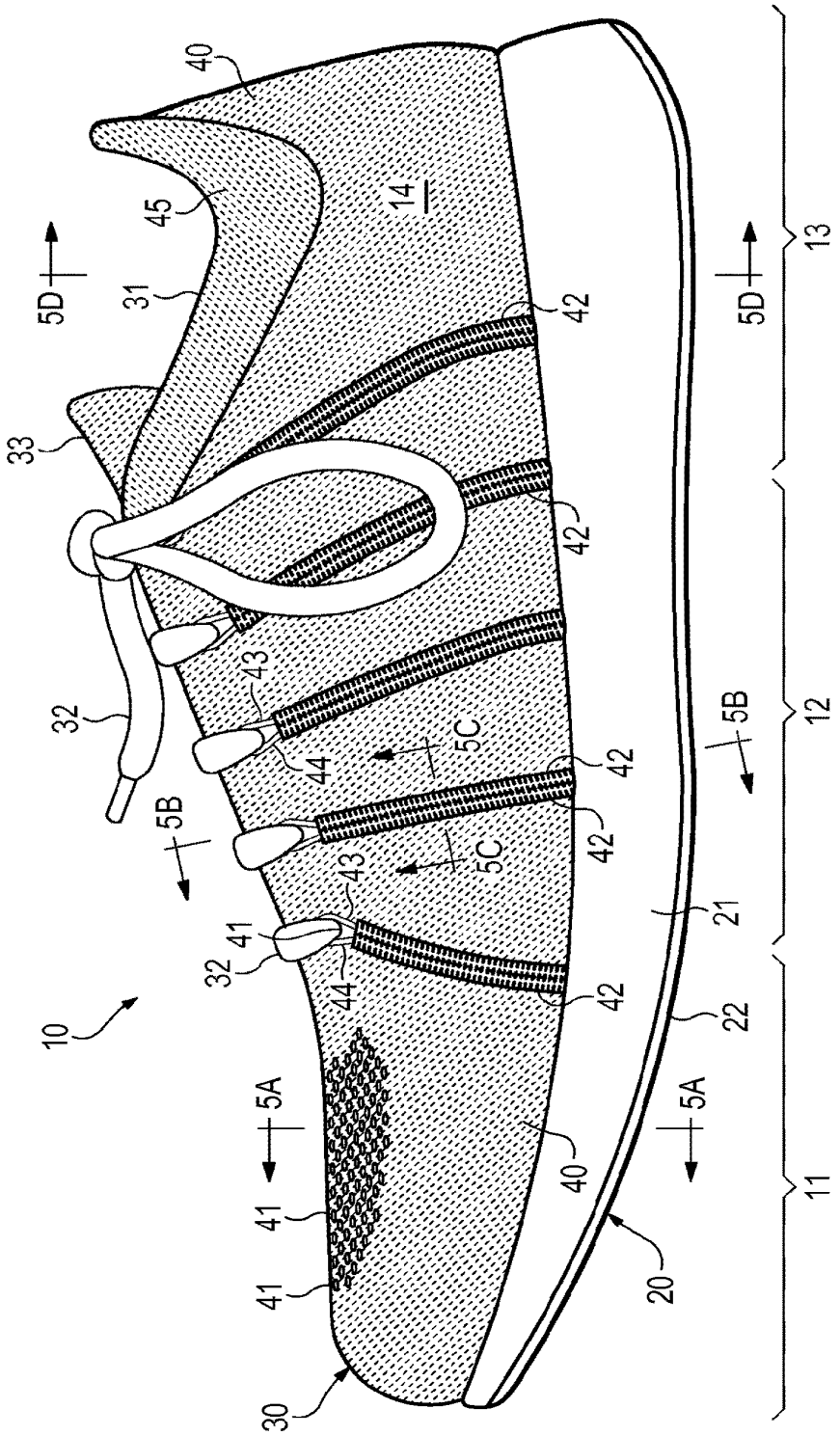
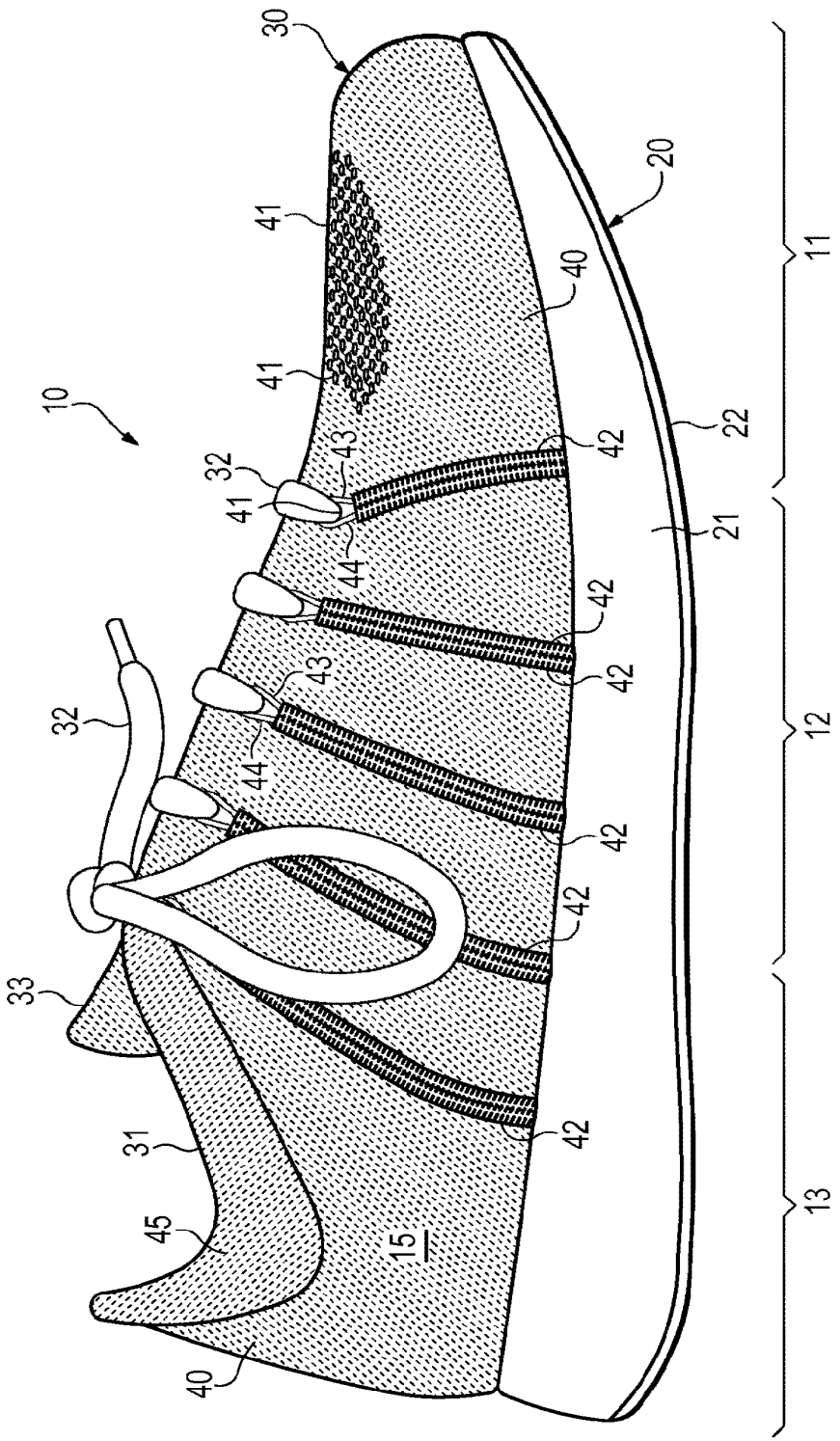


图 2



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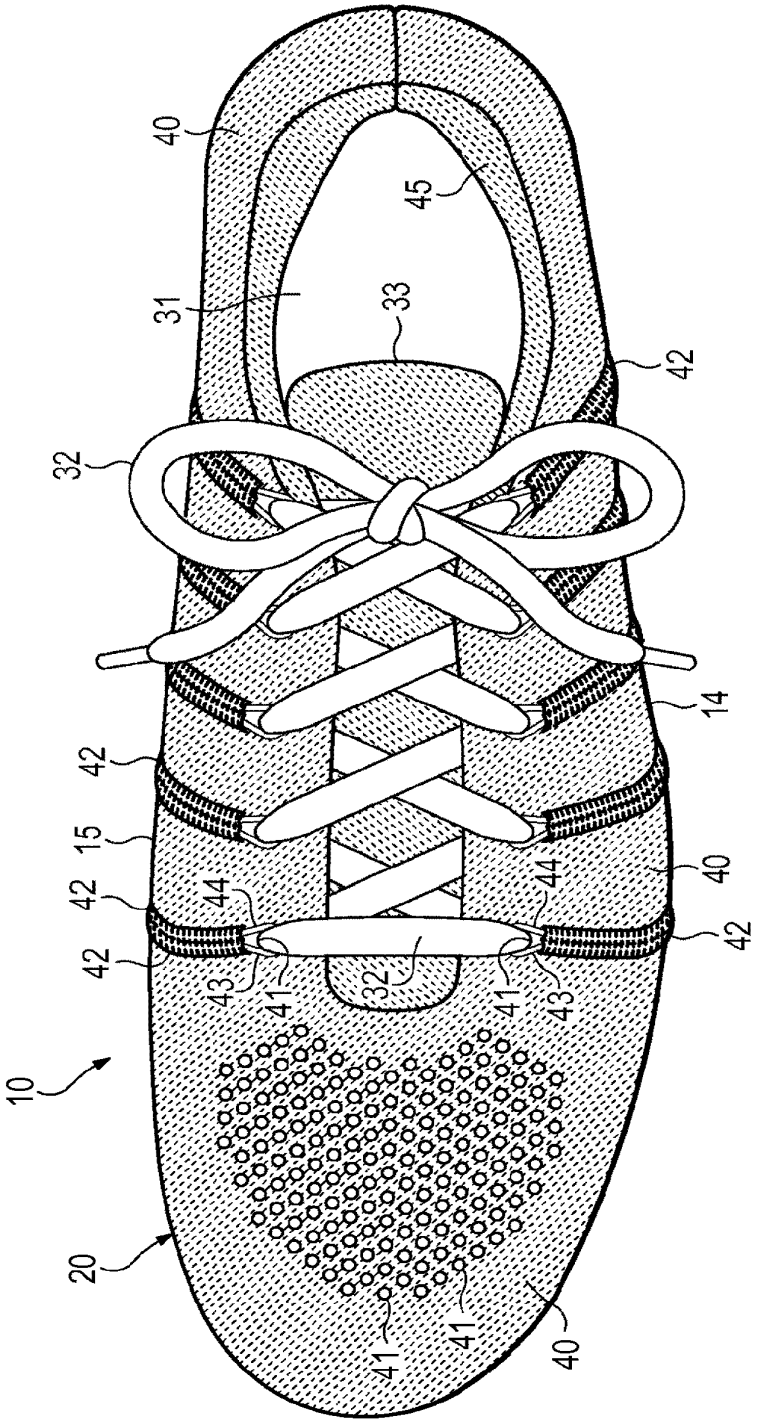

图 4

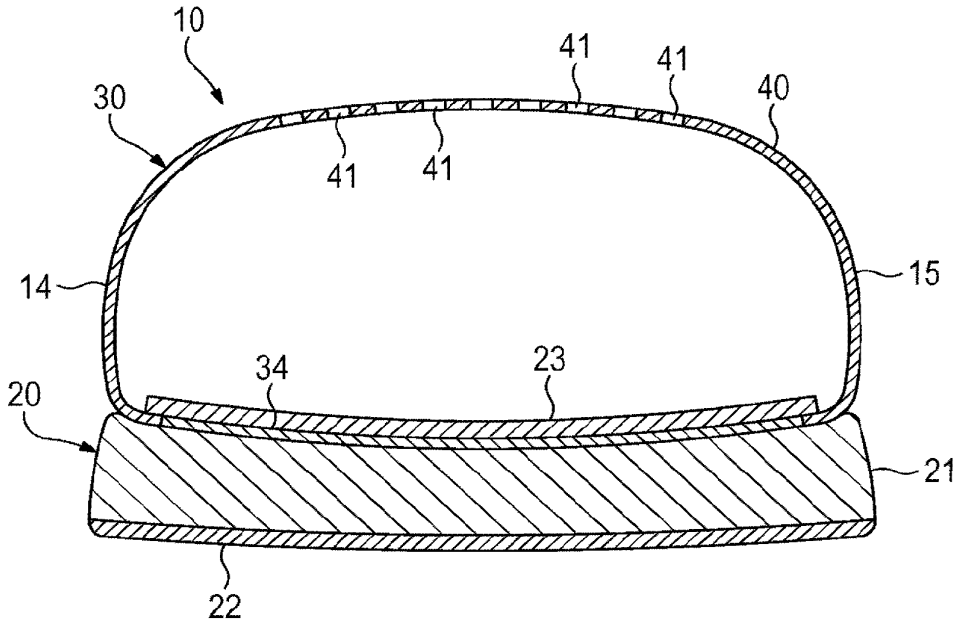

图 5A

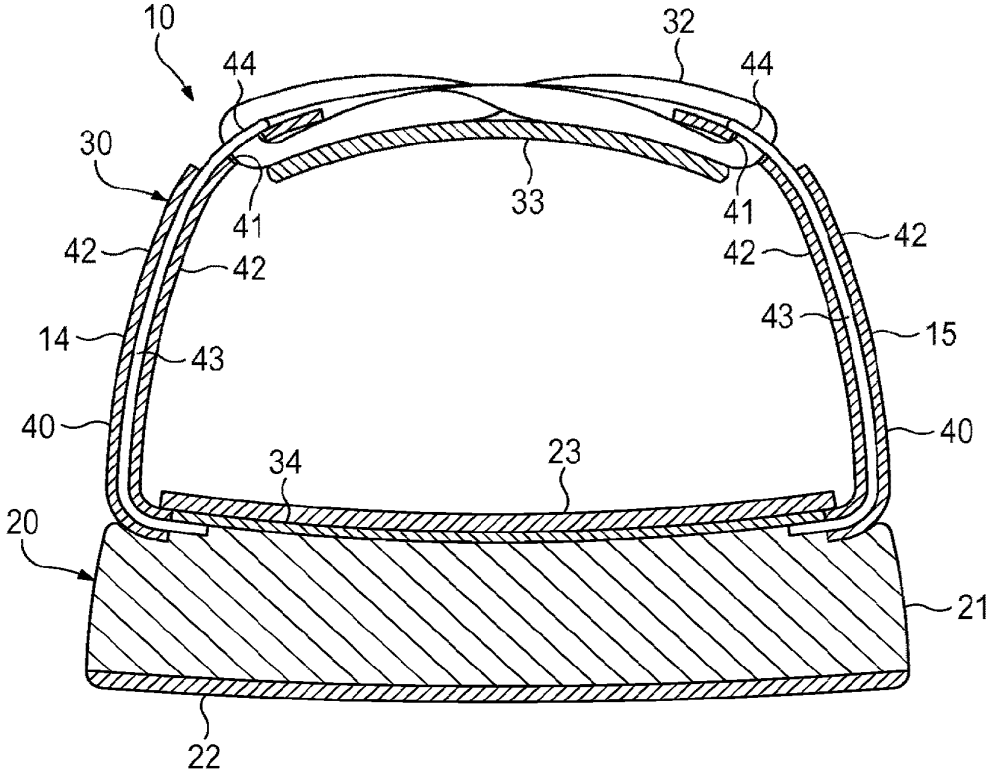

图 5B

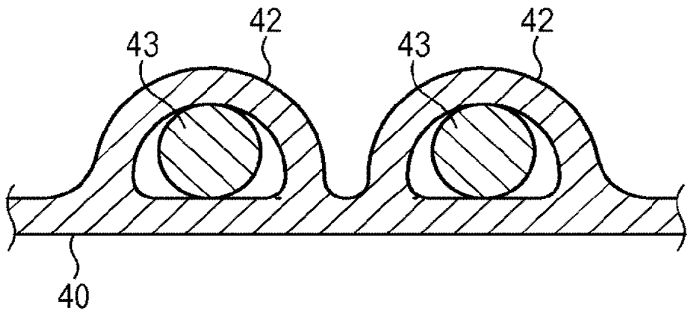

图 5C

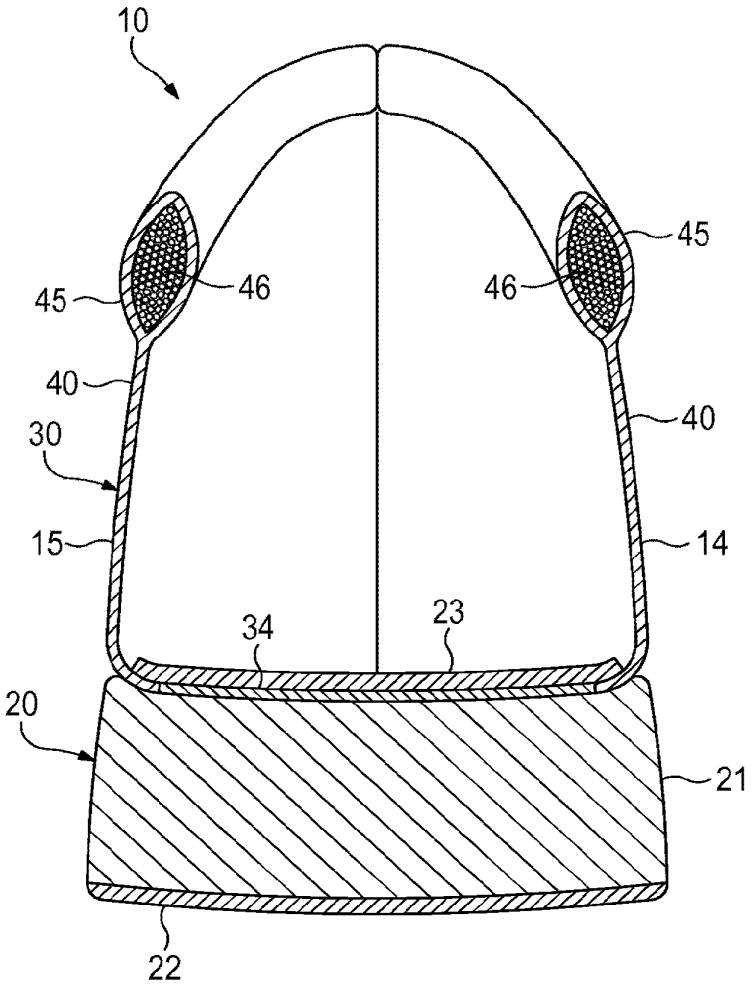

图 5D

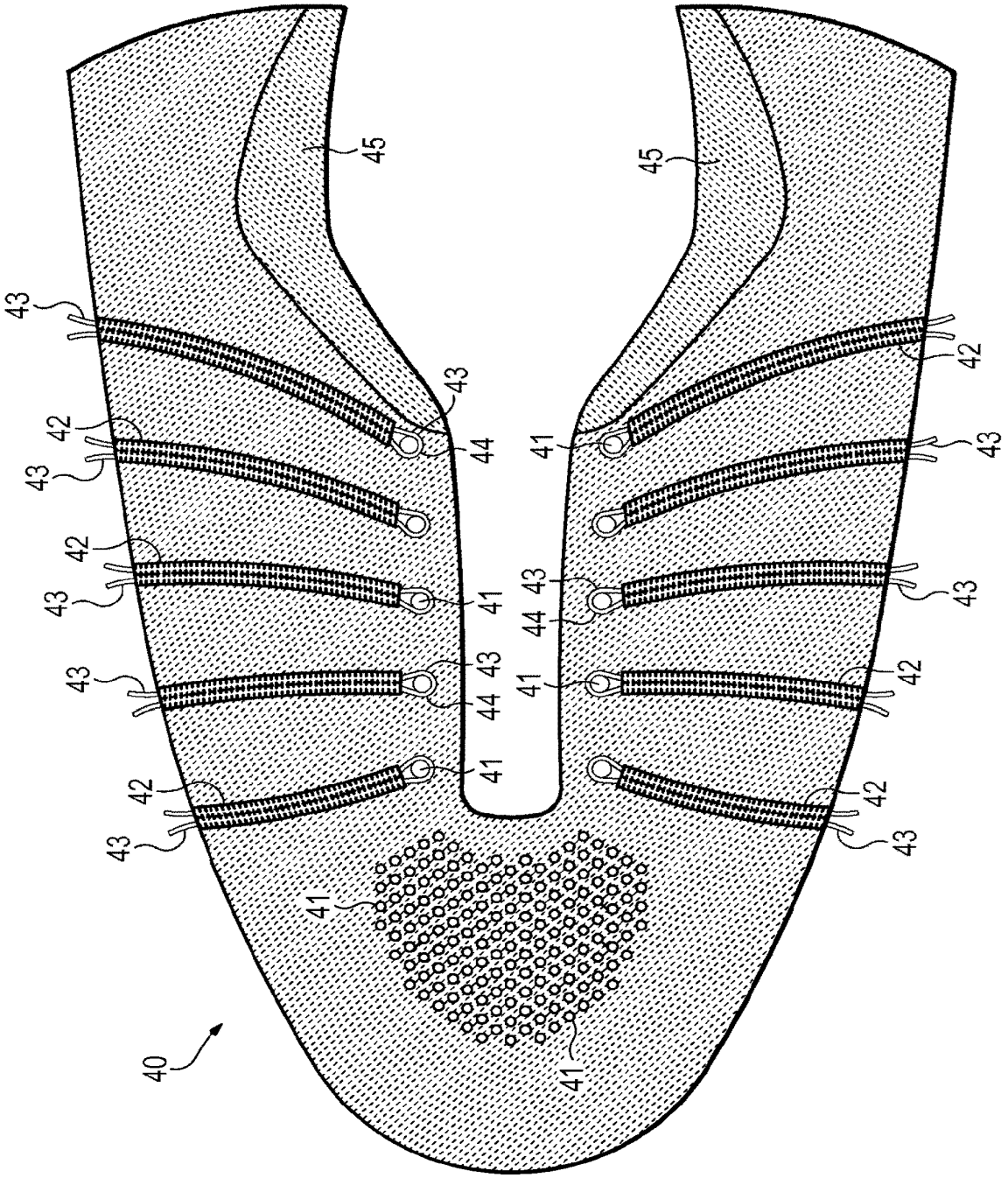

图 6

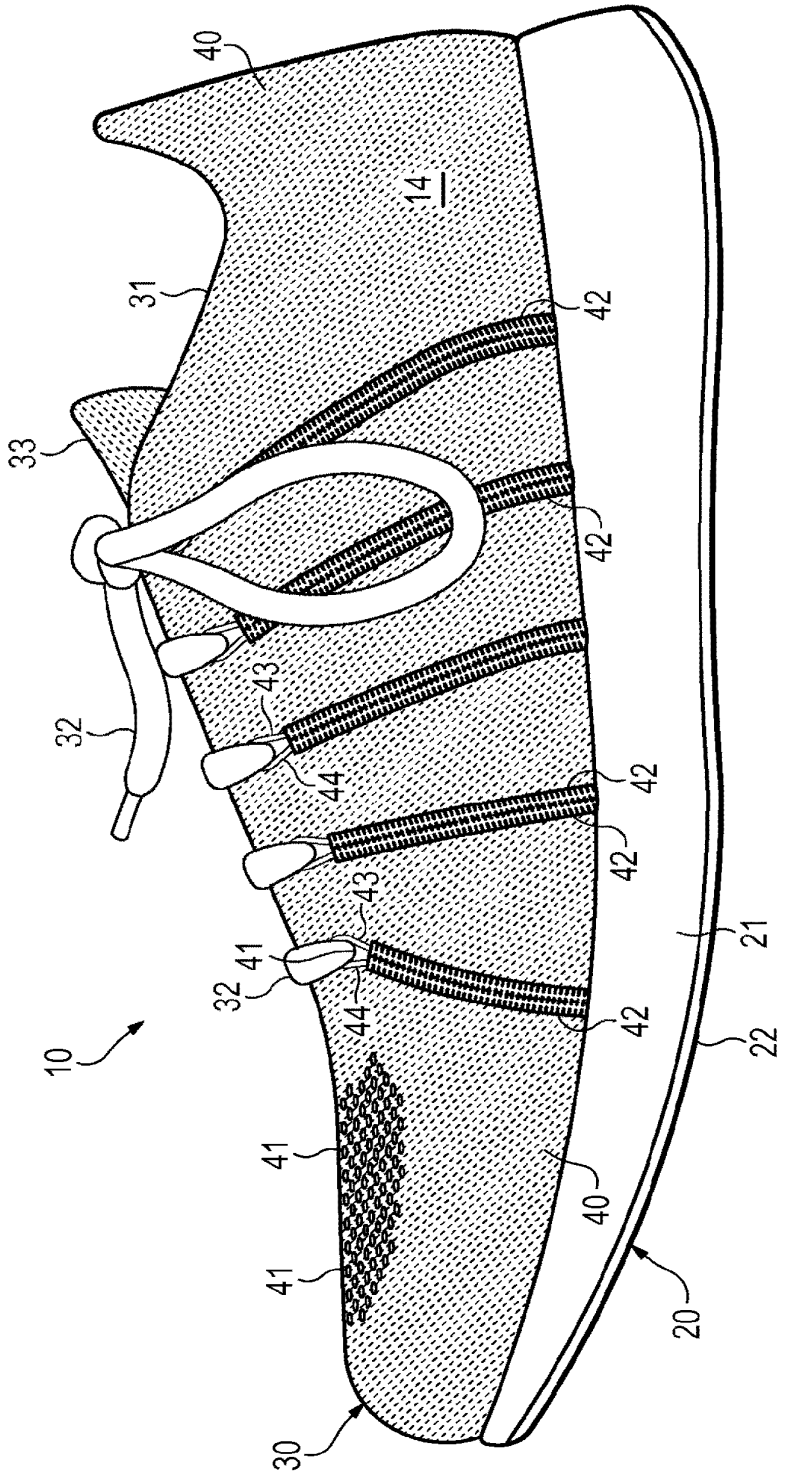

图 7A

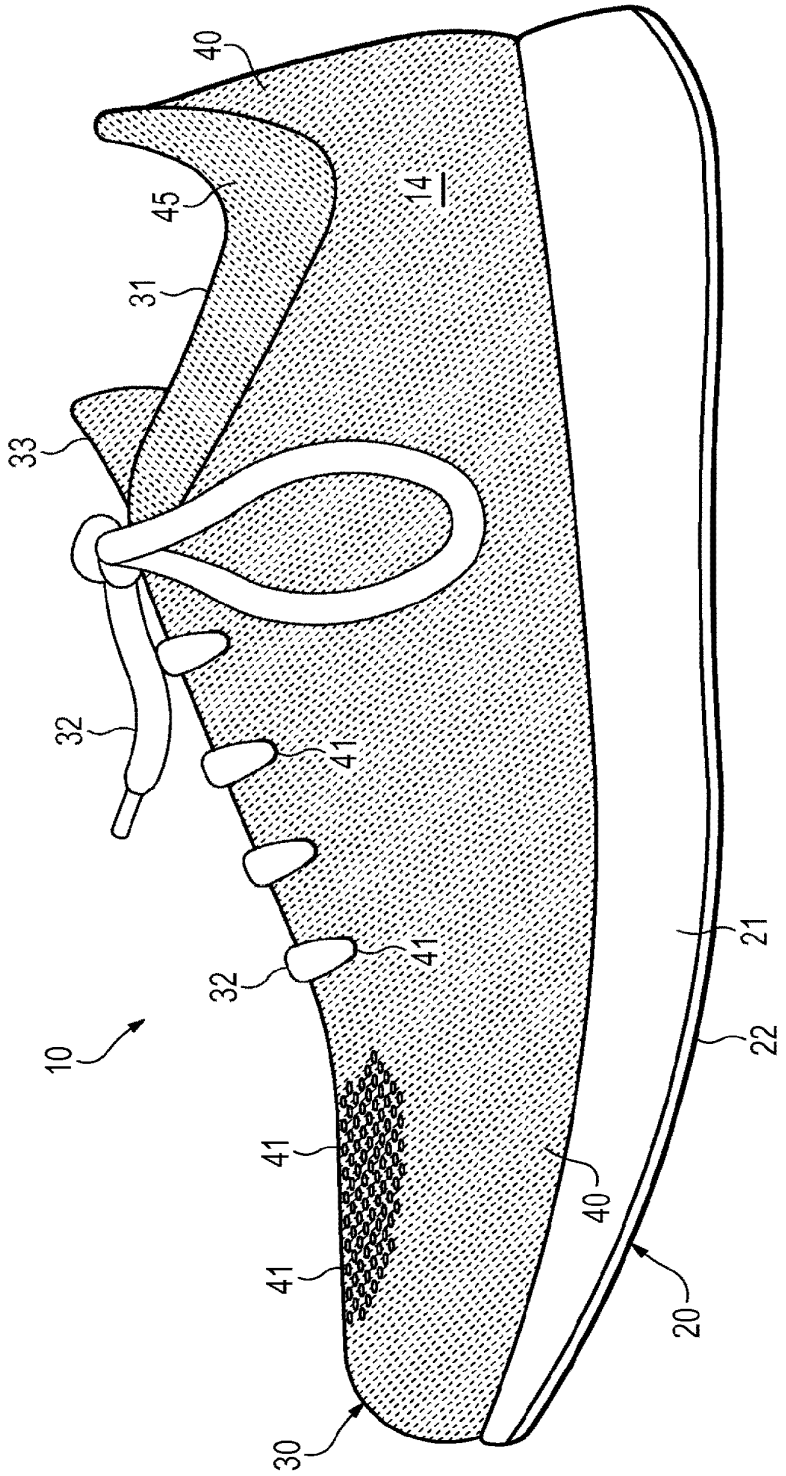

图 7B

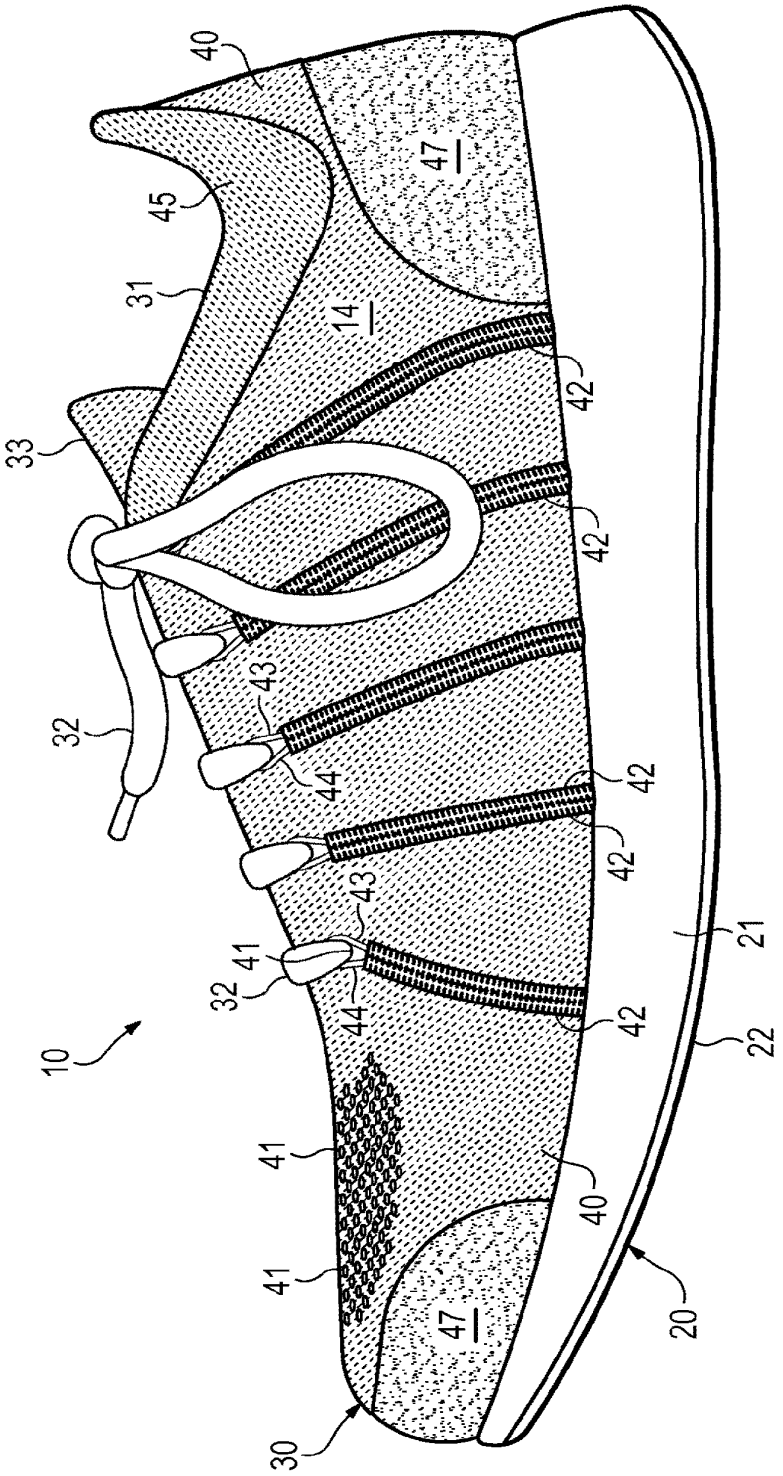

图 7C

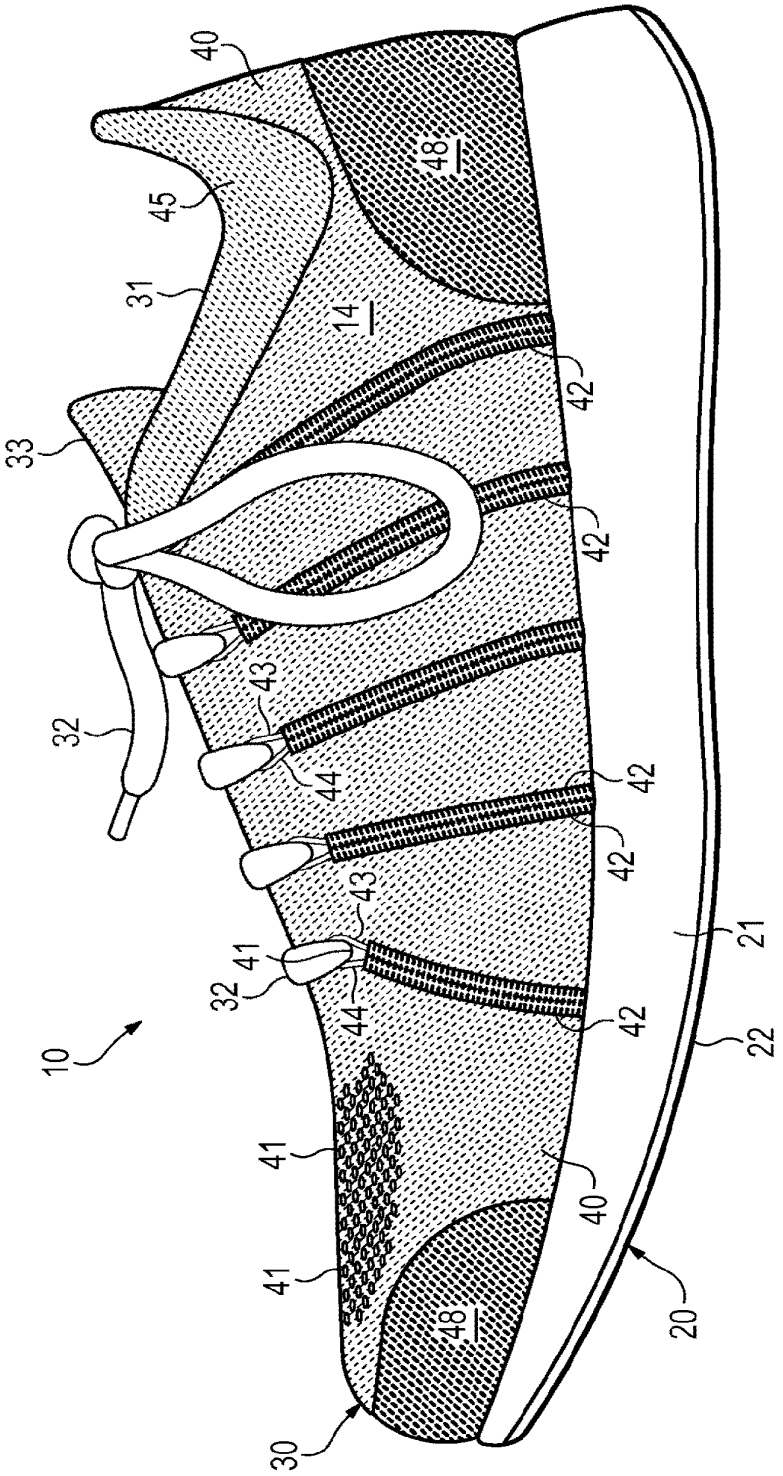

图 7D

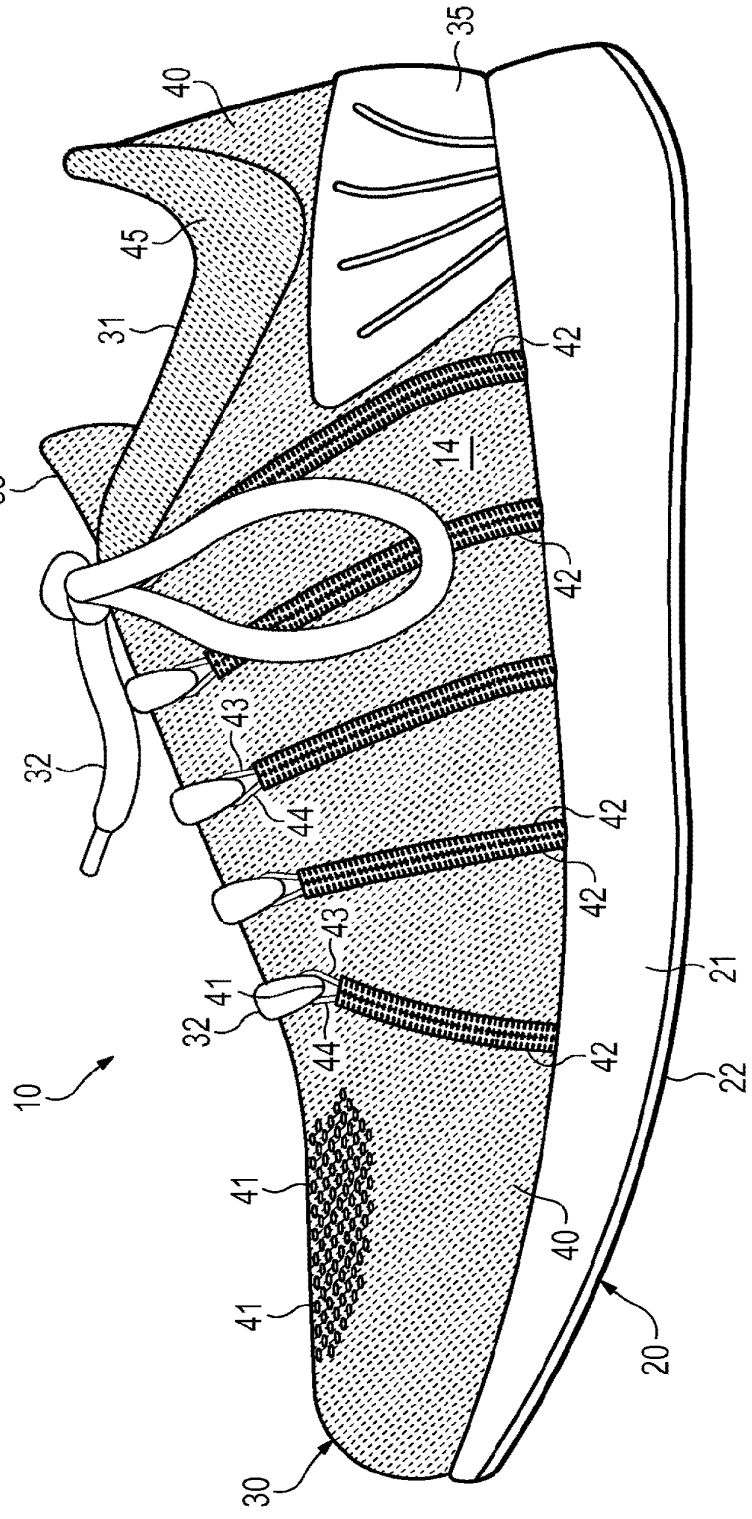

图 7E

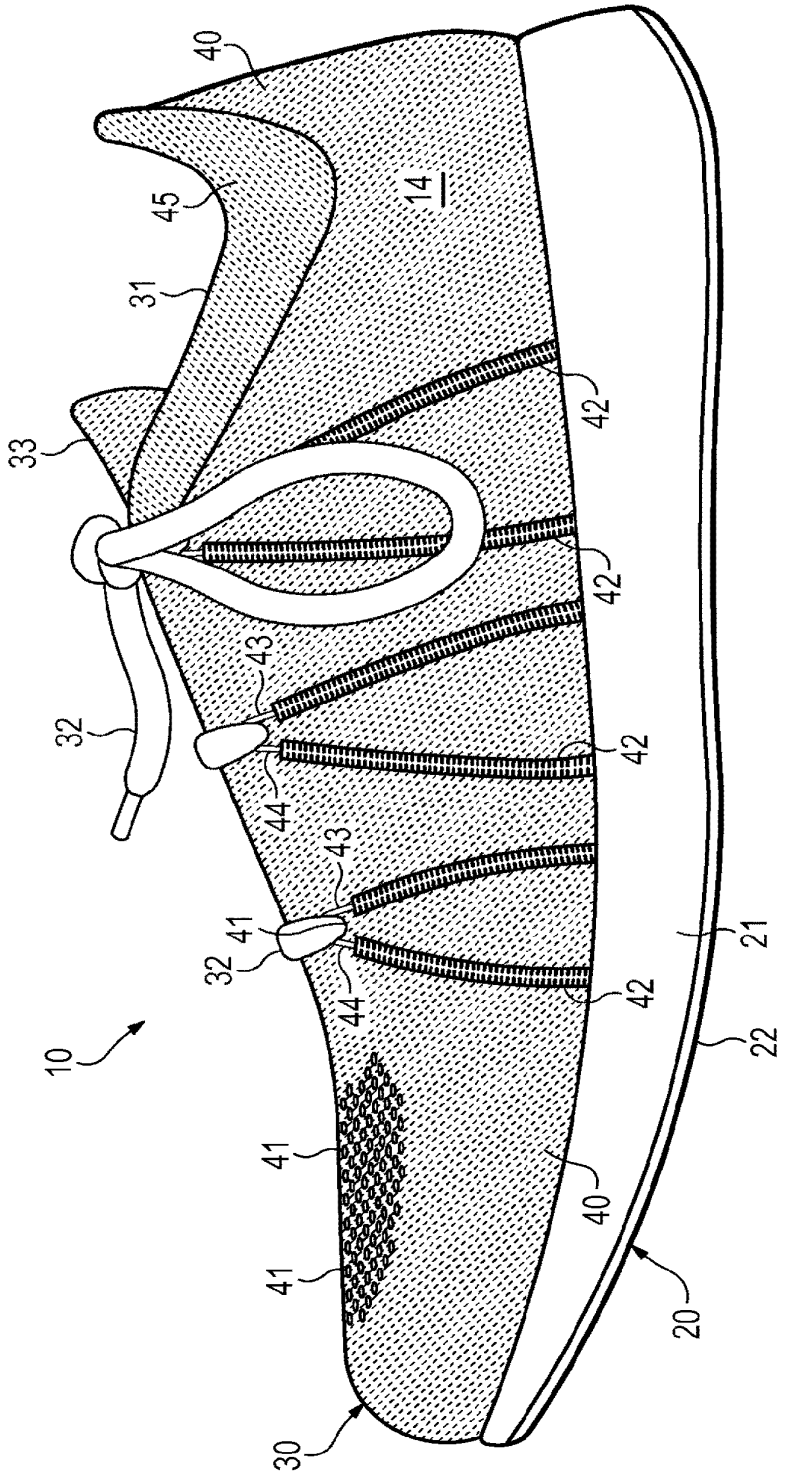

图 7F

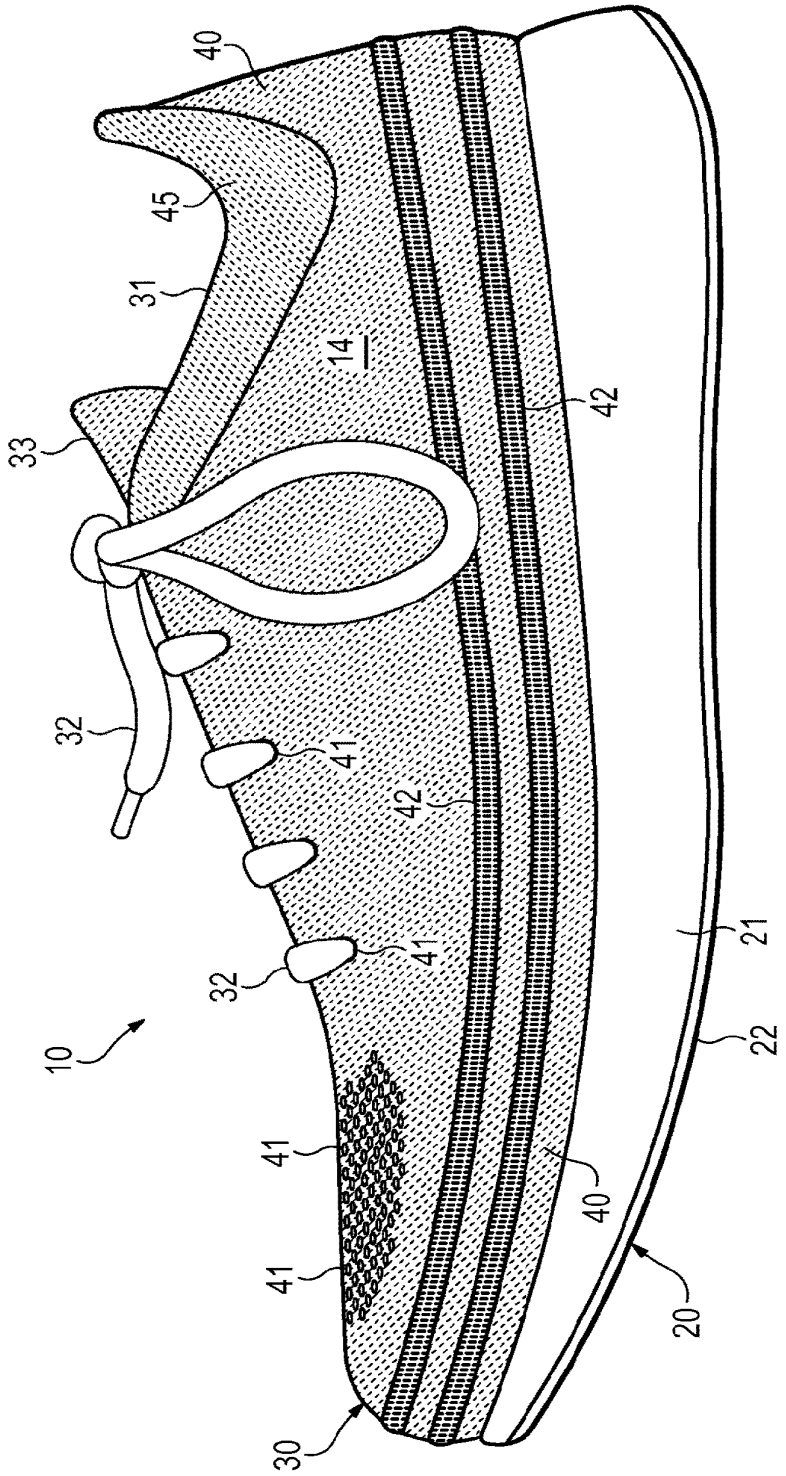

图 7G

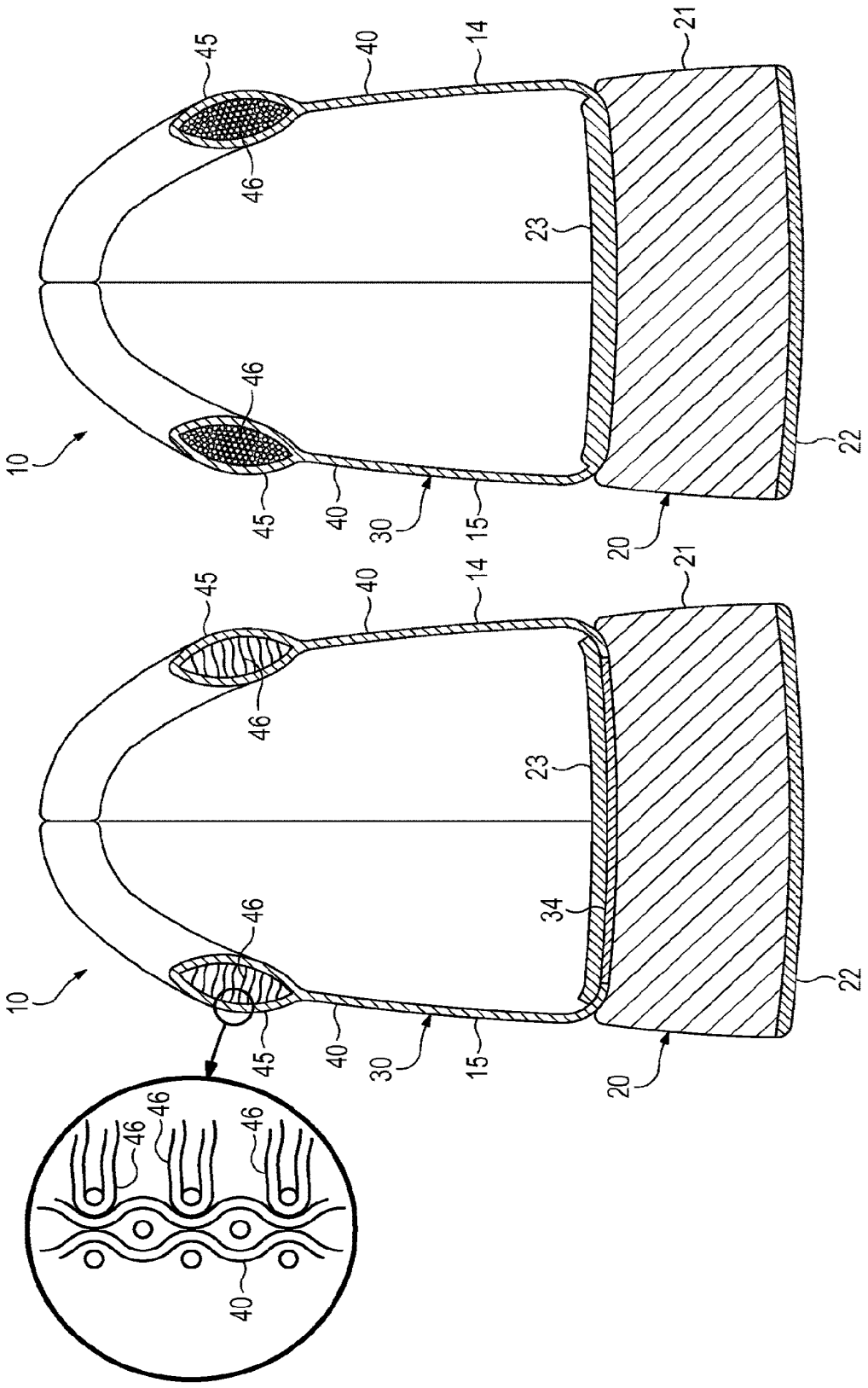

图8A

图8B

Electronic Acknowledgement Receipt

EFS ID:	20836193
Application Number:	13781551
International Application Number:	
Confirmation Number:	8567
Title of Invention:	Method Of Knitting A Knitted Component With An Integral Knit Tongue
First Named Inventor/Applicant Name:	Adrian Meir
Customer Number:	57618
Filer:	Eric M. Gibson/Jose Espejo
Filer Authorized By:	Eric M. Gibson
Attorney Docket Number:	51-3238
Receipt Date:	02-DEC-2014
Filing Date:	28-FEB-2013
Time Stamp:	09:38:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	2014-12-02_51-3238_IDS.pdf	28985 3b32193fc39bbe15cb9cbc710b2f407e3d1a2742	no	3

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/781,551	02/28/2013	Adrian Meir	51-3238	8567

57618 7590 09/16/2014

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EXAMINER	
WORRELL JR, LARRY D	

ART UNIT	PAPER NUMBER
3765	

MAIL DATE	DELIVERY MODE
09/16/2014	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 13/781,551	Applicant(s) MEIR ET AL.	
	Examiner DANNY WORRELL	Art Unit 3765	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-23* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-23* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date *See Continuation Sheet*.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

Continuation of Attachment(s) 2). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :8/12/14, 8/1/14, 7/7/14, 9/30/13, 5/9/13.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application is being examined under the pre-AIA first to invent provisions.

Double Patenting

Claims 1-23 of this application is patentably indistinct from claims 1-23 of Application No. 13/781551. Pursuant to 37 CFR 1.78(f) or pre-AIA 37 CFR 1.78(b), when two or more applications filed by the same applicant contain patentably indistinct claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. Applicant is required to either cancel the patentably indistinct claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP § 822.

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process... may obtain a patent therefor..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the claims that are directed to the same invention so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

Claims 1-23 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-23 of copending Application No. 13/781551. This is a provisional statutory double patenting rejection since the claims directed to the same invention have not in fact been patented.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Dua et al. (US 2008/0110048), henceforth known as Dua.

Dua teaches the method of manufacturing a knitted component for an article of footwear, as claimed including knitting a portion of the knitted component defining an upper with a

knitting machine (40,50) the upper including a portion of at least one of an exterior surface of the knitted component and an opposite interior surface of the knitted component [0040]; and knitting an integral knit tongue (60) that is of unitary knit construction with the upper with the knitting machine, the integral knit tongue (60) extending through a throat area [0043] of the knitted component; and wherein the integral knit tongue is joined by knitting with the knitting machine to a forward portion of the throat area (figure 8b) and at least along a portion of a lateral side (64a to 40) and a medial side (64b to 50) of the throat area of the knitted component [0043] extending from the forward portion to an ankle opening of the upper (figure 8c).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Applicant is reminded that all business with the Patent and Trademark Office should be transacted in writing. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt. 37 C.F.R. 1.2

Further it is noted that a complete response must satisfy the requirements of 37 C.F.R. 1.111, including:

-The reply must present arguments pointing out the specific distinctions believed to render the claims, including any newly presented claims, patentable over any applied references.

-A general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references does not comply with the requirements of this section.

-Moreover, The prompt development of a clear issue requires that the replies of the applicant meet the objections to and rejections of the claims. Applicant should also specifically point out the support for any amendments made to the disclosure. See MPEP 2163.06, MPEP 714.02. The "disclosure" includes the claims, the specification and the drawings.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANNY WORRELL whose telephone number is (571)272-4997. The examiner can normally be reached on MONDAY and WEDNESDAY-FRIDAY.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Khoa Huynh can be reached on 571/272-4888. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DANNY WORRELL/
Primary Examiner
Art Unit 3765

ldw

Notice of References Cited	Application/Control No. 13/781,551	Applicant(s)/Patent Under Reexamination MEIR ET AL.	
	Examiner DANNY WORRELL	Art Unit 3765	Page 1 of 1

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-8,621,891	01-2014	Dua et al.	66/177
*	B	US-8,800,172	08-2014	Dua et al.	36/50.1
*	C	US-8,745,895	06-2014	Sokolowski et al.	36/50.1
*	D	US-8,650,916	02-2014	Dua et al.	66/177
*	E	US-8,490,299	07-2013	Dua et al.	36/50.1
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(**Not for submission under 37 CFR 1.99)**

Application Number	13781551
Filing Date	2013-02-28
First Named Inventor	Adrian Meir
Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3238

U.S.PATENTS

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
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	2	2608078		1952-08-26	Anderson	
	3	2569764		1951-10-02	Jonas	
	4	2314098		1943-03-16	McDonald	
	5	2641004		1953-06-09	Whiting et al.	
	6	2440393		1948-04-27	Clark	
	7	4750339		1988-06-14	Simpson et al.	
	8	2147197		1939-02-14	Glidden	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.W./

Receipt date: 09/30/2013	Application Number	13781551	13781551 - GAU: 3765
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-02-28	
	First Named Inventor	Adrian Meir	
	Art Unit	3765	
	Examiner Name	Larry D. Worrell Jr.	
	Attorney Docket Number	51-3238	

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	10	3583081		1974-06-08	Hayashi	
	11	4447967		1984-05-15	Mortara	
	12	4813158		1989-03-21	Brown	
	13	4756098		1988-07-12	Boggia	
	14	5345638		1994-09-13	Nishida	
	15	4785558		1988-11-22	Shiomura	

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U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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FOREIGN PATENT DOCUMENTS

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Receipt date: 09/30/2013

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(**Not for submission under 37 CFR 1.99)**

Application Number	13781551 13781551 - GAU: 3765
Filing Date	2013-02-28
First Named Inventor	Adrian Meir
Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3238

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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	3	1233091	EP		2002-08-21	Ractcliffe et al.		☐
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.W./

Receipt date: 09/30/2013	Application Number	13781551	13781551 - GAU: 3765
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-02-28	
	First Named Inventor	Adrian Meir	
	Art Unit	3765	
	Examiner Name	Larry D. Worrell Jr.	
	Attorney Docket Number	51-3238	

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	14	2171172	FR		1973-09-21	Simonnot		☐
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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Declaration of Dr. Edward C. Frederick from the US Patent and Trademark Office Inter Partes Review of US Patent No. 7,347,011 (178 pp).	☐
	2	David J. Spencer, Knitting Technology: A Comprehensive Handbook and Practical Guide (Third ed., Woodhead Publishing Ltd. 2001) (413 pp).	☐

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Receipt date: 09/30/2013	Application Number	13781551 13781551 - GAU: 3765
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-02-28
	First Named Inventor	Adrian Meir
	Art Unit	3765
	Examiner Name	Larry D. Worrell Jr.
	Attorney Docket Number	51-3238

	3	Excerpt of Hannelore Eberle et al., Clothing Technology (Third English ed., Beuth-Verlag GmnH 2002) (book cover and back; pp2-3, 83).	☐

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EXAMINER SIGNATURE

Examiner Signature	/Danny Worrell/ (09/12/2014)	Date Considered	

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[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.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13781551
Filing Date	2013-02-28
First Named Inventor	Adrian Meir
Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3238

U.S.PATENTS

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	1							☐

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

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Receipt date: 08/01/2014	Application Number	13781551	13781551 - GAU: 3765
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-02-28	
	First Named Inventor	Adrian Meir	
	Art Unit	3765	
	Examiner Name	Larry D. Worrell Jr.	
	Attorney Docket Number	51-3238	

	1	Letter from Bruce Huffa dated December 23, 2013 (71 Pages).	☐

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Examiner Signature	/Danny Worrell/ (09/12/2014)	Date Considered	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(**Not for submission under 37 CFR 1.99)**

Application Number	13781551
Filing Date	2013-02-28
First Named Inventor	Meir
Art Unit	3765
Examiner Name	TBD
Attorney Docket Number	51-3238

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Receipt date: 05/09/2013	Application Number	13781551	13781551 - GAU: 3765
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	First Named Inventor	Meir	
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	Art Unit	3765	
	Examiner Name	TBD	
	Attorney Docket Number	51-3238	

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	Examiner Name	TBD	
	Attorney Docket Number	51-3238	

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Receipt date: 05/09/2013	Application Number	13781551	13781551 - GAU: 3765
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	First Named Inventor	Meir	
	Art Unit	3765	
	Examiner Name	TBD	
	Attorney Docket Number	51-3238	

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Receipt date: 05/09/2013	Application Number	13781551	13781551 - GAU: 3765
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	First Named Inventor	Meir	
	Art Unit	3765	
	Examiner Name	TBD	
	Attorney Docket Number	51-3238	

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	54	7051460	B2	2006-05-30	Orei	
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	Examiner Name	TBD	
	Attorney Docket Number	51-3238	

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If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	Art Unit	3765	
	Examiner Name	TBD	
	Attorney Docket Number	51-3238	

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.W./

Receipt date: 05/09/2013	Application Number	13781551	13781551 - GAU: 3765
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-02-28	
	First Named Inventor	Meir	
	Art Unit	3765	
	Examiner Name	TBD	
	Attorney Docket Number	51-3238	

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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	1563752	EP	A1	2005-08-17	Calzados		☐

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.W./

Receipt date: 05/09/2013	Application Number	13781551	13781551 - GAU: 3765
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-02-28	
	First Named Inventor	Meir	
	Art Unit	3765	
	Examiner Name	TBD	
	Attorney Docket Number	51-3238	

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If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Non-Final Office Action mailed October 17, 2012 in US Patent Application No. 13/400,511.	☐
	2	Non-Final Office Action mailed December 19, 2012 in US Patent Application No. 13/474,531.	☐
	3	Notice of Allowance mailed January 31, 2013 in US Patent Application No. 13/400,511.	☐

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EXAMINER SIGNATURE

Examiner Signature	/Danny Worrell/ (09/12/2014)	Date Considered	

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[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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.W./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(**Not for submission under 37 CFR 1.99)**

Application Number	13781551
Filing Date	2013-02-28
First Named Inventor	Adrian Meir
Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3238

U.S.PATENTS

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	1888172		1932-11-15	Joha	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050115284		2005-06-02	Dua	

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2013126313	WO		2013-08-29	NIKE INTERNATIONAL LTD		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

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Receipt date: 08/12/2014	Application Number	13781551 13781551 - GAU: 3765
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-02-28
	First Named Inventor	Adrian Meir
	Art Unit	3765
	Examiner Name	Larry D. Worrell Jr.
	Attorney Docket Number	51-3238

	1	International Search Report and Written Opinion mailed July 30, 2014 in International Application Number PCT/US2014/018845	☐

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Examiner Signature	/Danny Worrell/ (09/12/2014)	Date Considered	

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[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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.W./

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13781551	MEIR ET AL.
	Examiner	Art Unit
	LARRY WORRELL JR	3765

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
66	169R, 170, 171, 177	9/12/2014	/dw/
2	3R, 3A, 84, 114, 47	9/12/2014	/dw/

SEARCH NOTES		
Search Notes	Date	Examiner
Review related applications	9/12/2014	/dw/
inventor search	9/12/2014	/dw/

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

	/L.W./ Primary Examiner.Art Unit 3765

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Attorney Docket Number	51-3238

U.S.PATENTS

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					

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U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050193592		2005-09-08	Dua et al.	
	2	20050115284		2005-06-02	Dua	
	3	20040118018		2004-06-24	Dua	

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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2013126313	WO		2013-08-29	NIKE INTERNATIONAL LTD		☐

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.W./

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

Appln. No.	:	13/781,551	Confirmation No. 8567
Applicant	:	Adrian MEIR	
Filed	:	2/28/2013	
Title	:	Method Of Knitting A Knitted Component With An Integral Knit Tongue	
TC/A.U.	:	3765	
Examiner	:	Larry D. Worrell, Jr.	
Attorney Docket No.:		51-3238	
Customer No.	:	57618	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT

Please amend the above-identified application as follows:

Amendments to the Specification begin on page 2 of this paper.

Remarks/Arguments begin on page 4 of this paper.

Amendments to the Specification

Please replace paragraph [00111] with the following amended paragraph:

[00111] In this embodiment, a first yarn 1801 from a spool (not shown) passes through first standard feeder 1800 and an end of yarn 1801 extends outward from a dispensing tip at the end of first standard feeder 1800. Although yarn 1801 is depicted, any other strand (e.g., filament, thread, rope, webbing, cable, chain, or yarn) may pass through first standard feeder 1800. A second yarn 1803 similarly passes through second standard feeder 1802 and extends outward from a dispensing tip. In an exemplary embodiment, first yarn 1801 and second yarn 1803 may be used to form portions of ~~second~~first knitted component 500. In this embodiment, loops of first yarn 1801 are shown forming an uppermost course of medial heel edge 507 of ~~second~~first knitted component 500 and are held by hooks located on ends of needles 1703 and needles 1704. Similarly, loops of second yarn 1803 may be used to form lateral heel edge 506 of ~~second~~first knitted component 500.

Please replace paragraph [00112] with the following amended paragraph:

[00112] Next, as shown in FIG. 19, knitting machine 1700 may use a similar process to add additional courses to the material forming ~~second~~first knitted component 500 to form further portions, including lateral perimeter edge 504, medial perimeter edge 505, lateral inner edge 508, medial inner edge 509, and front inner edge 510 of integral knit tongue 512. In this embodiment, first standard feeder 1800 and second standard feeder 1802 may form integral knit tongue 512 according to the loop diagram illustrated in FIG. 16, above. FIG. 20 illustrates knitting machine 1700 completing the courses associated with knitting integral knit tongue 512, lateral raised element 514, medial raised element 515, and a portion of the rest of ~~second~~first knitted component 500 forming upper 502. FIG. 21 illustrates knitting machine 1700 nearly completing the knitting process of forming ~~second~~first knitted component 500. By adding additional courses using a similar process, ~~second~~first knitted component 500 may be completed.

REMARKS

This Preliminary Amendment is submitted prior to the issuance of a First Office Action. The specification has been amended to correct typographical errors. No new matter has been added.

All of the pending claims in this application are believed to be in condition for allowance. No fee is believed due. Should the Examiner have any questions or determine that any further action is desirable to place this application in even better condition for allowance, the Examiner is encouraged to contact the Applicant's representative at the number listed below.

Any fee for consideration of this response is hereby authorized to be charged to Deposit Account Number 502846.

Respectfully submitted,

PLUMSEA LAW GROUP, LLC

Date: August 22, 2014 By: /Eric M. Gibson/

Eric M. Gibson
Registration Number: 59,058
Telephone number: 301-365-9040

Electronic Acknowledgement Receipt

EFS ID:	19935892
Application Number:	13781551
International Application Number:	
Confirmation Number:	8567
Title of Invention:	Method Of Knitting A Knitted Component With An Integral Knit Tongue
First Named Inventor/Applicant Name:	Adrian Meir
Customer Number:	57618
Filer:	Eric M. Gibson/Jose Espejo
Filer Authorized By:	Eric M. Gibson
Attorney Docket Number:	51-3238
Receipt Date:	22-AUG-2014
Filing Date:	28-FEB-2013
Time Stamp:	09:53:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Preliminary Amendment	2014-08-22_51-3238_Preliminary_Amendment_Specification.pdf	73661 48f93c06cd96bfd9f70b2d3f3aa8993d463c8a11	no	4

Warnings:	
Information:	

Total Files Size (in bytes):	73661

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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(**Not for submission under 37 CFR 1.99)**

Application Number	13781551
Filing Date	2013-02-28
First Named Inventor	Adrian Meir
Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3238

U.S.PATENTS

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	1888172		1932-11-15	Joha	

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U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050115284		2005-06-02	Dua	

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	1	2013126313	WO		2013-08-29	NIKE INTERNATIONAL LTD		☐

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
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	Filing Date	2013-02-28
	First Named Inventor	Adrian Meir
	Art Unit	3765
	Examiner Name	Larry D. Worrell Jr.
	Attorney Docket Number	51-3238

	1	International Search Report and Written Opinion mailed July 30, 2014 in International Application Number PCT/US2014/018845	☐

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Examiner Signature		Date Considered	

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[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.

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Application Number	13781551
Filing Date	2013-02-28
First Named Inventor	Adrian Meir
Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3238

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	/Eric M. Gibson/	Date (YYYY-MM-DD)	2014-08-12
Name/Print	Eric M. Gibson	Registration Number	59,058

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.**

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

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29 August 2013 (29.08.2013)

WIPO | PCT

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19 February 2013 (19.02.2013)

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(30) Priority Data:
13/400,511 20 February 2012 (20.02.2012) US

(71) Applicant *(for all designated States except US)*: **NIKE INTERNATIONAL LTD.**; One Bowerman Drive, Beaverton, OR 97005-6453 (US).

(72) Inventors; and

(71) Applicants *(for US only)*: **TATLER, Daren, P.** [GB/US]; C/o Nike, Inc., One Bowerman Drive, Beaverton, OR 97005-6453 (US). **PODHAJNY, Daniel, A.** [UY/US]; C/o Nike, Inc., One Bowerman Drive, Beaverton, OR 97005-6453 (US).

(74) Agents: **GIBSON, Eric, M.** et al.; Plumsea Law Group, LLC, 10411 Motor City Drive, Suite 320, Bethesda, MD 20817 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ,

[Continued on next page]

(54) Title: ARTICLE OF FOOTWEAR INCORPORATING A KNITTED COMPONENT WITH A TONGUE

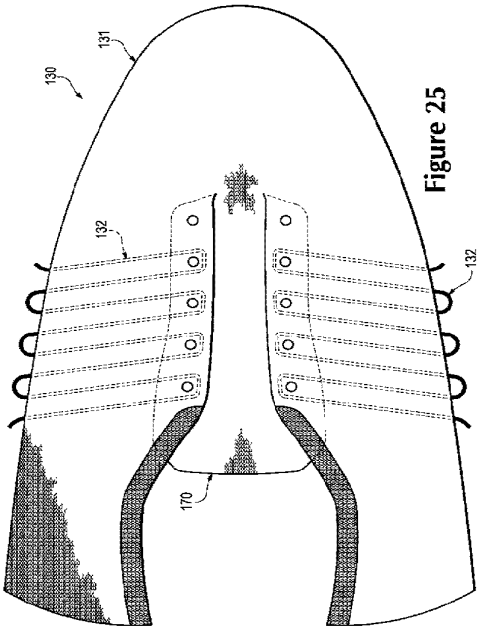


Figure 25

(57) Abstract: Articles of footwear may have an upper that includes a knit element and a tongue. The knit element defines a portion of an exterior surface and an opposite interior surface of the upper, with the interior surface defining a void for receiving a foot. The tongue is formed of unitary knit construction with the knit element and extends through a throat area of the upper. Methods of manufacturing a knitted component for an article of footwear may include knitting a tongue. The tongue is held on needles of a knitting machine. A first portion of a knit element is formed with the knitting machine while the tongue is held on the needles. The tongue is then joined to the first portion of the knit element. Additionally, a second portion of the knit element is formed with the knitting machine.

WO 2013/126313 A2

UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*

ARTICLE OF FOOTWEAR INCORPORATING A KNITTED COMPONENT WITH A TONGUE

BACKGROUND

[01] Conventional articles of footwear generally include two primary elements, an upper and a sole structure. The upper is secured to the sole structure and forms a void on the interior of the footwear for comfortably and securely receiving a foot. The sole structure is secured to a lower area of the upper, thereby being positioned between the upper and the ground. In athletic footwear, for example, the sole structure may include a midsole and an outsole. The midsole often includes a polymer foam material that attenuates ground reaction forces to lessen stresses upon the foot and leg during walking, running, and other ambulatory activities. Additionally, the midsole may include fluid-filled chambers, plates, moderators, or other elements that further attenuate forces, enhance stability, or influence the motions of the foot. The outsole is secured to a lower surface of the midsole and provides a ground-engaging portion of the sole structure formed from a durable and wear-resistant material, such as rubber. The sole structure may also include a sockliner positioned within the void and proximal a lower surface of the foot to enhance footwear comfort.

[02] The upper generally extends over the instep and toe areas of the foot, along the medial and lateral sides of the foot, under the foot, and around the heel area of the foot. In some articles of footwear, such as basketball footwear and boots, the upper may extend upward and around the ankle to provide support or protection for the ankle. Access to the void on the interior of the upper is generally provided by an ankle opening in a heel region of the footwear. A lacing system is often incorporated into the upper to adjust the fit of the upper, thereby permitting entry and removal of the foot from the void within the upper. The lacing system also

permits the wearer to modify certain dimensions of the upper, particularly girth, to accommodate feet with varying dimensions. In addition, the upper may include a tongue that extends under the lacing system to enhance adjustability of the footwear, and the upper may incorporate a heel counter to limit movement of the heel.

[03] A variety of material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) are conventionally utilized in manufacturing the upper. In athletic footwear, for example, the upper may have multiple layers that each include a variety of joined material elements. As examples, the material elements may be selected to impart stretch-resistance, wear-resistance, flexibility, air-permeability, compressibility, comfort, and moisture-wicking to different areas of the upper. In order to impart the different properties to different areas of the upper, material elements are often cut to desired shapes and then joined together, usually with stitching or adhesive bonding. Moreover, the material elements are often joined in a layered configuration to impart multiple properties to the same areas. As the number and type of material elements incorporated into the upper increases, the time and expense associated with transporting, stocking, cutting, and joining the material elements may also increase. Waste material from cutting and stitching processes also accumulates to a greater degree as the number and type of material elements incorporated into the upper increases. Moreover, uppers with a greater number of material elements may be more difficult to recycle than uppers formed from fewer types and numbers of material elements. By decreasing the number of material elements utilized in the upper, therefore, waste may be decreased while increasing the manufacturing efficiency and recyclability of the upper.

SUMMARY

[04] Various configurations of an article of footwear may have an upper and a sole structure secured to the upper. The upper includes a knit element and a tongue. The knit element defines a portion of an exterior surface of the upper and an opposite interior surface of the upper, with the interior surface defining a void for receiving a foot. The tongue is formed of unitary knit construction with the knit element and extends through a throat area of the upper.

[05] Methods of manufacturing a knitted component for an article of footwear may include knitting a tongue with a knitting machine. The tongue is held on needles of the knitting machine. A first portion of a knit element is formed with the knitting machine while the tongue is held on the needles. The tongue is then joined to the first portion of the knit element. Additionally, a second portion of the knit element is formed with the knitting machine.

[06] Methods of knitting may also include providing a knitting pattern with a modifiable field. The modifiable field is updated with data representing a first alphanumeric character. A first component with a knit structure of the first alphanumeric character is formed. The modifiable field is updated with data representing a second alphanumeric character, the second alphanumeric character being different than the first alphanumeric character. Additionally, a second component with a knit structure of the second alphanumeric character is formed.

[07] The advantages and features of novelty characterizing aspects of the invention are pointed out with particularity in the appended claims. To gain an improved understanding of the advantages and features of novelty, however, reference may be made to the following descriptive matter and accompanying figures that describe and illustrate various configurations and concepts related to the invention.

FIGURE DESCRIPTIONS

[08] The foregoing Summary and the following Detailed Description will be better understood when read in conjunction with the accompanying figures.

[09] Figure 1 is a perspective view of an article of footwear.

[10] Figure 2 is a lateral side elevational view of the article of footwear.

[11] Figure 3 is a medial side elevational view of the article of footwear.

[12] Figures 4A-4C are cross-sectional views of the article of footwear, as defined by section lines 4A-4C in Figures 2 and 3.

[13] Figure 5 is a top plan view of a first knitted component that forms a portion of an upper of the article of footwear.

[14] Figure 6 is a bottom plan view of the first knitted component.

[15] Figures 7A-7E are cross-sectional views of the first knitted component, as defined by section lines 7A-7E in Figure 5.

[16] Figures 8A and 8B are plan views showing knit structures of the first knitted component.

[17] Figure 9 is a top plan view of a second knitted component that may form a portion of the upper of the article of footwear.

[18] Figure 10 is a bottom plan view of the second knitted component.

[19] Figure 11 is a schematic top plan view of the second knitted component showing knit zones.

[20] Figures 12A-12E are cross-sectional views of the second knitted component, as defined by section lines 12A-12E in Figure 9.

[21] Figures 13A-13H are loop diagrams of the knit zones.

[22] Figures 14A-14C are top plan views corresponding with Figure 5 and depicting further configurations of the first knitted component.

[23] Figure 15 is a perspective view of a knitting machine.

[24] Figures 16-18 are elevational views of a combination feeder from the knitting machine.

[25] Figure 19 is an elevational view corresponding with Figure 16 and showing internal components of the combination feeder.

[26] Figures 20A-20C are elevational views corresponding with Figure 19 and showing the operation of the combination feeder.

[27] Figures 21A-21I are schematic perspective views of a knitting process utilizing the combination feeder and a conventional feeder.

[28] Figures 22A-22C are schematic cross-sectional views of the knitting process showing positions of the combination feeder and the conventional feeder.

[29] Figure 23 is a schematic perspective view showing another aspect of the knitting process.

[30] Figure 24 is a perspective view of another configuration of the knitting machine.

[31] Figure 25 is a top plan view of the first knitted component with a first knitted tongue.

[32] Figure 26 is a partial top plan view of the first knitted component with the first knitted tongue.

[33] Figure 27 is a cross-sectional view of the first knitted tongue, as defined by section line 27 in Figure 26.

[34] Figure 28 is a top plan view of the second knitted component with a second knitted tongue.

[35] Figure 29 is a partial top plan view of the second knitted component with the second knitted tongue.

[36] Figure 30 is a cross-sectional view of the second knitted tongue, as defined by section line 30 in Figure 29.

[37] Figure 31 is a top plan view of a third knitted component with a third knitted tongue.

[38] Figure 32 is a partial top plan view of the third knitted component with the third knitted tongue.

[39] Figure 33 is a cross-sectional view of the third knitted tongue, as defined by section line 33 in Figure 32.

[40] Figure 34 is a top plan view of a fourth knitted component with a fourth knitted tongue.

[41] Figure 35 is a cross-sectional view of the fourth knitted component and fourth knitted tongue, as defined by section line 35 in Figure 34.

[42] Figures 36A-36G are schematic elevational views of a knitting process for forming the first knitted component with the first knitted tongue.

[43] Figure 37 is a schematic elevational view depicting a further example step of the knitting process.

[44] Figure 38 is a schematic block diagram of the knitting machine.

[45] Figures 39A-39C are partial top plan views corresponding with Figure 26 and depicting sequential variations in the first knitted tongue.

DETAILED DESCRIPTION

[46] The following discussion and accompanying figures disclose a variety of concepts relating to knitted components and the manufacture of knitted components. Although the knitted components may be utilized in a variety of products, an article of footwear that incorporates one of the knitted components is disclosed below as an example. In addition to footwear, the knitted components may be utilized in other types of apparel (e.g., shirts, pants, socks, jackets, undergarments), athletic equipment (e.g., golf bags, baseball and football gloves, soccer ball restriction structures), containers (e.g., backpacks, bags), and upholstery for furniture (e.g., chairs, couches, car seats). The knitted components may also be utilized in bed coverings (e.g., sheets, blankets), table coverings, towels, flags, tents, sails, and parachutes. The knitted components may be utilized as technical textiles for industrial purposes, including structures for automotive and aerospace applications, filter materials, medical textiles (e.g. bandages, swabs, implants), geotextiles for reinforcing embankments, agrotextiles for crop protection, and industrial apparel that protects or insulates against heat and radiation. Accordingly, the knitted components and other concepts disclosed herein may be incorporated into a variety of products for both personal and industrial purposes.

[47] Footwear Configuration

[48] An article of footwear 100 is depicted in Figures 1-4C as including a sole structure 110 and an upper 120. Although footwear 100 is illustrated as having a general configuration suitable for running, concepts associated with footwear 100 may also be applied to a variety of other athletic footwear types, including baseball shoes, basketball shoes, cycling shoes, football shoes, tennis shoes, soccer shoes, training shoes, walking shoes, and hiking boots, for example. The concepts may also be applied to footwear types that are generally considered to be non-athletic, including dress shoes, loafers, sandals, and work boots.

Accordingly, the concepts disclosed with respect to footwear 100 apply to a wide variety of footwear types.

[49] For reference purposes, footwear 100 may be divided into three general regions: a forefoot region 101, a midfoot region 102, and a heel region 103. Forefoot region 101 generally includes portions of footwear 100 corresponding with the toes and the joints connecting the metatarsals with the phalanges. Midfoot region 102 generally includes portions of footwear 100 corresponding with an arch area of the foot. Heel region 103 generally corresponds with rear portions of the foot, including the calcaneus bone. Footwear 100 also includes a lateral side 104 and a medial side 105, which extend through each of regions 101-103 and correspond with opposite sides of footwear 100. More particularly, lateral side 104 corresponds with an outside area of the foot (i.e. the surface that faces away from the other foot), and medial side 105 corresponds with an inside area of the foot (i.e., the surface that faces toward the other foot). Regions 101-103 and sides 104-105 are not intended to demarcate precise areas of footwear 100. Rather, regions 101-103 and sides 104-105 are intended to represent general areas of footwear 100 to aid in the following discussion. In addition to footwear 100, regions 101-103 and sides 104-105 may also be applied to sole structure 110, upper 120, and individual elements thereof.

[50] Sole structure 110 is secured to upper 120 and extends between the foot and the ground when footwear 100 is worn. The primary elements of sole structure 110 are a midsole 111, an outsole 112, and a sockliner 113. Midsole 111 is secured to a lower surface of upper 120 and may be formed from a compressible polymer foam element (e.g., a polyurethane or ethylvinylacetate foam) that attenuates ground reaction forces (i.e., provides cushioning) when compressed between the foot and the ground during walking, running, or other ambulatory activities. In further configurations, midsole 111 may incorporate plates, moderators, fluid-filled chambers, lasting elements, or motion control members that further

attenuate forces, enhance stability, or influence the motions of the foot, or midsole 21 may be primarily formed from a fluid-filled chamber. Outsole 112 is secured to a lower surface of midsole 111 and may be formed from a wear-resistant rubber material that is textured to impart traction. Sockliner 113 is located within upper 120 and is positioned to extend under a lower surface of the foot to enhance the comfort of footwear 100. Although this configuration for sole structure 110 provides an example of a sole structure that may be used in connection with upper 120, a variety of other conventional or nonconventional configurations for sole structure 110 may also be utilized. Accordingly, the features of sole structure 110 or any sole structure utilized with upper 120 may vary considerably.

[51] Upper 120 defines a void within footwear 100 for receiving and securing a foot relative to sole structure 110. The void is shaped to accommodate the foot and extends along a lateral side of the foot, along a medial side of the foot, over the foot, around the heel, and under the foot. Access to the void is provided by an ankle opening 121 located in at least heel region 103. A lace 122 extends through various lace apertures 123 in upper 120 and permits the wearer to modify dimensions of upper 120 to accommodate proportions of the foot. More particularly, lace 122 permits the wearer to tighten upper 120 around the foot, and lace 122 permits the wearer to loosen upper 120 to facilitate entry and removal of the foot from the void (i.e., through ankle opening 121). In addition, upper 120 includes a tongue 124 that extends under lace 122 and lace apertures 123 to enhance the comfort of footwear 100. In further configurations, upper 120 may include additional elements, such as (a) a heel counter in heel region 103 that enhances stability, (b) a toe guard in forefoot region 101 that is formed of a wear-resistant material, and (c) logos, trademarks, and placards with care instructions and material information.

[52] Many conventional footwear uppers are formed from multiple material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) that are joined through stitching or bonding, for example. In contrast, a majority of upper 120 is formed from a knitted component 130, which extends through each of regions 101-103, along both lateral side 104 and medial side 105, over forefoot region 101, and around heel region 103. In addition, knitted component 130 forms portions of both an exterior surface and an opposite interior surface of upper 120. As such, knitted component 130 defines at least a portion of the void within upper 120. In some configurations, knitted component 130 may also extend under the foot. Referring to Figures 4A-4C, however, a strobel sock 125 is secured to knitted component 130 and an upper surface of midsole 111, thereby forming a portion of upper 120 that extends under sockliner 113.

[53] Knitted Component Configuration

[54] Knitted component 130 is depicted separate from a remainder of footwear 100 in Figures 5 and 6. Knitted component 130 is formed of unitary knit construction. As utilized herein, a knitted component (e.g., knitted component 130) is defined as being formed of "unitary knit construction" when formed as a one-piece element through a knitting process. That is, the knitting process substantially forms the various features and structures of knitted component 130 without the need for significant additional manufacturing steps or processes. Although portions of knitted component 130 may be joined to each other (e.g., edges of knitted component 130 being joined together) following the knitting process, knitted component 130 remains formed of unitary knit construction because it is formed as a one-piece knit element. Moreover, knitted component 130 remains formed of unitary knit construction when other elements (e.g., lace 122, tongue 124, logos, trademarks, placards with care instructions and material information) are added following the knitting process.

[55] The primary elements of knitted component 130 are a knit element 131 and an inlaid strand 132. Knit element 131 is formed from at least one yarn that is manipulated (e.g., with a knitting machine) to form a plurality of intermeshed loops that define a variety of courses and wales. That is, knit element 131 has the structure of a knit textile. Inlaid strand 132 extends through knit element 131 and passes between the various loops within knit element 131. Although inlaid strand 132 generally extends along courses within knit element 131, inlaid strand 132 may also extend along wales within knit element 131. Advantages of inlaid strand 132 include providing support, stability, and structure. For example, inlaid strand 132 assists with securing upper 120 around the foot, limits deformation in areas of upper 120 (e.g., imparts stretch-resistance) and operates in connection with lace 122 to enhance the fit of footwear 100.

[56] Knit element 131 has a generally U-shaped configuration that is outlined by a perimeter edge 133, a pair of heel edges 134, and an inner edge 135. When incorporated into footwear 100, perimeter edge 133 lays against the upper surface of midsole 111 and is joined to strobel sock 125. Heel edges 134 are joined to each other and extend vertically in heel region 103. In some configurations of footwear 100, a material element may cover a seam between heel edges 134 to reinforce the seam and enhance the aesthetic appeal of footwear 100. Inner edge 135 forms ankle opening 121 and extends forward to an area where lace 122, lace apertures 123, and tongue 124 are located. In addition, knit element 131 has a first surface 136 and an opposite second surface 137. First surface 136 forms a portion of the exterior surface of upper 120, whereas second surface 137 forms a portion of the interior surface of upper 120, thereby defining at least a portion of the void within upper 120.

[57] Inlaid strand 132, as noted above, extends through knit element 131 and passes between the various loops within knit element 131. More particularly, inlaid strand 132 is located within the knit structure of knit element 131, which may

have the configuration of a single textile layer in the area of inlaid strand 132, and between surfaces 136 and 137, as depicted in Figures 7A-7D. When knitted component 130 is incorporated into footwear 100, therefore, inlaid strand 132 is located between the exterior surface and the interior surface of upper 120. In some configurations, portions of inlaid strand 132 may be visible or exposed on one or both of surfaces 136 and 137. For example, inlaid strand 132 may lay against one of surfaces 136 and 137, or knit element 131 may form indentations or apertures through which inlaid strand passes. An advantage of having inlaid strand 132 located between surfaces 136 and 137 is that knit element 131 protects inlaid strand 132 from abrasion and snagging.

[58] Referring to Figures 5 and 6, inlaid strand 132 repeatedly extends from perimeter edge 133 toward inner edge 135 and adjacent to a side of one lace aperture 123, at least partially around the lace aperture 123 to an opposite side, and back to perimeter edge 133. When knitted component 130 is incorporated into footwear 100, knit element 131 extends from a throat area of upper 120 (i.e., where lace 122, lace apertures 123, and tongue 124 are located) to a lower area of upper 120 (i.e., where knit element 131 joins with sole structure 110. In this configuration, inlaid strand 132 also extends from the throat area to the lower area. More particularly, inlaid strand repeatedly passes through knit element 131 from the throat area to the lower area.

[59] Although knit element 131 may be formed in a variety of ways, courses of the knit structure generally extend in the same direction as inlaid strands 132. That is, courses may extend in the direction extending between the throat area and the lower area. As such, a majority of inlaid strand 132 extends along the courses within knit element 131. In areas adjacent to lace apertures 123, however, inlaid strand 132 may also extend along wales within knit element 131. More particularly, sections of inlaid strand 132 that are parallel to inner edge 135 may extend along the wales.

[60] As discussed above, inlaid strand 132 passes back and forth through knit element 131. Referring to Figures 5 and 6, inlaid strand 132 also repeatedly exits knit element 131 at perimeter edge 133 and then re-enters knit element 131 at another location of perimeter edge 133, thereby forming loops along perimeter edge 133. An advantage to this configuration is that each section of inlaid strand 132 that extends between the throat area and the lower area may be independently tensioned, loosened, or otherwise adjusted during the manufacturing process of footwear 100. That is, prior to securing sole structure 110 to upper 120, sections of inlaid strand 132 may be independently adjusted to the proper tension.

[61] In comparison with knit element 131, inlaid strand 132 may exhibit greater stretch-resistance. That is, inlaid strand 132 may stretch less than knit element 131. Given that numerous sections of inlaid strand 132 extend from the throat area of upper 120 to the lower area of upper 120, inlaid strand 132 imparts stretch-resistance to the portion of upper 120 between the throat area and the lower area. Moreover, placing tension upon lace 122 may impart tension to inlaid strand 132, thereby inducing the portion of upper 120 between the throat area and the lower area to lay against the foot. As such, inlaid strand 132 operates in connection with lace 122 to enhance the fit of footwear 100.

[62] Knit element 131 may incorporate various types of yarn that impart different properties to separate areas of upper 120. That is, one area of knit element 131 may be formed from a first type of yarn that imparts a first set of properties, and another area of knit element 131 may be formed from a second type of yarn that imparts a second set of properties. In this configuration, properties may vary throughout upper 120 by selecting specific yarns for different areas of knit element 131. The properties that a particular type of yarn will impart to an area of knit element 131 partially depend upon the materials that form the various filaments and fibers within the yarn. Cotton, for example, provides a soft hand,

natural aesthetics, and biodegradability. Elastane and stretch polyester each provide substantial stretch and recovery, with stretch polyester also providing recyclability. Rayon provides high luster and moisture absorption. Wool also provides high moisture absorption, in addition to insulating properties and biodegradability. Nylon is a durable and abrasion-resistant material with relatively high strength. Polyester is a hydrophobic material that also provides relatively high durability. In addition to materials, other aspects of the yarns selected for knit element 131 may affect the properties of upper 120. For example, a yarn forming knit element 131 may be a monofilament yarn or a multifilament yarn. The yarn may also include separate filaments that are each formed of different materials. In addition, the yarn may include filaments that are each formed of two or more different materials, such as a bicomponent yarn with filaments having a sheath-core configuration or two halves formed of different materials. Different degrees of twist and crimping, as well as different deniers, may also affect the properties of upper 120. Accordingly, both the materials forming the yarn and other aspects of the yarn may be selected to impart a variety of properties to separate areas of upper 120.

[63] As with the yarns forming knit element 131, the configuration of inlaid strand 132 may also vary significantly. In addition to yarn, inlaid strand 132 may have the configurations of a filament (e.g., a monofilament), thread, rope, webbing, cable, or chain, for example. In comparison with the yarns forming knit element 131, the thickness of inlaid strand 132 may be greater. In some configurations, inlaid strand 132 may have a significantly greater thickness than the yarns of knit element 131. Although the cross-sectional shape of inlaid strand 132 may be round, triangular, square, rectangular, elliptical, or irregular shapes may also be utilized. Moreover, the materials forming inlaid strand 132 may include any of the materials for the yarn within knit element 131, such as cotton, elastane, polyester, rayon, wool, and nylon. As noted above, inlaid strand 132 may exhibit greater stretch-resistance than knit element 131. As such, suitable materials for

inlaid strands 132 may include a variety of engineering filaments that are utilized for high tensile strength applications, including glass, aramids (e.g., para-aramid and meta-aramid), ultra-high molecular weight polyethylene, and liquid crystal polymer. As another example, a braided polyester thread may also be utilized as inlaid strand 132.

[64] An example of a suitable configuration for a portion of knitted component 130 is depicted in Figure 8A. In this configuration, knit element 131 includes a yarn 138 that forms a plurality of intermeshed loops defining multiple horizontal courses and vertical wales. Inlaid strand 132 extends along one of the courses and alternates between being located (a) behind loops formed from yarn 138 and (b) in front of loops formed from yarn 138. In effect, inlaid strand 132 weaves through the structure formed by knit element 131. Although yarn 138 forms each of the courses in this configuration, additional yarns may form one or more of the courses or may form a portion of one or more of the courses.

[65] Another example of a suitable configuration for a portion of knitted component 130 is depicted in Figure 8B. In this configuration, knit element 131 includes yarn 138 and another yarn 139. Yarns 138 and 139 are plated and cooperatively form a plurality of intermeshed loops defining multiple horizontal courses and vertical wales. That is, yarns 138 and 139 run parallel to each other. As with the configuration in Figure 8A, inlaid strand 132 extends along one of the courses and alternates between being located (a) behind loops formed from yarns 138 and 139 and (b) in front of loops formed from yarns 138 and 139. An advantage of this configuration is that the properties of each of yarns 138 and 139 may be present in this area of knitted component 130. For example, yarns 138 and 139 may have different colors, with the color of yarn 138 being primarily present on a face of the various stitches in knit element 131 and the color of yarn 139 being primarily present on a reverse of the various stitches in knit element 131. As another example, yarn 139 may be formed from a yarn that is softer and more

comfortable against the foot than yarn 138, with yarn 138 being primarily present on first surface 136 and yarn 139 being primarily present on second surface 137.

[66] Continuing with the configuration of Figure 8B, yarn 138 may be formed from at least one of a thermoset polymer material and natural fibers (e.g., cotton, wool, silk), whereas yarn 139 may be formed from a thermoplastic polymer material. In general, a thermoplastic polymer material melts when heated and returns to a solid state when cooled. More particularly, the thermoplastic polymer material transitions from a solid state to a softened or liquid state when subjected to sufficient heat, and then the thermoplastic polymer material transitions from the softened or liquid state to the solid state when sufficiently cooled. As such, thermoplastic polymer materials are often used to join two objects or elements together. In this case, yarn 139 may be utilized to join (a) one portion of yarn 138 to another portion of yarn 138, (b) yarn 138 and inlaid strand 132 to each other, or (c) another element (e.g., logos, trademarks, and placards with care instructions and material information) to knitted component 130, for example. As such, yarn 139 may be considered a fusible yarn given that it may be used to fuse or otherwise join portions of knitted component 130 to each other. Moreover, yarn 138 may be considered a non-fusible yarn given that it is not formed from materials that are generally capable of fusing or otherwise joining portions of knitted component 130 to each other. That is, yarn 138 may be a non-fusible yarn, whereas yarn 139 may be a fusible yarn. In some configurations of knitted component 130, yarn 138 (i.e., the non-fusible yarn) may be substantially formed from a thermoset polyester material and yarn 139 (i.e., the fusible yarn) may be at least partially formed from a thermoplastic polyester material.

[67] The use of plated yarns may impart advantages to knitted component 130. When yarn 139 is heated and fused to yarn 138 and inlaid strand 132, this process may have the effect of stiffening or rigidifying the structure of knitted

component 130. Moreover, joining (a) one portion of yarn 138 to another portion of yarn 138 or (b) yarn 138 and inlaid strand 132 to each other has the effect of securing or locking the relative positions of yarn 138 and inlaid strand 132, thereby imparting stretch-resistance and stiffness. That is, portions of yarn 138 may not slide relative to each other when fused with yarn 139, thereby preventing warping or permanent stretching of knit element 131 due to relative movement of the knit structure. Another benefit relates to limiting unraveling if a portion of knitted component 130 becomes damaged or one of yarns 138 is severed. Also, inlaid strand 132 may not slide relative to knit element 131, thereby preventing portions of inlaid strand 132 from pulling outward from knit element 131. Accordingly, areas of knitted component 130 may benefit from the use of both fusible and non-fusible yarns within knit element 131.

[68] Another aspect of knitted component 130 relates to a padded area adjacent to ankle opening 121 and extending at least partially around ankle opening 121. Referring to Figure 7E, the padded area is formed by two overlapping and at least partially coextensive knitted layers 140, which may be formed of unitary knit construction, and a plurality of floating yarns 141 extending between knitted layers 140. Although the sides or edges of knitted layers 140 are secured to each other, a central area is generally unsecured. As such, knitted layers 140 effectively form a tube or tubular structure, and floating yarns 141 may be located or inlaid between knitted layers 140 to pass through the tubular structure. That is, floating yarns 141 extend between knitted layers 140, are generally parallel to surfaces of knitted layers 140, and also pass through and fill an interior volume between knitted layers 140. Whereas a majority of knit element 131 is formed from yarns that are mechanically-manipulated to form intermeshed loops, floating yarns 141 are generally free or otherwise inlaid within the interior volume between knitted layers 140. As an additional matter, knitted layers 140 may be at least partially formed from a stretch yarn. An advantage of this configuration is that knitted layers will effectively compress floating yarns 141 and provide an

elastic aspect to the padded area adjacent to ankle opening 121. That is, the stretch yarn within knitted layers 140 may be placed in tension during the knitting process that forms knitted component 130, thereby inducing knitted layers 140 to compress floating yarns 141. Although the degree of stretch in the stretch yarn may vary significantly, the stretch yarn may stretch at least one-hundred percent in many configurations of knitted component 130.

[69] The presence of floating yarns 141 imparts a compressible aspect to the padded area adjacent to ankle opening 121, thereby enhancing the comfort of footwear 100 in the area of ankle opening 121. Many conventional articles of footwear incorporate polymer foam elements or other compressible materials into areas adjacent to an ankle opening. In contrast with the conventional articles of footwear, portions of knitted component 130 formed of unitary knit construction with a remainder of knitted component 130 may form the padded area adjacent to ankle opening 121. In further configurations of footwear 100, similar padded areas may be located in other areas of knitted component 130. For example, similar padded areas may be located as an area corresponding with joints between the metatarsals and proximal phalanges to impart padding to the joints. As an alternative, a terry loop structure may also be utilized to impart some degree of padding to areas of upper 120.

[70] Based upon the above discussion, knitted component 130 imparts a variety of features to upper 120. Moreover, knitted component 130 provides a variety of advantages over some conventional upper configurations. As noted above, conventional footwear uppers are formed from multiple material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) that are joined through stitching or bonding, for example. As the number and type of material elements incorporated into an upper increases, the time and expense associated with transporting, stocking, cutting, and joining the material elements may also increase. Waste material from cutting and stitching processes also accumulates

to a greater degree as the number and type of material elements incorporated into the upper increases. Moreover, uppers with a greater number of material elements may be more difficult to recycle than uppers formed from fewer types and numbers of material elements. By decreasing the number of material elements utilized in the upper, therefore, waste may be decreased while increasing the manufacturing efficiency and recyclability of the upper. To this end, knitted component 130 forms a substantial portion of upper 120, while increasing manufacturing efficiency, decreasing waste, and simplifying recyclability.

[71] Further Knitted Component Configurations

[72] A knitted component 150 is depicted in Figures 9 and 10 and may be utilized in place of knitted component 130 in footwear 100. The primary elements of knitted component 150 are a knit element 151 and an inlaid strand 152. Knit element 151 is formed from at least one yarn that is manipulated (e.g., with a knitting machine) to form a plurality of intermeshed loops that define a variety of courses and wales. That is, knit element 151 has the structure of a knit textile. Inlaid strand 152 extends through knit element 151 and passes between the various loops within knit element 151. Although inlaid strand 152 generally extends along courses within knit element 151, inlaid strand 152 may also extend along wales within knit element 151. As with inlaid strand 132, inlaid strand 152 imparts stretch-resistance and, when incorporated into footwear 100, operates in connection with lace 122 to enhance the fit of footwear 100.

[73] Knit element 151 has a generally U-shaped configuration that is outlined by a perimeter edge 153, a pair of heel edges 154, and an inner edge 155. In addition, knit element 151 has a first surface 156 and an opposite second surface 157. First surface 156 may form a portion of the exterior surface of upper 120, whereas second surface 157 may form a portion of the interior surface of upper 120, thereby defining at least a portion of the void within upper 120. In many

configurations, knit element 151 may have the configuration of a single textile layer in the area of inlaid strand 152. That is, knit element 151 may be a single textile layer between surfaces 156 and 157. In addition, knit element 151 defines a plurality of lace apertures 158.

[74] Similar to inlaid strand 132, inlaid strand 152 repeatedly extends from perimeter edge 153 toward inner edge 155, at least partially around one of lace apertures 158, and back to perimeter edge 153. In contrast with inlaid strand 132, however, some portions of inlaid strand 152 angle rearwards and extend to heel edges 154. More particularly, the portions of inlaid strand 152 associated with the most rearward lace apertures 158 extend from one of heel edges 154 toward inner edge 155, at least partially around one of the most rearward lace apertures 158, and back to one of heel edges 154. Additionally, some portions of inlaid strand 152 do not extend around one of lace apertures 158. More particularly, some sections of inlaid strand 152 extend toward inner edge 155, turn in areas adjacent to one of lace apertures 158, and extend back toward perimeter edge 153 or one of heel edges 154.

[75] Although knit element 151 may be formed in a variety of ways, courses of the knit structure generally extend in the same direction as inlaid strands 152. In areas adjacent to lace apertures 158, however, inlaid strand 152 may also extend along wales within knit element 151. More particularly, sections of inlaid strand 152 that are parallel to inner edge 155 may extend along wales.

[76] In comparison with knit element 151, inlaid strand 152 may exhibit greater stretch-resistance. That is, inlaid strand 152 may stretch less than knit element 151. Given that numerous sections of inlaid strand 152 extend through knit element 151, inlaid strand 152 may impart stretch-resistance to portions of upper 120 between the throat area and the lower area. Moreover, placing tension upon lace 122 may impart tension to inlaid strand 152, thereby inducing the portions of upper 120 between the throat area and the lower area to lay against the foot.

Additionally, given that numerous sections of inlaid strand 152 extend toward heel edges 154, inlaid strand 152 may impart stretch-resistance to portions of upper 120 in heel region 103. Moreover, placing tension upon lace 122 may induce the portions of upper 120 in heel region 103 to lay against the foot. As such, inlaid strand 152 operates in connection with lace 122 to enhance the fit of footwear 100.

[77] Knit element 151 may incorporate any of the various types of yarn discussed above for knit element 131. Inlaid strand 152 may also be formed from any of the configurations and materials discussed above for inlaid strand 132. Additionally, the various knit configurations discussed relative to Figures 8A and 8B may also be utilized in knitted component 150. More particularly, knit element 151 may have areas formed from a single yarn, two plated yarns, or a fusible yarn and a non-fusible yarn, with the fusible yarn joining (a) one portion of the non-fusible yarn to another portion of the non-fusible yarn or (b) the non-fusible yarn and inlaid strand 152 to each other.

[78] A majority of knit element 131 is depicted as being formed from a relatively untextured textile and a common or single knit structure (e.g., a tubular knit structure). In contrast, knit element 151 incorporates various knit structures that impart specific properties and advantages to different areas of knitted component 150. Moreover, by combining various yarn types with the knit structures, knitted component 150 may impart a range of properties to different areas of upper 120. Referring to Figure 11, a schematic view of knitted component 150 shows various zones 160-169 having different knit structures, each of which will now be discussed in detail. For purposes of reference, each of regions 101-103 and sides 104 and 105 are shown in Figure 11 to provide a reference for the locations of knit zones 160-169 when knitted component 150 is incorporated into footwear 100.

[79] A tubular knit zone 160 extends along a majority of perimeter edge 153 and through each of regions 101-103 on both of sides 104 and 105. Tubular knit zone 160 also extends inward from each of sides 104 and 105 in an area approximately located at an interface regions 101 and 102 to form a forward portion of inner edge 155. Tubular knit zone 160 forms a relatively untextured knit configuration. Referring to Figure 12A, a cross-section through an area of tubular knit zone 160 is depicted, and surfaces 156 and 157 are substantially parallel to each other. Tubular knit zone 160 imparts various advantages to footwear 100. For example, tubular knit zone 160 has greater durability and wear resistance than some other knit structures, especially when the yarn in tubular knit zone 160 is plated with a fusible yarn. In addition, the relatively untextured aspect of tubular knit zone 160 simplifies the process of joining strobel sock 125 to perimeter edge 153. That is, the portion of tubular knit zone 160 located along perimeter edge 153 facilitates the lasting process of footwear 100. For purposes of reference, Figure 13A depicts a loop diagram of the manner in which tubular knit zone 160 is formed with a knitting process.

[80] Two stretch knit zones 161 extend inward from perimeter edge 153 and are located to correspond with a location of joints between metatarsals and proximal phalanges of the foot. That is, stretch zones extend inward from perimeter edge in the area approximately located at the interface regions 101 and 102. As with tubular knit zone 160, the knit configuration in stretch knit zones 161 may be a tubular knit structure. In contrast with tubular knit zone 160, however, stretch knit zones 161 are formed from a stretch yarn that imparts stretch and recovery properties to knitted component 150. Although the degree of stretch in the stretch yarn may vary significantly, the stretch yarn may stretch at least one-hundred percent in many configurations of knitted component 150.

[81] A tubular and interlock tuck knit zone 162 extends along a portion of inner edge 155 in at least midfoot region 102. Tubular and interlock tuck knit zone 162 also

forms a relatively untextured knit configuration, but has greater thickness than tubular knit zone 160. In cross-section, tubular and interlock tuck knit zone 162 is similar to Figure 12A, in which surfaces 156 and 157 are substantially parallel to each other. Tubular and interlock tuck knit zone 162 imparts various advantages to footwear 100. For example, tubular and interlock tuck knit zone 162 has greater stretch resistance than some other knit structures, which is beneficial when lace 122 places tubular and interlock tuck knit zone 162 and inlaid strands 152 in tension. For purposes of reference, Figure 13B depicts a loop diagram of the manner in which tubular and interlock tuck knit zone 162 is formed with a knitting process.

[82] A 1x1 mesh knit zone 163 is located in forefoot region 101 and spaced inward from perimeter edge 153. 1x1 mesh knit zone has a C-shaped configuration and forms a plurality of apertures that extend through knit element 151 and from first surface 156 to second surface 157, as depicted in Figure 12B. The apertures enhance the permeability of knitted component 150, which allows air to enter upper 120 and moisture to escape from upper 120. For purposes of reference, Figure 13C depicts a loop diagram of the manner in which 1x1 mesh knit zone 163 is formed with a knitting process.

[83] A 2x2 mesh knit zone 164 extends adjacent to 1x1 mesh knit zone 163. In comparison with 1x1 mesh knit zone 163, 2x2 mesh knit zone 164 forms larger apertures, which may further enhance the permeability of knitted component 150. For purposes of reference, Figure 13D depicts a loop diagram of the manner in which 2x2 mesh knit zone 164 is formed with a knitting process.

[84] A 3x2 mesh knit zone 165 is located within 2x2 mesh knit zone 164, and another 3x2 mesh knit zone 165 is located adjacent to one of stretch zones 161. In comparison with 1x1 mesh knit zone 163 and 2x2 mesh knit zone 164, 3x2 mesh knit zone 165 forms even larger apertures, which may further enhance the permeability of knitted component 150. For purposes of reference, Figure 13E

depicts a loop diagram of the manner in which 3x2 mesh knit zone 165 is formed with a knitting process.

[85] A 1x1 mock mesh knit zone 166 is located in forefoot region 101 and extends around 1x1 mesh knit zone 163. In contrast with mesh knit zones 163-165, which form apertures through knit element 151, 1x1 mock mesh knit zone 166 forms indentations in first surface 156, as depicted in Figure 12C. In addition to enhancing the aesthetics of footwear 100, 1x1 mock mesh knit zone 166 may enhance flexibility and decrease the overall mass of knitted component 150. For purposes of reference, Figure 13F depicts a loop diagram of the manner in which 1x1 mock mesh knit zone 166 is formed with a knitting process.

[86] Two 2x2 mock mesh knit zones 167 are located in heel region 103 and adjacent to heel edges 154. In comparison with 1x1 mock mesh knit zone 166, 2x2 mock mesh knit zones 167 forms larger indentations in first surface 156. In areas where inlaid strands 152 extend through indentations in 2x2 mock mesh knit zones 167, as depicted in Figure 12D, inlaid strands 152 may be visible and exposed in a lower area of the indentations. For purposes of reference, Figure 13G depicts a loop diagram of the manner in which 2x2 mock mesh knit zones 167 are formed with a knitting process.

[87] Two 2x2 hybrid knit zones 168 are located in midfoot region 102 and forward of 2x2 mock mesh knit zones 167. 2x2 hybrid knit zones 168 share characteristics of 2x2 mesh knit zone 164 and 2x2 mock mesh knit zones 167. More particularly, 2x2 hybrid knit zones 168 form apertures having the size and configuration of 2x2 mesh knit zone 164, and 2x2 hybrid knit zones 168 form indentations having the size and configuration of 2x2 mock mesh knit zones 167. In areas where inlaid strands 152 extend through indentations in 2x2 hybrid knit zones 168, as depicted in Figure 12E, inlaid strands 152 are visible and exposed. For purposes of reference, Figure 13H depicts a loop diagram of the manner in which 2x2 hybrid knit zones 168 are formed with a knitting process.

[88] Knitted component 150 also includes two padded zones 169 having the general configuration of the padded area adjacent to ankle opening 121 and extending at least partially around ankle opening 121, which was discussed above for knitted component 130. As such, padded zones 169 are formed by two overlapping and at least partially coextensive knitted layers, which may be formed of unitary knit construction, and a plurality of floating yarns extending between the knitted layers.

[89] A comparison between Figures 9 and 10 reveals that a majority of the texturing in knit element 151 is located on first surface 156, rather than second surface 157. That is, the indentations formed by mock mesh knit zones 166 and 167, as well as the indentations in 2x2 hybrid knit zones 168, are formed in first surface 156. This configuration has an advantage of enhancing the comfort of footwear 100. More particularly, this configuration places the relatively untextured configuration of second surface 157 against the foot. A further comparison between Figures 9 and 10 reveals that portions of inlaid strand 152 are exposed on first surface 156, but not on second surface 157. This configuration also has an advantage of enhancing the comfort of footwear 100. More particularly, by spacing inlaid strand 152 from the foot by a portion of knit element 151, inlaid strands 152 will not contact the foot.

[90] Additional configurations of knitted component 130 are depicted in Figures 14A-14C. Although discussed in relation to kitted component 130, concepts associated with each of these configurations may also be utilized with knitted component 150. Referring to Figure 14A, inlaid strands 132 are absent from knitted component 130. Although inlaid strands 132 impart stretch-resistance to areas of knitted component 130, some configurations may not require the stretch-resistance from inlaid strands 132. Moreover, some configurations may benefit from greater stretch in upper 120. Referring to Figure 14B, knit element 131 includes two flaps 142 that are formed of unitary knit construction with a

remainder of knit element 131 and extend along the length of knitted component 130 at perimeter edge 133. When incorporated into footwear 100, flaps 142 may replace strobel sock 125. That is, flaps 142 may cooperatively form a portion of upper 120 that extends under sockliner 113 and is secured to the upper surface of midsole 111. Referring to Figure 14C, knitted component 130 has a configuration that is limited to midfoot region 102. In this configuration, other material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) may be joined to knitted component 130 through stitching or bonding, for example, to form upper 120.

[91] Based upon the above discussion, each of knitted components 130 and 150 may have various configurations that impart features and advantages to upper 120. More particularly, knit elements 131 and 151 may incorporate various knit structures and yarn types that impart specific properties to different areas of upper 120, and inlaid strands 132 and 152 may extend through the knit structures to impart stretch-resistance to areas of upper 120 and operate in connection with lace 122 to enhance the fit of footwear 100.

[92] Knitting Machine And Feeder Configurations

[93] Although knitting may be performed by hand, the commercial manufacture of knitted components is generally performed by knitting machines. An example of a knitting machine 200 that is suitable for producing either of knitted components 130 and 150 is depicted in Figure 15. Knitting machine 200 has a configuration of a V-bed flat knitting machine for purposes of example, but either of knitted components 130 and 150 or aspects of knitted components 130 and 150 may be produced on other types of knitting machines.

[94] Knitting machine 200 includes two needle beds 201 that are angled with respect to each other, thereby forming a V-bed. Each of needle beds 201 include a plurality of individual needles 202 that lay on a common plane. That is, needles

202 from one needle bed 201 lay on a first plane, and needles 202 from the other needle bed 201 lay on a second plane. The first plane and the second plane (i.e., the two needle beds 201) are angled relative to each other and meet to form an intersection that extends along a majority of a width of knitting machine 200. As described in greater detail below, needles 202 each have a first position where they are retracted and a second position where they are extended. In the first position, needles 202 are spaced from the intersection where the first plane and the second plane meet. In the second position, however, needles 202 pass through the intersection where the first plane and the second plane meet.

[95] A pair of rails 203 extend above and parallel to the intersection of needle beds 201 and provide attachment points for multiple standard feeders 204 and combination feeders 220. Each rail 203 has two sides, each of which accommodates either one standard feeder 204 or one combination feeder 220. As such, knitting machine 200 may include a total of four feeders 204 and 220. As depicted, the forward-most rail 203 includes one combination feeder 220 and one standard feeder 204 on opposite sides, and the rearward-most rail 203 includes two standard feeders 204 on opposite sides. Although two rails 203 are depicted, further configurations of knitting machine 200 may incorporate additional rails 203 to provide attachment points for more feeders 204 and 220.

[96] Due to the action of a carriage 205, feeders 204 and 220 move along rails 203 and needle beds 201, thereby supplying yarns to needles 202. In Figure 15, a yarn 206 is provided to combination feeder 220 by a spool 207. More particularly, yarn 206 extends from spool 207 to various yarn guides 208, a yarn take-back spring 209, and a yarn tensioner 210 before entering combination feeder 220. Although not depicted, additional spools 207 may be utilized to provide yarns to feeders 204.

[97] Standard feeders 204 are conventionally-utilized for a V-bed flat knitting machine, such as knitting machine 200. That is, existing knitting machines

incorporate standard feeders 204. Each standard feeder 204 has the ability to supply a yarn that needles 202 manipulate to knit, tuck, and float. As a comparison, combination feeder 220 has the ability to supply a yarn (e.g., yarn 206) that needles 202 knit, tuck, and float, and combination feeder 220 has the ability to inlay the yarn. Moreover, combination feeder 220 has the ability to inlay a variety of different strands (e.g., filament, thread, rope, webbing, cable, chain, or yarn). Accordingly, combination feeder 220 exhibits greater versatility than each standard feeder 204.

[98] As noted above, combination feeder 220 may be utilized when inlaying a yarn or other strand, in addition to knitting, tucking, and floating the yarn. Conventional knitting machines, which do not incorporate combination feeder 220, may also inlay a yarn. More particularly, conventional knitting machines that are supplied with an inlay feeder may also inlay a yarn. A conventional inlay feeder for a V-bed flat knitting machine includes two components that operate in conjunction to inlay the yarn. Each of the components of the inlay feeder are secured to separate attachment points on two adjacent rails, thereby occupying two attachment points. Whereas an individual standard feeder 204 only occupies one attachment point, two attachment points are generally occupied when an inlay feeder is utilized to inlay a yarn into a knitted component. Moreover, whereas combination feeder 220 only occupies one attachment point, a conventional inlay feeder occupies two attachment points.

[99] Given that knitting machine 200 includes two rails 203, four attachment points are available in knitting machine 200. If a conventional inlay feeder were utilized with knitting machine 200, only two attachment points would be available for standard feeders 204. When using combination feeder 220 in knitting machine 200, however, three attachment points are available for standard feeders 204. Accordingly, combination feeder 220 may be utilized when inlaying a yarn or

other strand, and combination feeder 220 has an advantage of only occupying one attachment point.

[100] Combination feeder 220 is depicted individually in Figures 16-19 as including a carrier 230, a feeder arm 240, and a pair of actuation members 250. Although a majority of combination feeder 220 may be formed from metal materials (e.g., steel, aluminum, titanium), portions of carrier 230, feeder arm 240, and actuation members 250 may be formed from polymer, ceramic, or composite materials, for example. As discussed above, combination feeder 220 may be utilized when inlaying a yarn or other strand, in addition to knitting, tucking, and floating a yarn. Referring to Figure 16 specifically, a portion of yarn 206 is depicted to illustrate the manner in which a strand interfaces with combination feeder 220.

[101] Carrier 230 has a generally rectangular configuration and includes a first cover member 231 and a second cover member 232 that are joined by four bolts 233. Cover members 231 and 232 define an interior cavity in which portions of feeder arm 240 and actuation members 250 are located. Carrier 230 also includes an attachment element 234 that extends outward from first cover member 231 for securing feeder 220 to one of rails 203. Although the configuration of attachment element 234 may vary, attachment element 234 is depicted as including two spaced protruding areas that form a dovetail shape, as depicted in Figure 17. A reverse dovetail configuration on one of rails 203 may extend into the dovetail shape of attachment element 234 to effectively join combination feeder 220 to knitting machine 200. It should also be noted that second cover member 234 forms a centrally-located and elongate slot 235, as depicted in Figure 18.

[102] Feeder arm 240 has a generally elongate configuration that extends through carrier 230 (i.e., the cavity between cover members 231 and 232) and outward from a lower side of carrier 230. In addition to other elements, feeder arm 240 includes an actuation bolt 241, a spring 242, a pulley 243, a loop 244, and a dispensing area 245. Actuation bolt 241 extends outward from feeder arm 240

and is located within the cavity between cover members 231 and 232. One side of actuation bolt 241 is also located within slot 235 in second cover member 232, as depicted in Figure 18. Spring 242 is secured to carrier 230 and feeder arm 240. More particularly, one end of spring 242 is secured to carrier 230, and an opposite end of spring 242 is secured to feeder arm 240. Pulley 243, loop 244, and dispensing area 245 are present on feeder arm 240 to interface with yarn 206 or another strand. Moreover, pulley 243, loop 244, and dispensing area 245 are configured to ensure that yarn 206 or another strand smoothly passes through combination feeder 220, thereby being reliably-supplied to needles 202. Referring again to Figure 16, yarn 206 extends around pulley 243, through loop 244, and into dispensing area 245. In addition, yarn 206 extends out of a dispensing tip 246, which is an end region of feeder arm 240, to then supply needles 202.

[103] Each of actuation members 250 includes an arm 251 and a plate 252. In many configurations of actuation members 250, each arm 251 is formed as a one-piece element with one of plates 252. Whereas arms 251 are located outside of carrier 230 and at an upper side of carrier 230, plates 252 are located within carrier 250. Each of arms 251 has an elongate configuration that defines an outside end 253 and an opposite inside end 254, and arms 251 are positioned to define a space 255 between both of inside ends 254. That is, arms 251 are spaced from each other. Plates 252 have a generally planar configuration. Referring to Figure 19, each of plates 252 define an aperture 256 with an inclined edge 257. Moreover, actuation bolt 241 of feeder arm 240 extends into each aperture 256.

[104] The configuration of combination feeder 220 discussed above provides a structure that facilitates a translating movement of feeder arm 240. As discussed in greater detail below, the translating movement of feeder arm 240 selectively positions dispensing tip 246 at a location that is above or below the intersection of needle beds 201. That is, dispensing tip 246 has the ability to reciprocate

through the intersection of needle beds 201. An advantage to the translating movement of feeder arm 240 is that combination feeder 220 (a) supplies yarn 206 for knitting, tucking, and floating when dispensing tip 246 is positioned above the intersection of needle beds 201 and (b) supplies yarn 206 or another strand for inlaying when dispensing tip 246 is positioned below the intersection of needle beds 201. Moreover, feeder arm 240 reciprocates between the two positions depending upon the manner in which combination feeder 220 is being utilized.

[105] In reciprocating through the intersection of needle beds 201, feeder arm 240 translates from a retracted position to an extended position. When in the retracted position, dispensing tip 246 is positioned above the intersection of needle beds 201. When in the extended position, dispensing tip 246 is positioned below the intersection of needle beds 201. Dispensing tip 246 is closer to carrier 230 when feeder arm 240 is in the retracted position than when feeder arm 240 is in the extended position. Similarly, dispensing tip 246 is further from carrier 230 when feeder arm 240 is in the extended position than when feeder arm 240 is in the retracted position. In other words, dispensing tip 246 moves away from carrier 230 when in the extended position, and dispensing tip 246 moves closer to carrier 230 when in the retracted position.

[106] For purposes of reference in Figures 16-20C, as well as further figures discussed later, an arrow 221 is positioned adjacent to dispensing area 245. When arrow 221 points upward or toward carrier 230, feeder arm 240 is in the retracted position. When arrow 221 points downward or away from carrier 230, feeder arm 240 is in the extended position. Accordingly, by referencing the position of arrow 221, the position of feeder arm 240 may be readily ascertained.

[107] The natural state of feeder arm 240 is the retracted position. That is, when no significant forces are applied to areas of combination feeder 220, feeder arm remains in the retracted position. Referring to Figures 16-19, for example, no

forces or other influences are shown as interacting with combination feeder 220, and feeder arm 240 is in the retracted position. The translating movement of feeder arm 240 may occur, however, when a sufficient force is applied to one of arms 251. More particularly, the translating movement of feeder arm 240 occurs when a sufficient force is applied to one of outside ends 253 and is directed toward space 255. Referring to Figures 20A and 20B, a force 222 is acting upon one of outside ends 253 and is directed toward space 255, and feeder arm 240 is shown as having translated to the extended position. Upon removal of force 222, however, feeder arm 240 will return to the retracted position. It should also be noted that Figure 20C depicts force 222 as acting upon inside ends 254 and being directed outward, and feeder arm 240 remains in the retracted position.

[108] As discussed above, feeders 204 and 220 move along rails 203 and needle beds 201 due to the action of carriage 205. More particularly, a drive bolt within carriage 205 contacts feeders 204 and 220 to push feeders 204 and 220 along needle beds 201. With respect to combination feeder 220, the drive bolt may either contact one of outside ends 253 or one of inside ends 254 to push combination feeder 220 along needle beds 201. When the drive bolt contacts one of outside ends 253, feeder arm 240 translates to the extended position and dispensing tip 246 passes below the intersection of needle beds 201. When the drive bolt contacts one of inside ends 254 and is located within space 255, feeder arm 240 remains in the retracted position and dispensing tip 246 is above the intersection of needle beds 201. Accordingly, the area where carriage 205 contacts combination feeder 220 determines whether feeder arm 240 is in the retracted position or the extended position.

[109] The mechanical action of combination feeder 220 will now be discussed. Figures 19-20B depict combination feeder 220 with first cover member 231 removed, thereby exposing the elements within the cavity in carrier 230. By comparing Figure 19 with Figures 20A and 20B, the manner in which force 222 induces

feeder arm 240 to translate may be apparent. When force 222 acts upon one of outside ends 253, one of actuation members 250 slides in a direction that is perpendicular to the length of feeder arm 240. That is, one of actuation members 250 slides horizontally in Figures 19-20B. The movement of one of actuation members 250 causes actuation bolt 241 to engage one of inclined edges 257. Given that the movement of actuation members 250 is constrained to the direction that is perpendicular to the length of feeder arm 240, actuation bolt 241 rolls or slides against inclined edge 257 and induces feeder arm 240 to translate to the extended position. Upon removal of force 222, spring 242 pulls feeder arm 240 from the extended position to the retracted position.

[110] Based upon the above discussion, combination feeder 220 reciprocates between the retracted position and the extended position depending upon whether a yarn or other strand is being utilized for knitting, tucking, or floating or being utilized for inlaying. Combination feeder 220 has a configuration wherein the application of force 222 induces feeder arm 240 to translate from the retracted position to the extended position, and removal of force 222 induces feeder arm 240 to translate from the extended position to the retracted position. That is, combination feeder 220 has a configuration wherein the application and removal of force 222 causes feeder arm 240 to reciprocate between opposite sides of needle beds 201. In general, outside ends 253 may be considered actuation areas, which induce movement in feeder arm 240. In further configurations of combination feeder 220, the actuation areas may be in other locations or may respond to other stimuli to induce movement in feeder arm 240. For example, the actuation areas may be electrical inputs coupled to servomechanisms that control movement of feeder arm 240. Accordingly, combination feeder 220 may have a variety of structures that operate in the same general manner as the configuration discussed above.

[111] Knitting Process

[112] The manner in which knitting machine 200 operates to manufacture a knitted component will now be discussed in detail. Moreover, the following discussion will demonstrate the operation of combination feeder 220 during a knitting process. Referring to Figure 21A, a portion of knitting machine 200 that includes various needles 202, rail 203, standard feeder 204, and combination feeder 220 is depicted. Whereas combination feeder 220 is secured to a front side of rail 203, standard feeder 204 is secured to a rear side of rail 203. Yarn 206 passes through combination feeder 220, and an end of yarn 206 extends outward from dispensing tip 246. Although yarn 206 is depicted, any other strand (e.g., filament, thread, rope, webbing, cable, chain, or yarn) may pass through combination feeder 220. Another yarn 211 passes through standard feeder 204 and forms a portion of a knitted component 260, and loops of yarn 211 forming an uppermost course in knitted component 260 are held by hooks located on ends of needles 202.

[113] The knitting process discussed herein relates to the formation of knitted component 260, which may be any knitted component, including knitted components that are similar to knitted components 130 and 150. For purposes of the discussion, only a relatively small section of knitted component 260 is shown in the figures in order to permit the knit structure to be illustrated. Moreover, the scale or proportions of the various elements of knitting machine 200 and knitted component 260 may be enhanced to better illustrate the knitting process.

[114] Standard feeder 204 includes a feeder arm 212 with a dispensing tip 213. Feeder arm 212 is angled to position dispensing tip 213 in a location that is (a) centered between needles 202 and (b) above an intersection of needle beds 201. Figure 22A depicts a schematic cross-sectional view of this configuration. Note that needles 202 lay on different planes, which are angled relative to each other.

That is, needles 202 from needle beds 201 lay on the different planes. Needles 202 each have a first position and a second position. In the first position, which is shown in solid line, needles 202 are retracted. In the second position, which is shown in dashed line, needles 202 are extended. In the first position, needles 202 are spaced from the intersection where the planes upon which needle beds 201 lay meet. In the second position, however, needles 202 are extended and pass through the intersection where the planes upon which needle beds 201 meet. That is, needles 202 cross each other when extended to the second position. It should be noted that dispensing tip 213 is located above the intersection of the planes. In this position, dispensing tip 213 supplies yarn 211 to needles 202 for purposes of knitting, tucking, and floating.

[115] Combination feeder 220 is in the retracted position, as evidenced by the orientation of arrow 221. Feeder arm 240 extends downward from carrier 230 to position dispensing tip 246 in a location that is (a) centered between needles 202 and (b) above the intersection of needle beds 201. Figure 22B depicts a schematic cross-sectional view of this configuration. Note that dispensing tip 246 is positioned in the same relative location as dispensing tip 213 in Figure 22A.

[116] Referring now to Figure 21B, standard feeder 204 moves along rail 203 and a new course is formed in knitted component 260 from yarn 211. More particularly, needles 202 pulled sections of yarn 211 through the loops of the prior course, thereby forming the new course. Accordingly, courses may be added to knitted component 260 by moving standard feeder 204 along needles 202, thereby permitting needles 202 to manipulate yarn 211 and form additional loops from yarn 211.

[117] Continuing with the knitting process, feeder arm 240 now translates from the retracted position to the extended position, as depicted in Figure 21C. In the extended position, feeder arm 240 extends downward from carrier 230 to position dispensing tip 246 in a location that is (a) centered between needles 202 and (b)

below the intersection of needle beds 201. Figure 22C depicts a schematic cross-sectional view of this configuration. Note that dispensing tip 246 is positioned below the location of dispensing tip 246 in Figure 22B due to the translating movement of feeder arm 240.

[118] Referring now to Figure 21D, combination feeder 220 moves along rail 203 and yarn 206 is placed between loops of knitted component 260. That is, yarn 206 is located in front of some loops and behind other loops in an alternating pattern. Moreover, yarn 206 is placed in front of loops being held by needles 202 from one needle bed 201, and yarn 206 is placed behind loops being held by needles 202 from the other needle bed 201. Note that feeder arm 240 remains in the extended position in order to lay yarn 206 in the area below the intersection of needle beds 201. This effectively places yarn 206 within the course recently formed by standard feeder 204 in Figure 21B.

[119] In order to complete inlaying yarn 206 into knitted component 260, standard feeder 204 moves along rail 203 to form a new course from yarn 211, as depicted in Figure 21E. By forming the new course, yarn 206 is effectively knit within or otherwise integrated into the structure of knitted component 260. At this stage, feeder arm 240 may also translate from the extended position to the retracted position.

[120] Figures 21D and 21E show separate movements of feeders 204 and 220 along rail 203. That is, Figure 21D shows a first movement of combination feeder 220 along rail 203, and Figure 21E shows a second and subsequent movement of standard feeder 204 along rail 203. In many knitting processes, feeders 204 and 220 may effectively move simultaneously to inlay yarn 206 and form a new course from yarn 211. Combination feeder 220, however, moves ahead or in front of standard feeder 204 in order to position yarn 206 prior to the formation of the new course from yarn 211.

[121] The general knitting process outlined in the above discussion provides an example of the manner in which inlaid strands 132 and 152 may be located in knit elements 131 and 151. More particularly, knitted components 130 and 150 may be formed by utilizing combination feeder 220 to effectively insert inlaid strands 132 and 152 into knit elements 131. Given the reciprocating action of feeder arm 240, inlaid strands may be located within a previously formed course prior to the formation of a new course.

[122] Continuing with the knitting process, feeder arm 240 now translates from the retracted position to the extended position, as depicted in Figure 21F. Combination feeder 220 then moves along rail 203 and yarn 206 is placed between loops of knitted component 260, as depicted in Figure 21G. This effectively places yarn 206 within the course formed by standard feeder 204 in Figure 21E. In order to complete inlaying yarn 206 into knitted component 260, standard feeder 204 moves along rail 203 to form a new course from yarn 211, as depicted in Figure 21H. By forming the new course, yarn 206 is effectively knit within or otherwise integrated into the structure of knitted component 260. At this stage, feeder arm 240 may also translate from the extended position to the retracted position.

[123] Referring to Figure 21H, yarn 206 forms a loop 214 between the two inlaid sections. In the discussion of knitted component 130 above, it was noted that inlaid strand 132 repeatedly exits knit element 131 at perimeter edge 133 and then re-enters knit element 131 at another location of perimeter edge 133, thereby forming loops along perimeter edge 133, as seen in Figures 5 and 6. Loop 214 is formed in a similar manner. That is, loop 214 is formed where yarn 206 exits the knit structure of knitted component 260 and then re-enters the knit structure.

[124] As discussed above, standard feeder 204 has the ability to supply a yarn (e.g., yarn 211) that needles 202 manipulate to knit, tuck, and float. Combination

feeder 220, however, has the ability to supply a yarn (e.g., yarn 206) that needles 202 knit, tuck, or float, as well as inlaying the yarn. The above discussion of the knitting process describes the manner in which combination feeder 220 inlays a yarn while in the extended position. Combination feeder 220 may also supply the yarn for knitting, tucking, and floating while in the retracted position. Referring to Figure 21I, for example, combination feeder 220 moves along rail 203 while in the retracted position and forms a course of knitted component 260 while in the retracted position. Accordingly, by reciprocating feeder arm 240 between the retracted position and the extended position, combination feeder 220 may supply yarn 206 for purposes of knitting, tucking, floating, and inlaying. An advantage to combination feeder 220 relates, therefore, to its versatility in supplying a yarn that may be utilized for a greater number of functions than standard feeder 204

[125] The ability of combination feeder 220 to supply yarn for knitting, tucking, floating, and inlaying is based upon the reciprocating action of feeder arm 240. Referring to Figures 22A and 22B, dispensing tips 213 and 246 are at identical positions relative to needles 220. As such, both feeders 204 and 220 may supply a yarn for knitting, tucking, and floating. Referring to Figure 22C, dispensing tip 246 is at a different position. As such, combination feeder 220 may supply a yarn or other strand for inlaying. An advantage to combination feeder 220 relates, therefore, to its versatility in supplying a yarn that may be utilized for knitting, tucking, floating, and inlaying.

[126] Further Knitting Process Considerations

[127] Additional aspects relating to the knitting process will now be discussed. Referring to Figure 23, the upper course of knitted component 260 is formed from both of yarns 206 and 211. More particularly, a left side of the course is formed from yarn 211, whereas a right side of the course is formed from yarn 206. Additionally, yarn 206 is inlaid into the left side of the course. In order to form this configuration, standard feeder 204 may initially form the left side of the

course from yarn 211. Combination feeder 220 then lays yarn 206 into the right side of the course while feeder arm 240 is in the extended position. Subsequently, feeder arm 240 moves from the extended position to the retracted position and forms the right side of the course. Accordingly, combination feeder may inlay a yarn into one portion of a course and then supply the yarn for purposes of knitting a remainder of the course.

[128] Figure 24 depicts a configuration of knitting machine 200 that includes four combination feeders 220. As discussed above, combination feeder 220 has the ability to supply a yarn (e.g., yarn 206) for knitting, tucking, floating, and inlaying. Given this versatility, standard feeders 204 may be replaced by multiple combination feeders 220 in knitting machine 200 or in various conventional knitting machines.

[129] Figure 8B depicts a configuration of knitted component 130 where two yarns 138 and 139 are plated to form knit element 131, and inlaid strand 132 extends through knit element 131. The general knitting process discussed above may also be utilized to form this configuration. As depicted in Figure 15, knitting machine 200 includes multiple standard feeders 204, and two of standard feeders 204 may be utilized to form knit element 131, with combination feeder 220 depositing inlaid strand 132. Accordingly, the knitting process discussed above in Figures 21A-21I may be modified by adding another standard feeder 204 to supply an additional yarn. In configurations where yarn 138 is a non-fusible yarn and yarn 139 is a fusible yarn, knitted component 130 may be heated following the knitting process to fuse knitted component 130.

[130] The portion of knitted component 260 depicted in Figures 21A-21I has the configuration of a rib knit textile with regular and uninterrupted courses and wales. That is, the portion of knitted component 260 does not have, for example, any mesh areas similar to mesh knit zones 163-165 or mock mesh areas similar to mock mesh knit zones 166 and 167. In order to form mesh knit zones 163-165

in either of knitted components 150 and 260, a combination of a racked needle bed 201 and a transfer of stitch loops from front to back needle beds 201 and back to front needle beds 201 in different racked positions is utilized. In order to form mock mesh areas similar to mock mesh knit zones 166 and 167, a combination of a racked needle bed and a transfer of stitch loops from front to back needle beds 201 is utilized.

[131] Courses within a knitted component are generally parallel to each other. Given that a majority of inlaid strand 152 follows courses within knit element 151, it may be suggested that the various sections of inlaid strand 152 should be parallel to each other. Referring to Figure 9, for example, some sections of inlaid strand 152 extend between edges 153 and 155 and other sections extend between edges 153 and 154. Various sections of inlaid strand 152 are, therefore, not parallel. The concept of forming darts may be utilized to impart this non-parallel configuration to inlaid strand 152. More particularly, courses of varying length may be formed to effectively insert wedge-shaped structures between sections of inlaid strand 152. The structure formed in knitted component 150, therefore, where various sections of inlaid strand 152 are not parallel, may be accomplished through the process of darting.

[132] Although a majority of inlaid strands 152 follow courses within knit element 151, some sections of inlaid strand 152 follow wales. For example, sections of inlaid strand 152 that are adjacent to and parallel to inner edge 155 follow wales. This may be accomplished by first inserting a section of inlaid strand 152 along a portion of a course and to a point where inlaid strand 152 is intended to follow a wale. Inlaid strand 152 is then kicked back to move inlaid strand 152 out of the way, and the course is finished. As the subsequent course is being formed, inlay strand 152 is again kicked back to move inlaid strand 152 out of the way at the point where inlaid strand 152 is intended to follow the wale, and the course is finished. This process is repeated until inlaid strand 152 extends a desired

distance along the wale. Similar concepts may be utilized for portions of inlaid strand 132 in knitted component 130.

[133] A variety of procedures may be utilized to reduce relative movement between (a) knit element 131 and inlaid strand 132 or (b) knit element 151 and inlaid strand 152. That is, various procedures may be utilized to prevent inlaid strands 132 and 152 from slipping, moving through, pulling out, or otherwise becoming displaced from knit elements 131 and 151. For example, fusing one or more yarns that are formed from thermoplastic polymer materials to inlaid strands 132 and 152 may prevent movement between inlaid strands 132 and 152 and knit elements 131 and 151. Additionally, inlaid strands 132 and 152 may be fixed to knit elements 131 and 151 when periodically fed to knitting needles as a tuck element. That is, inlaid strands 132 and 152 may be formed into tuck stitches at points along their lengths (e.g., once per centimeter) in order to secure inlaid strands 132 and 152 to knit elements 131 and 151 and prevent movement of inlaid strands 132 and 152.

[134] Following the knitting process described above, various operations may be performed to enhance the properties of either of knitted components 130 and 150. For example, a water-repellant coating or other water-resisting treatment may be applied to limit the ability of the knit structures to absorb and retain water. As another example, knitted components 130 and 150 may be steamed to improve loft and induce fusing of the yarns. As discussed above with respect to Figure 8B, yarn 138 may be a non-fusible yarn and yarn 139 may be a fusible yarn. When steamed, yarn 139 may melt or otherwise soften so as to transition from a solid state to a softened or liquid state, and then transition from the softened or liquid state to the solid state when sufficiently cooled. As such, yarn 139 may be utilized to join (a) one portion of yarn 138 to another portion of yarn 138, (b) yarn 138 and inlaid strand 132 to each other, or (c) another element (e.g., logos, trademarks, and placards with care instructions and material

information) to knitted component 130, for example. Accordingly, a steaming process may be utilized to induce fusing of yarns in knitted components 130 and 150.

[135] Although procedures associated with the steaming process may vary greatly, one method involves pinning one of knitted components 130 and 150 to a jig during steaming. An advantage of pinning one of knitted components 130 and 150 to a jig is that the resulting dimensions of specific areas of knitted components 130 and 150 may be controlled. For example, pins on the jig may be located to hold areas corresponding to perimeter edge 133 of knitted component 130. By retaining specific dimensions for perimeter edge 133, perimeter edge 133 will have the correct length for a portion of the lasting process that joins upper 120 to sole structure 110. Accordingly, pinning areas of knitted components 130 and 150 may be utilized to control the resulting dimensions of knitted components 130 and 150 following the steaming process.

[136] The knitting process described above for forming knitted component 260 may be applied to the manufacture of knitted components 130 and 150 for footwear 100. The knitting process may also be applied to the manufacture of a variety of other knitted components. That is, knitting processes utilizing one or more combination feeders or other reciprocating feeders may be utilized to form a variety of knitted components. As such, knitted components formed through the knitting process described above, or a similar process, may also be utilized in other types of apparel (e.g., shirts, pants, socks, jackets, undergarments), athletic equipment (e.g., golf bags, baseball and football gloves, soccer ball restriction structures), containers (e.g., backpacks, bags), and upholstery for furniture (e.g., chairs, couches, car seats). The knitted components may also be utilized in bed coverings (e.g., sheets, blankets), table coverings, towels, flags, tents, sails, and parachutes. The knitted components may be utilized as technical textiles for industrial purposes, including structures for automotive and

aerospace applications, filter materials, medical textiles (e.g. bandages, swabs, implants), geotextiles for reinforcing embankments, agrotextiles for crop protection, and industrial apparel that protects or insulates against heat and radiation. Accordingly, knitted components formed through the knitting process described above, or a similar process, may be incorporated into a variety of products for both personal and industrial purposes.

[137] Knitted Components With Tongues

[138] In footwear 100, tongue 124 is separate from knitted component 130 and joined to knitted component 130, possibly with stitching, an adhesive, or thermal bonding. Moreover, tongue 124 is discussed as being added to knitted component 130 following the knitting process. As depicted in Figures 25 and 26, however, knitted component 130 includes a knitted tongue 170 that is formed of unitary knit construction with knit element 131. That is, knit element 131 and tongue 170 are formed as a one-piece element through a knitting process, which will be discussed in greater detail below. Although tongue 124 or another tongue may be joined to knit element 131 after knitted component 130 is formed, tongue 170 or another knitted tongue may be formed during the knitting process and of unitary knit construction with a portion of knitted component 130.

[139] Tongue 170 is located within a throat area (i.e., where lace 122 and lace apertures 123 are located) of knitted component 130 and extends along the throat area. When incorporated into footwear 100, for example, tongue 170 extends from a forward portion of the throat area to ankle opening 121. As with knit element 131, tongue 170 is depicted as being formed from a relatively untextured textile and a common or single knit structure. Tongue 170 is also depicted in Figure 27 as having a generally planar configuration. Examples of knit structures that may impart this configuration for tongue 170, as well as knit element 131, are any of the various knit structures in knit zones 160-162 discussed above. In further configurations, however, apertures may be formed in

areas of tongue 170 by utilizing the knit structures of mesh knit zones 163-165, indentations may be formed in areas of tongue 170 by utilizing the knit structures of mock mesh knit zones 166 or 167, or a combination of apertures and indentations may be formed in areas of tongue 170 by utilizing the knit structure of hybrid knit zone 168. Additionally, areas of tongue 170 may have a padded aspect when formed to have layers and floating yarns, for example, that are similar to padded zone 169. Accordingly, the untextured and planar aspect of tongue 170 is shown for purposes of example, and various features may be imparted through the use of different knit structures.

[140] Referring to Figures 28 and 29, a knitted tongue 175 is depicted as being formed of unitary knit construction with knit element 151 of knitted component 150. Tongue 175 has the same general shape as tongue 170, but may have a padded aspect with greater thickness. More particularly, tongue 175 is depicted in Figure 30 as including two overlapping and at least partially coextensive knitted layers 176, which may be formed of unitary knit construction, and a plurality of yarn loops 177 located between layers 176. Although the sides or edges of layers 176 are secured or knit to each other, a central area is generally unsecured. As such, layers 176 effectively form a tube or tubular structure, and yarn loops 177 are located between and extend outward from one of layers 176. In effect, yarn loops 177 fill an interior volume between layers 176 and impart a compressible or padded aspect to tongue 175. It should also be noted that each of layers 176 and yarn loops 177 may be formed of unitary knit construction during the knitting process that forms knitted component 150.

[141] Another knitted component 180 is depicted in Figure 31 as including a knit element 181, an inlaid strand 182, and a knitted tongue 183. With the exception of the presence of tongue 183, knitted component 180 has a general structure of a knitted component disclosed in U.S. Patent Application Publication 2010/0154256 to Dua, which is incorporated herein by reference. Tongue 183 is

formed of unitary knit construction with knit element 181 and includes various knit structures. Referring to Figure 32, for example, peripheral areas of tongue 183 exhibit an untextured configuration that may have any of the various knit structures in knit zones 160-162. At least two areas of tongue 183 incorporate apertures and may have any of the various knit structures in mesh knit zones 163-165. Referring to Figure 33, a central area of tongue 183 has a compressible or padded aspect that includes two overlapping and at least partially coextensive knitted layers 184, which may be formed of unitary knit construction, and a plurality of floating yarns 185 extending between layers 184. The central area of tongue 183 may exhibit, therefore, the knit structure of padded zone 169. Although the sides or edges of layers 184 are secured to each other, a central area is generally unsecured. As such, layers 184 effectively form a tube or tubular structure, and floating yarns 185 may be located or inlaid between layers 184 to pass through the tubular structure. That is, floating yarns 185 extend between layers 184, are generally parallel to surfaces of layers 184, and also pass through and fill an interior volume between layers 184. Whereas a majority of tongue 183 is formed from yarns that are mechanically-manipulated to form intermeshed loops, floating yarns 185 are generally free or otherwise inlaid within the interior volume between layers 184. As an additional matter, layers 184 may be at least partially formed from a stretch yarn to impart the advantages discussed above for knitted layers 140 and floating yarns 141.

[142] Tongue 183 provides an example of the manner in which various knit structures may be utilized. As discussed above, the peripheral areas of tongue 183 exhibit an untextured configuration, two areas of tongue 183 incorporate apertures, and the central area of tongue 183 includes knitted layers 184 and floating yarns 185 to provide a compressible or padded aspect. Mock mesh knit structures and hybrid knit structures may also be utilized. Accordingly, various knit structures may be incorporated into tongue 183 or any other knitted tongue (e.g., tongues 170 and 175) to impart different properties or aesthetics.

[143] Tongue 170 is secured to a forward portion of the throat area of knit element 131. That is, tongue 170 is joined through knitting to knit element 131 in a portion of the throat area that is closest to forefoot region 101 in footwear 100. Each of tongues 175 and 183 are respectively secured or knit to a similar position in knitted components 150 and 180. Referring to Figures 34 and 35, however, a knitted tongue 190 is secured along a length of the throat area of a configuration of knitted component 131 that does not include inlaid strand 132 or lace apertures 123. More particularly, edges of tongue 190 are knit to an area of knit element 131 that is spaced outward from inner edge 135. Accordingly, any of the configurations of tongues 170, 175, 183, and 190 may be secured (e.g., through unitary knit construction) to various locations in the throat areas of knitted components 130, 150, and 180.

[144] Advantages of constructing tongue 170 during the knitting process and of unitary knit construction are more efficient manufacture and common properties. More particularly, manufacturing efficiency may be increased by forming more of knitted component 130 during the knitting process and eliminating various steps (e.g., making a separate tongue, securing the tongue) that are often performed manually. Tongue 170 and knit element 131 may also have common properties when formed from the same yarn (or type of yarn) or with similar knit structures. For example, utilizing the same yarn in both of tongue 170 and knit element 131 imparts similar durability, strength, stretch, wear-resistance, biodegradability, thermal, and hydrophobic properties. In addition to physical properties, utilizing the same yarn in both of tongue 170 and knit element 131 may impart common aesthetic or tactile properties, such as color, sheen, and texture. Utilizing the same knit structures in both of tongue 170 and knit element 131 may also impart common physical properties and aesthetic properties. These advantages may also be present when at least a portion of knit element 131 and at least a portion of tongue 170 are formed from a common yarn (or type of yarn) or with common knit structures.

[145] Tongue 175 includes yarn loops 177 between layers 176, and tongue 183 includes floating yarns 185 between layers 184. A benefit of yarn loops 177 and floating yarns 185 is that compressible or padded areas are formed. In addition to yarn loops 177 and floating yarns 185, other types of free yarn sections may be utilized. For purposes of the present application, "free yarn sections" or variants thereof is defined as segments or portions of yarns that are not directly forming intermeshed loops (e.g., that define courses and wales) of a knit structure, such as floating yarns, inlaid yarns, terry loops, ends of yarns, and cut segments of yarn, for example. Moreover, it should be noted that free yarn sections may be one portion of an individual yarn, with other portions of the yarn forming intermeshed loops of the knit structure, For example, the portion of a yarn forming terry loops (e.g., the free yarn sections) may be between portions of the yarn forming intermeshed loops of a knit structure. As an alternative to free yarn sections, foam materials or other types of compressible materials may be utilized within either of tongues 175 and 183.

[146] As a final matter, although tongue 170 is disclosed in combination with knitted component 130, tongue 170 may also be utilized with knitted components 150 and 180, as well as other knitted components. Similarly, tongues 175, 183, and 190 may be utilized with any of knitted components 130, 150, and 180, as well as other knitted components. The combinations disclosed herein are, therefore, for purposes of example and other combinations may also be utilized. Moreover, the specific configurations of tongues 170, 175, 183, and 190 are also meant to provide examples and may also vary significantly. For example, the position of layers 184 and floating yarns 185 may be enlarged, moved to a periphery of tongue 183, or removed from tongue 183. Accordingly, the various combinations and configurations are intended to provide examples, and other combinations and configurations may also be utilized.

[147] Tongue Knitting Process

[148] The manner in which knitting machine 200 operates to manufacture a knitted component with a tongue will now be discussed in detail. Moreover, the following discussion will demonstrate the manner in which knit element 131 and tongue 170 are formed of unitary knit construction, but similar processes may be utilized for other knitted components and tongues. Referring to Figures 36A-36G, a portion of knitting machine 200 is schematically-depicted as including needle beds 201, one rail 203, one standard feeder 204, and one combination feeder 220. It should be understood that although knitted component 130 is formed between needle beds 201, knitted component 130 is shown adjacent to needle beds 201 to (a) be more visible during discussion of the knitting process and (b) show the position of portions of knitted component 130 relative to each other and needle beds 201. Also, although one rail 203, one standard feeder 204, and one combination feeder 220 are depicted, additional rails 203, standard feeders 204, and combination feeders 220 may be utilized. Accordingly, the general structure of knitting machine 200 is simplified for purposes of explaining the knitting process.

[149] Initially, a portion of tongue 170 is formed by knitting machine 200, as depicted in Figure 36A. In forming this portion of tongue 170, standard feeder 204 repeatedly moves along rail 203 and various courses are formed from at least yarn 211. More particularly, needles 202 pull sections of yarn 211 through loops of a prior course, thereby forming another course. This action continues until tongue 170 is substantially formed, as depicted in Figure 36B. It should be noted at this stage that although tongue 170 is depicted as being formed from one yarn 211, additional yarns may be incorporated into tongue 170 from further standard feeders 204. For example, a fusible yarn may be incorporated into at least the upper or final course of tongue 170 to assist with ensuring that tongue 170 is properly joined or knitted with knit element 131. Additionally, at least the final

course of tongue 170 may include cross-tuck stitches with a relatively tight or dense knit to ensure that tongue 170 remains properly positioned on needles 202 during later stages of the knitting process.

[150] Knitting machine 200 now begins the process of forming knit element 131, as depicted in Figure 36C, in accordance with the knitting process discussed previously. As the knitting process continues, combination feeder 220 inlays yarn 206 to form inlaid strand 132, as depicted in Figure 36D, also in accordance with the knitting process discussed previously. Through a comparison of Figures 36C and 36D, tongue 170 remains stationary relative to needle beds 201, but knit element 131 moves downward and may overlap tongue 170 as successive courses are formed in knit element 131. This continues until a course is formed that is intended to join tongue 170 to knit element 131. More particularly, tongue 170 remains stationary relative to needle beds 201 as portions of knitted component 131 are formed. At the point depicted in Figure 36E, however, a course is formed that (a) extends across the final course of tongue 170, which includes the cross-tuck stitches, and (b) joins with the final course of tongue 170. In effect, this course joins tongue 170 to knit element 131. At this stage, therefore, knit element 131 and tongue 170 are effectively formed of unitary knit construction.

[151] Once tongue 170 is joined to knit element 131, knitting machine 200 continues the process of forming courses, thereby forming more of knit element 131, as depicted in Figure 36F. Given that tongue 170 is now joined to knit element 131, tongue 170 moves downward with knit element 131 as successive courses are formed, as seen through a comparison of Figures 36E and 36F. Moving forward, knitting machine 200 continues the process of forming courses in knit element 131 until knitted component 130 is substantially formed, as depicted in Figure 36G.

[152] Now that the general process associated with forming knitted component 130 to include tongue 170 is presented, additional aspects of the knitting process will be discussed. As noted above, a fusible yarn may be incorporated into at least the final course of tongue 170 to assist with ensuring that tongue 170 is properly joined or knitted with knit element 131. In some knitting processes, the yarn forming the final course of tongue 170 is cut. By incorporating the fusible yarn into the final course of tongue 170, the knit structure at the interface of tongue 170 with knit element 131 may be strengthened. That is, melting of the fusible yarn will fuse or otherwise join the sections of yarn at the interface and prevent unraveling of the cut yarn.

[153] Also as noted above, at least the final course of tongue 170 may include cross-tuck stitches with a relatively tight or dense knit to ensure that tongue 170 remains properly positioned on needles 202 during later stages of the knitting process. During a majority of the knitting process that forms knit element 131, tongue 170 remains stationary relative to needle beds 201. Movement, vibration, or other actions of knitting machine 200 may, however, dislodge portions of the final course from needles 202, thereby forming dropped stitches. By forming cross-tuck stitches with a relatively tight or dense knit, fewer dropped stitches are formed. Moreover, if dropped stitches are formed, the fusible yarn within the final course will fuse or otherwise join the dropped stitches within the knit structure.

[154] Once tongue 170 is knit, various needles 202 hold tongue 170 in position while knit element 131 is formed. In effect, the needles 202 that hold tongue 170 are unavailable for further knitting until tongue 170 is joined with knit element 131. As a result, only those needles 202 located beyond the edges (i.e., to the right and to the left) of tongue 170 are available for forming knit element 131. The final course of tongue 170 should, therefore, have equal or less width than the distance between opposite sides of inner edge 135 in the area where tongue 170 is joined with knit element 131. In other words, the design of knitted component

130 should account for (a) the length of the final course of tongue 170 and (b) the number of needles 202 that are reserved for holding tongue 170 while knit element 131 is formed.

[155] In the knitting process discussed above, both tongue 170 and knit element 131 are formed from yarn 211. Whereas tongue 170 remains stationary relative to needle beds 201 through a portion of the knitting process, portions of knit element 131 move downward as successive courses are formed. Given that a segment of yarn 211 may extend from the final course of tongue 170 to the first course of knit element 131 (i.e., the bottom edges of knit element 131), this segment of yarn should have sufficient length to account for the downward movement of the first course of knit element 131. In effect, a comparison of Figures 36C-36E, demonstrates that the first course of knit element 131 moves downward and away from the final course of tongue 170 as knit element 131 is formed. Accordingly, if a segment of yarn 211 extends from the final course of tongue 170 to the first course of knit element 131, this segment of yarn should have sufficient length to account for the growing distance between the final course of tongue 170 and the first course of knit element 131.

[156] Although various methods may be employed to account for the growing distance between the final course of tongue 170 and the first course of knit element 131, Figure 37 depicts an expansion section 195 as being formed following the formation of tongue 170. Expansion section 195 may then be cast off of needles 202. As the distance between the final course of tongue 170 and the first course of knit element 131 increases, expansion section 195 may unravel and lengthen. That is, unraveling of expansion section 195 may be used to effectively lengthen the section of yarn 211 between the final course of tongue 170 and the first course of knit element 131. In some configurations, expansion section 195 may be formed as a jersey fabric to facilitate unraveling.

[157] The various Figures 36A-36G show knitted component 130 as being formed independently. In some knitting processes, however, a waste element is knit prior to forming knitted component 130. The waste element engages various rollers that provide a downward force upon knitted component 130. The downward force ensures that courses move away from needles 202 as later courses are formed.

[158] Based upon the above discussion, knit element 131 and tongue 170 may be formed of unitary knit construction through a single knitting process. As described, tongue 170 is formed first and remains stationary upon needle beds 201 as knit element 131 is formed. After a course is formed that joins knit element 131 and tongue 170, knit element 131 and tongue 170 move downward together as further portions of knit element 131 are formed.

[159] Sequential Alterations

[160] Knitting machine 200 includes, among other elements, a knitting mechanism 270, a pattern 280, and a computing device 290, as schematically-depicted in Figure 38. Knitting mechanism 270 includes many of the mechanical components of knitting machine 200 (e.g., needles 202, feeders 204 and 220, carriage 205) that mechanically-manipulate yarns 206 and 211 to form a knitted component (e.g., knitted component 130). Pattern 280 includes data on the knitted component, including the yarns that are utilized for each stitch, the type of knit structures formed by each stitch, and the specific needles 202 and feeders 204 and 220 that are used for each stitch, for example. The operation of knitting machine 200 is governed by computing device 290, which reads data from pattern 280 and directs the corresponding operation of knitting mechanism 270.

[161] Multiple and substantially identical knitted components may be formed by knitting machine 200. More particularly, computing device 290 may repeatedly read pattern 280 and direct knitting mechanism 270 to form substantially identical

knitted components. In general, therefore, each knitted component that is formed will be substantially identical to other knitted components that are formed based upon a particular pattern 280. Referring to Figures 39A-39C, however, three versions of tongue 170 are shown. Whereas Figure 39A depicts tongue 170 as including a knit structure (e.g., yarns with different colors) with alphanumeric characters that form "1 OF 100," Figures 39B and 39C respectively depict tongue 170 as including knit structures with alphanumeric characters that form "2 OF 100" and "3 OF 100."

[162] One manner of accomplishing the sequential alterations of the type shown in Figures 39A-39C is to create multiple patterns. In effect, each of the configurations of tongue 170 shown in Figures 39A-39C may have a different pattern. As an alternative, an application (e.g., software) run by computing device 290 may alter pattern 280 while each successive tongue 170 is formed to provide sequential alterations. For example, pattern 280 may include a modifiable field 281, which is an area of pattern 280 that can be updated or changed by computing device 290. For purposes of reference, portions of pattern 280 that correspond with "1," "2," and "3" in Figures 39A-39C may be governed by modifiable field 281. Computing device 290 may include a counter, for example, that updates modifiable field 281 with each successive knitted component that is formed. Accordingly, sequential alterations of pattern 280 may be automated through the use of an application run by computing device 290, thereby rectifying the need for different patterns 280 for each sequential variation of tongue 170.

[163] In operation, pattern 280 with modifiable field 281 is provided by an operator, designer, or manufacturer, for example. Computing device 290 may either form a first knitted component with a default setting for modifiable field 281 or may update modifiable field 281 according to other instructions or data. As such, for example, tongue 170 of Figure 39A may be knitted with "1 OF 100." Computing

device 290 now updates modifiable field 281 with data representing another alphanumeric character, possibly a sequential alphanumeric character when computing device 290 includes a counter, and tongue 170 of Figure 39B may be knitted with "2 OF 100." The procedure repeats and computing device 290 updates modifiable field 281 with data representing another alphanumeric character and tongue 170 of Figure 39C may be knitted with "3 OF 100." Accordingly, modifiable field of pattern 280 may be repeatedly updated with data representing different alphanumeric characters, possibly sequential alphanumeric characters.

[164] The invention is disclosed above and in the accompanying figures with reference to a variety of configurations. The purpose served by the disclosure, however, is to provide an example of the various features and concepts related to the invention, not to limit the scope of the invention. One skilled in the relevant art will recognize that numerous variations and modifications may be made to the configurations described above without departing from the scope of the present invention, as defined by the appended claims.

CLAIMS

1. A method of manufacturing a knitted component for an article of footwear, the method comprising:

knitting a tongue with a knitting machine;

holding the tongue on needles of the knitting machine;

knitting a first portion of a knit element with the knitting machine while the tongue is held on the needles;

joining the tongue to the first portion of the knit element; and

knitting a second portion of the knit element with the knitting machine.

2. The method recited in claim 1, further including a step of selecting the knitting machine to be a flat knitting machine.

3. The method recited in claim 1, further including a step of knitting an expansion section following the step of knitting the tongue, and wherein the step of knitting the first portion of the knit element includes unraveling the expansion section.

4. The method recited in claim 1, wherein the step of knitting the tongue includes forming a course of the tongue to include at least one of (a) a fusible yarn and (b) cross-tuck stitches.

5. The method recited in claim 1, wherein the step of joining the tongue includes forming a course with the knitting machine that joins the tongue to the knit element.

6. A method of manufacturing a knitted component for an article of footwear, the method comprising:

knitting a tongue with a knitting machine;

knitting a first portion of a knit element with the knitting machine, the tongue being stationary with respect to a needle bed of the knitting machine during knitting of the first portion of the knit element, and the first portion of the knit element moving with respect to the tongue during knitting of the first portion of the knit element;

forming a course with the knitting machine that joins the tongue to the knit element; and

knitting a second portion of the knit element with the knitting machine, the tongue and the first portion of the knit element moving together during knitting of the second portion of the knit element.

7. The method recited in claim 6, further including a step of selecting the knitting machine to be a flat knitting machine.

8. The method recited in claim 6, further including a step of knitting an expansion section following the step of knitting the tongue, and wherein the step of knitting the first portion of the knit element includes unraveling the expansion section.

9. The method recited in claim 6, wherein the step of knitting the tongue includes forming a final course of the tongue to include at least one of (a) a fusible yarn and (b) cross-tuck stitches.

10. A method of knitting comprising:

providing a knitting pattern with a modifiable field;

updating the modifiable field with data representing a first alphanumeric character;

knitting a first component with a knit structure of the first alphanumeric character;

updating the modifiable field with data representing a second alphanumeric character, the second alphanumeric character being different than the first alphanumeric character; and

knitting a second component with a knit structure of the second alphanumeric character.

11. The method recited in claim 10, wherein the second alphanumeric character is sequential from the first alphanumeric character.

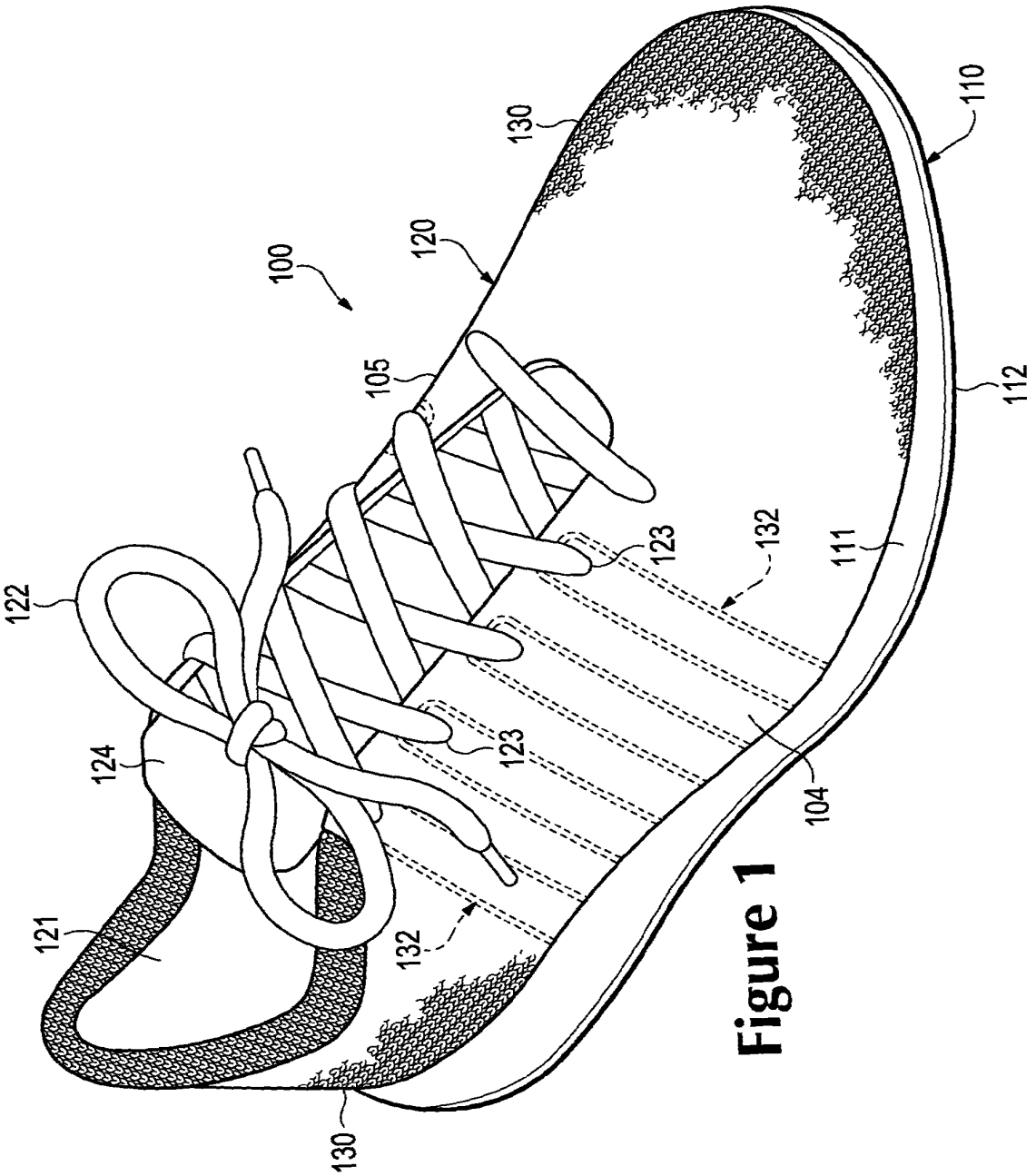


Figure 1

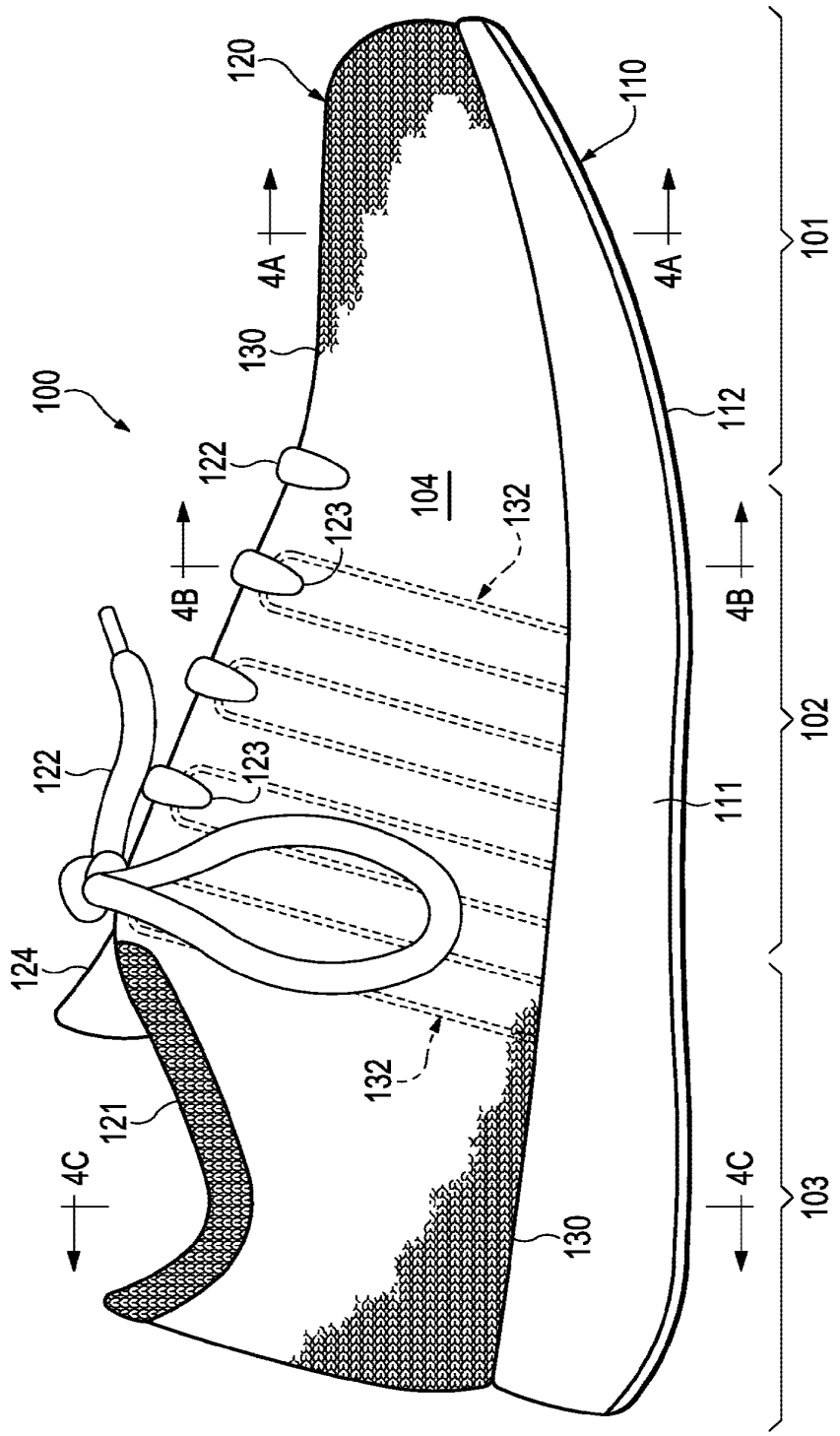

120
110
4A
4A
101
130
100
112
122
104
132
123
4B
4B
102
122
123
111
124
132
121
4C
4C
103
130

Figure 2

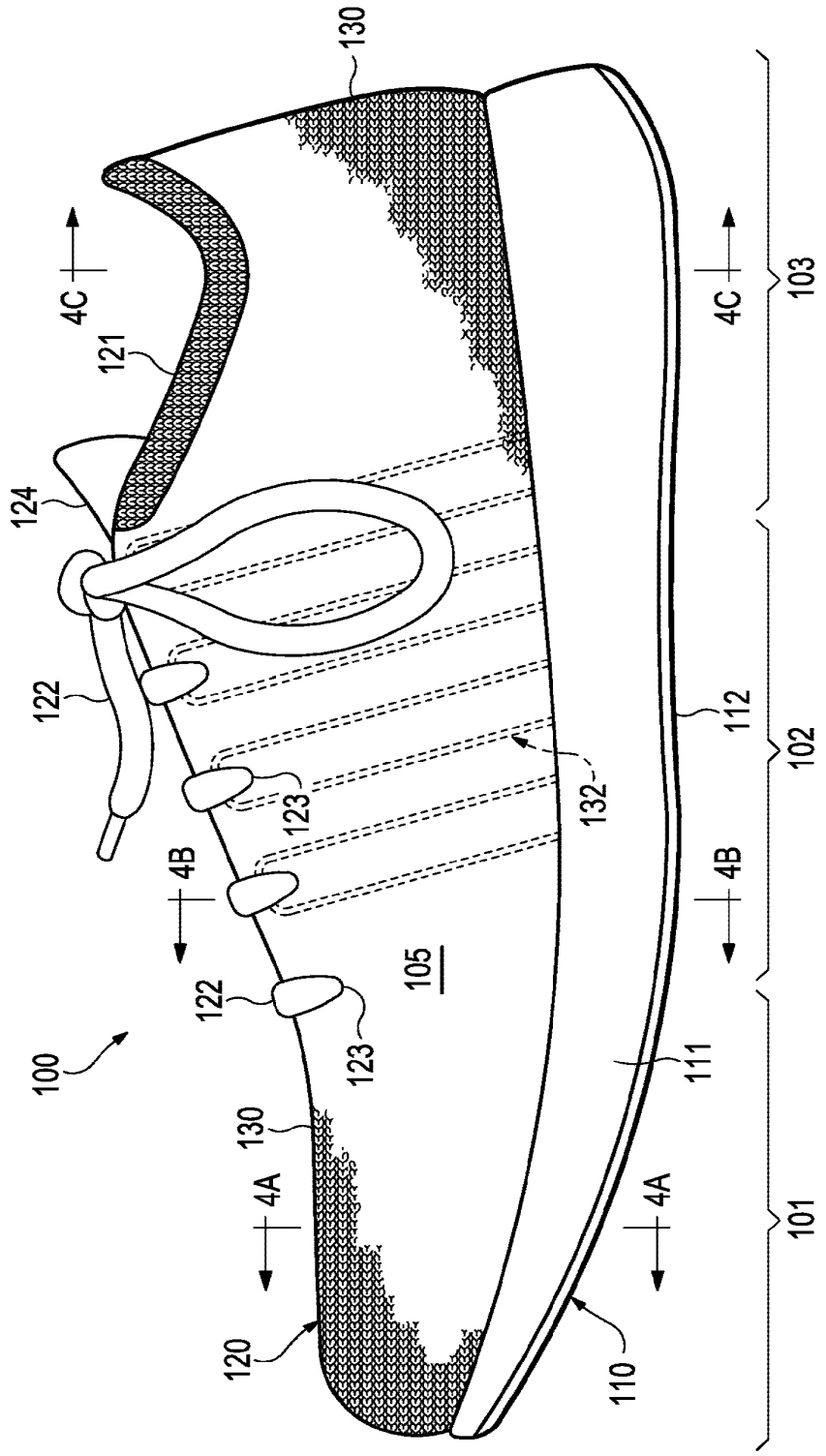

130
4C
121
124
122
123
4B
105
132
112
102
103
100
111
101
4A
120
110

Figure 3

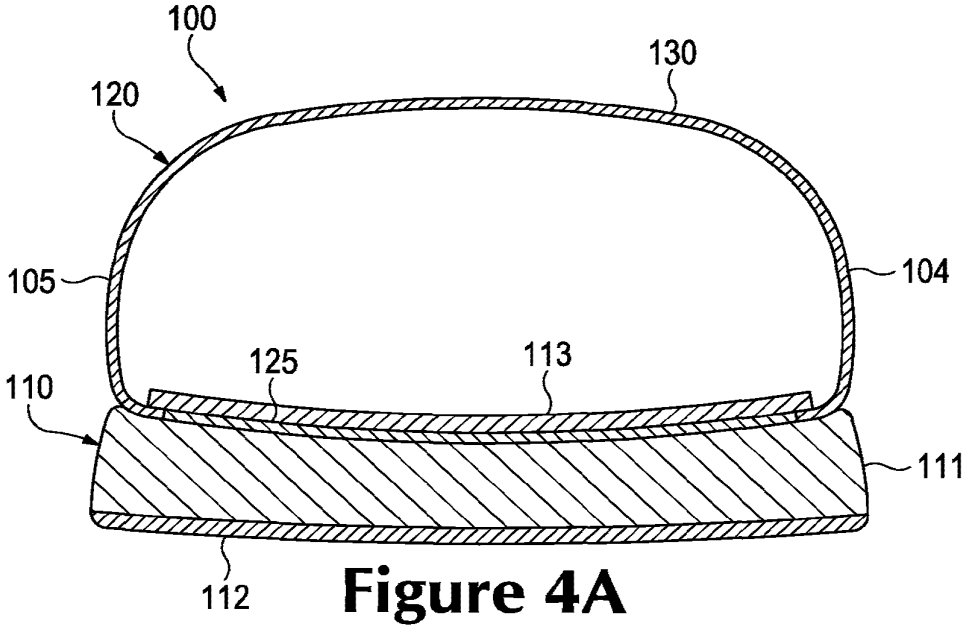


Figure 4A

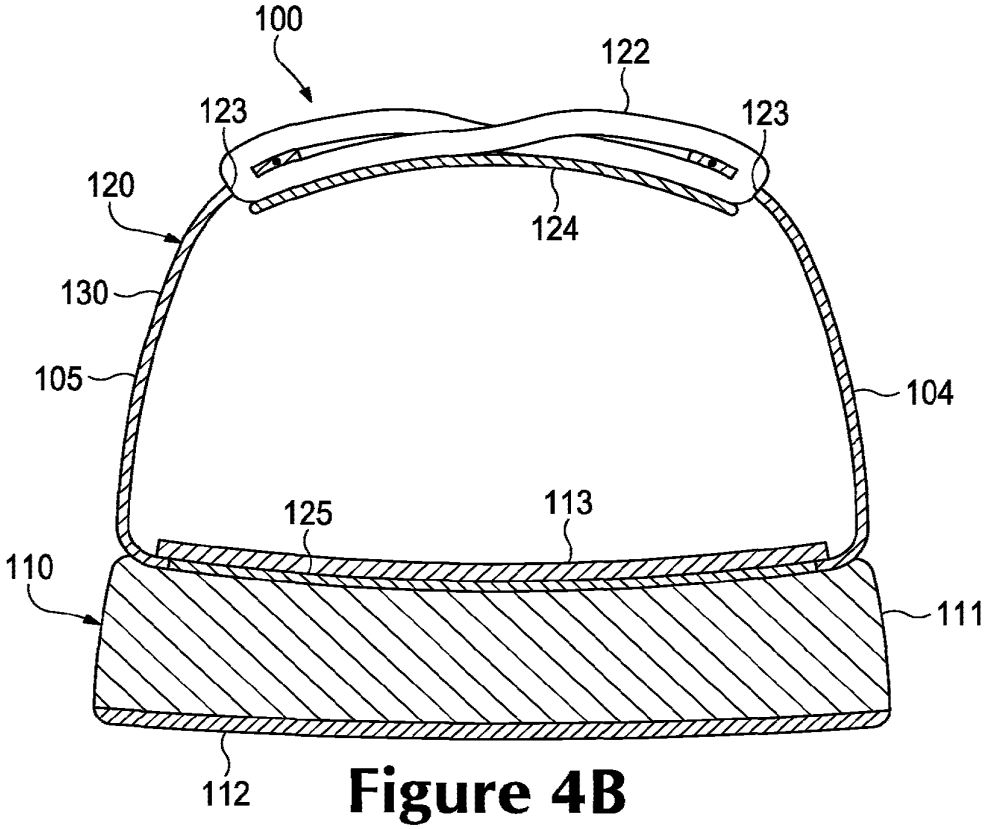


Figure 4B

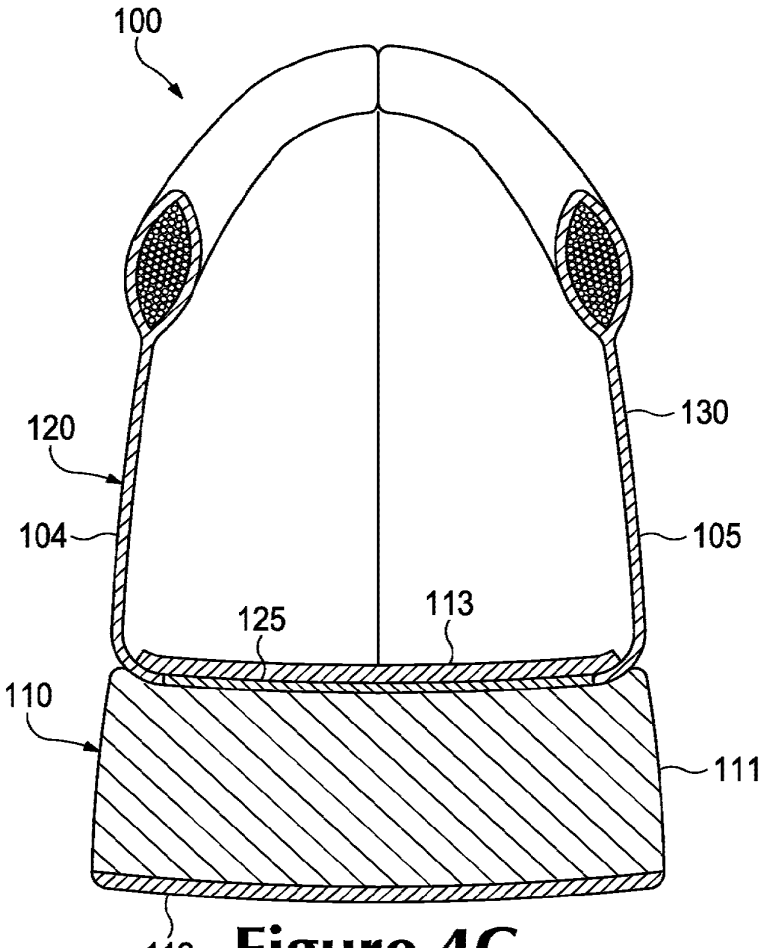


Figure 4C

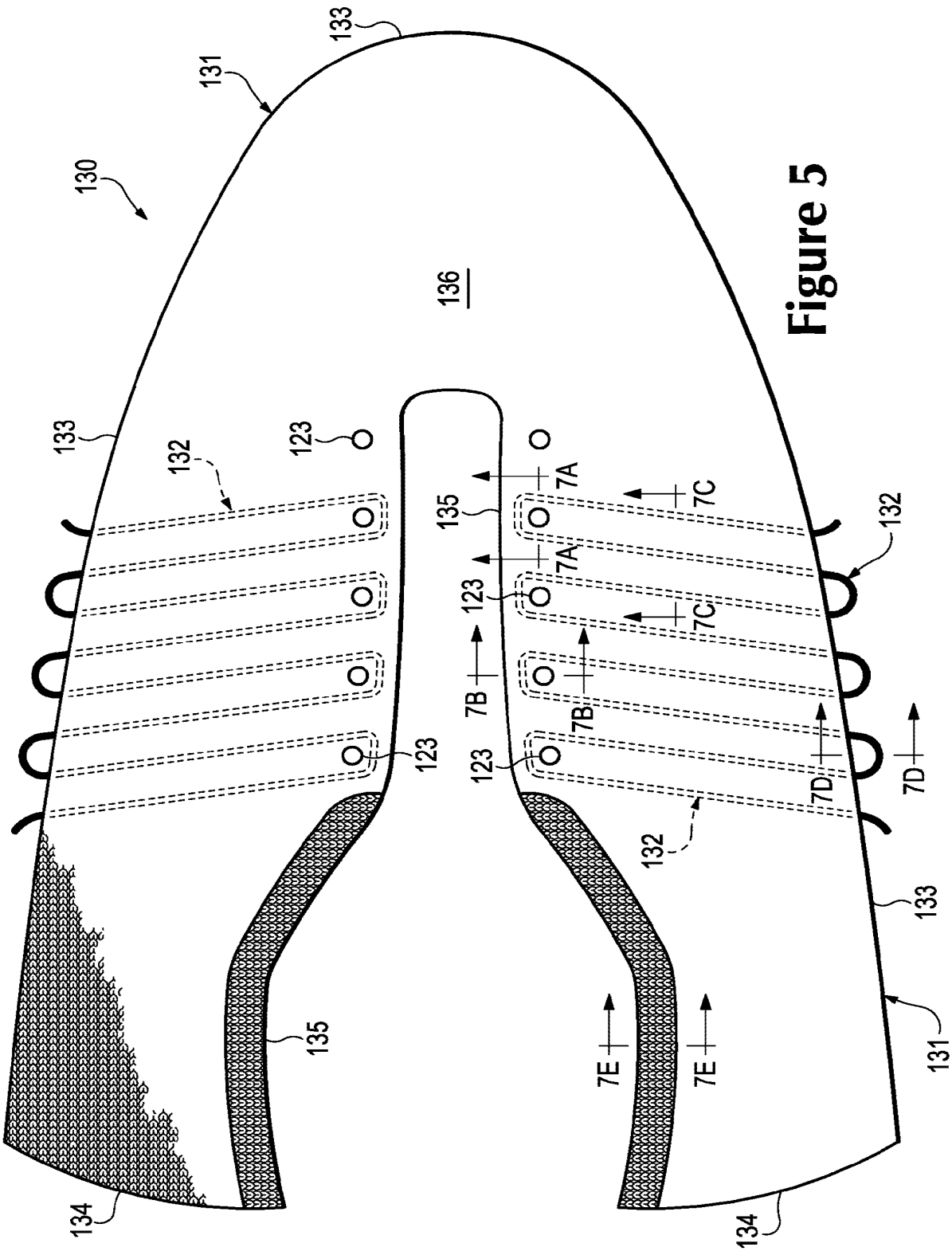
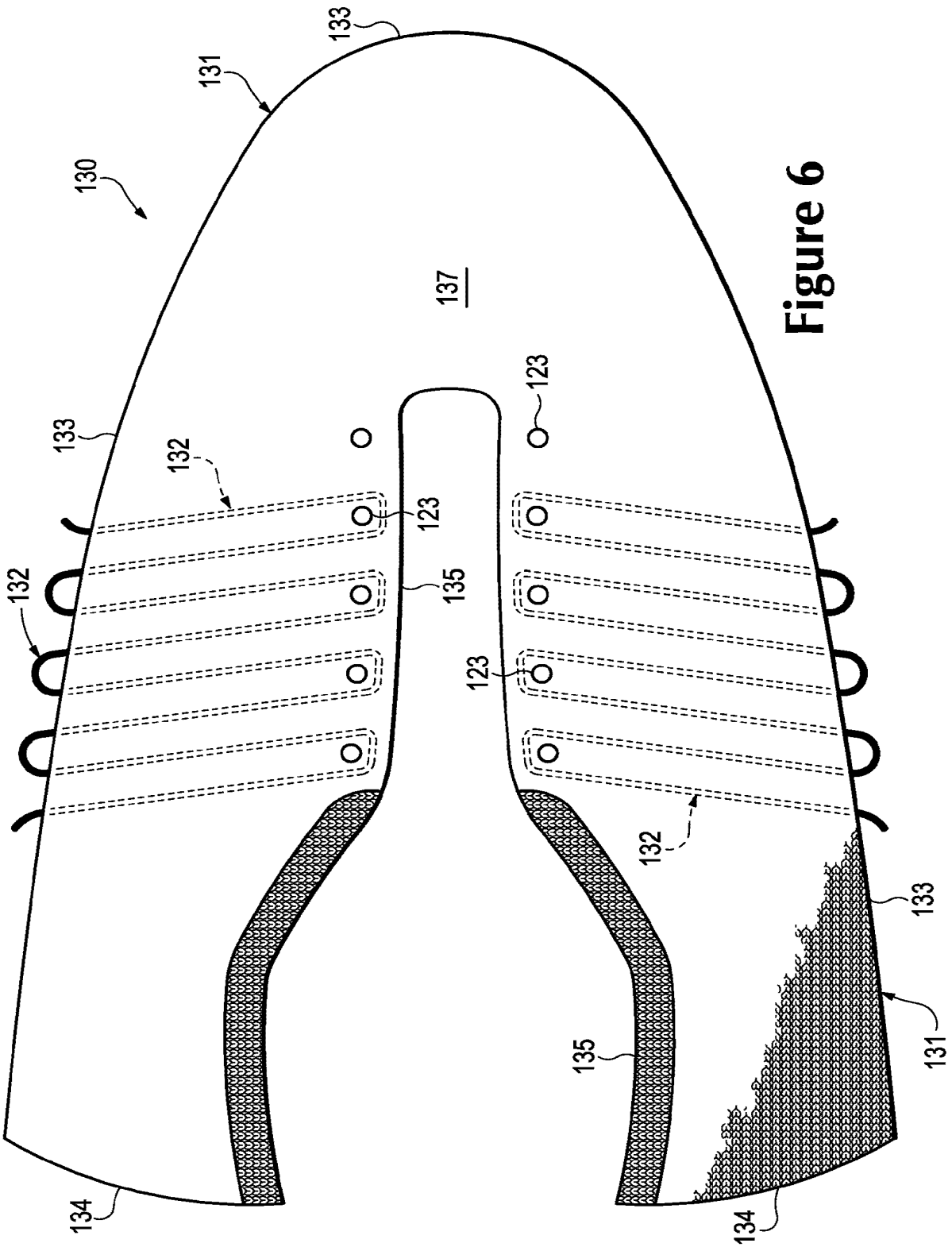


Figure 5



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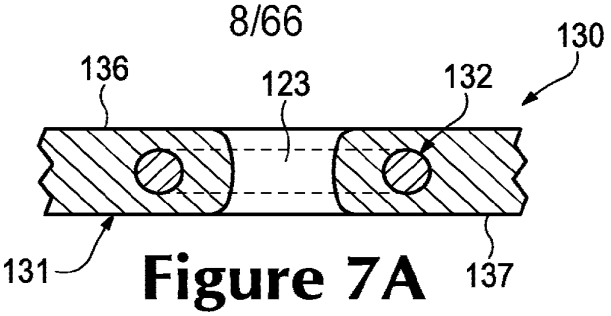
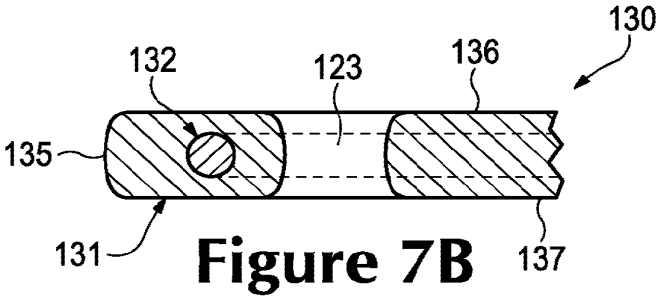


Figure 7A



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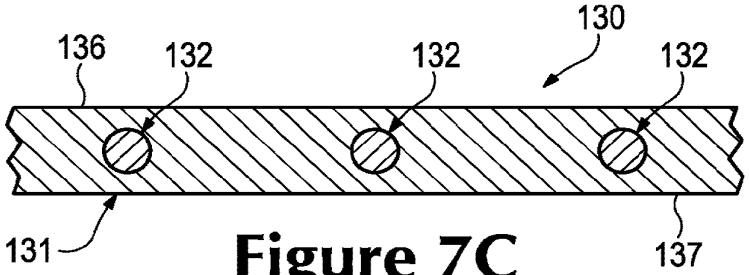


Figure 7C

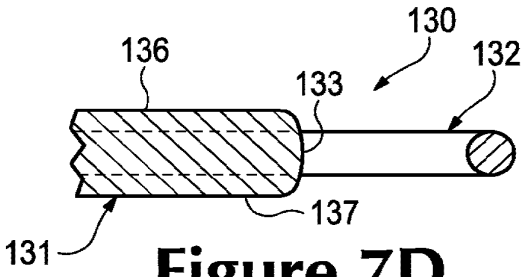


Figure 7D

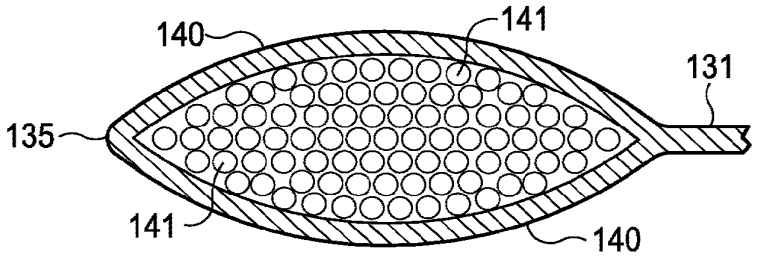


Figure 7E

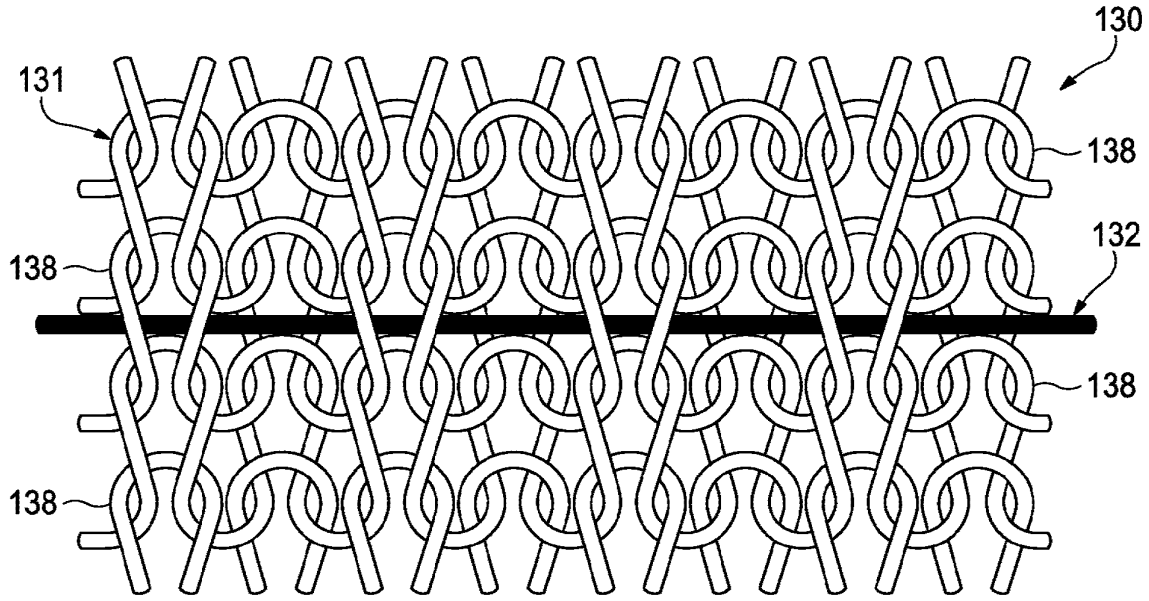
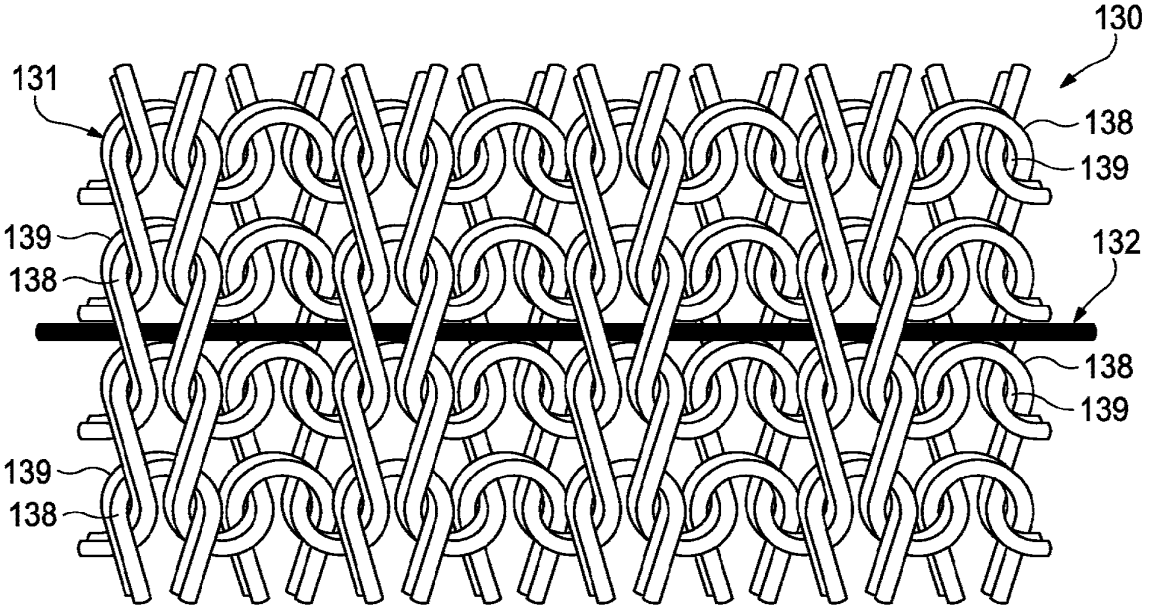


Figure 8A



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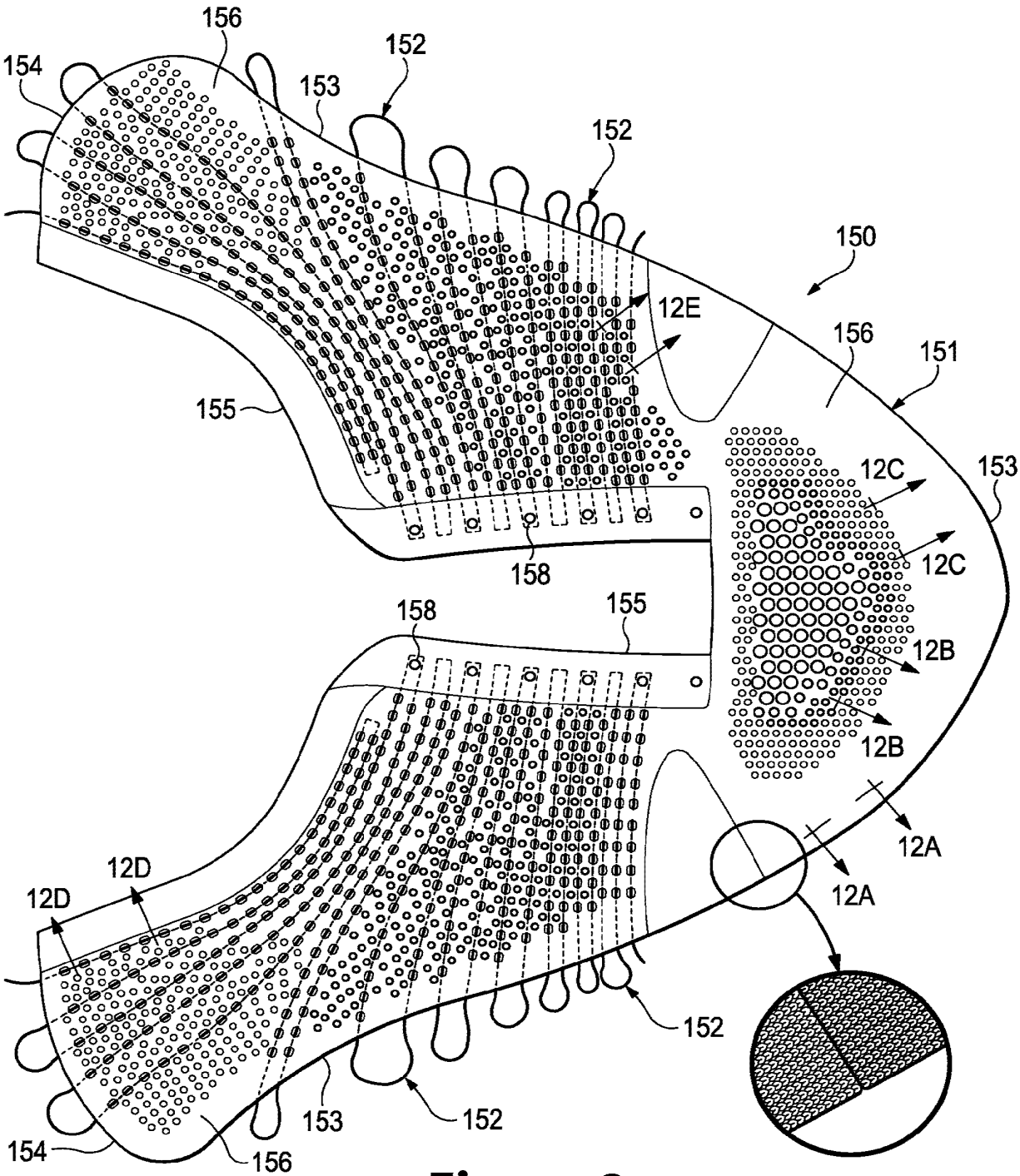
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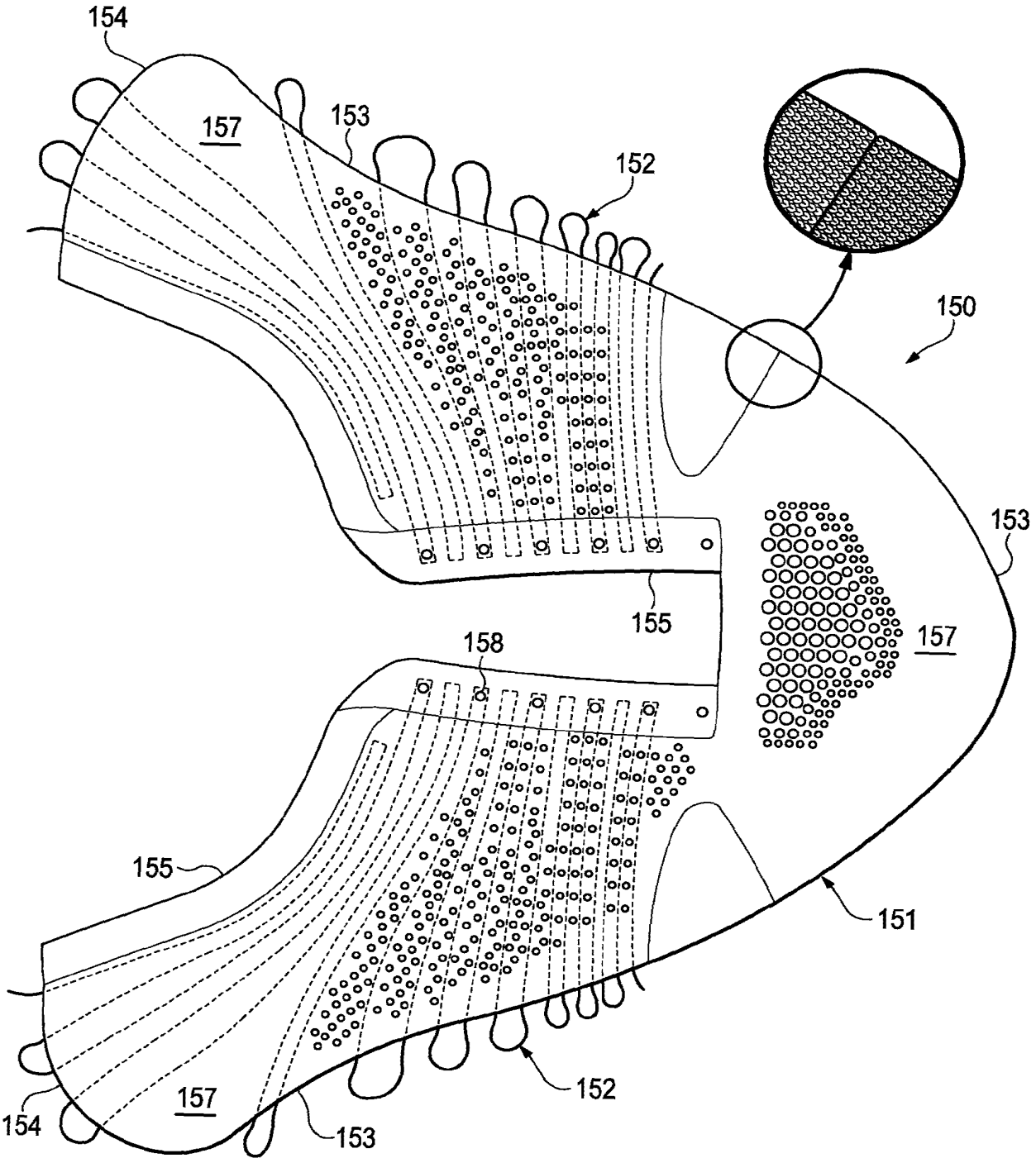
Figure 9



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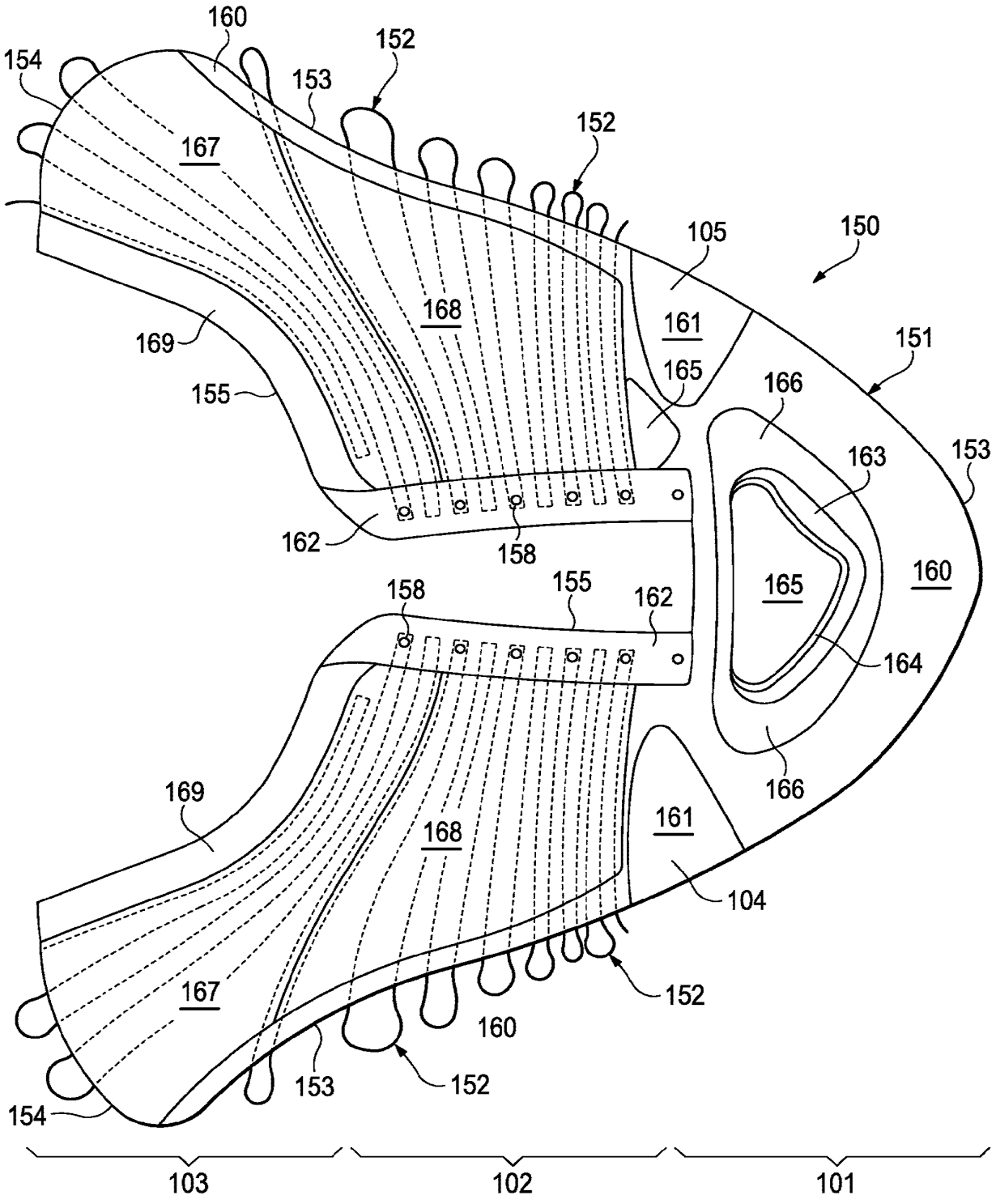
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Figure 11

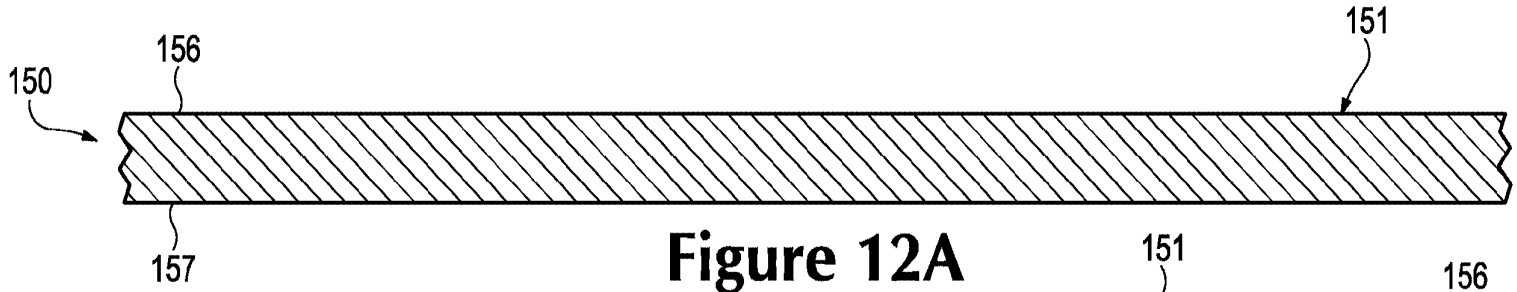
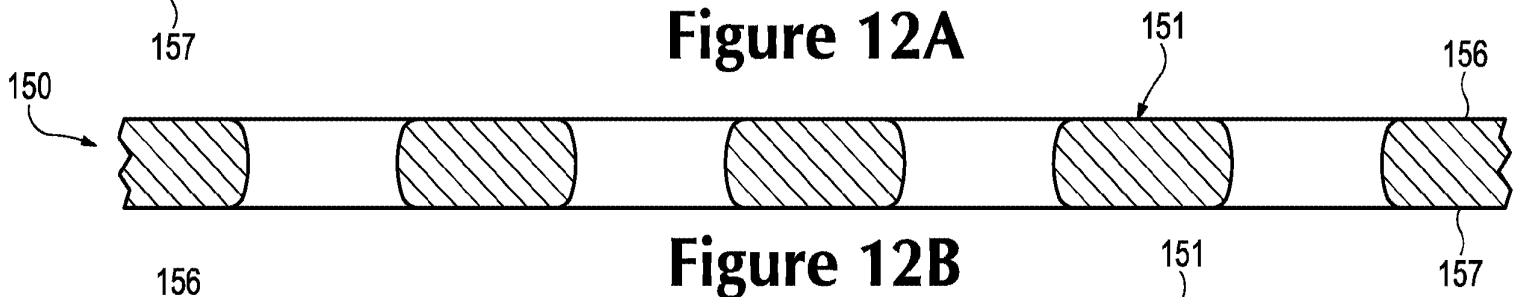


Figure 12A



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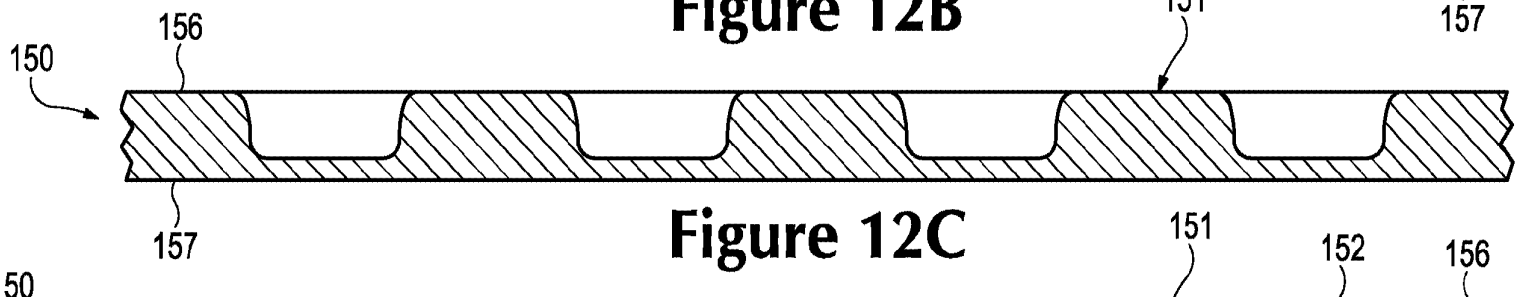


Figure 12C

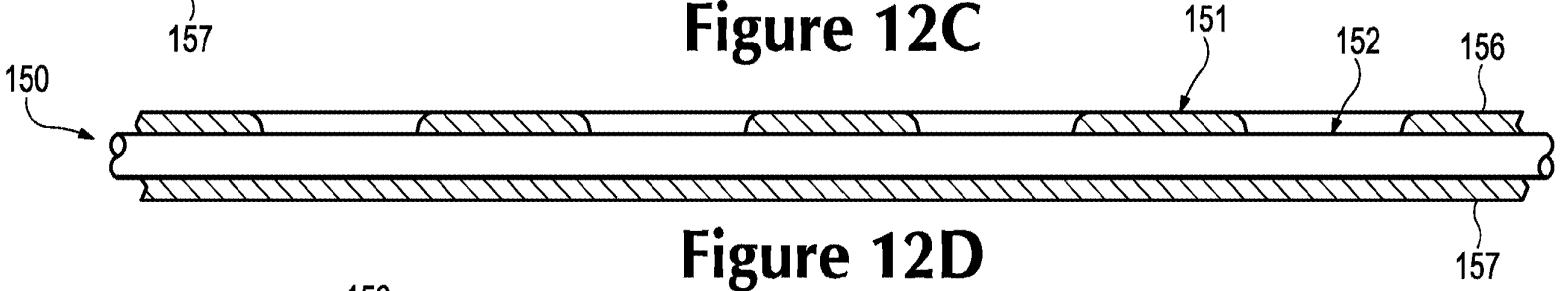
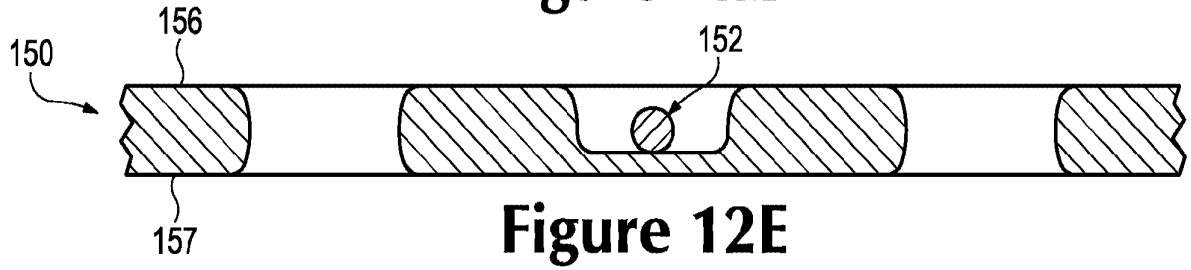


Figure 12D



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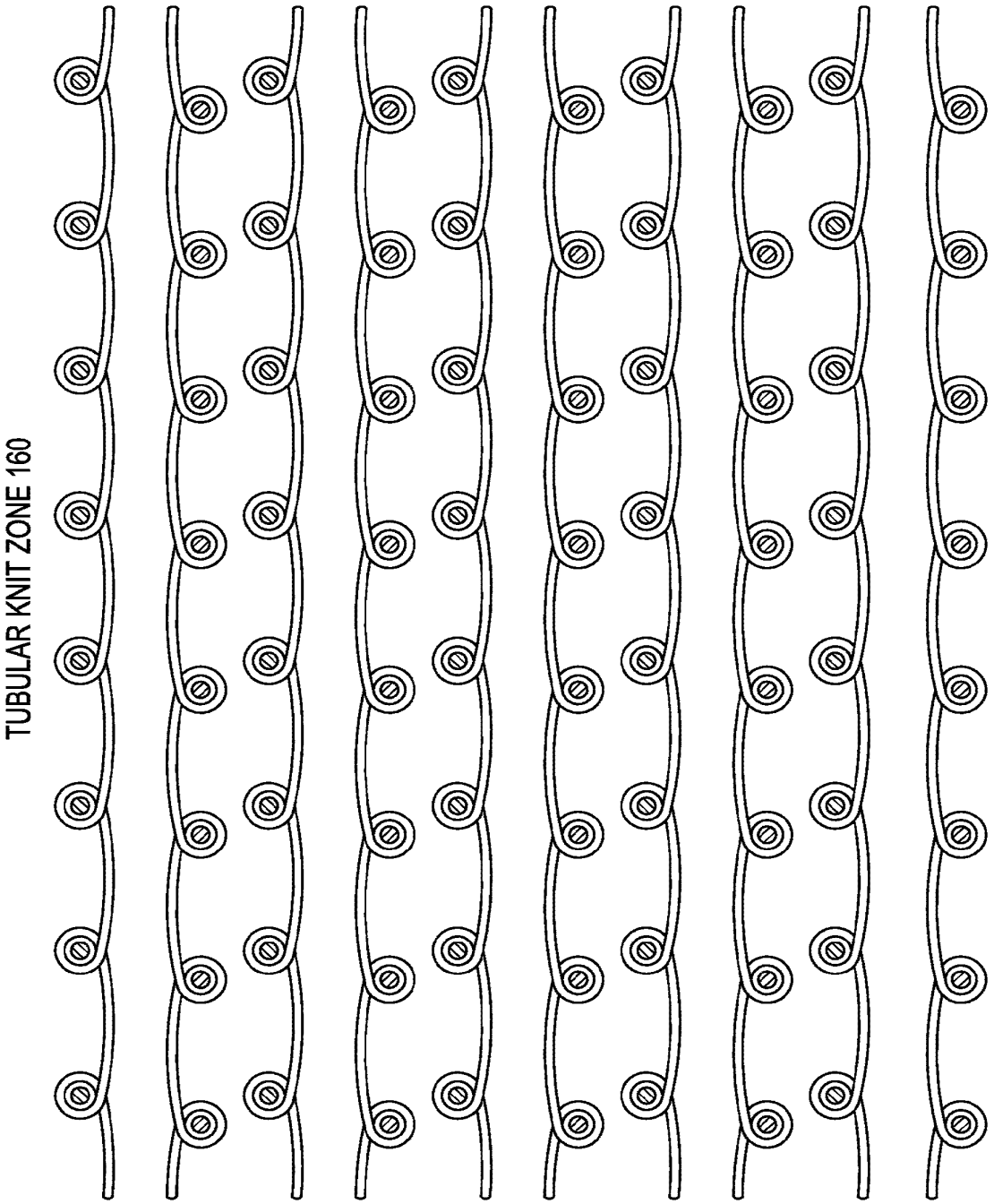


Figure 13A

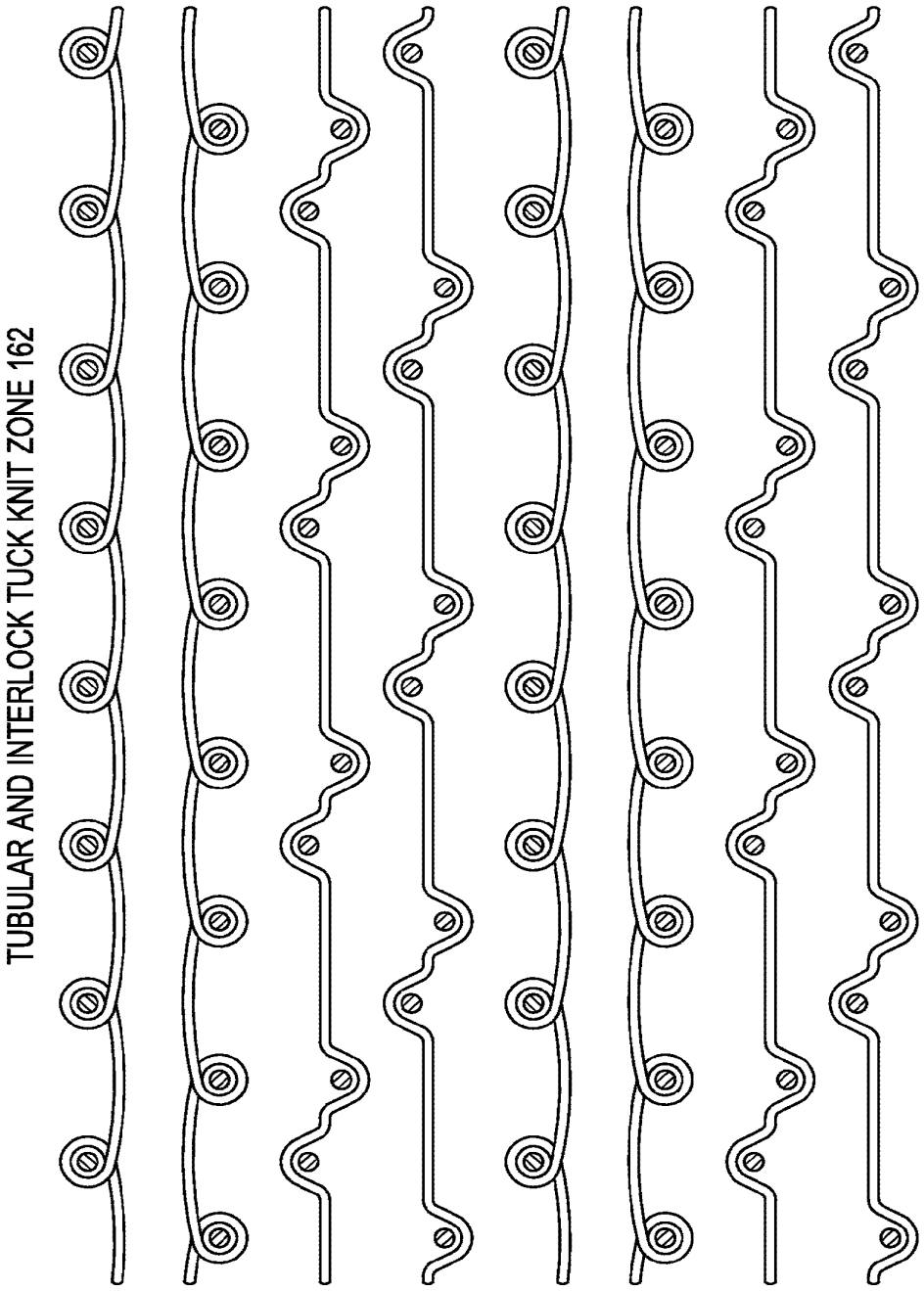
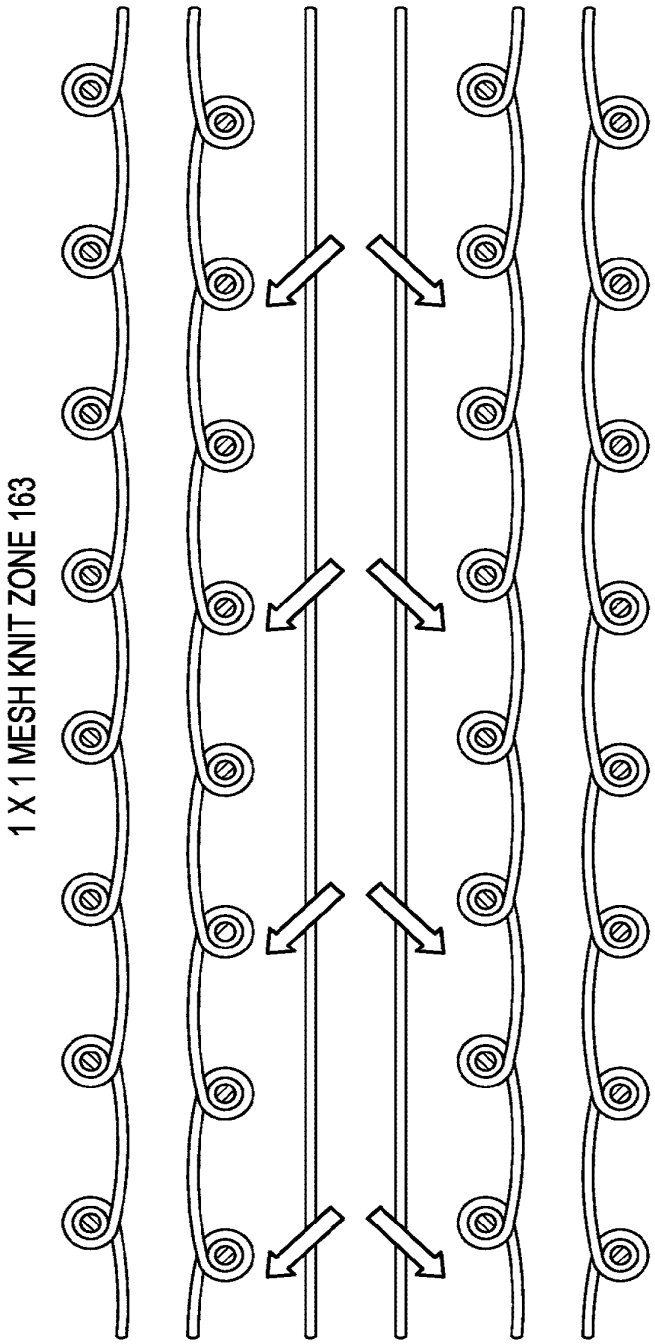


Figure 13B



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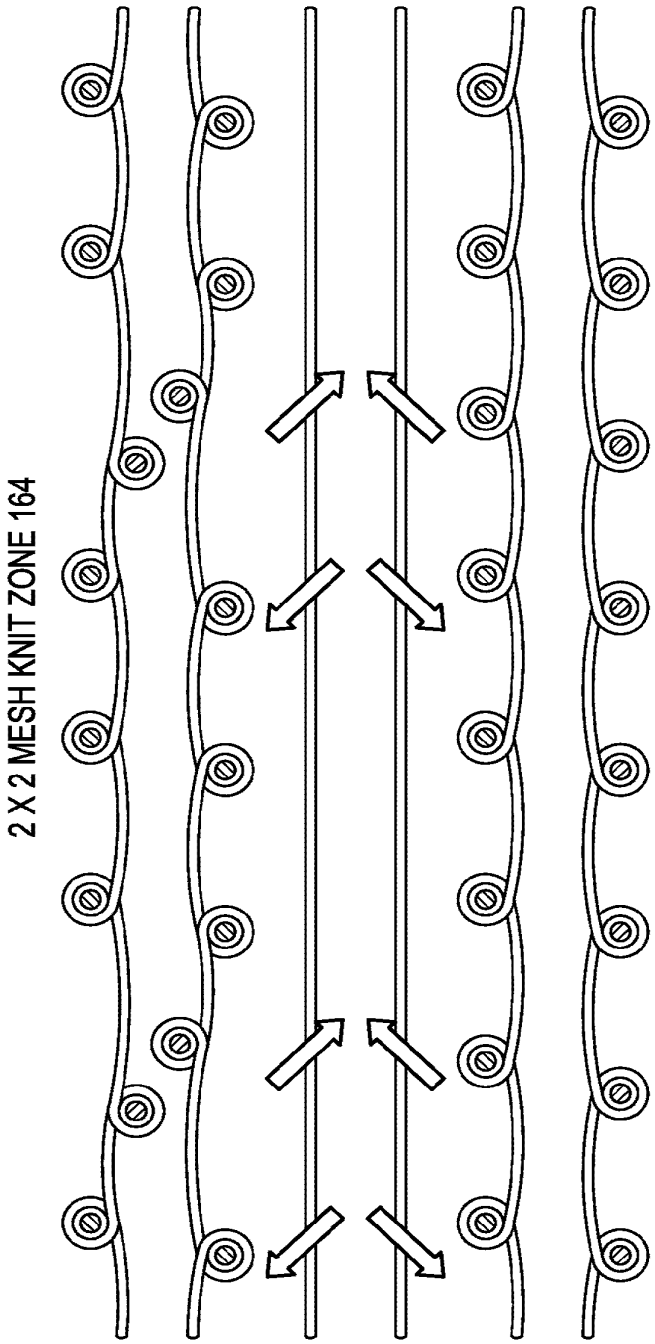

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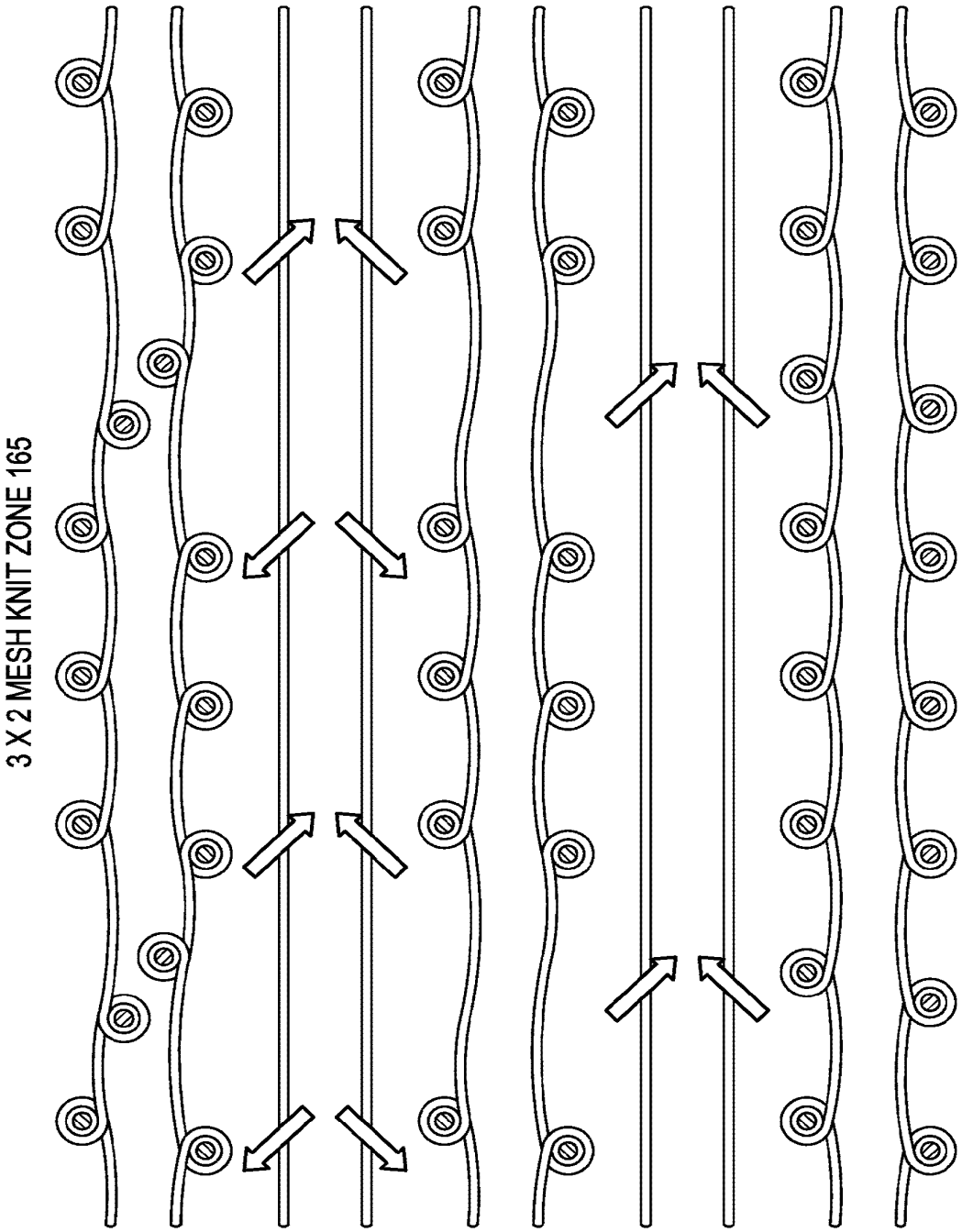

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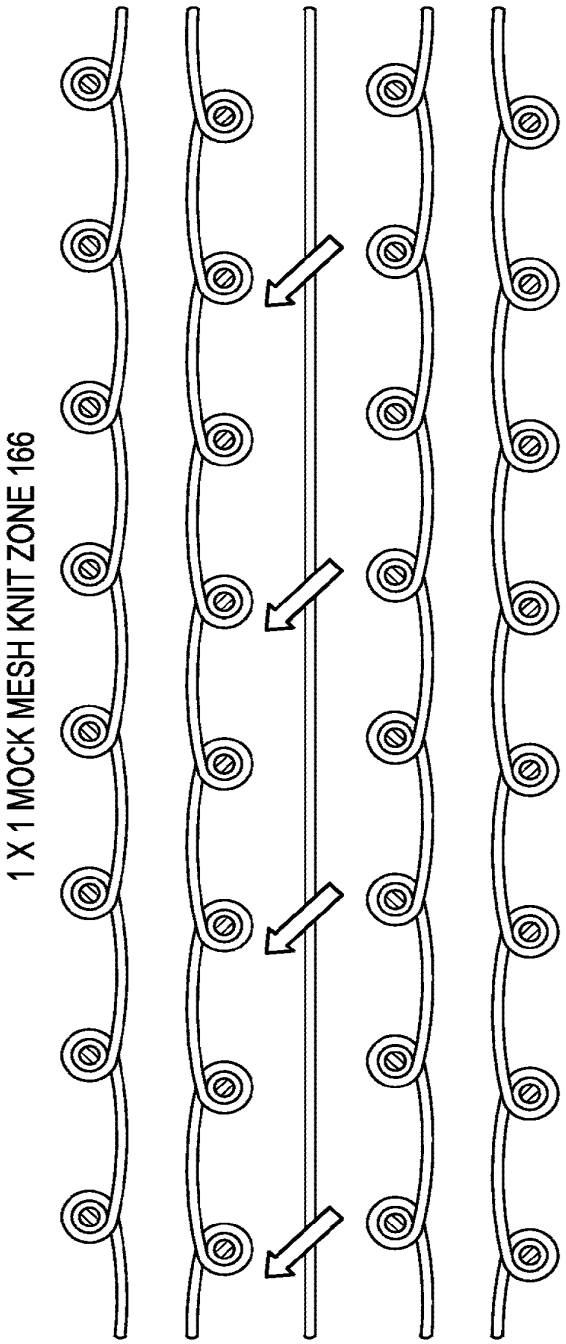


Figure 13F

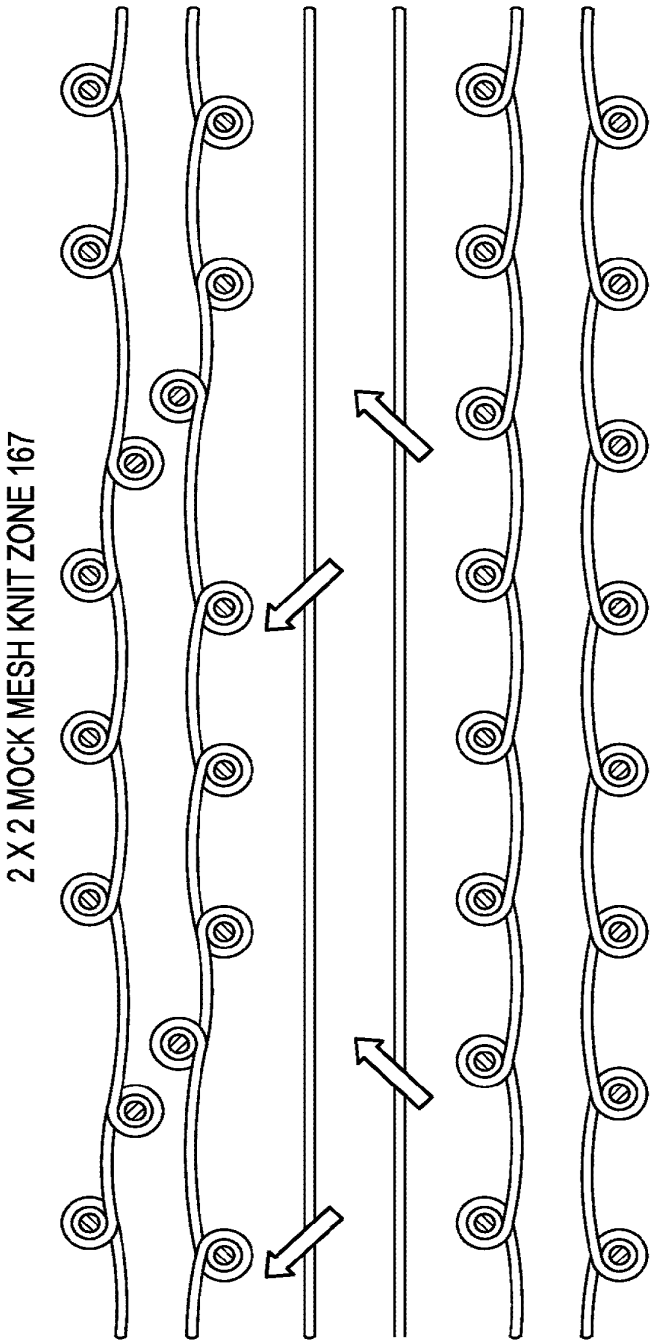


Figure 13G

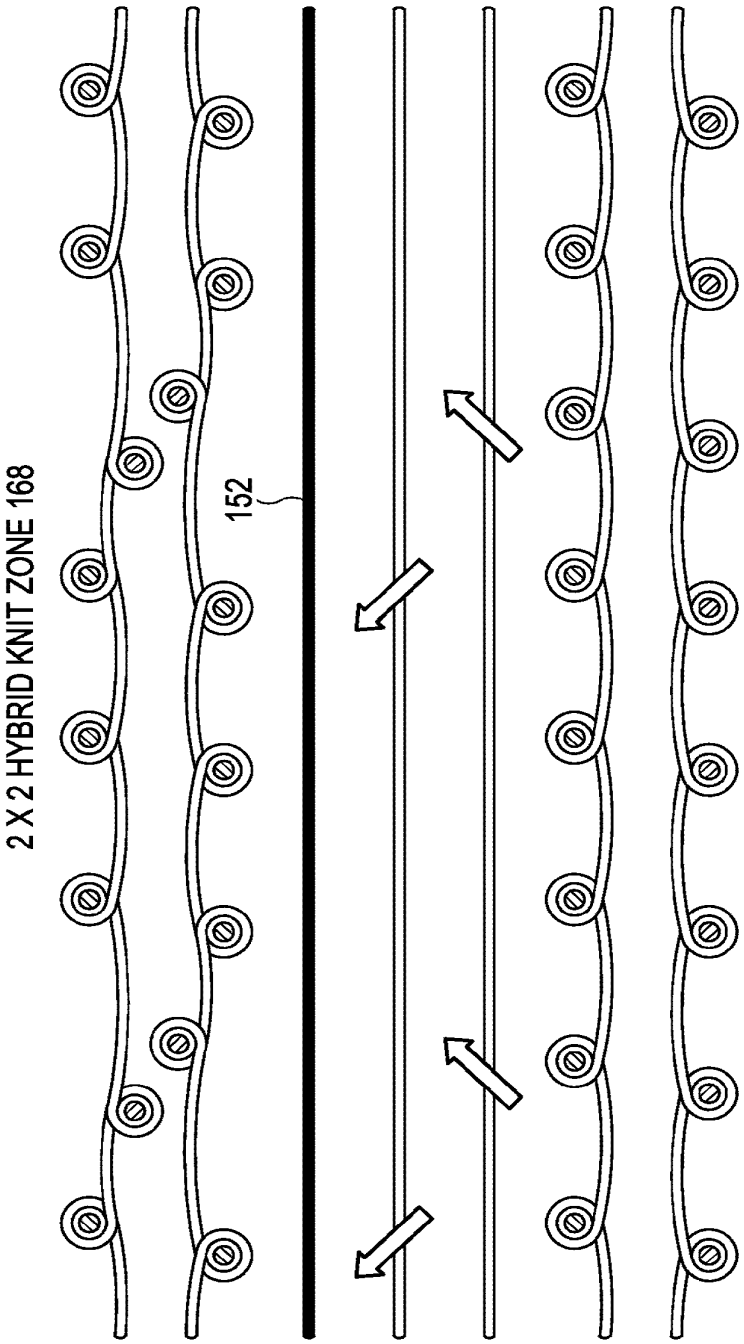


Figure 13H

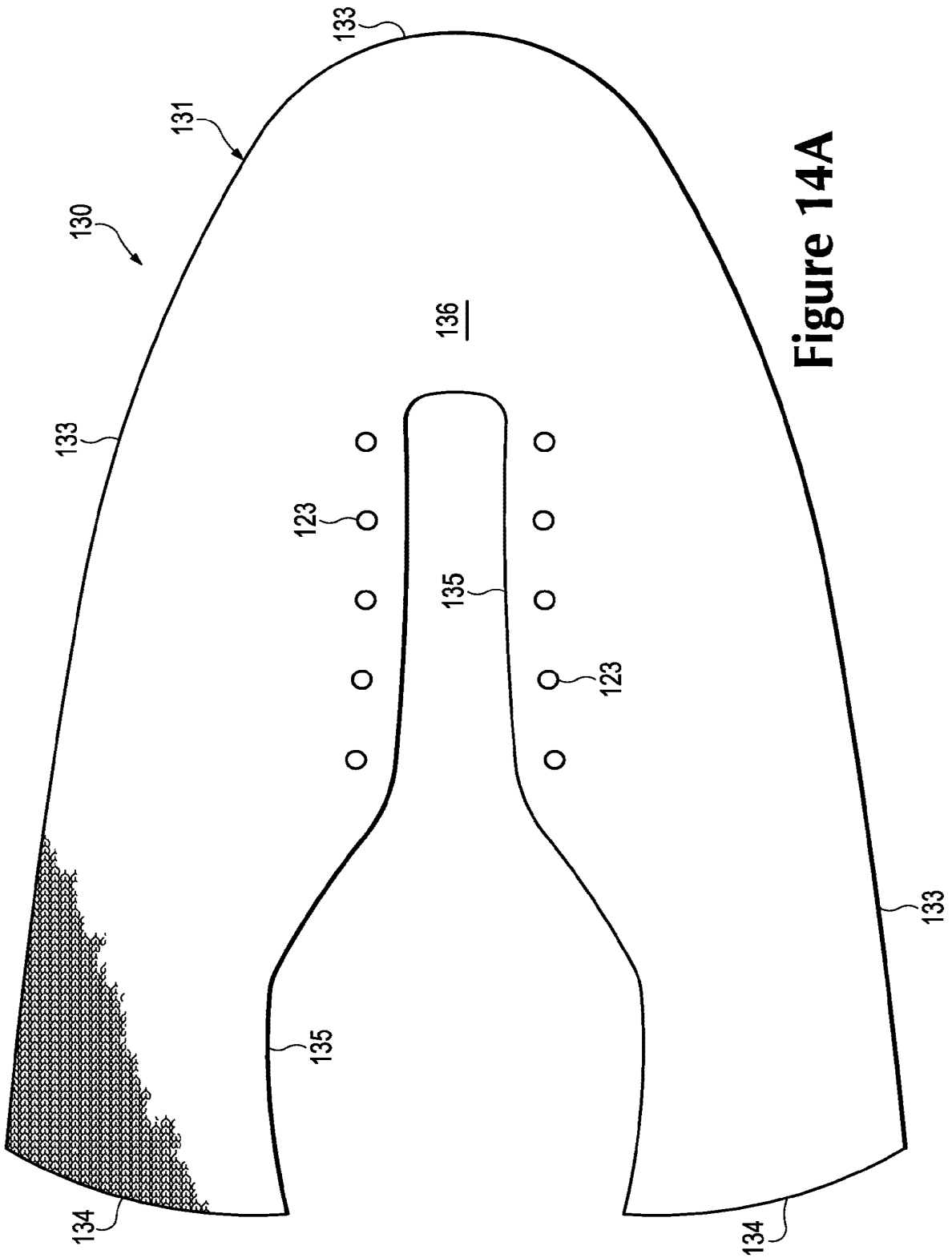


Figure 14A

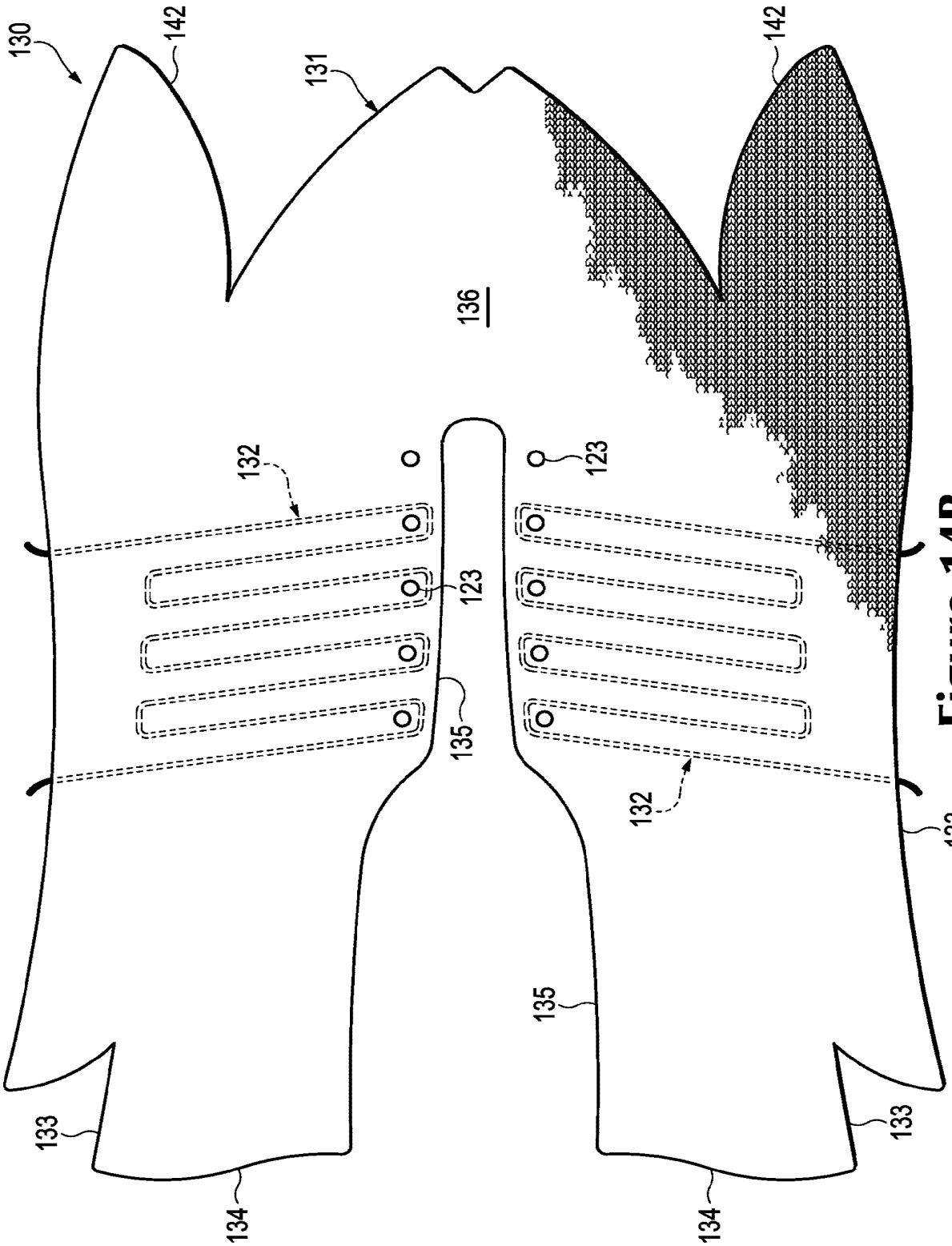


Figure 14B

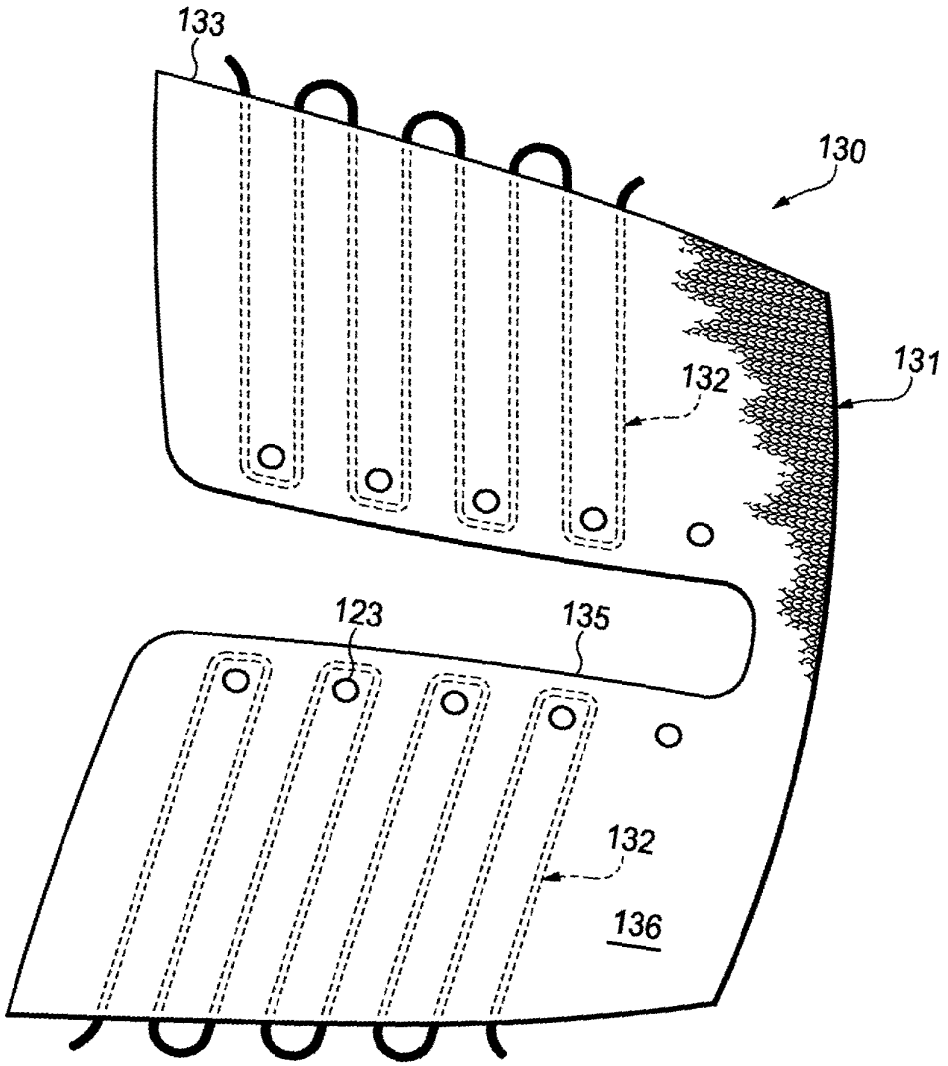
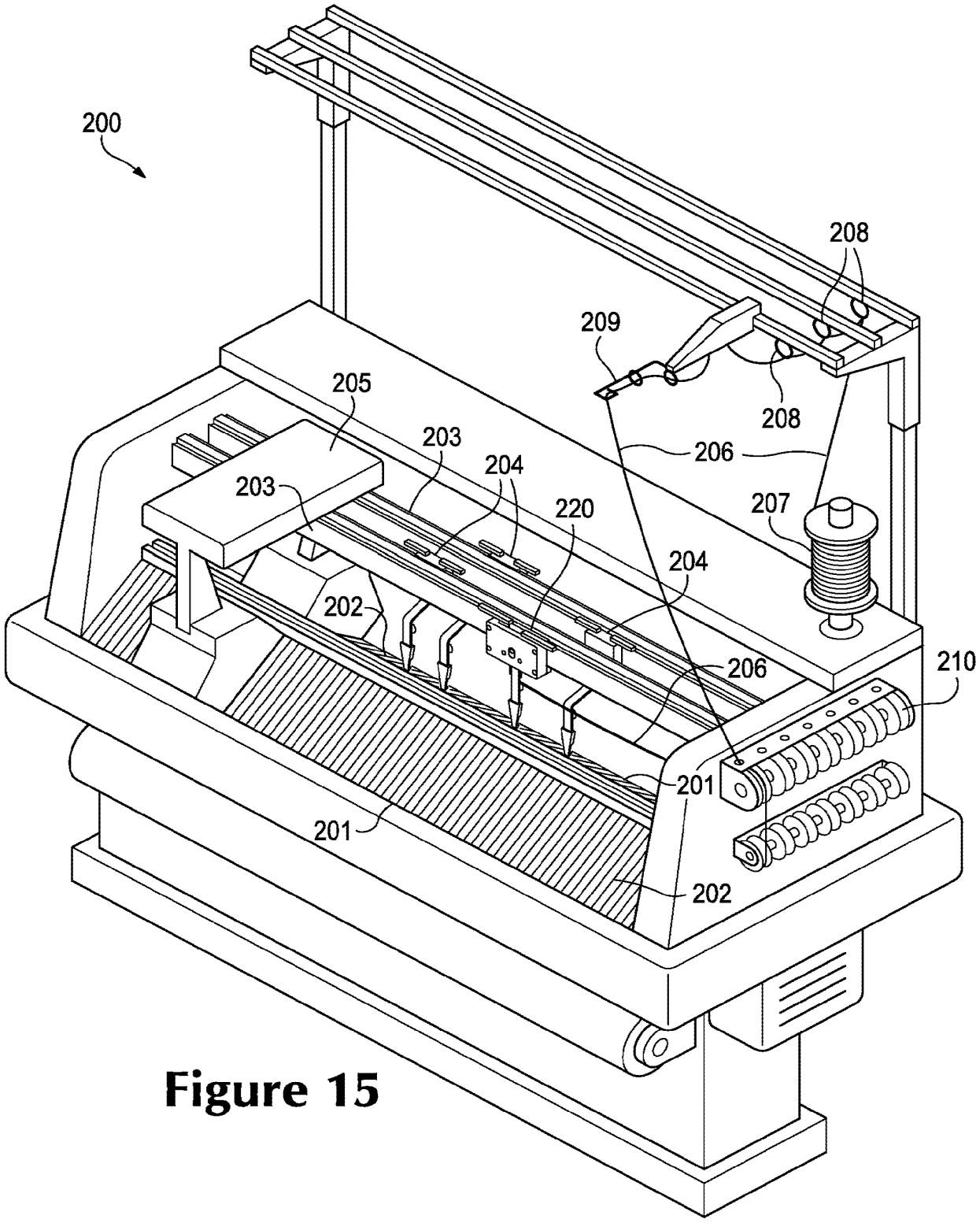


Figure 14C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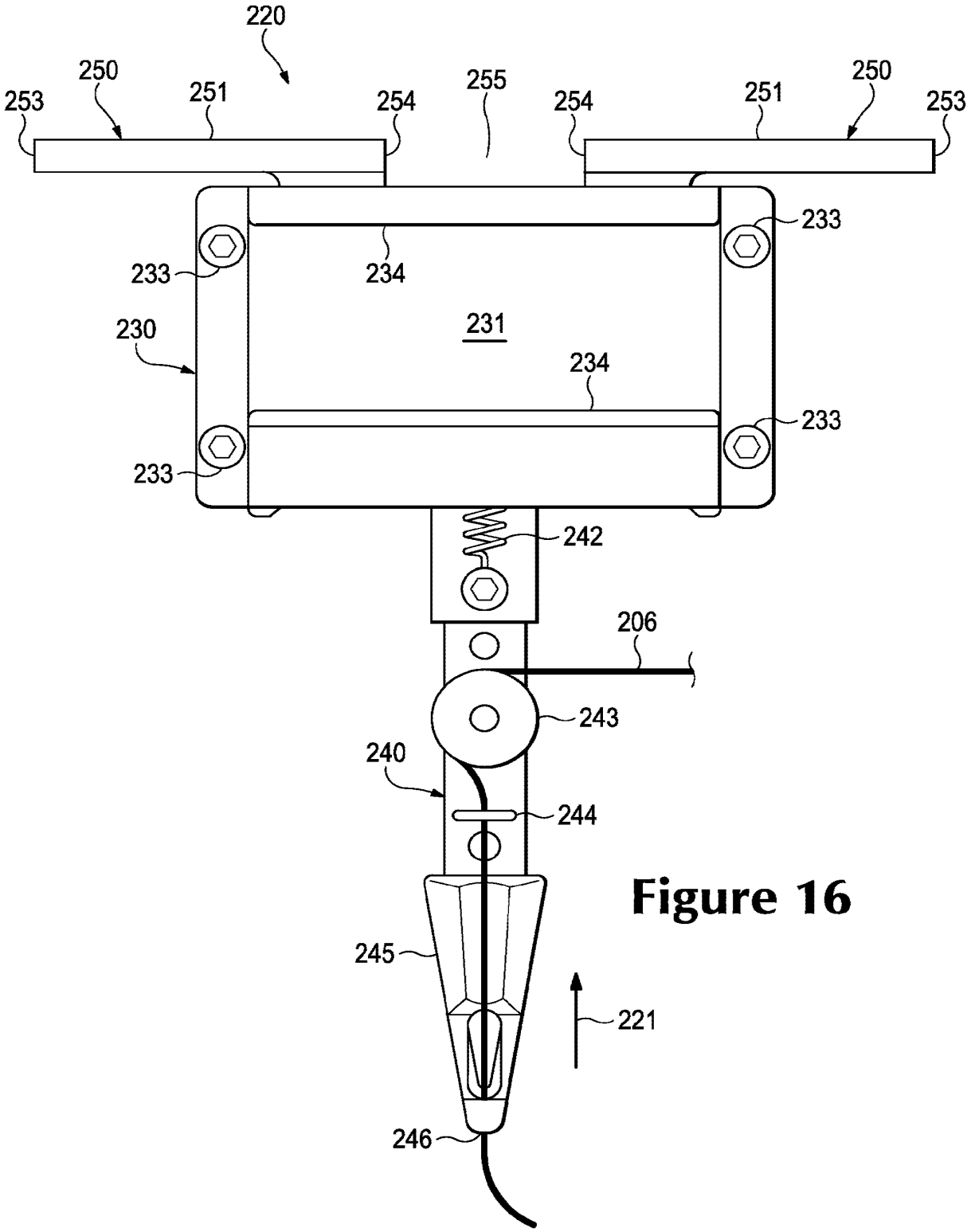
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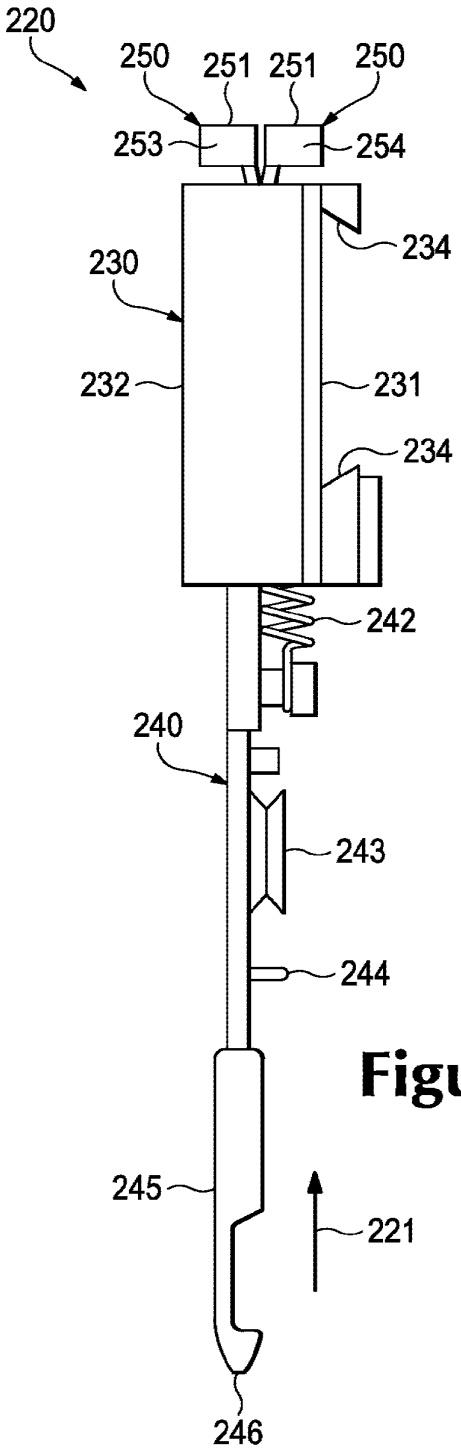
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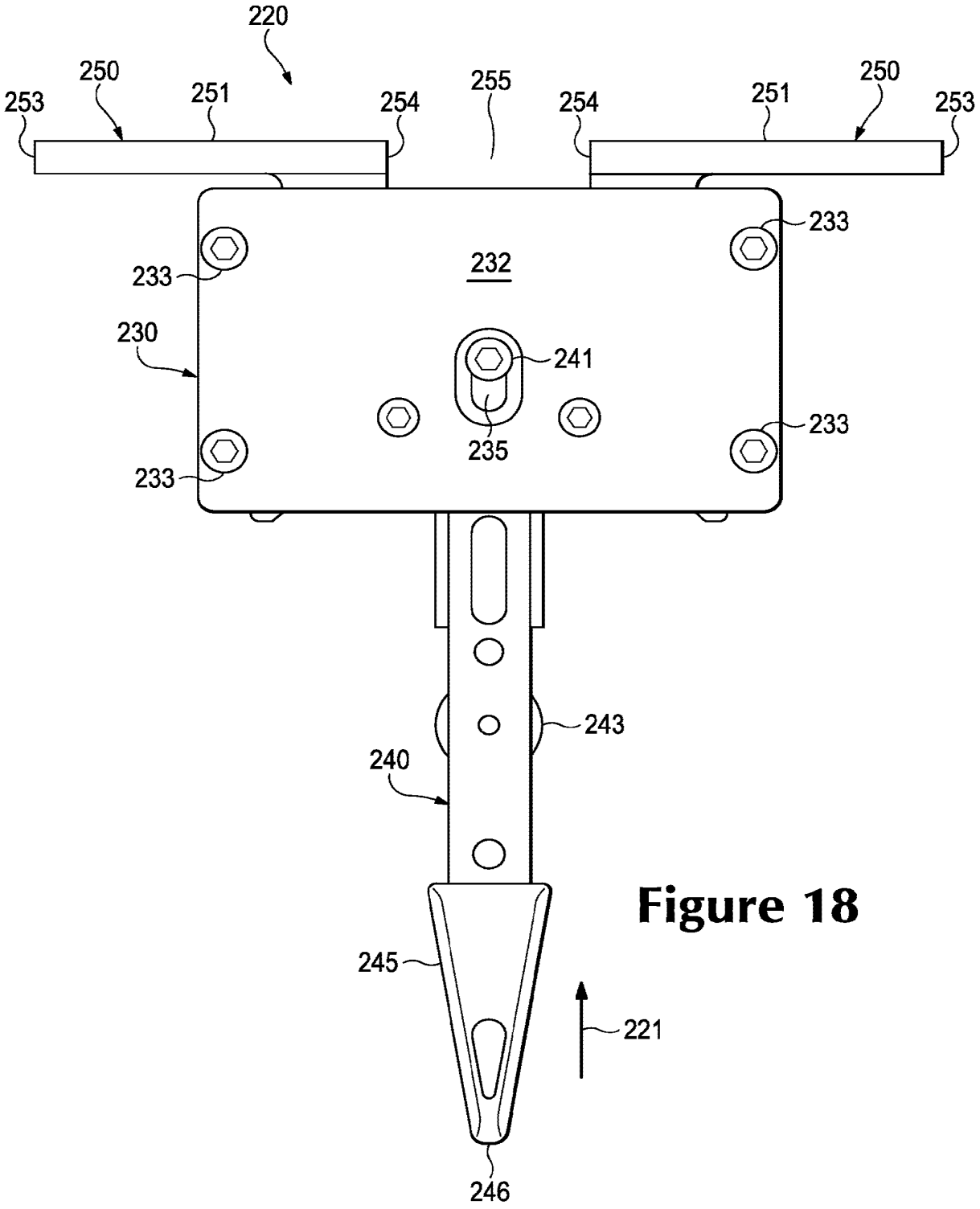
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Figure 18

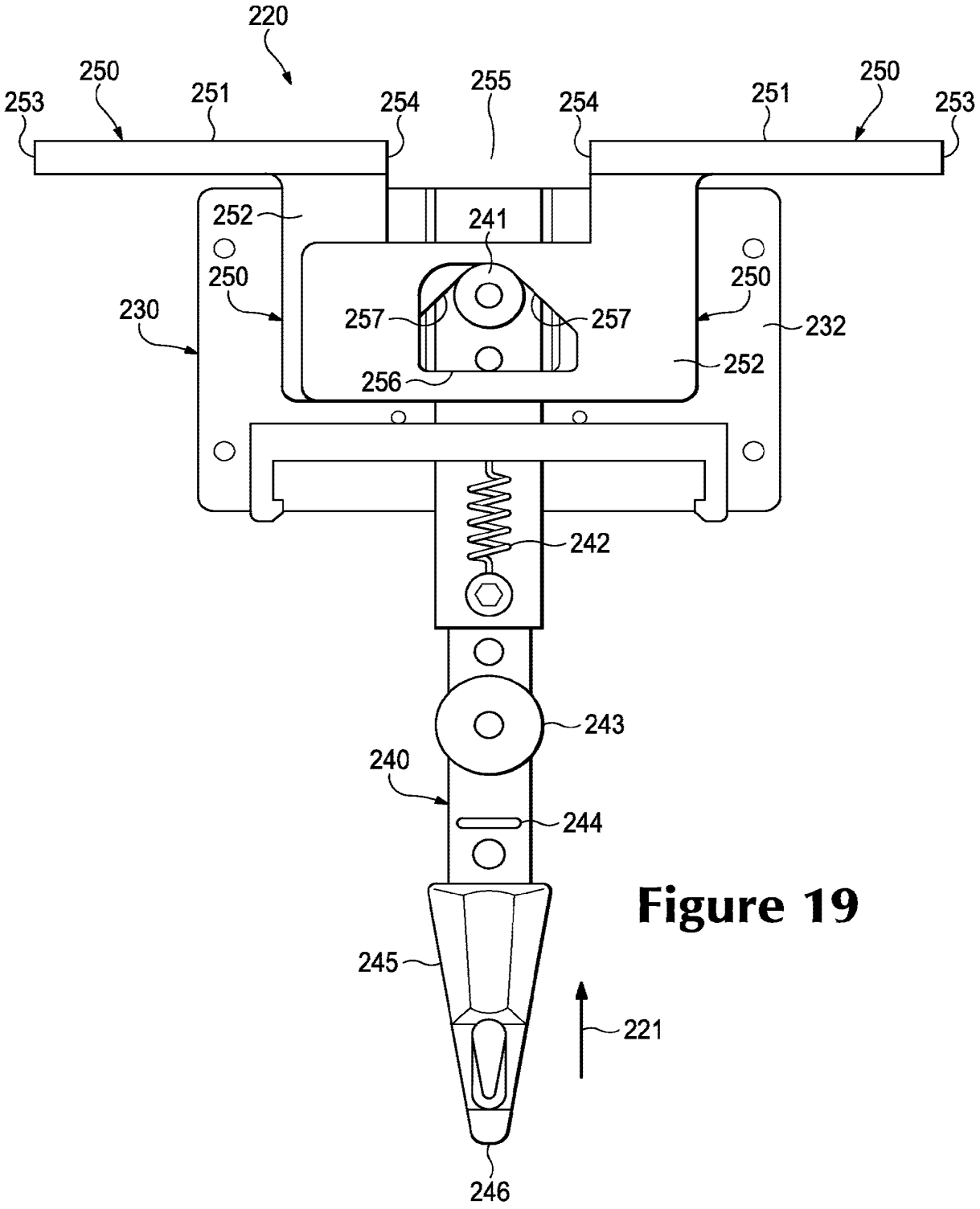
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Figure 19

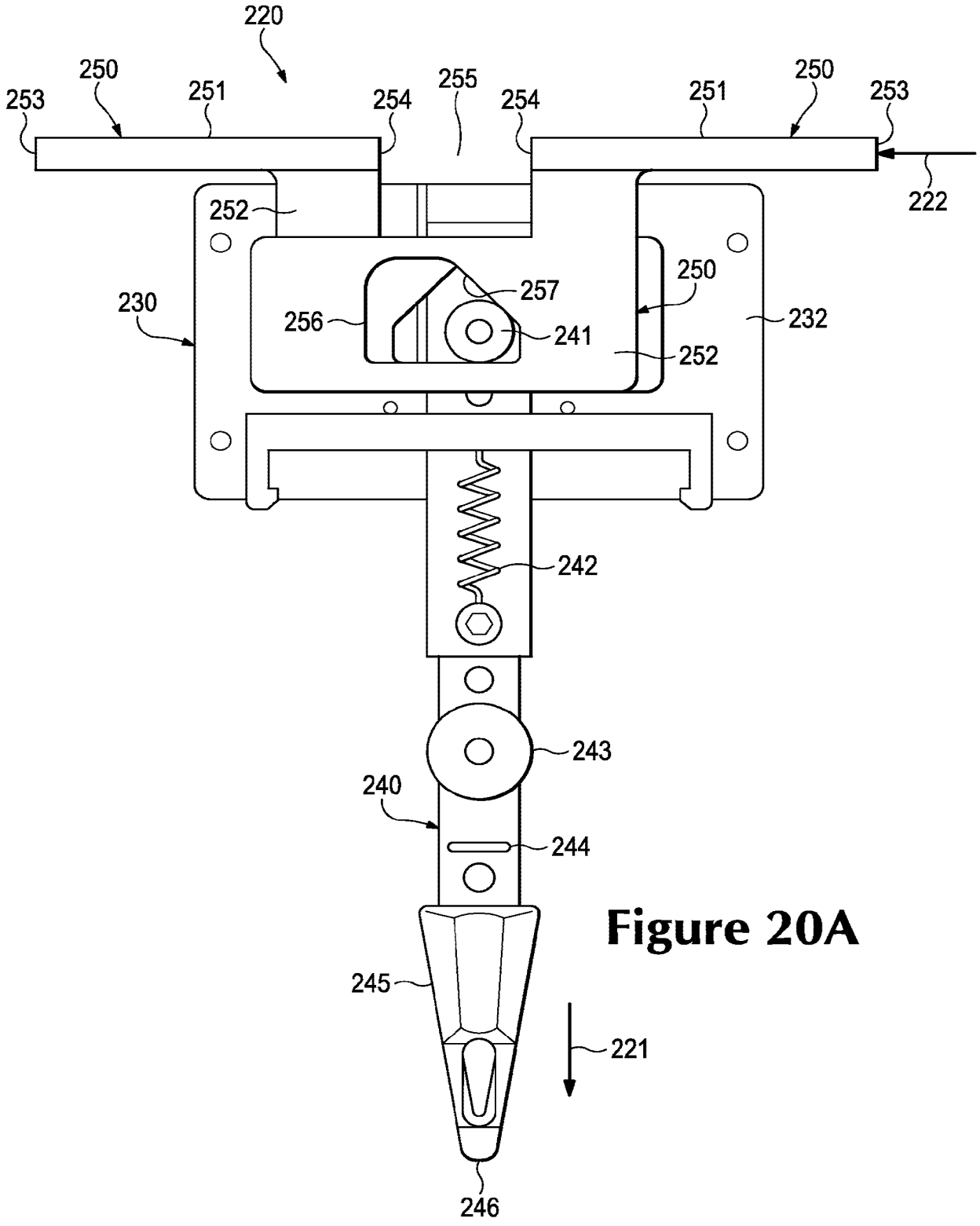
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Figure 20A

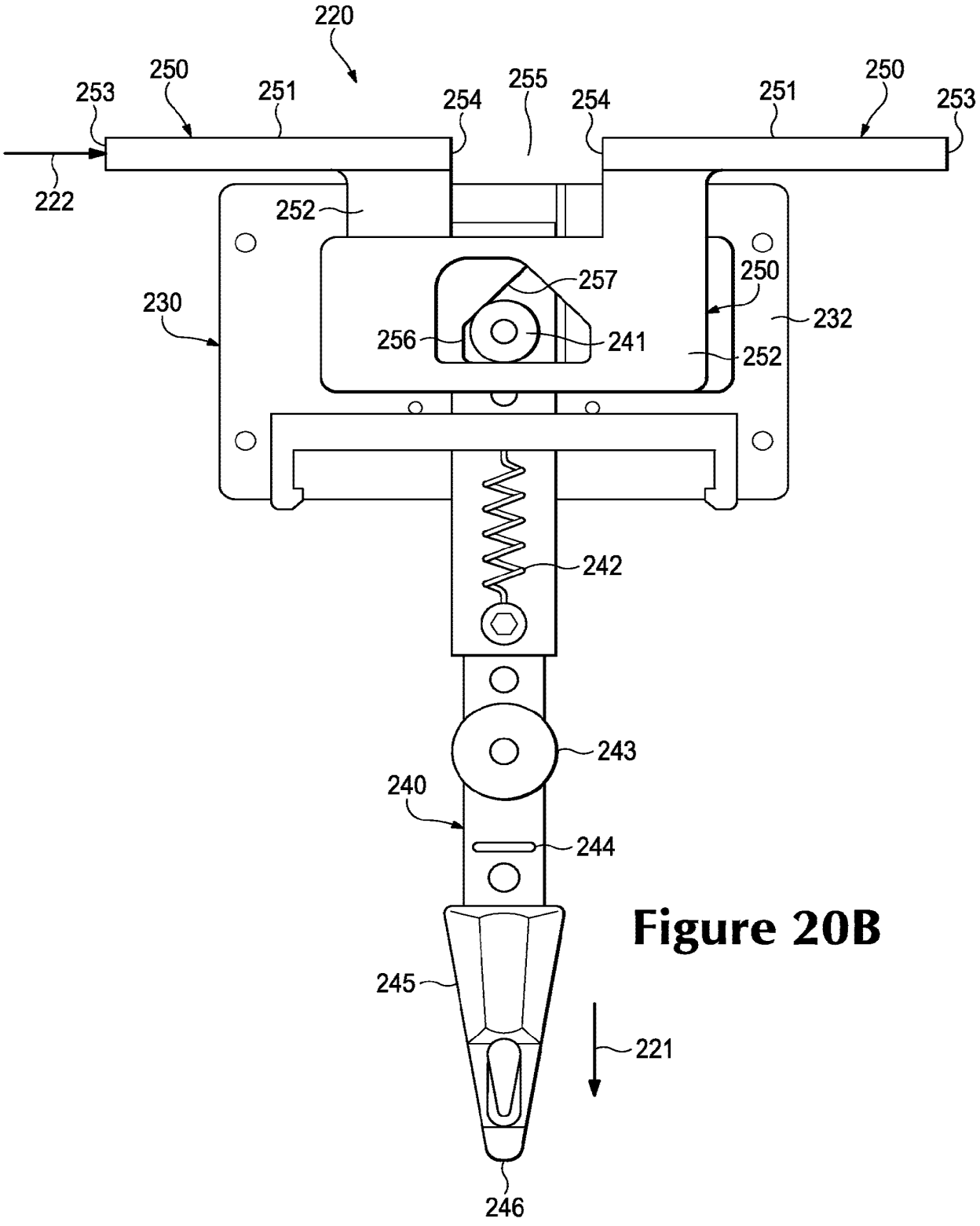
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Figure 20B

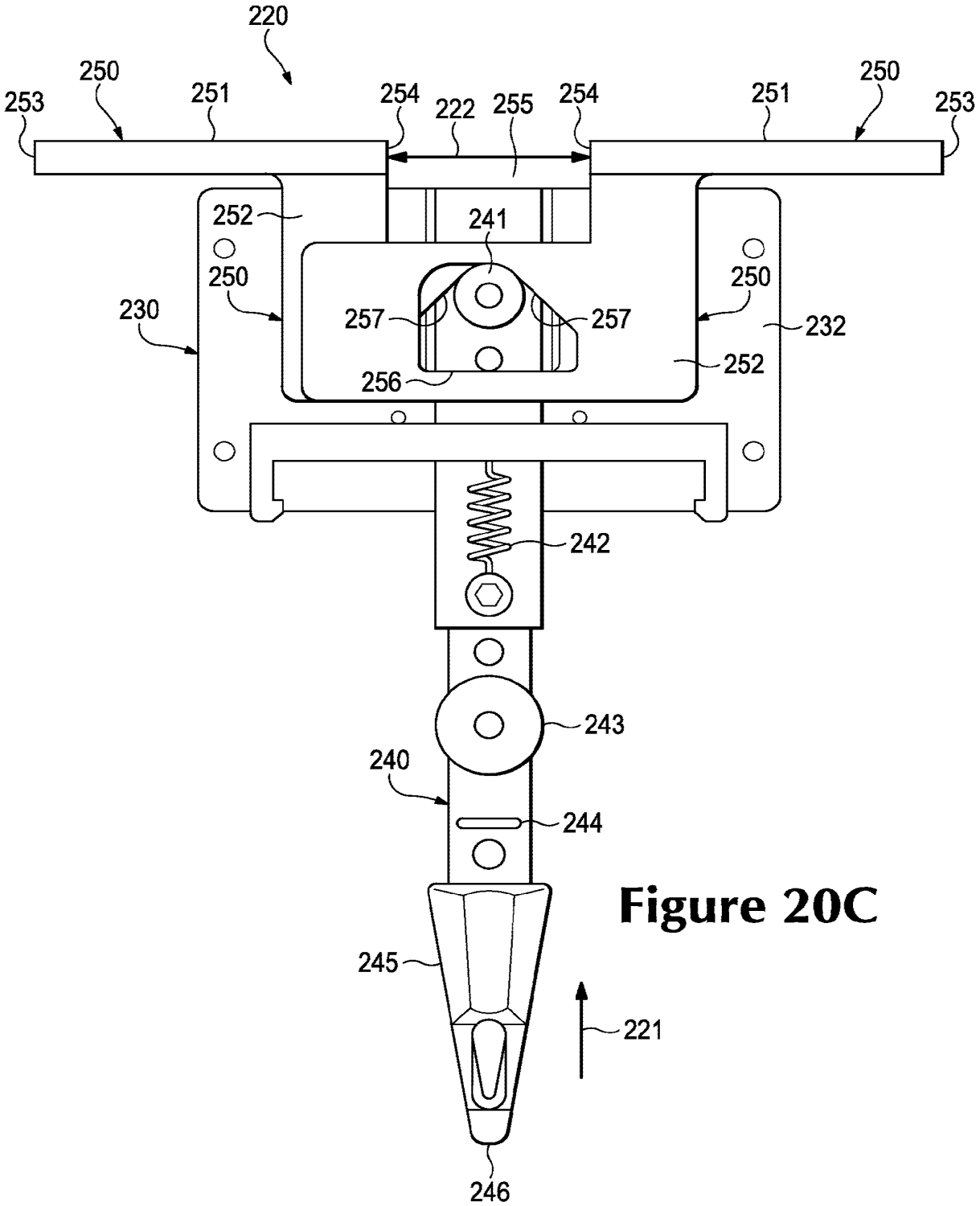
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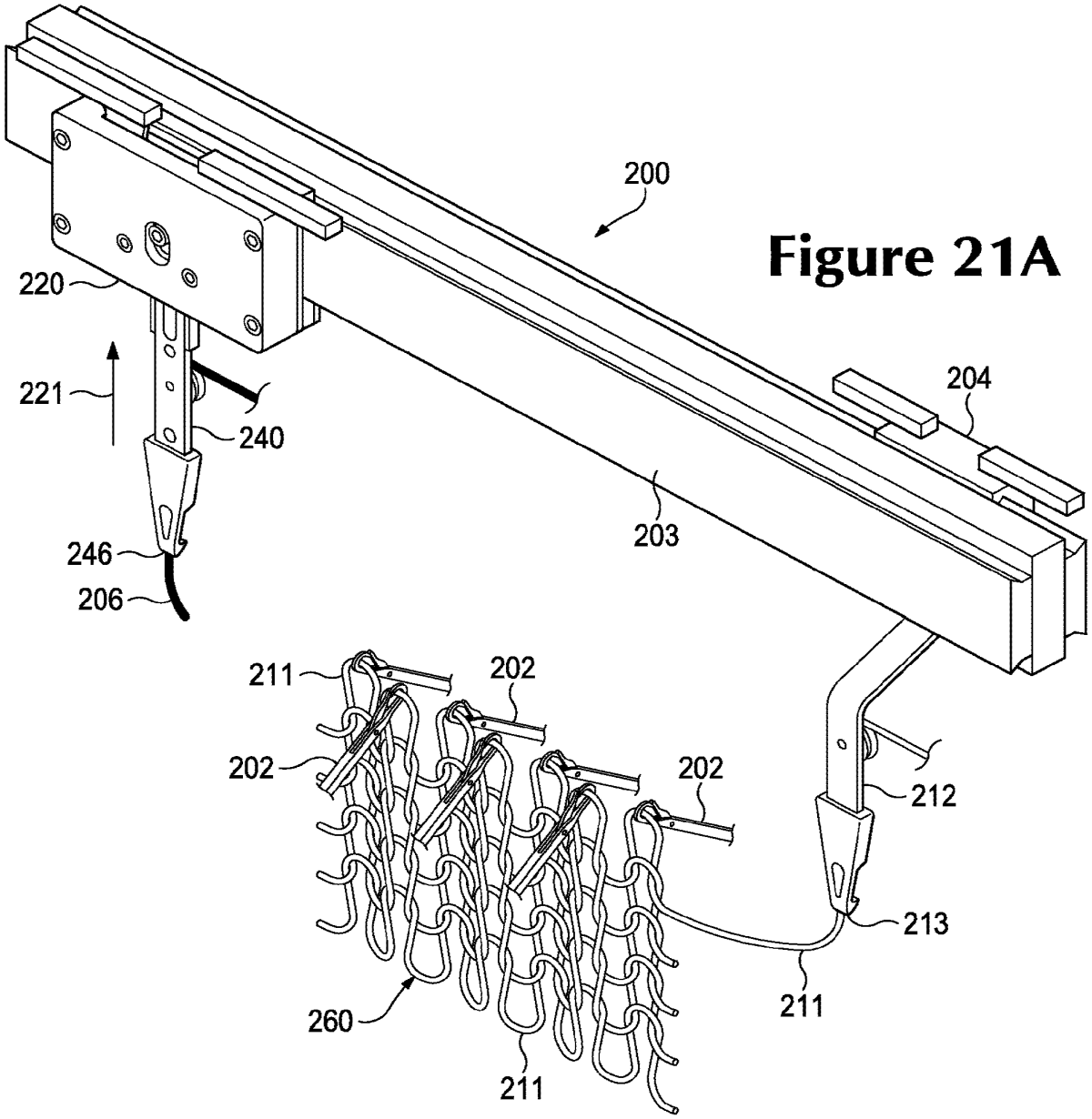
Figure 20C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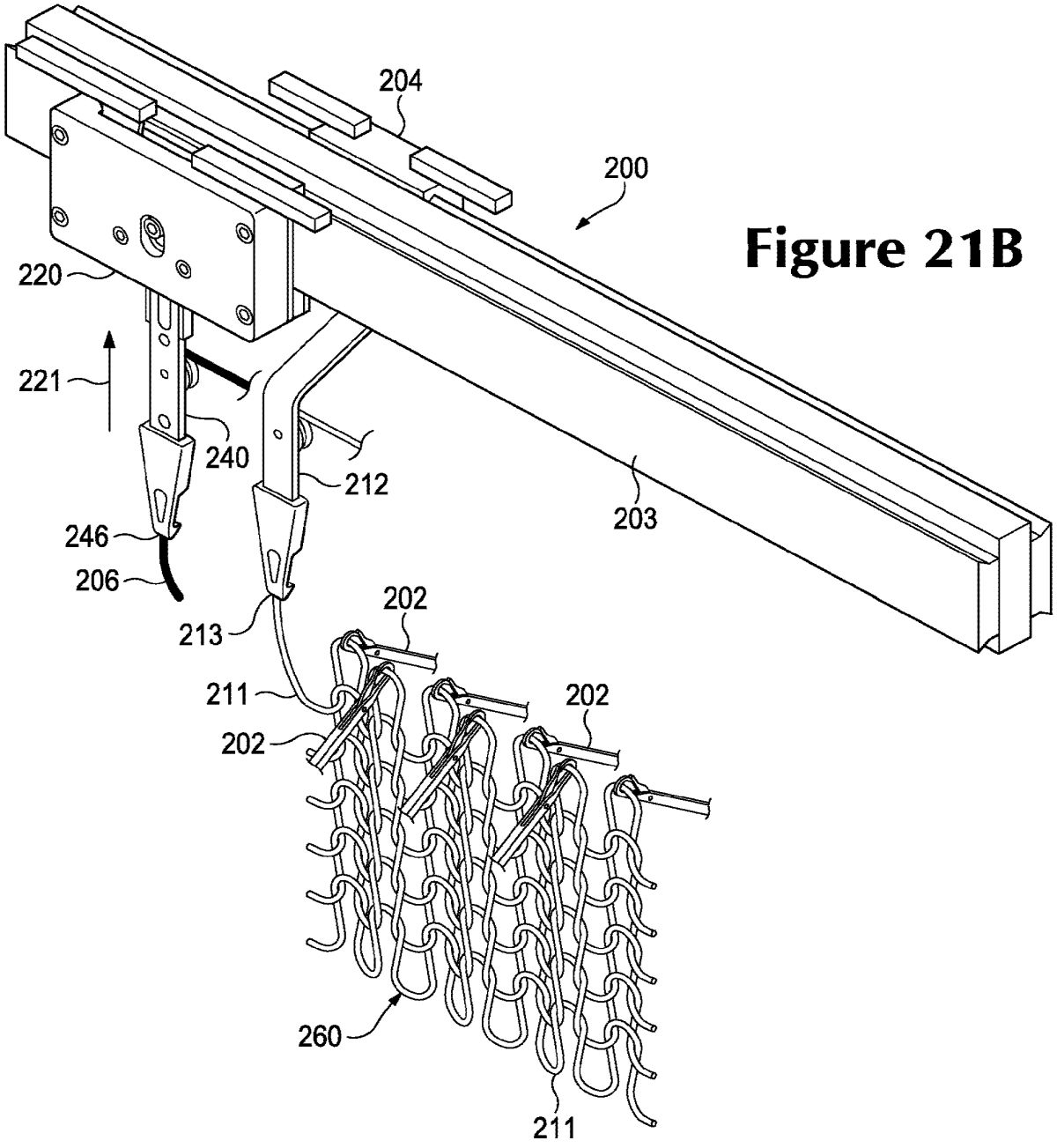
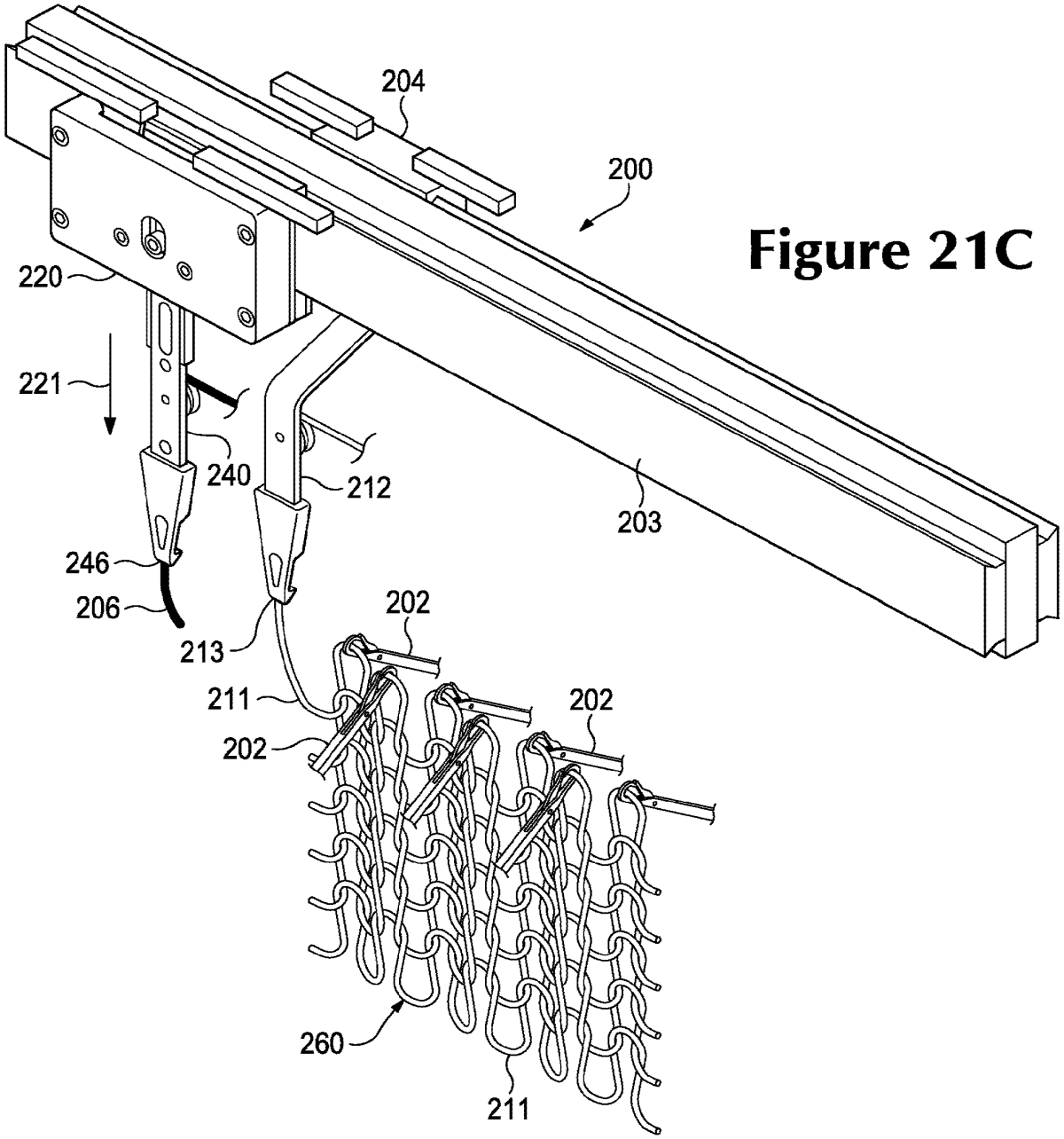


Figure 21B



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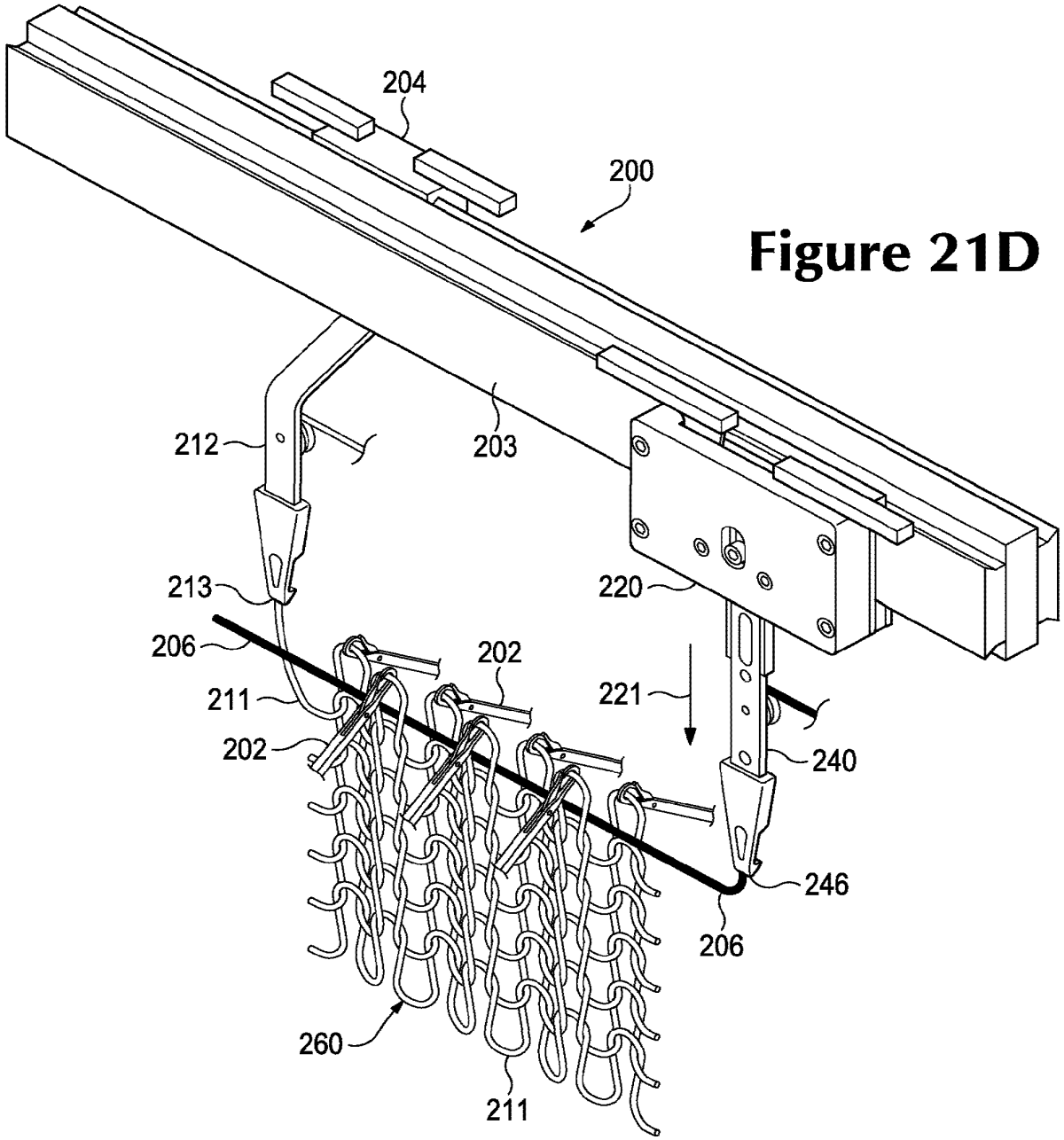
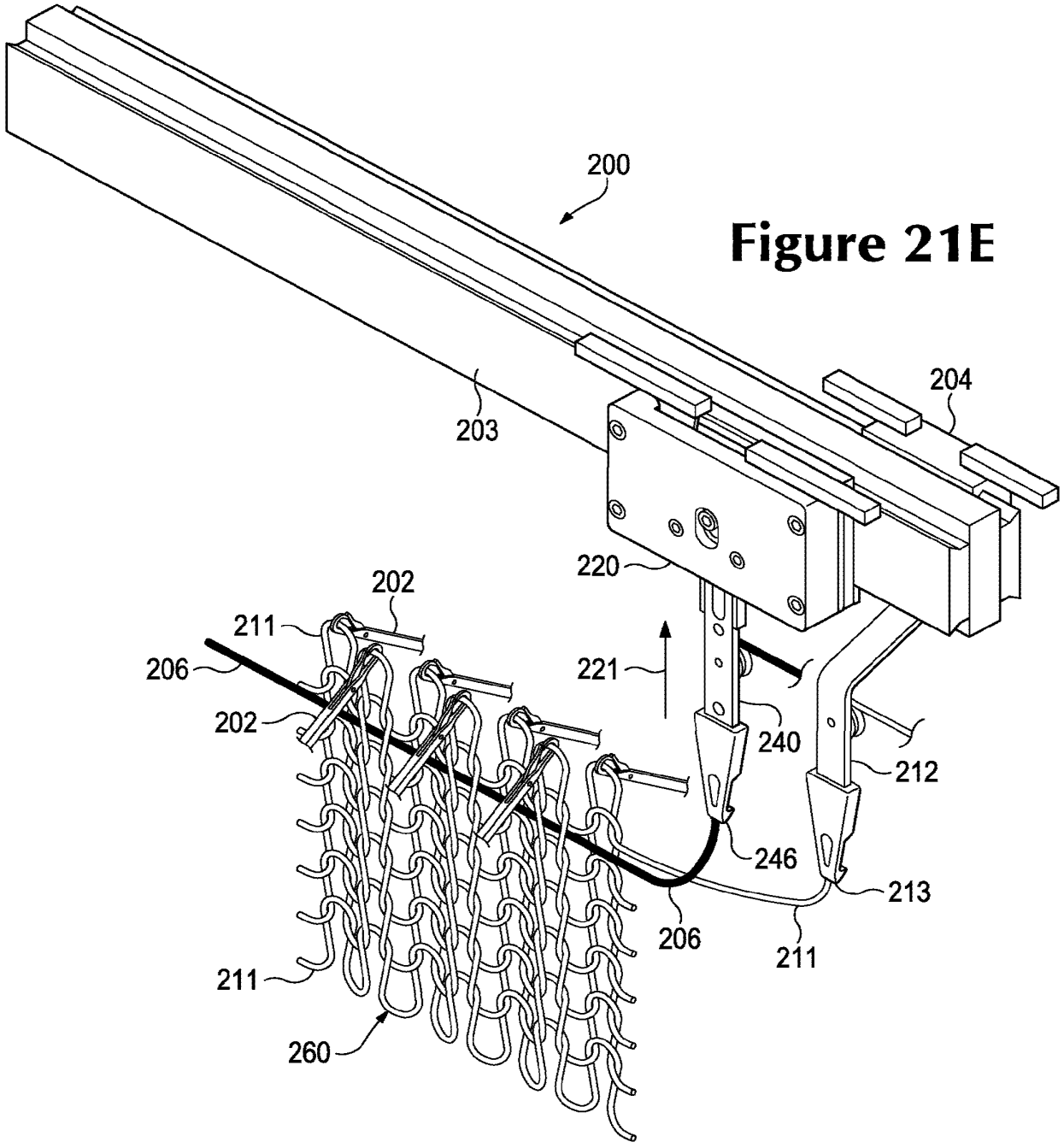


Figure 21D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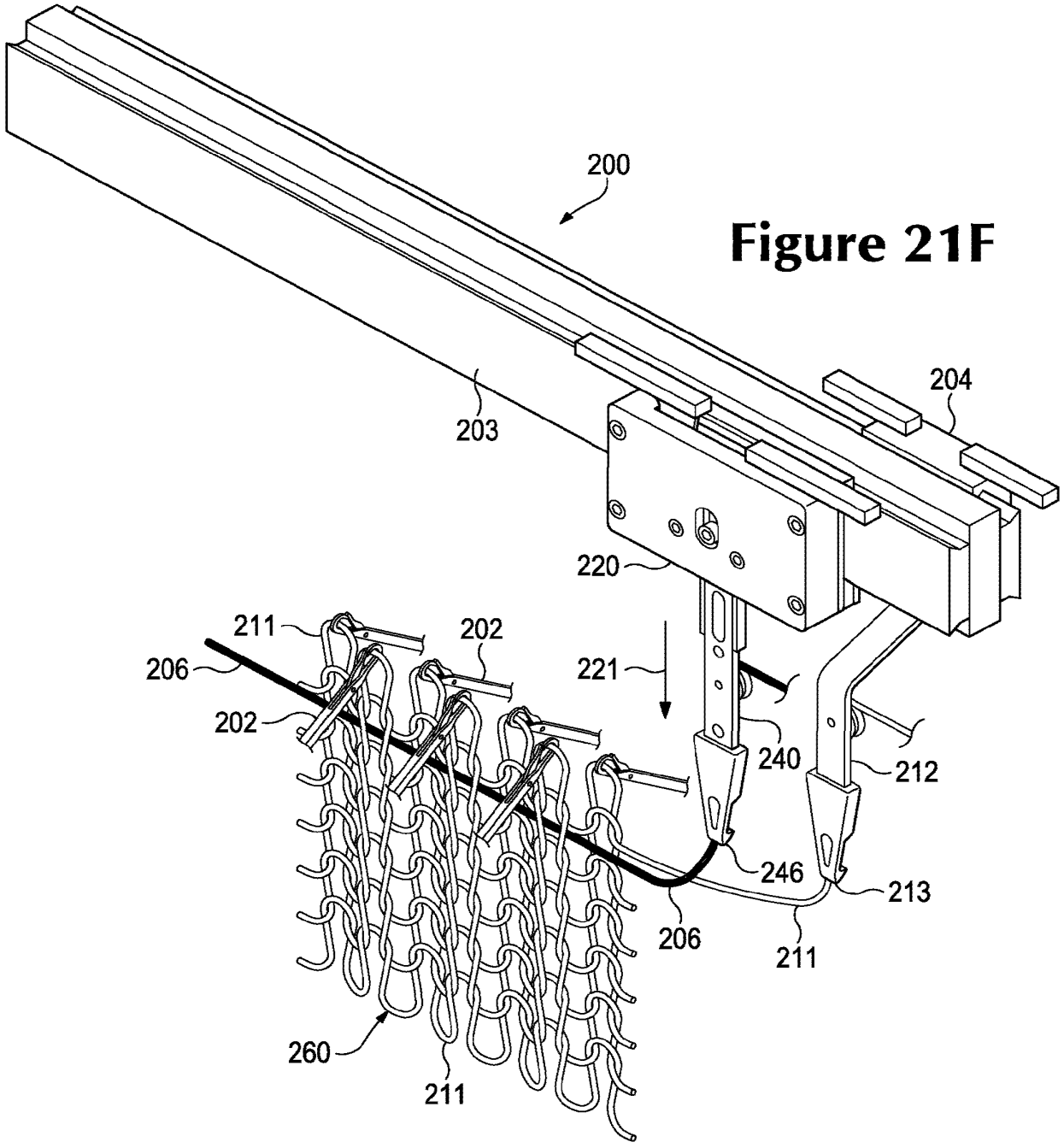
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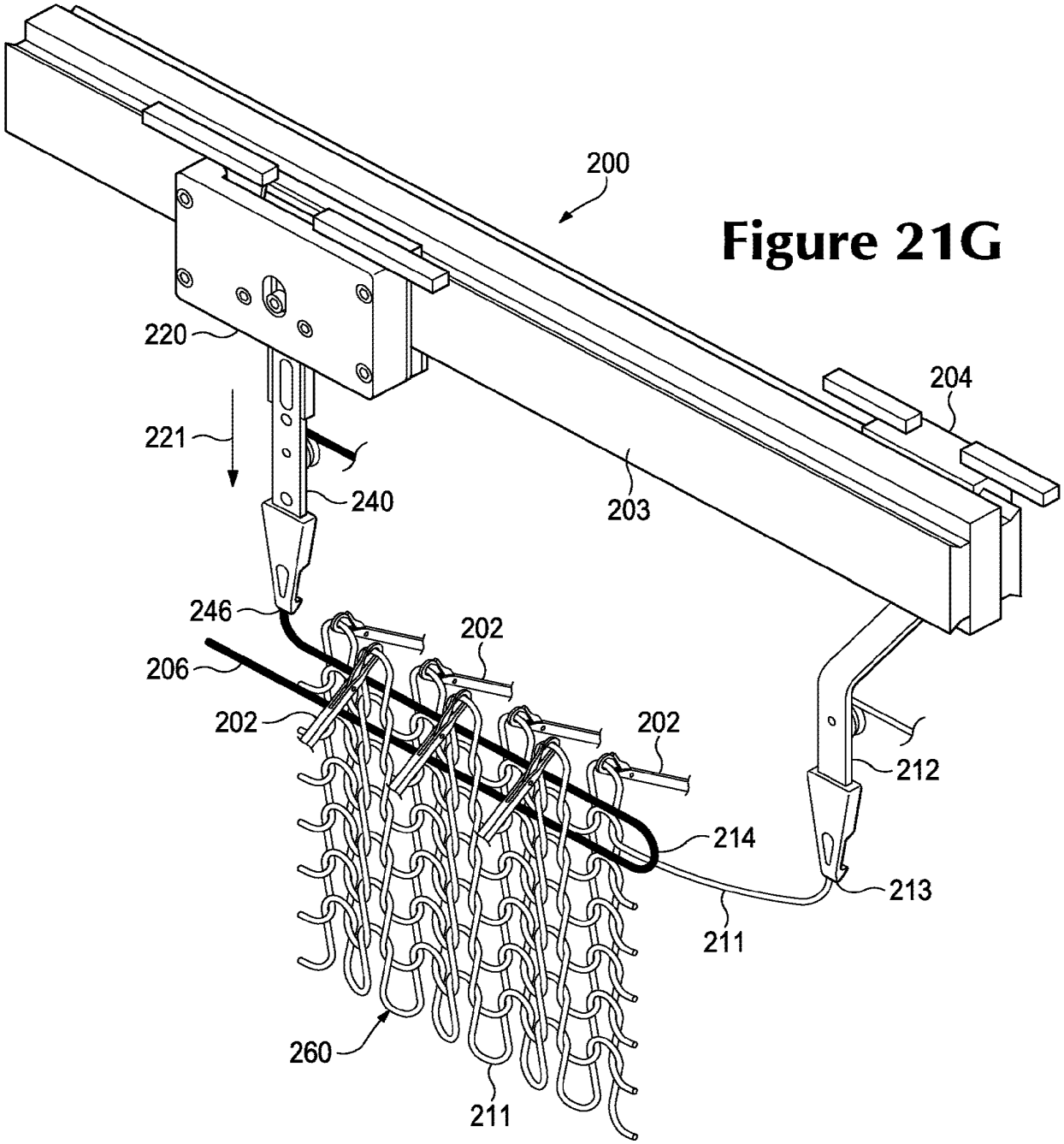
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Figure 21G

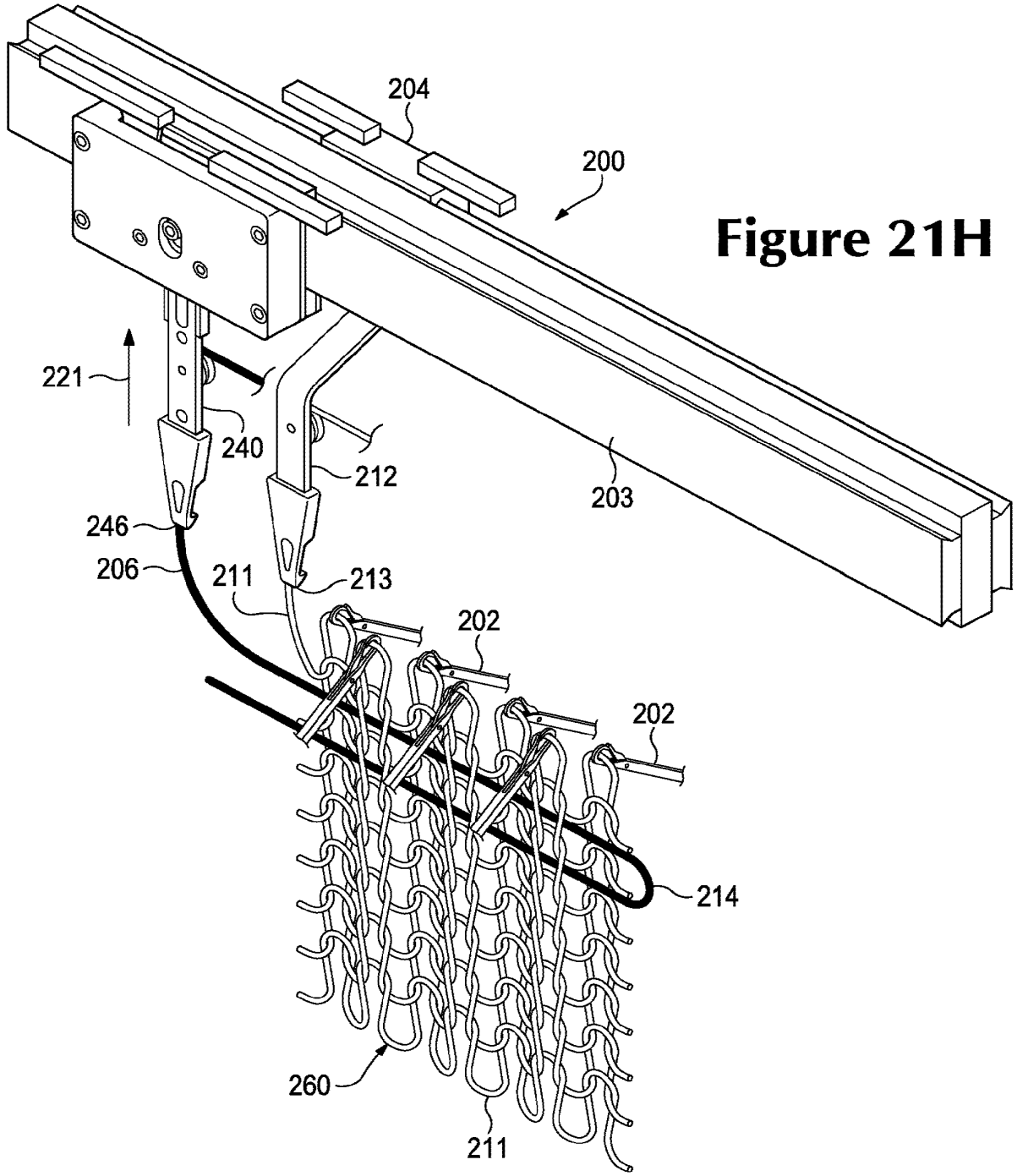

Figure 21H

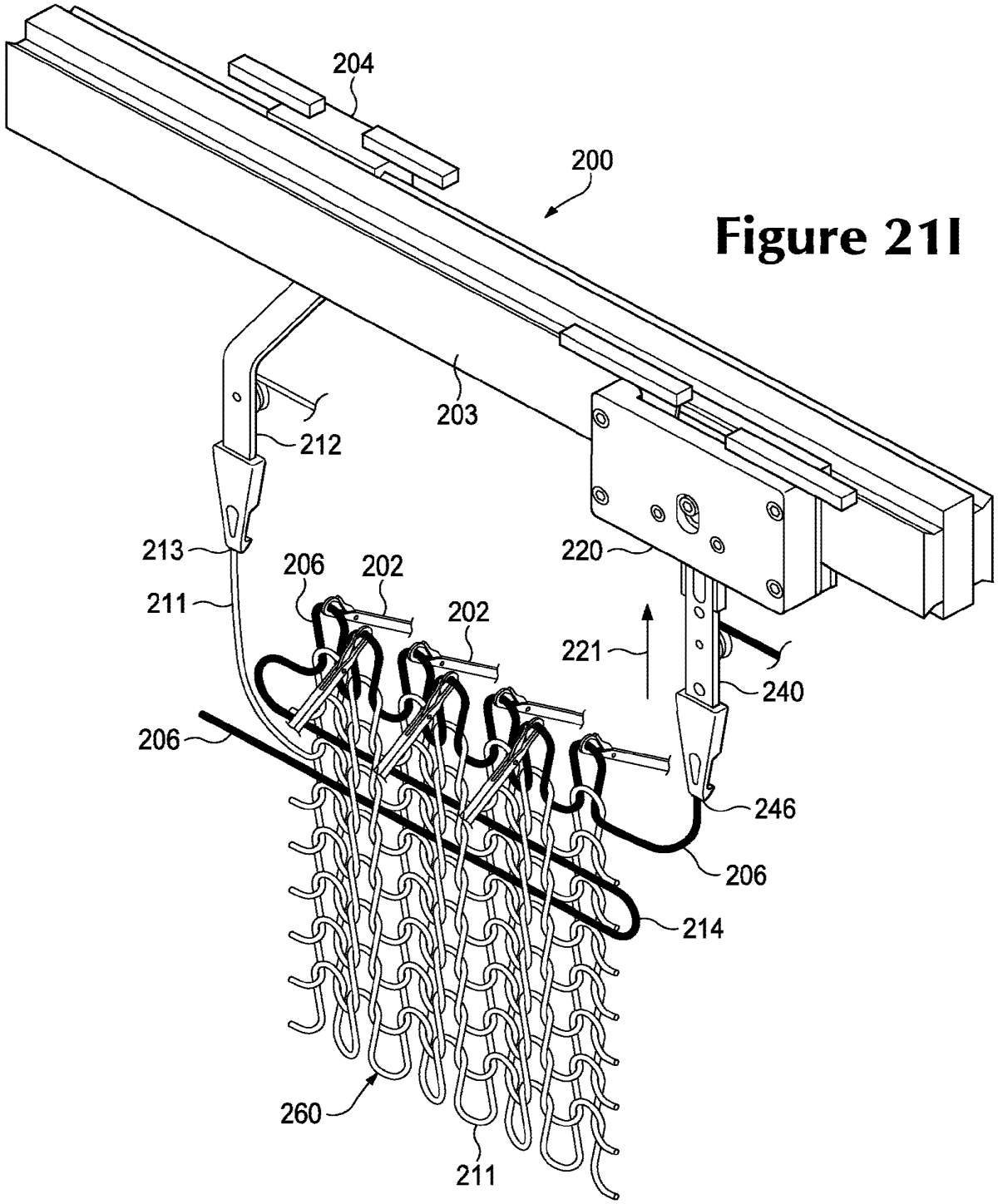
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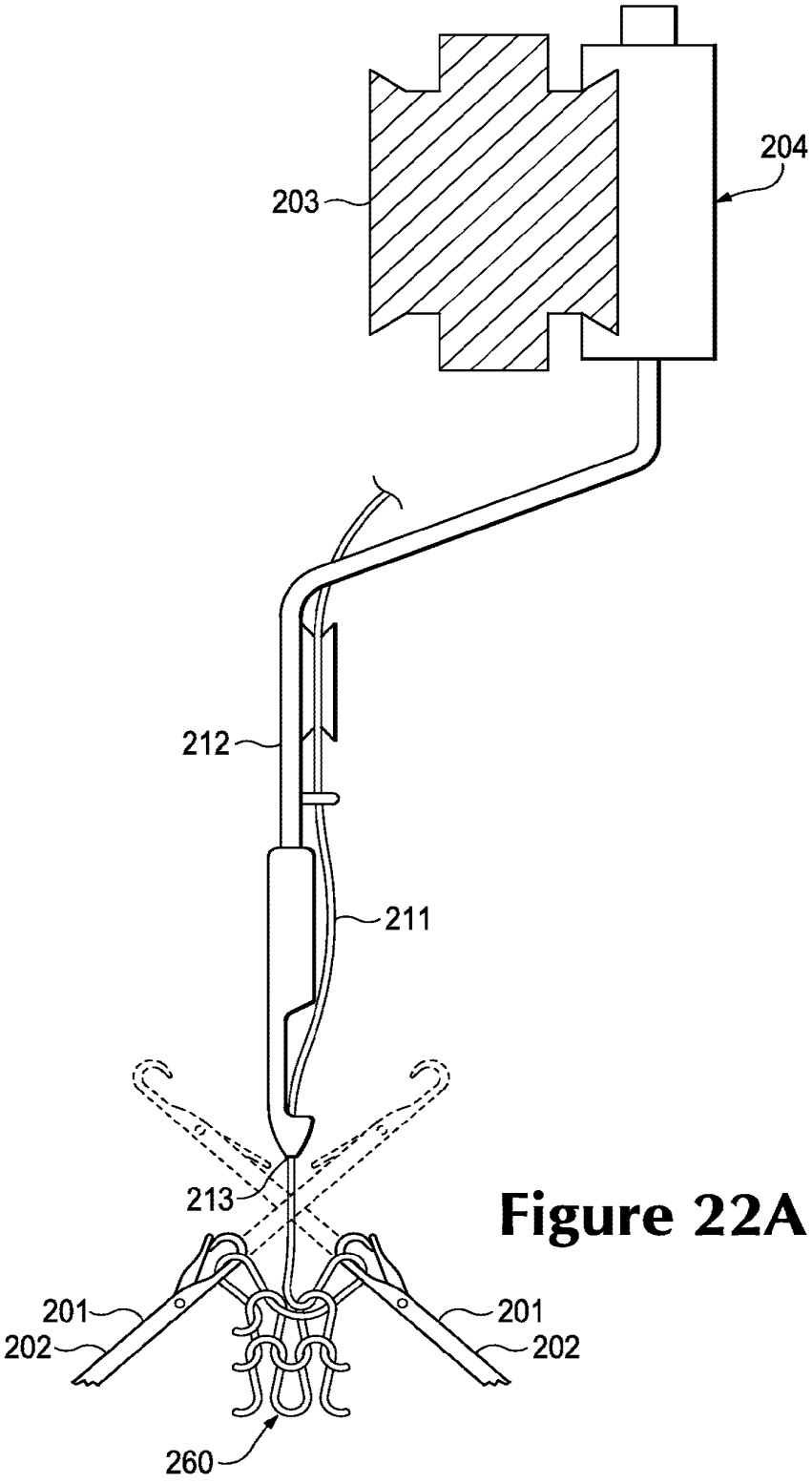
Figure 21I



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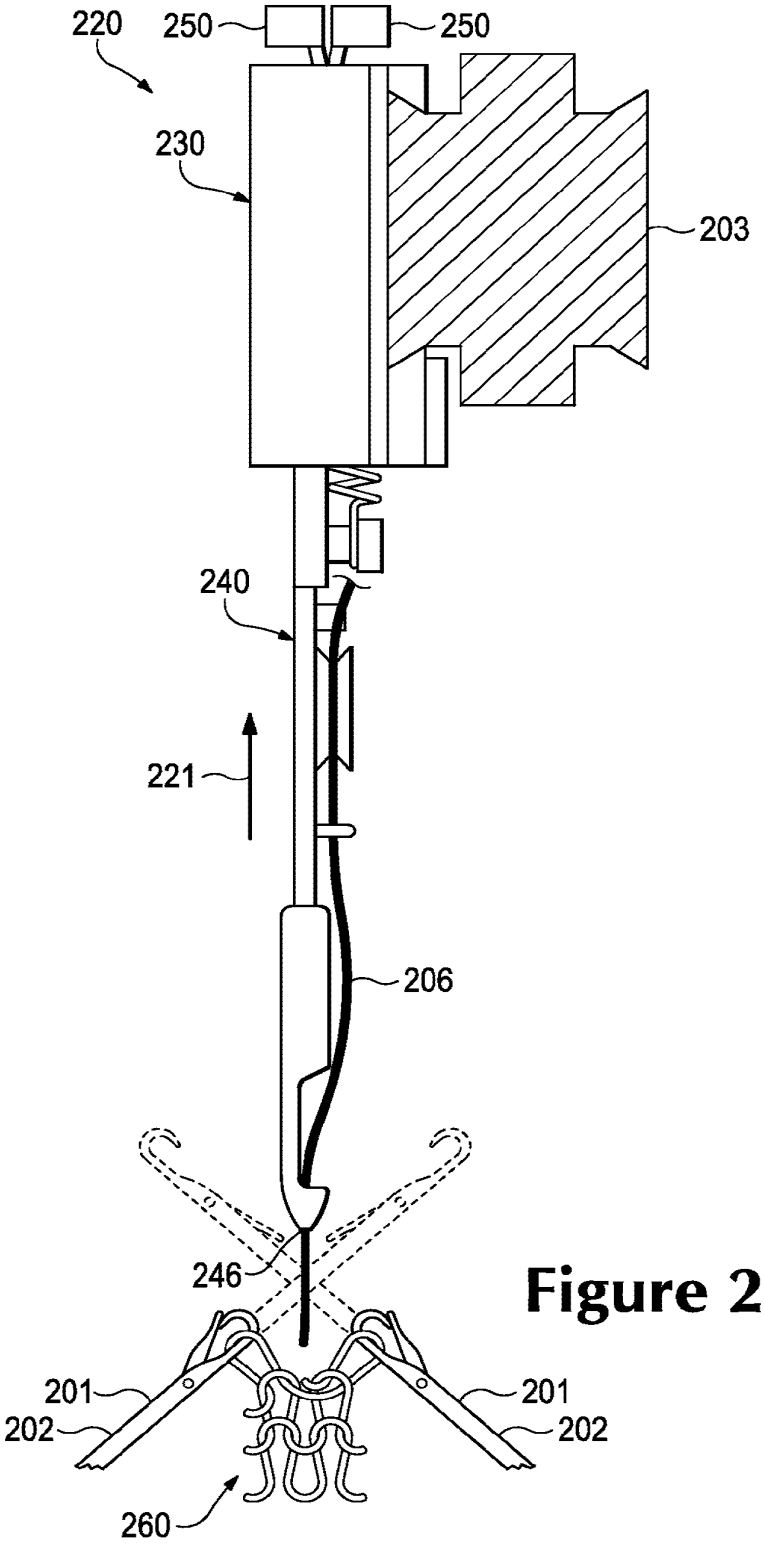


Figure 22B

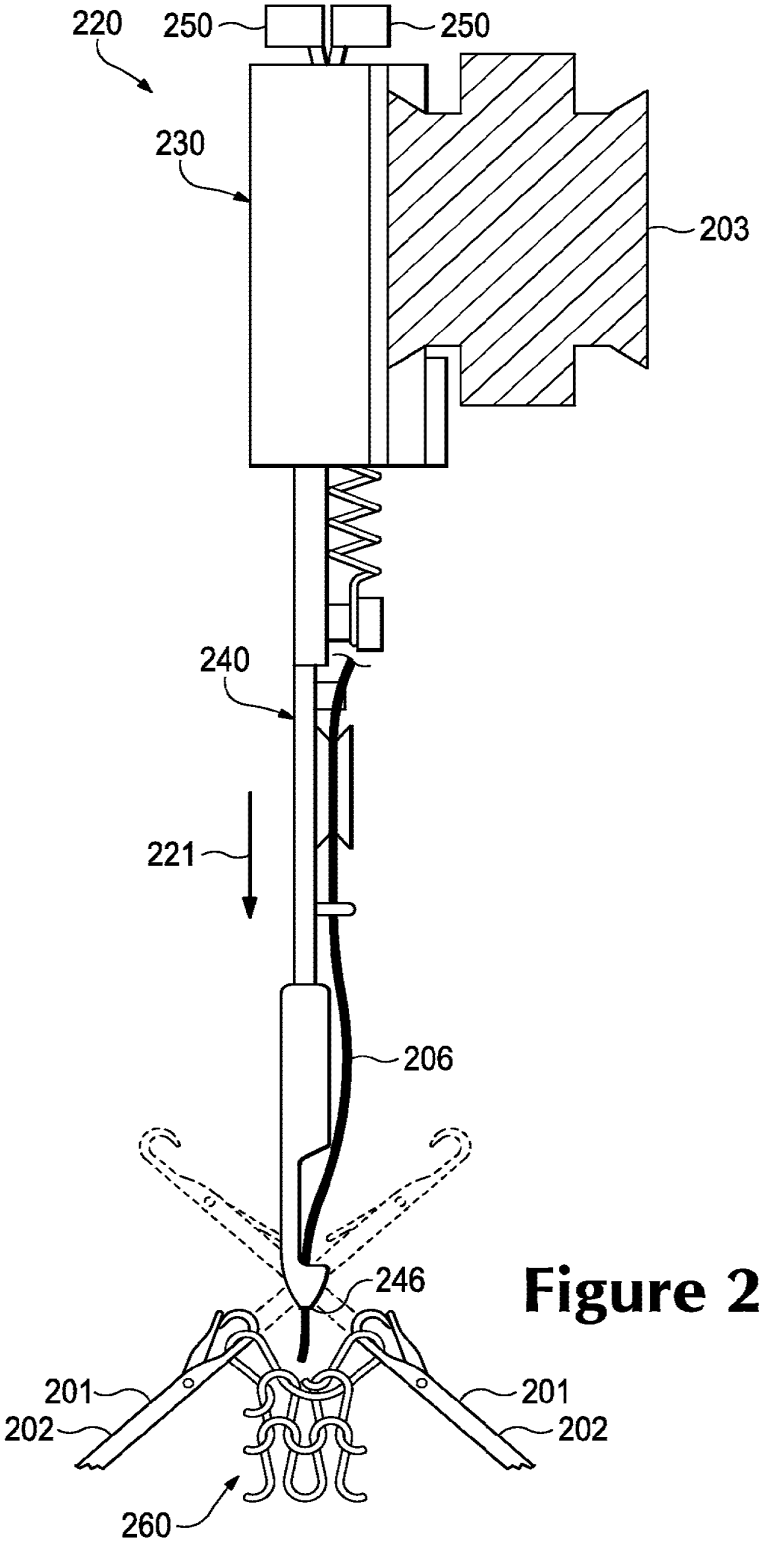
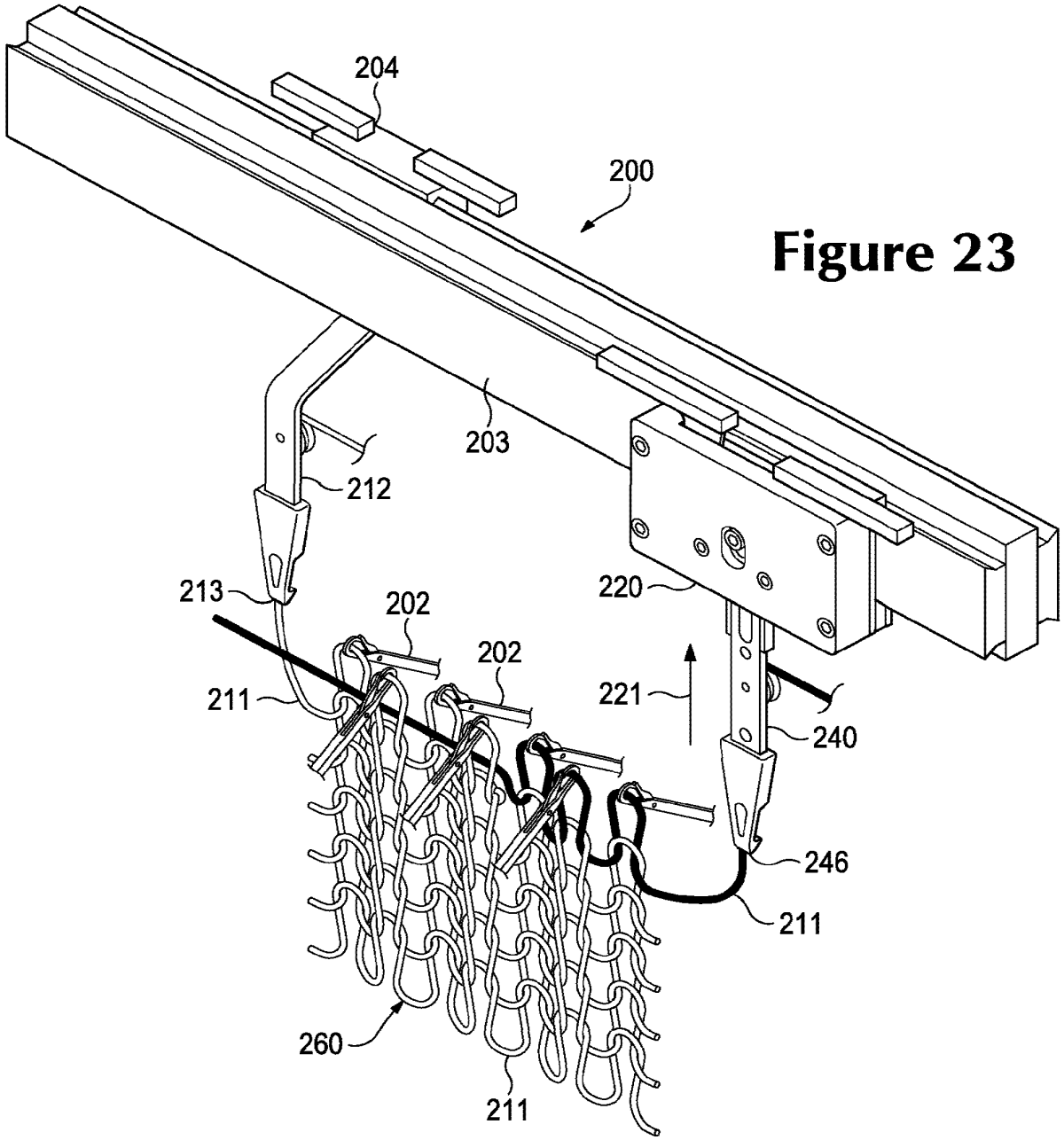


Figure 22C



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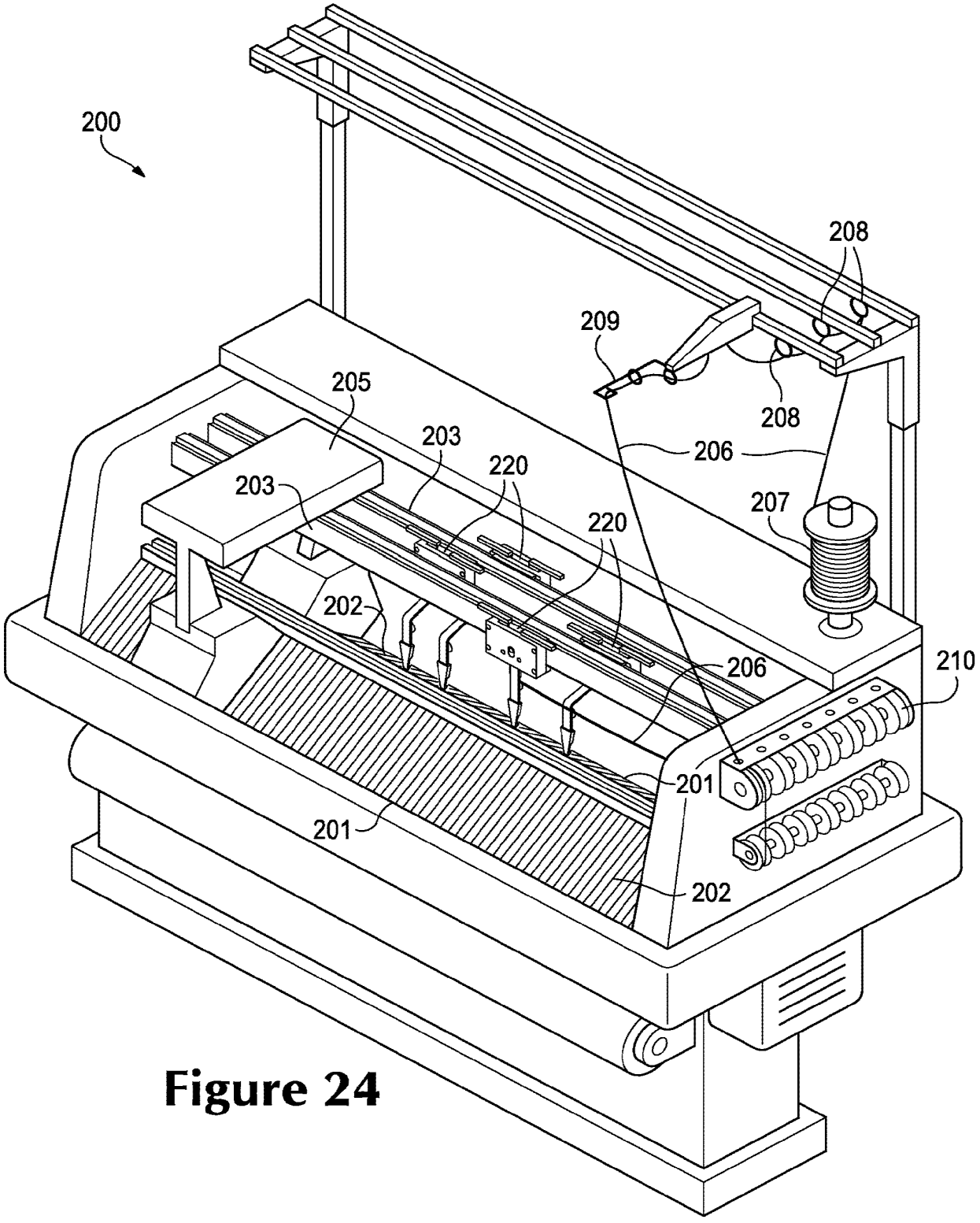
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Figure 24

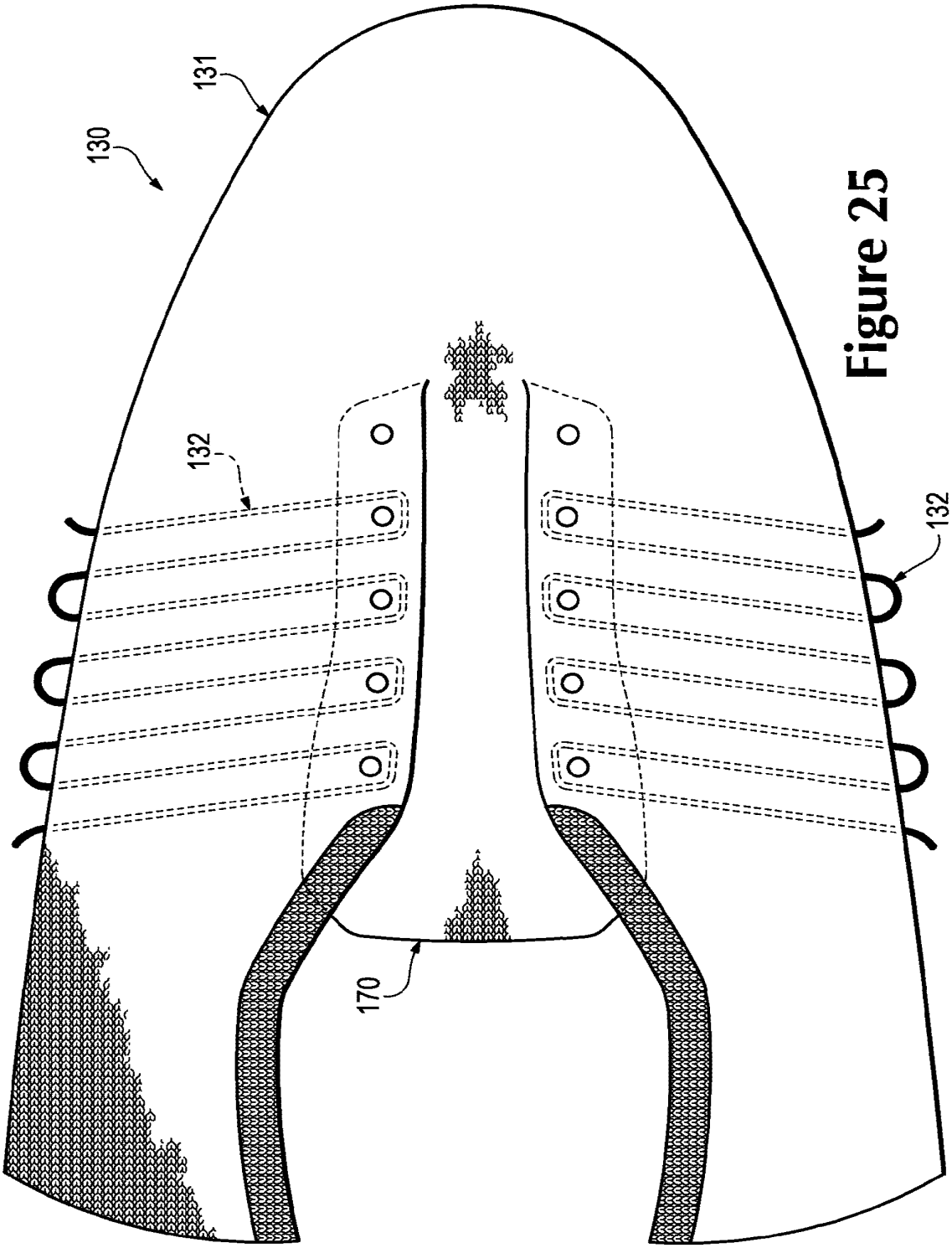

Figure 25

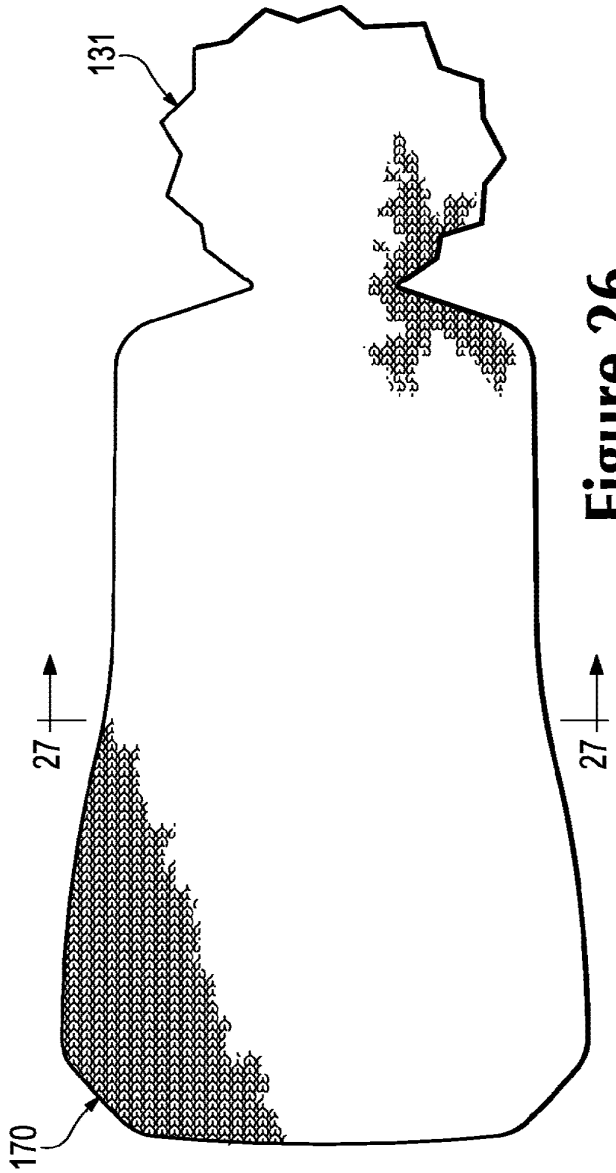

Figure 26

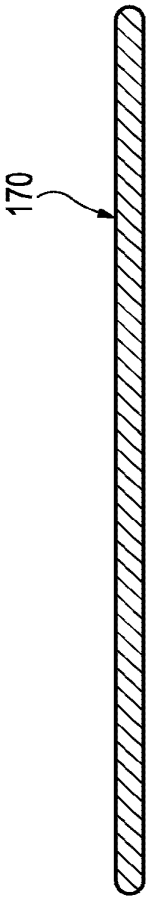

Figure 27

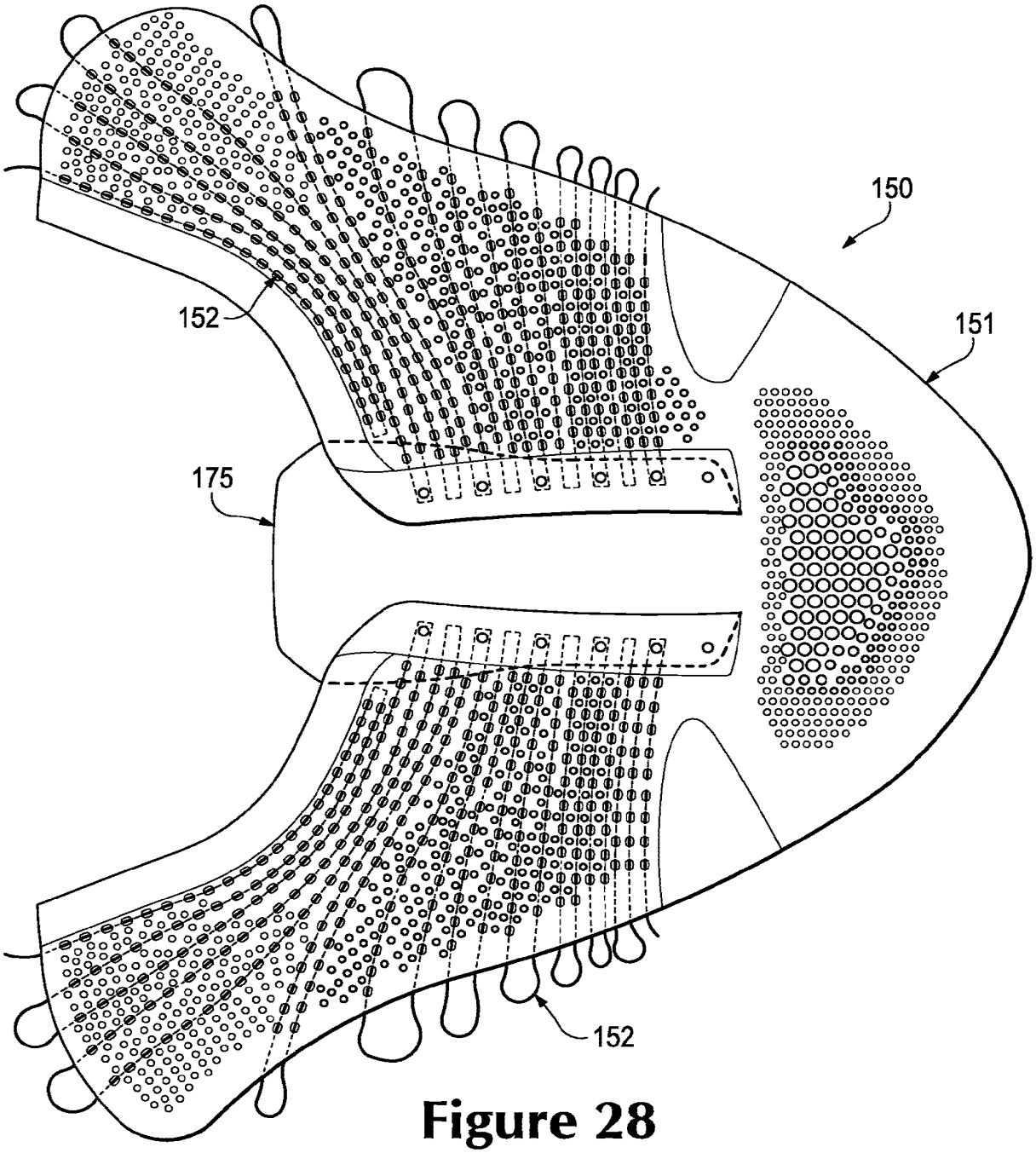

Figure 28

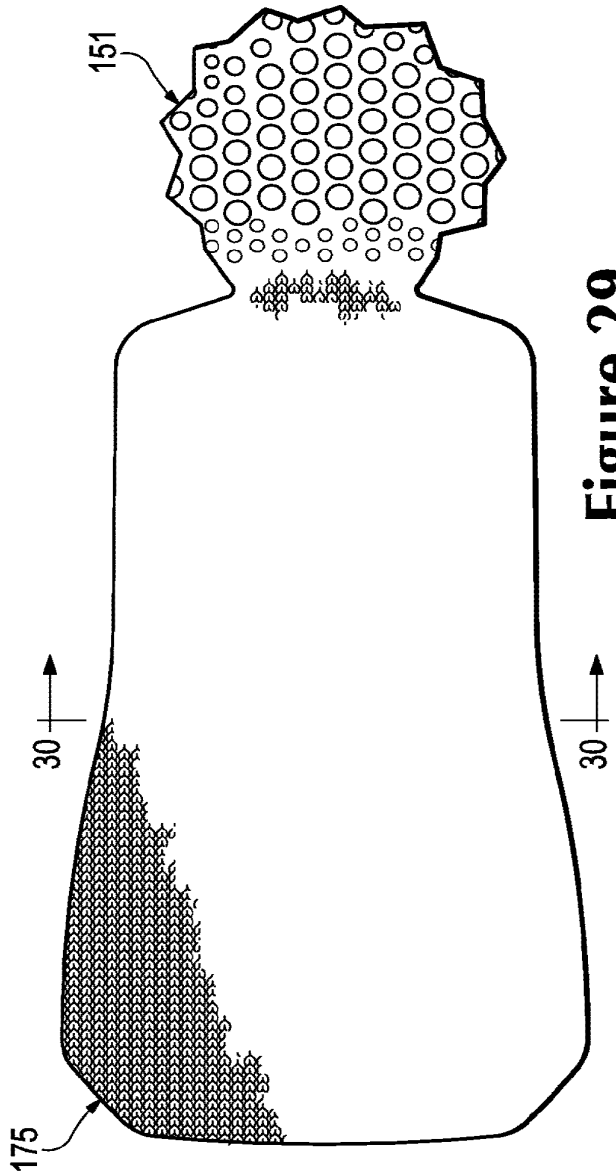

Figure 29

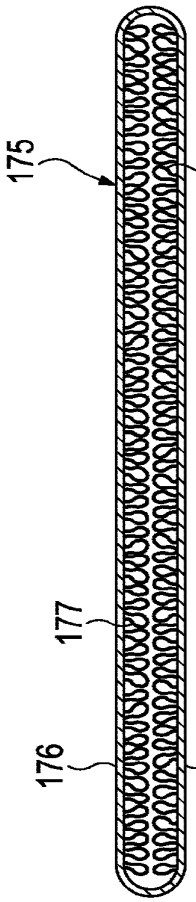

Figure 30

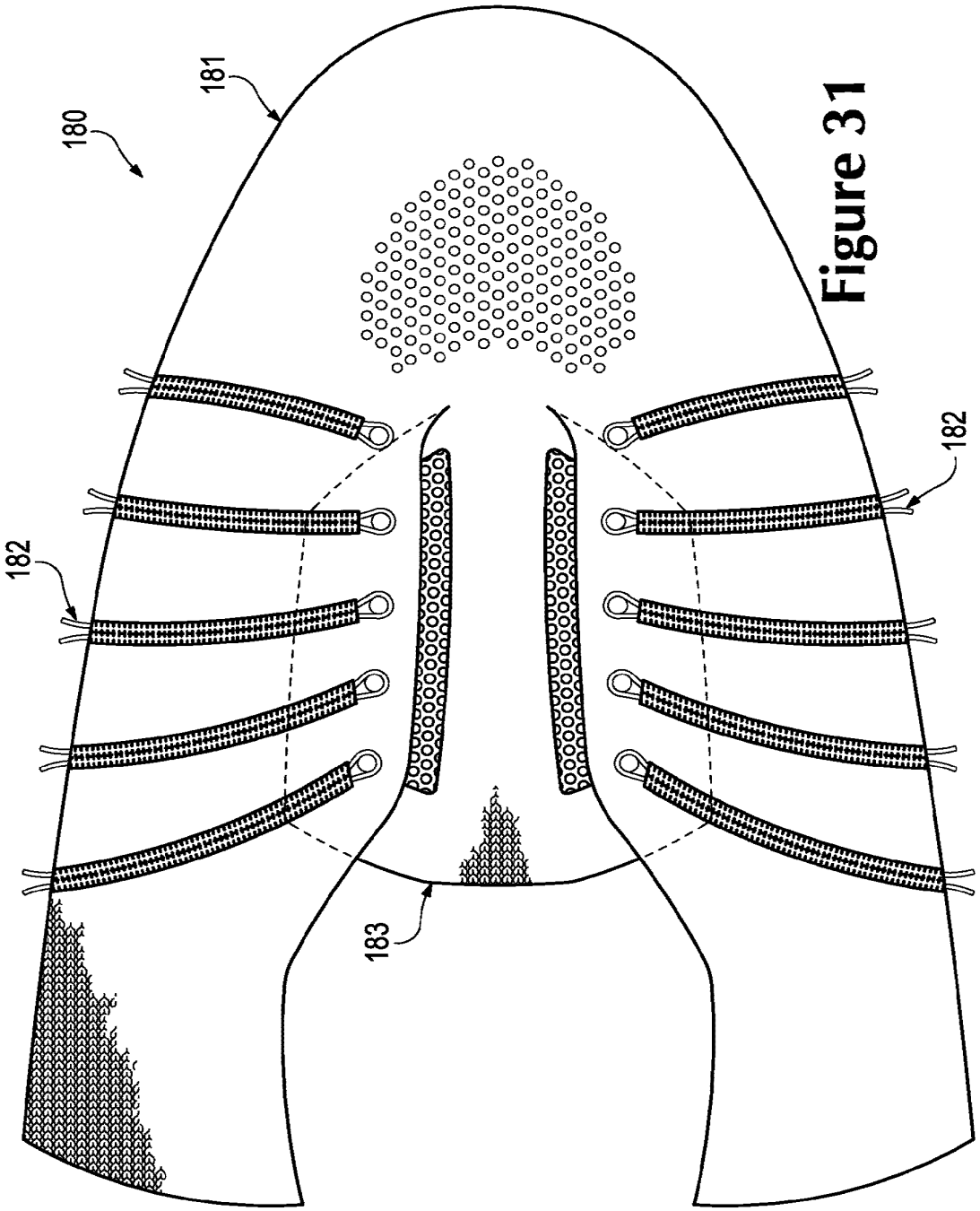

Figure 31

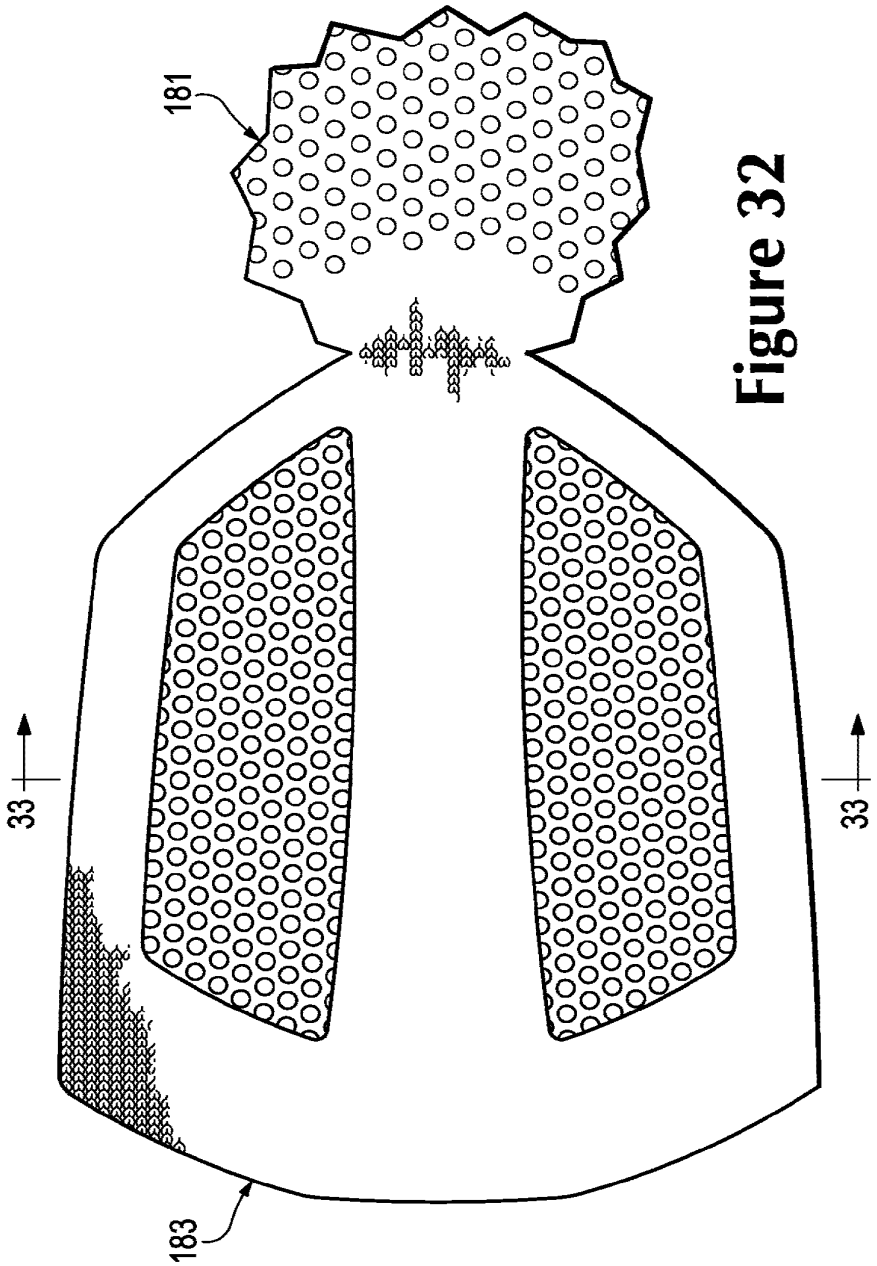

Figure 32

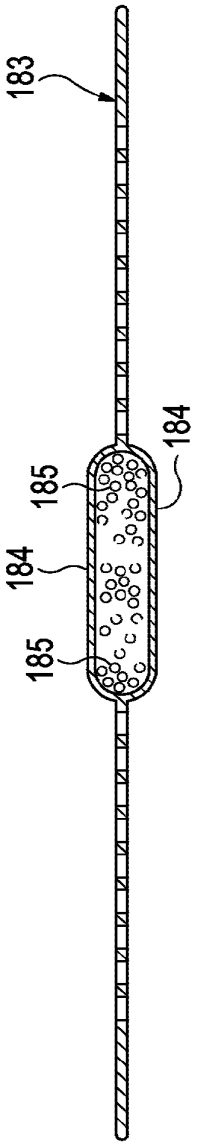

Figure 33

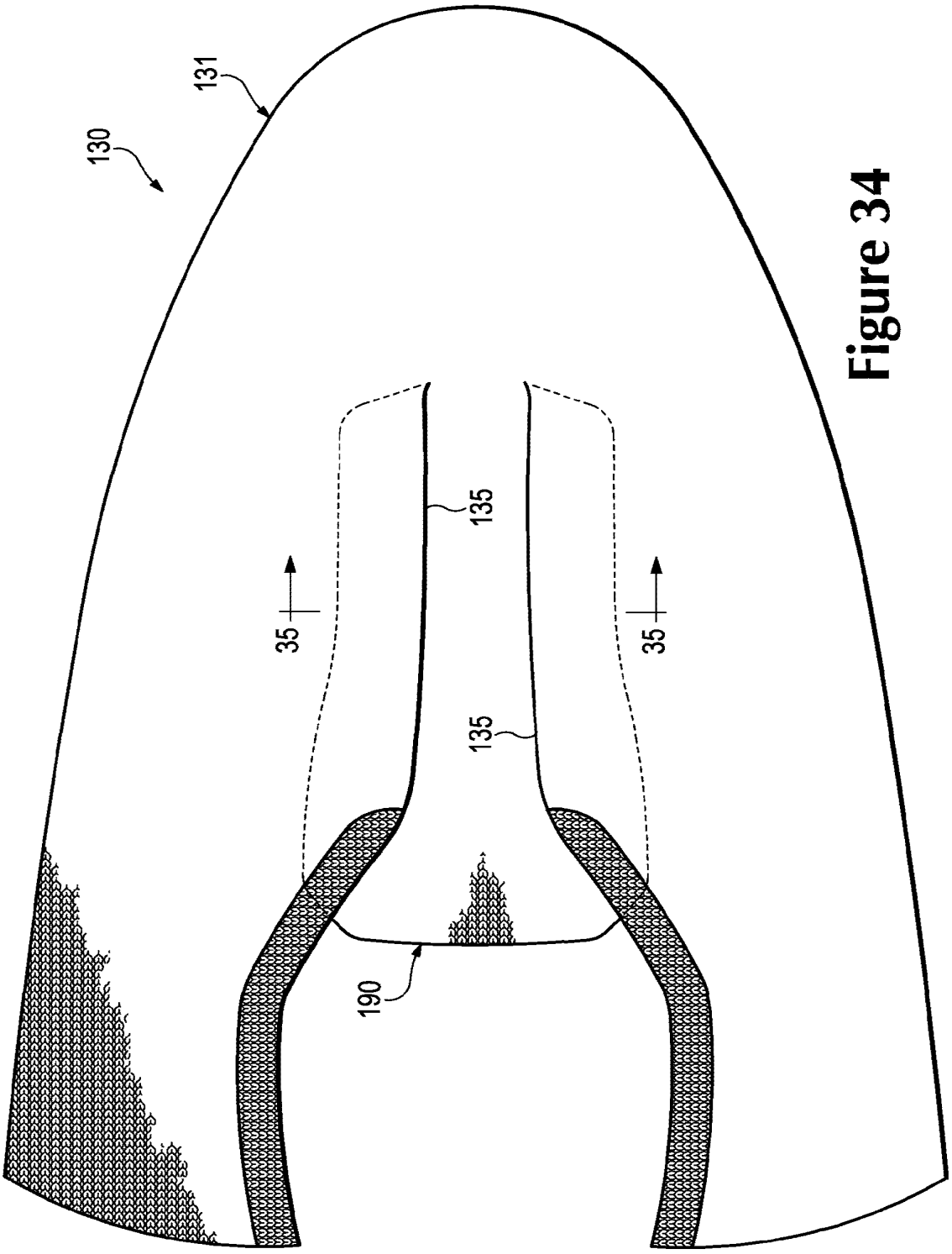

Figure 34

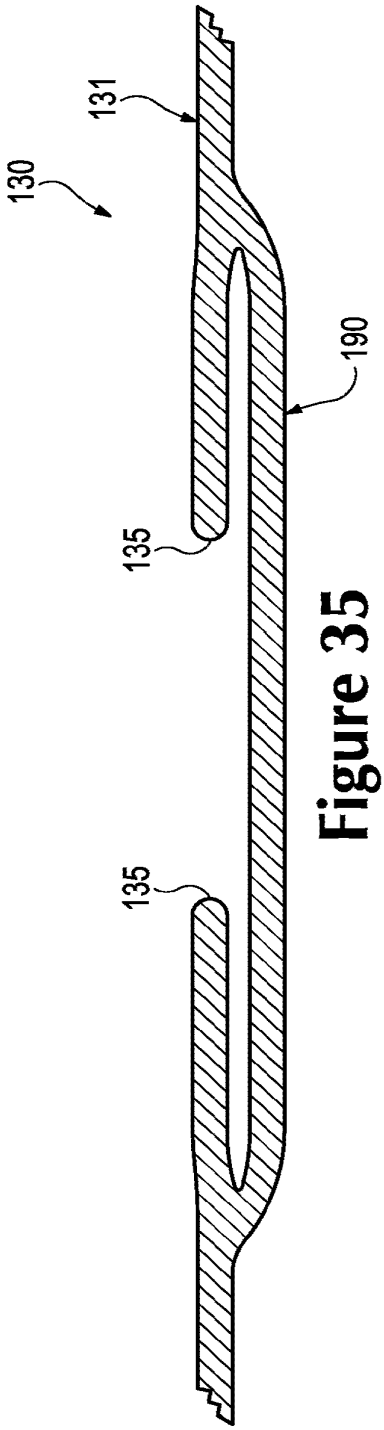

Figure 35

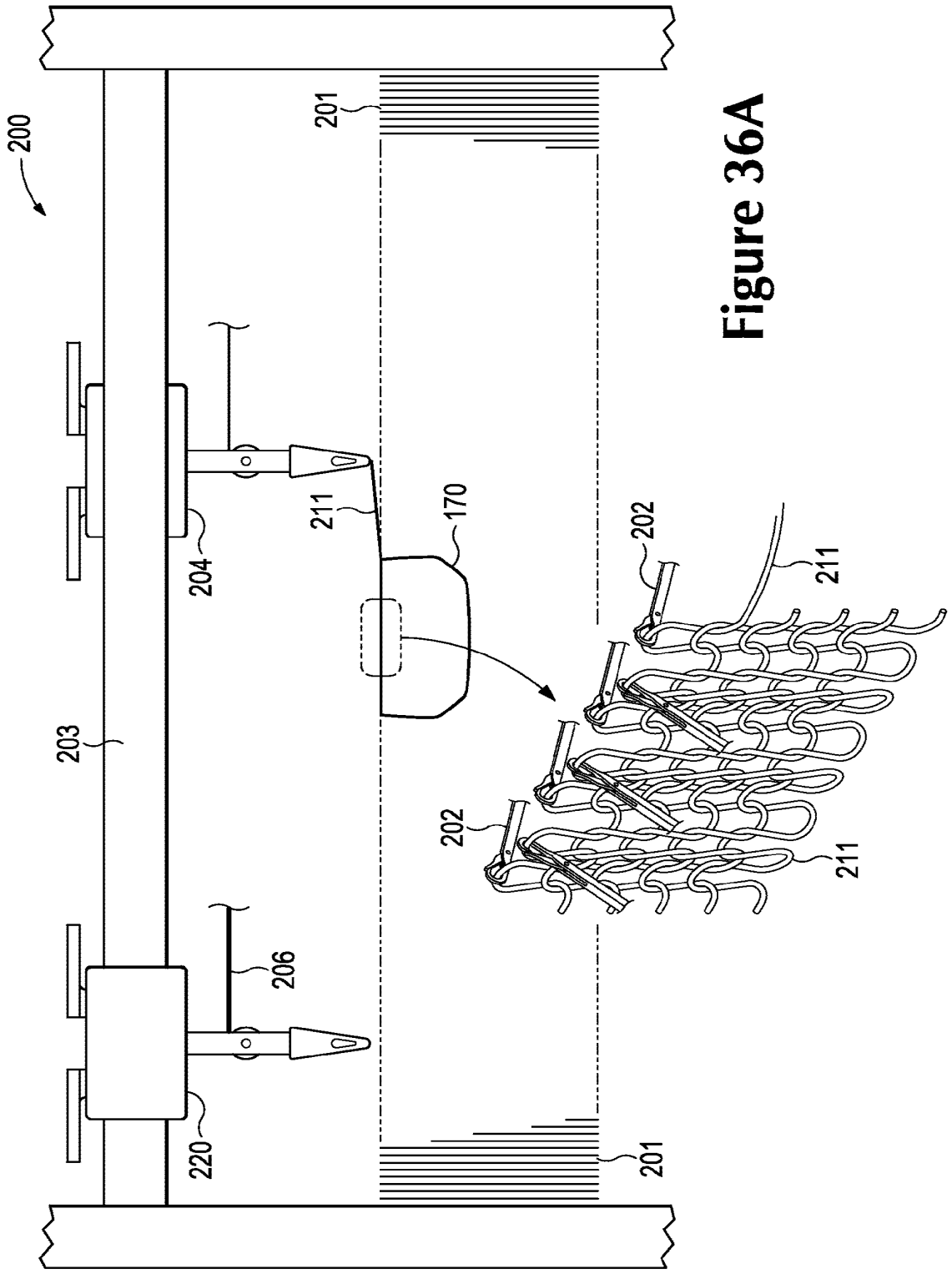

Figure 36A

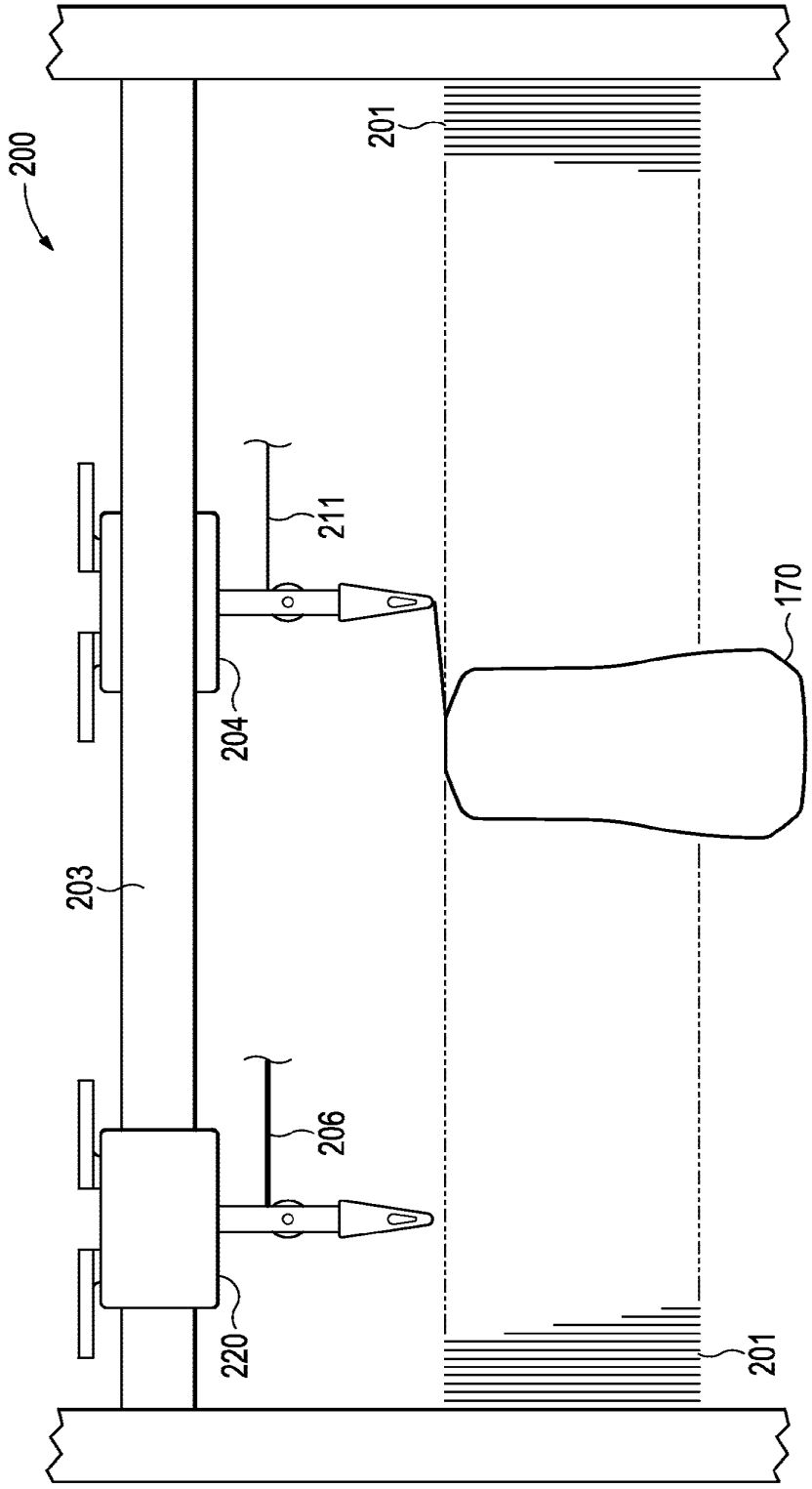

Figure 36B

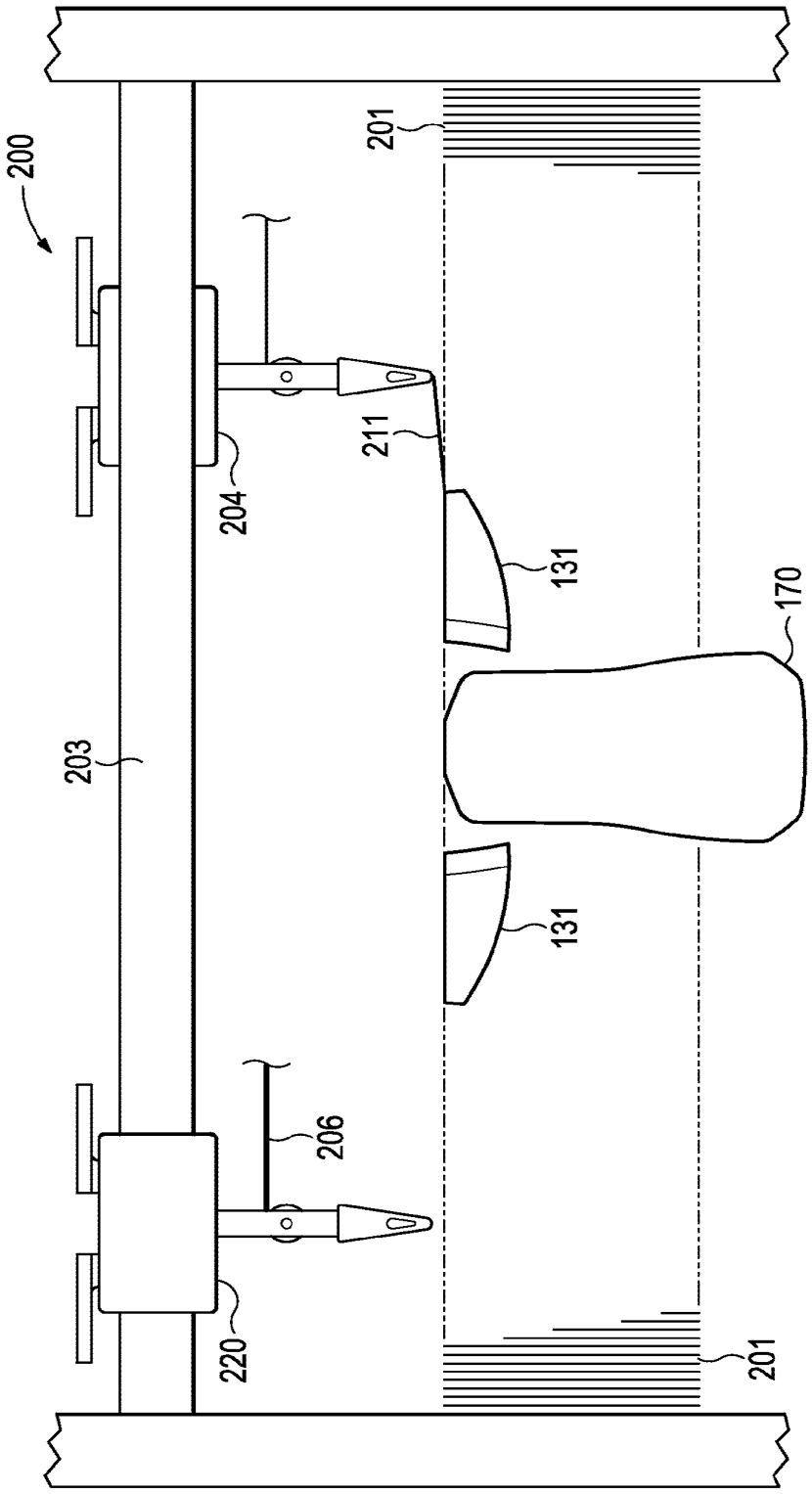

Figure 36C

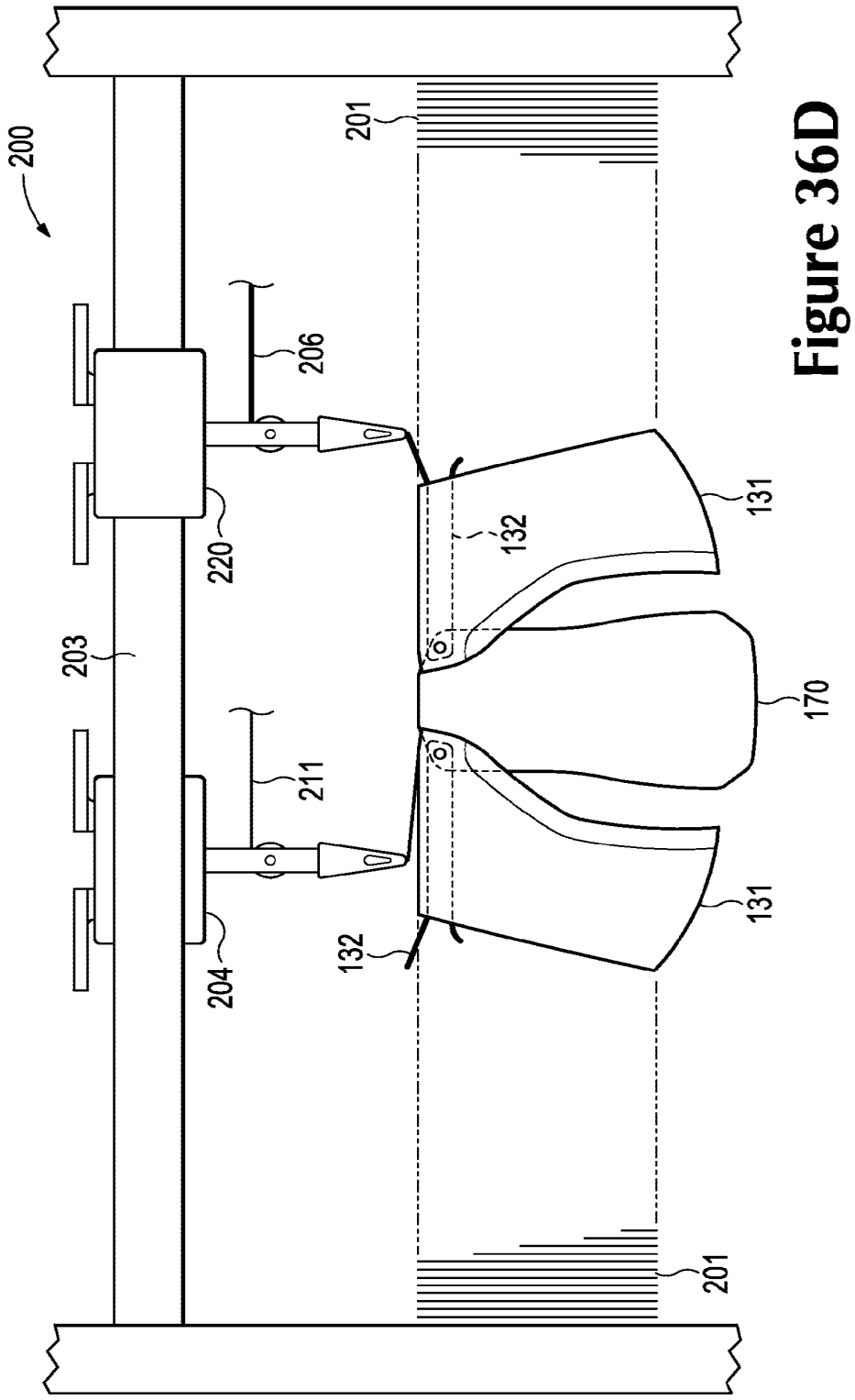

Figure 36D

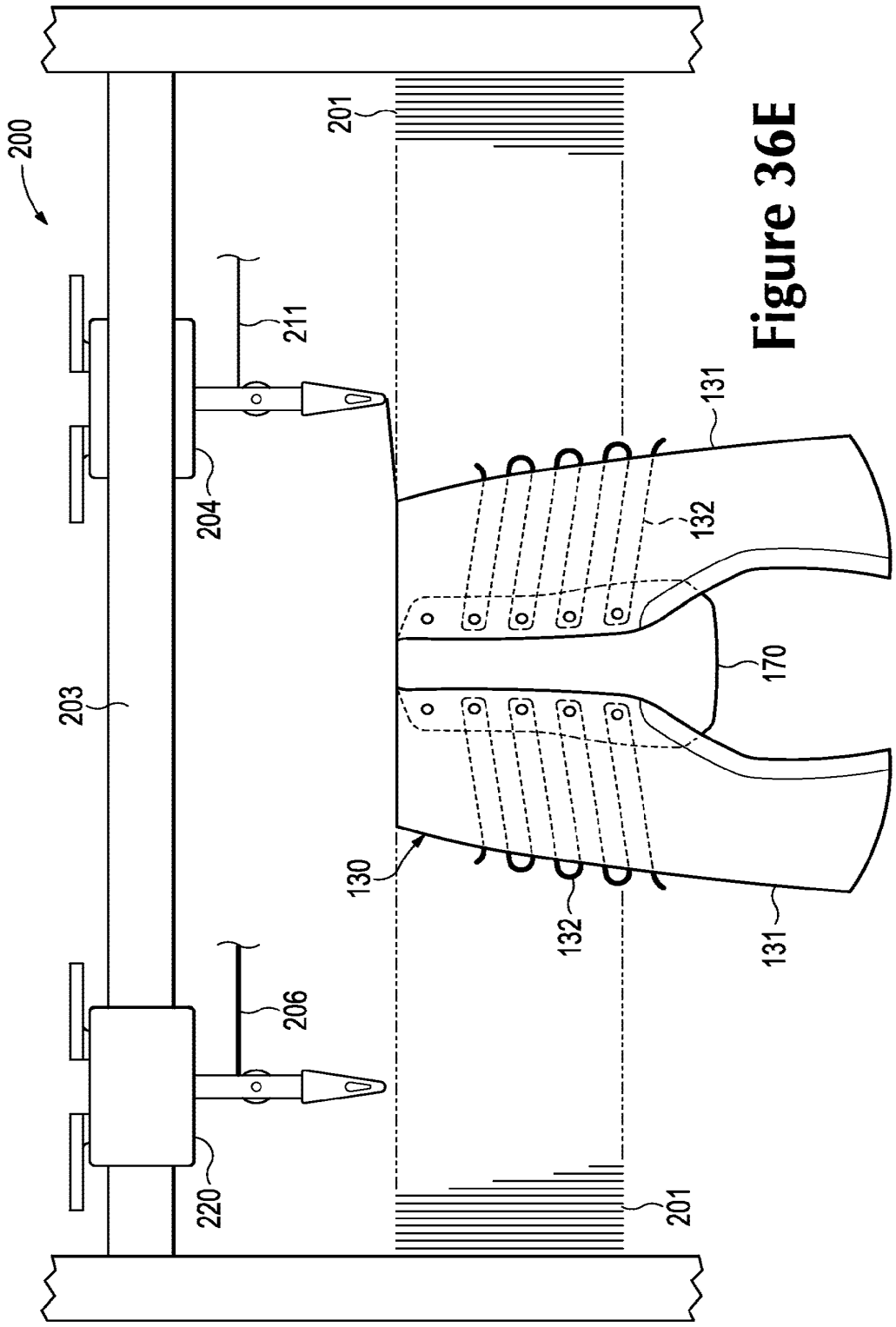

Figure 36E

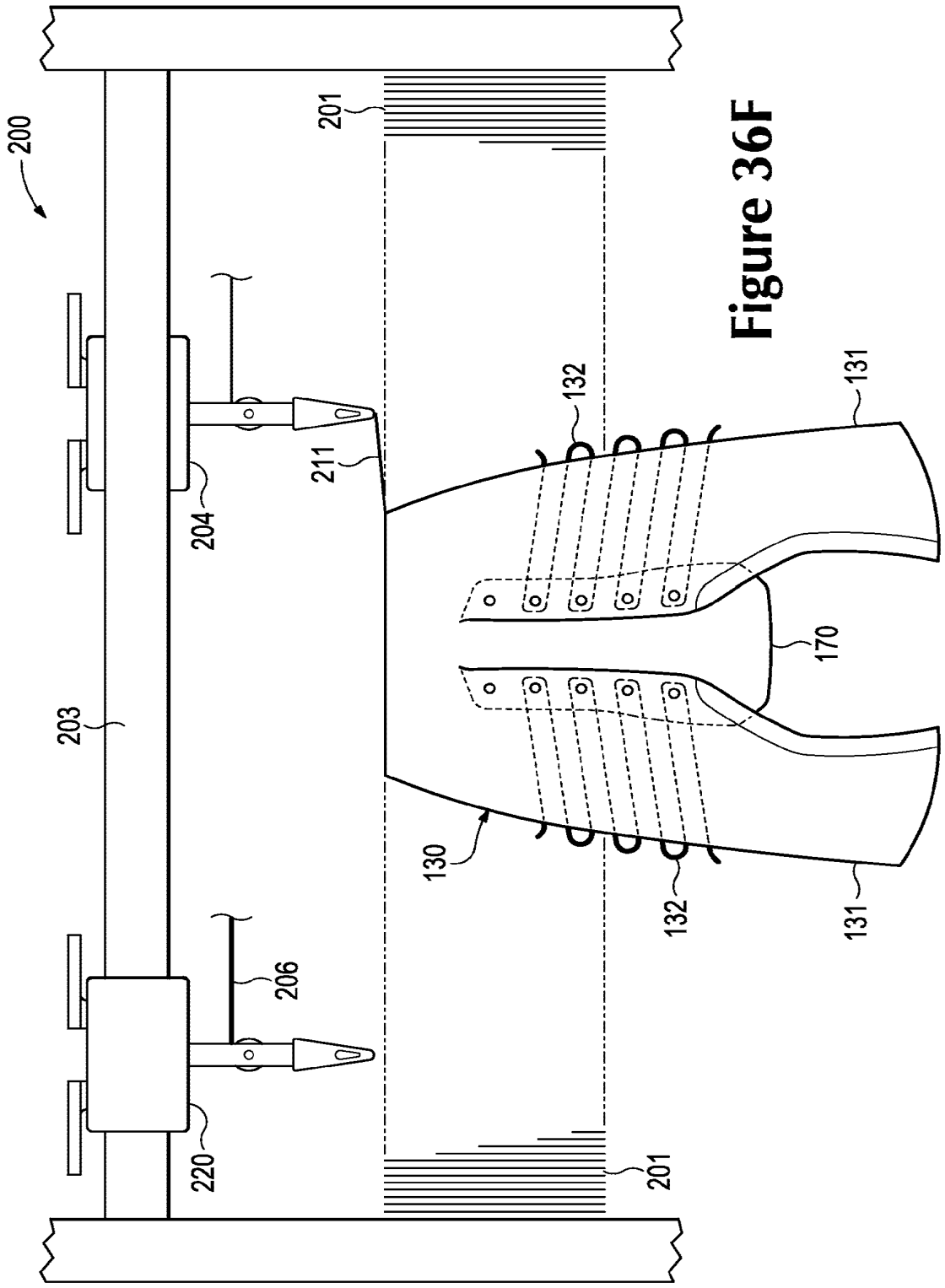

Figure 36F

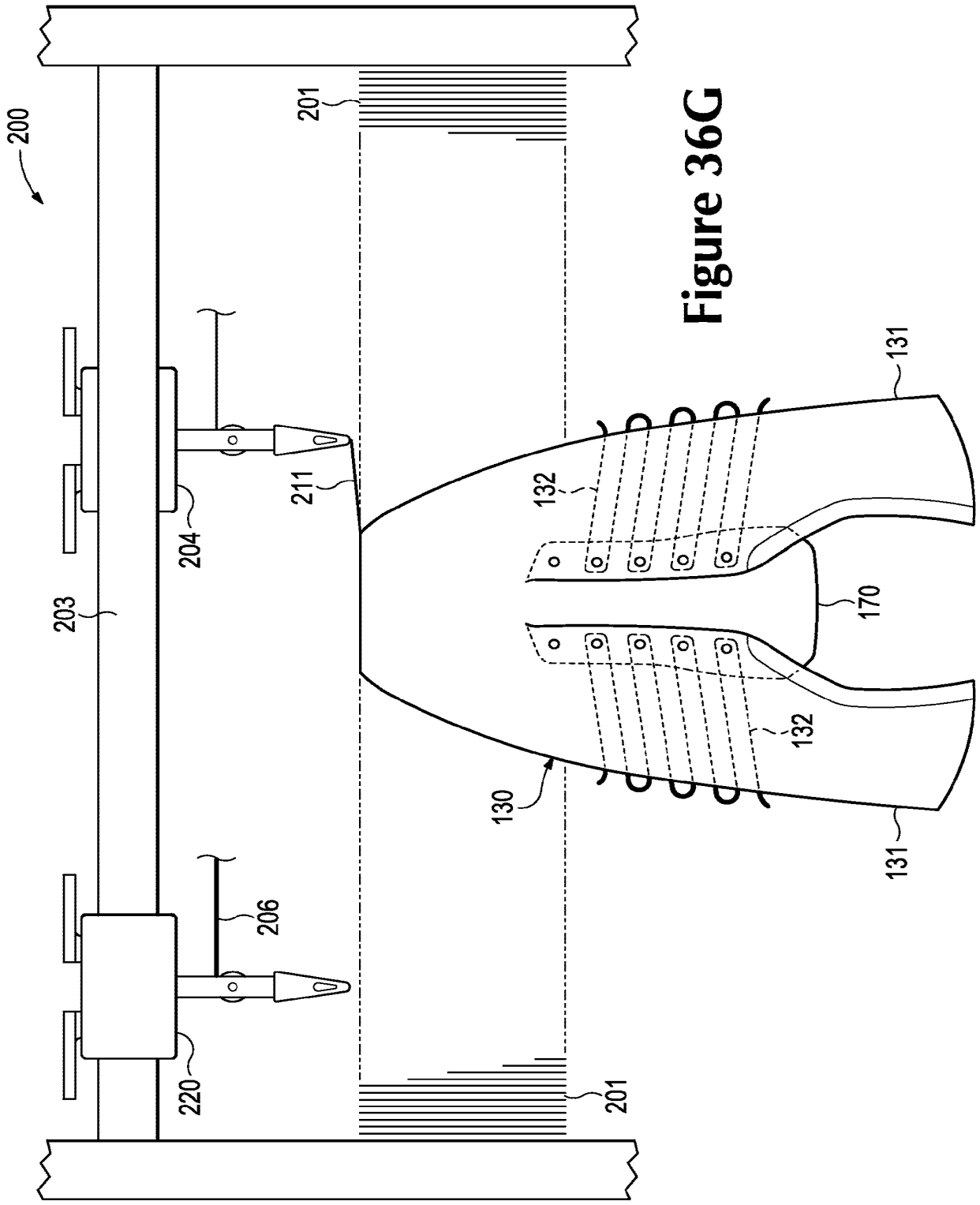

Figure 36G

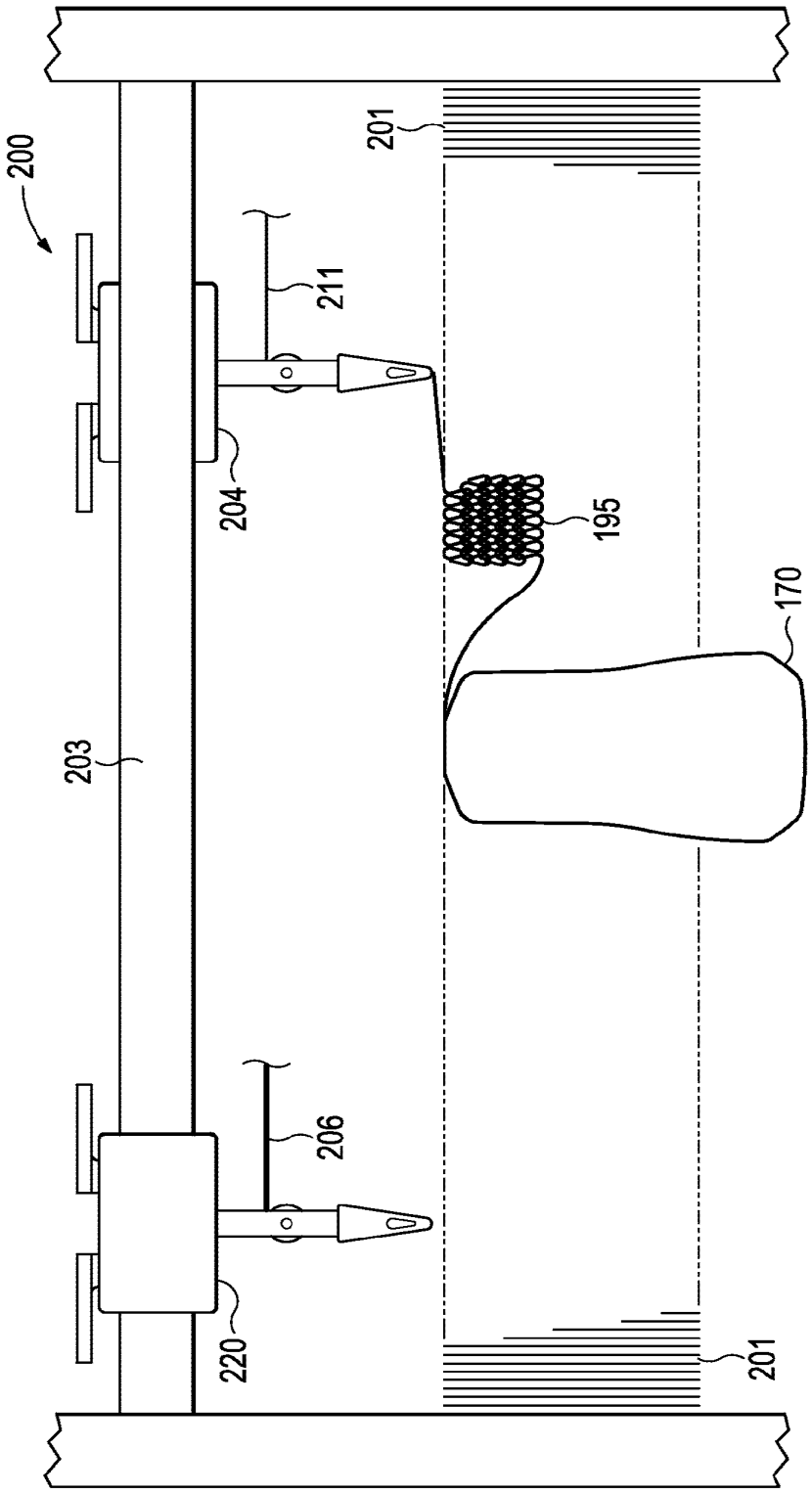

Figure 37

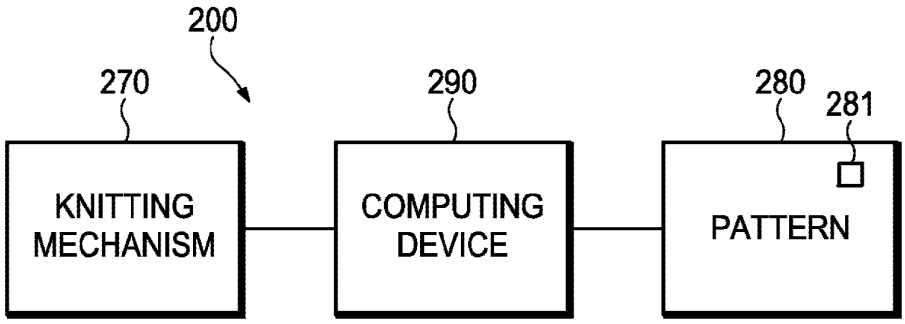
200
270
290
280
281
KNITTING MECHANISM
COMPUTING DEVICE
PATTERN

Figure 38

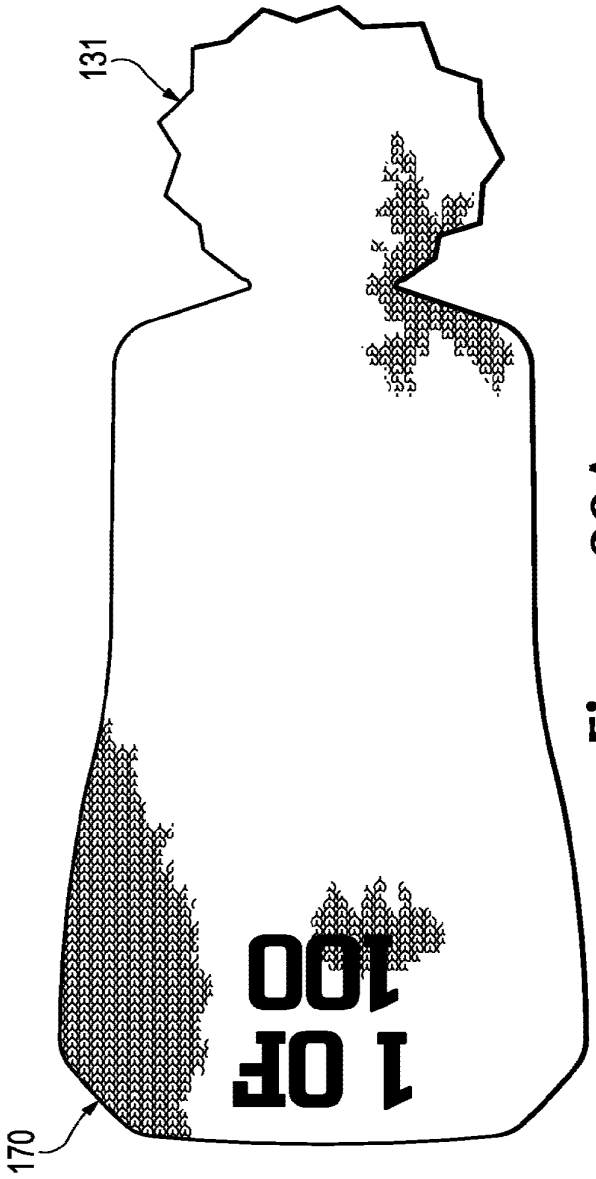

Figure 39A

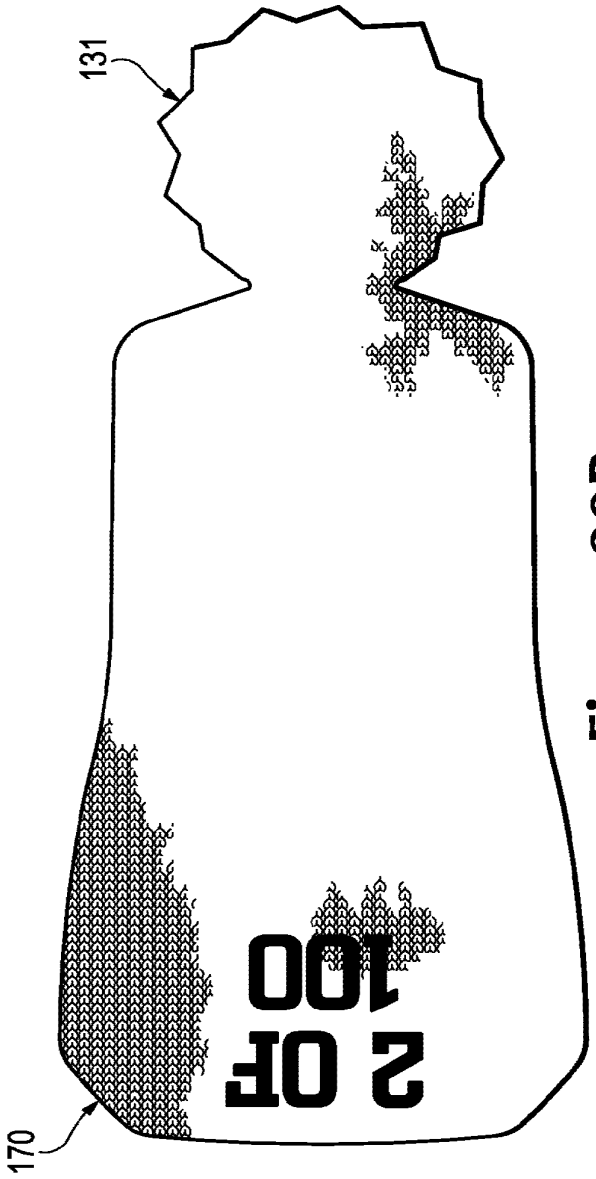

Figure 39B

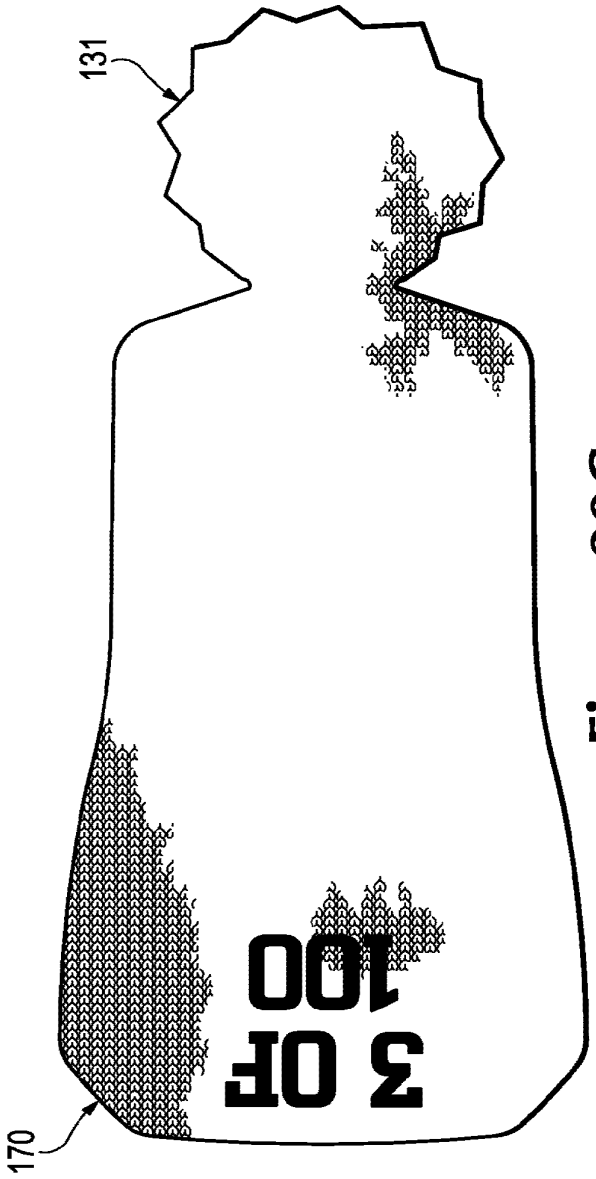

Figure 39C

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To:
Gibson, Eric M.
PLUMSEA LAW GROUP, LLC
10411 Motor City Drive, Suite 320
Bethesda, MD 20817
ETATS-UNIS D'AMERIQUE

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference 51-3930	Date of mailing *(day/month/year)* 30 July 2014 (30-07-2014)
International application No. PCT/US2014/018845	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
Applicant NIKE INTERNATIONAL LTD	International filing date *(day/month/year)* 27 February 2014 (27-02-2014)

1. [X] The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the International Search Report.

   How? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Fascimile No.: (41-22) 338.82.70

   For more detailed instructions, see *PCT Applicant's Guide,* International Phase, paragraphs 9.004 - 9.011.

2. [ ] The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. [ ] **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   [ ] the protest together with the decision thereon has been transmitted to the International Bureau together with any applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

   [ ] no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may **submit comments on an informal basis on the written opinion of the International Searching Authority** to the International Bureau. These comments will be made available to the public after international publication. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established.

   Shortly after the expiration of **18 months from the priority date, the international application will be published** by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for **entry into the national phase** before those designated Offices. In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

   Within **19 months from the priority date, the applicant may request that a supplementary international search be carried out** by a different International Searching Authority that offers this service (Rule 45*bis*.1). The procedure for requesting supplementary international search is described in the *PCT Applicant's Guide,* International Phase, paragraphs 8.006-8.032.

Name and mailing address of the International Searching Authority	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040 Fax: (+31-70) 340-3016	DE BRUIJN, John Tel: +31 (0)70 340-3077

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
51-3930		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2014/018845	27 February 2014 (27-02-2014)	28 February 2013 (28-02-2013)
Applicant		
NIKE INTERNATIONAL LTD.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 5 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the **language**, the international search was carried out on the basis of:
      [X] the international application in the language in which it was filed
      [ ] a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
   b. [ ] This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).
   c. [ ] With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. [X] **Certain claims were found unsearchable** (See Box No. II)

3. [ ] **Unity of invention is lacking** (see Box No III)

4. With regard to the **title,**
   [X] the text is approved as submitted by the applicant
   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**
   [X] the text is approved as submitted by the applicant
   [ ] the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings,**
   a. the figure of the **drawings** to be published with the abstract is Figure No. 1
      [X] as suggested by the applicant
      [ ] as selected by this Authority, because the applicant failed to suggest a figure
      [ ] as selected by this Authority, because this figure better characterizes the invention
   b. [ ] none of the figures is to be published with the abstract

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2014/018845

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 21-27
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2014/018845

A. CLASSIFICATION OF SUBJECT MATTER
INV. A43B1/04 A43B23/04 A43B23/26
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A43B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/115284 A1 (DUA BHUPESH [US]) 2 June 2005 (2005-06-02) the whole document	1-4, 8-10, 13-16, 19,20
X	US 1 888 172 A (JOHA ELMER N) 15 November 1932 (1932-11-15) the whole document	1-3,7, 13-15,18
X,P	WO 2013/126313 A2 (NIKE INTERNATIONAL LTD; TATLER DAREN P [US]; PODHAJNY DANIEL A [US]) 29 August 2013 (2013-08-29) paragraph [0137] - paragraph [0162]; figures 25-39	1-8,10, 11,13-19

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23 July 2014	30/07/2014

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Millward, Richard

1

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2014/018845

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005115284 A1	02-06-2005	US 6931762 B1	23-08-2005
		US 2005115284 A1	02-06-2005
		US 2006130359 A1	22-06-2006
US 1888172 A	15-11-1932	NONE	
WO 2013126313 A2	29-08-2013	TW 201402030 A	16-01-2014
		US 8448474 B1	28-05-2013
		US 2013212907 A1	22-08-2013
		US 2014144190 A1	29-05-2014
		US 2014150296 A1	05-06-2014
		WO 2013126313 A2	29-08-2013

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 21-27

The present application contains 27 claims, of which claims 1,13 and 21 are independent product claims. There is no clear distinction between the independent claims because of overlapping scope. There are so many independent claims, and they are drafted in such a way that the claims as a whole are not in compliance with the provisions of clarity and conciseness of Article 6 PCT, as it is particularly burdensome for a skilled person to establish the subject-matter for which protection is sought. The non-compliance with the substantive provisions is to such an extent, that the search was performed taking into consideration the non-compliance in determining the extent of the search (PCT Guidelines 9.19 and 9.25).

The search was based on the subject-matter that, as far as can be understood, could reasonably be expected to be claimed later in the procedure, and the corresponding claims, namely claims 1 and 13.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guidelines C-IV, 7.2), should the problems which led to the Article 17(2) declaration be overcome.

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2014/018845	27.02.2014	28.02.2013

International Patent Classification (IPC) or both national classification and IPC
INV. A43B1/04 A43B23/04 A43B23/26

Applicant
NIKE INTERNATIONAL LTD.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	Millward, Richard Telephone No. +31 70 340-3345

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. II Priority

1. ☒ The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43*bis*.1 and 64.1) is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of

☐ the entire international application

☒ claims Nos. 21-27

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international search *(specify)*:

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed *(specify)*:

☒ no international search report has been established for the whole application or for said claims Nos. 21-27

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

- ☐ furnish a sequence listing on paper complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in a form and manner acceptable to it.
- ☐ furnish a sequence listing in electronic form complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in a form and manner acceptable to it.
- ☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rules 13*ter*.1(a) or (b).

☒ See Supplemental Box for further details

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	5, 6, 11, 12, 17
	No:	Claims	1-4, 7-10, 13-16, 18-20
Inventive step (IS)	Yes:	Claims	5, 6, 11, 12, 17
	No:	Claims	1-4, 7-10, 13-16, 18-20
Industrial applicability (IA)	Yes:	Claims	1-20
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rules 43*bis*.1 and 70.10)

and / or

2. Non-written disclosures (Rules 43*bis*.1 and 70.9)

see form 210

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1 The present application contains 27 claims, of which claims 1,13 and 21 are independent product claims. There is no clear distinction between the independent claims because of overlapping scope. There are so many independent claims, and they are drafted in such a way that the claims as a whole are not in compliance with the provisions of clarity and conciseness of Article 6 PCT, as it is particularly burdensome for a skilled person to establish the subject-matter for which protection is sought.

1.1 The non-compliance with the substantive provisions is to such an extent, that the search was performed taking into consideration the non-compliance in determining the extent of the search (PCT Guidelines 9.19 and 9.25).

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

2 Reference is made to the following documents:

D1 US 2005/115284 A1 (DUA BHUPESH [US]) 2 June 2005 (2005-06-02)

D2 US 1 888 172 A (JOHA ELMER N) 15 November 1932 (1932-11-15)

3 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

3.1 The document D1 discloses:

An article of footwear (10; figure 1; paragraph 0020) having

an upper (30) and a sole structure (20) secured to the upper,

the article of footwear (10) incorporating a knitted component (paragraphs 0023-0031)

comprising: a portion of the knitted component defining the upper (30), the upper including a portion of at least one of an exterior surface of the knitted component and an opposite interior surface of the knitted component, the interior surface defining a void for receiving a foot (figures 1 and 3); and

an integral knit tongue (33) formed of unitary knit construction with the upper and extending through a throat area of the knitted component; and
wherein the integral knit tongue (33) is joined to a forward portion of the throat area and at least along a portion of a lateral side and a medial side of the throat area of the knitted component extending from the forward portion to an ankle opening of the upper (figures 1 and 3).

3.1.1 Therefore, the subject-matter of claim 1 is not new (Article 33(2) PCT).

3.2 The same objection applies *mutatis mutandis* to the subject-matter of claim 13, which is also consequently, not new (Article 33(2)PCT)

4 Regarding the dependent claims:

4.1 Dependent claims 2-4,7-10,14-16 and 18-20 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/ or inventive step, since those features are known from either or both of D1 and D2 (see the search report for indication).

4.2 The combination of the features of dependent claims 5,6,11,12 and 17 is neither known from, nor rendered obvious by, the available prior art. There would be no motivation, based on the teachings of the currently available prior art, for the skilled man to modify the shoes/knitted components of D1 or D2 such as to arrive at any of the said claims.

Re Item VI

Certain documents cited

Application No Patent No	Publication date *(day/month/year)*	Filing date *(day/month/year)*	Priority date *(valid claim)* *(day/month/year)*
WO2013/126313	29/08/2013	19/02/2013	20/02/2012

5 The current assessment is based on the assumption that all claims enjoy priority rights from the filing date of the priority document. If it later turns out that this is not correct, the document listed above could become relevant.

Re Item VII

Certain defects in the international application

6 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in D1 or D2 is not mentioned in the description, nor are these documents identified therein.

7 Independent claims 1 and 13 are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

8 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

9 Claim 1 has all the features of claim 13, and is therefore not appropriately formulated as a claim dependent on the latter (Rule 6.4 PCT).

Electronic Acknowledgement Receipt

EFS ID:	19838915
Application Number:	13781551
International Application Number:	
Confirmation Number:	8567
Title of Invention:	Method Of Knitting A Knitted Component With An Integral Knit Tongue
First Named Inventor/Applicant Name:	Adrian Meir
Customer Number:	57618
Filer:	Eric M. Gibson/Jose Espejo
Filer Authorized By:	Eric M. Gibson
Attorney Docket Number:	51-3238
Receipt Date:	12-AUG-2014
Filing Date:	28-FEB-2013
Time Stamp:	11:54:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	2014-08-12_51-3238_IDS.pdf	28774 188aae47fd617d06e5558ce28bb757cbbcc41d94	no	3

Warnings:	
Information:	

This is not an USPTO supplied IDS fillable form					
2	Foreign Reference	2014-08-12_51-3238_IDS_WO2013126313A2.pdf	4331204 42660954ecf0b1a254ae72babc4f8ab7e5fe493f	no	125
Warnings:					
Information:					
3	Non Patent Literature	2014-08-12_51-3238_IDS_ISR.pdf	756381 740cacee55922f1e00f1ce16a803b0707f49cc4a	no	13
Warnings:					
Information:					
		Total Files Size (in bytes):	5116359		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13781551
Filing Date	2013-02-28
First Named Inventor	Adrian Meir
Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3238

U.S.PATENTS

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					

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U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13781551
	Filing Date	2013-02-28
	First Named Inventor	Adrian Meir
	Art Unit	3765
	Examiner Name	Larry D. Worrell Jr.
	Attorney Docket Number	51-3238

	1	Letter from Bruce Huffa dated December 23, 2013 (71 Pages).	☐

If you wish to add additional non-patent literature document citation information please click the Add button

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	13781551
	Filing Date	2013-02-28
	First Named Inventor	Adrian Meir
	Art Unit	3765
	Examiner Name	Larry D. Worrell Jr.
	Attorney Docket Number	51-3238

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	/Eric M. Gibson/	Date (YYYY-MM-DD)	2014-08-01
Name/Print	Eric M. Gibson	Registration Number	59,058

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.**

Electronic Acknowledgement Receipt

EFS ID:	19753825
Application Number:	13781551
International Application Number:	
Confirmation Number:	8567
Title of Invention:	Method Of Knitting A Knitted Component With An Integral Knit Tongue
First Named Inventor/Applicant Name:	Adrian Meir
Customer Number:	57618
Filer:	Eric M. Gibson/Jose Espejo
Filer Authorized By:	Eric M. Gibson
Attorney Docket Number:	51-3238
Receipt Date:	01-AUG-2014
Filing Date:	28-FEB-2013
Time Stamp:	14:42:26
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	2014-08-01_51-3238_IDS_Cover_letter.pdf	55197 cfef173470c58e48045bfa12ff3ad53af250c4c5	no	1

Warnings:

Information:

2	Information Disclosure Statement (IDS) Form (SB08)	2014-08-01_51-3238_IDS.pdf	28557 02ead0a282278f6ecc2a444db5ca001c09a4405f	no	3
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	Non Patent Literature	2014-08-01_51-3238_IDS_Bruce_Huffa_Letter.pdf	5045650 e1f5ee583cd35bb1d8a3222aa266883f026b0079	no	71
Warnings:					
Information:					
		Total Files Size (in bytes):	5129404		

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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

Appln. No.	:	13/781,551	Confirmation No. 8567
Applicant	:	Adrian Meir	
Filed	:	February 28, 2013	
Title	:	Method Of Knitting A Knitted Component With An Integral Knit Tongue	
TC/A.U.	:	3765	
Examiner	:	Larry D. Worrell Jr.	
Attorney Docket No.:		51-3238	
Customer No.	:	57618	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT
UNDER 37 C.F.R. § 1.97(b)

Dear Sir:

Submitted herewith are three (3) sheets of Form PTO/SB/08a, listing one (1) non-patent literature document. A copy of the non-patent literature document is submitted herewith.

Applicant's representatives have received the Non-Patent Literature Document listed on the accompanying Information Disclosure Statement. The document is being supplied so that the Examiner may evaluate and consider its relevance to the claimed invention. Submission of this document does not constitute any acknowledgement, admission, or endorsement of the allegations and statements contained therein.

Respectfully submitted,

PLUMSEA LAW GROUP, LLC

Date: August 1, 2014

By: /Eric M. Gibson/
Eric M. Gibson
Registration Number: 59,058
Telephone number: 301-365-9040

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13781551
Filing Date	2013-02-28
First Named Inventor	Adrian Meir
Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3238

U.S.PATENTS

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					

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U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050193592		2005-09-08	Dua et al.	
	2	20050115284		2005-06-02	Dua	
	3	20040118018		2004-06-24	Dua	

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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2013126313	WO		2013-08-29	NIKE INTERNATIONAL LTD		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	13781551
	Filing Date	2013-02-28
	First Named Inventor	Adrian Meir
	Art Unit	3765
	Examiner Name	Larry D. Worrell Jr.
	Attorney Docket Number	51-3238

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	International Search Report and Written Opinion mailed June 20, 2014 in International Application Number PCT/US2014/018852.	☐

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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	13781551
Filing Date	2013-02-28
First Named Inventor	Adrian Meir
Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3238

CERTIFICATION STATEMENT

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☐ 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	/Eric M. Gibson/	Date (YYYY-MM-DD)	2014-07-07
Name/Print	Eric M. Gibson	Registration Number	59,058

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.**

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
29 August 2013 (29.08.2013)

WIPO | PCT

(10) International Publication Number
WO 2013/126313 A2

(51) International Patent Classification:
D04B 7/04 (2006.01)

(21) International Application Number:
PCT/US2013/026618

(22) International Filing Date:
19 February 2013 (19.02.2013)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
13/400,511 20 February 2012 (20.02.2012) US

(71) Applicant *(for all designated States except US)*: **NIKE INTERNATIONAL LTD.**; One Bowerman Drive, Beaverton, OR 97005-6453 (US).

(72) Inventors; and

(71) Applicants *(for US only)*: **TATLER, Daren, P.** [GB/US]; C/o Nike, Inc., One Bowerman Drive, Beaverton, OR 97005-6453 (US). **PODHAJNY, Daniel, A.** [UY/US]; C/o Nike, Inc., One Bowerman Drive, Beaverton, OR 97005-6453 (US).

(74) Agents: **GIBSON, Eric, M.** et al.; Plumsea Law Group, LLC, 10411 Motor City Drive, Suite 320, Bethesda, MD 20817 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ,

[Continued on next page]

(54) Title: ARTICLE OF FOOTWEAR INCORPORATING A KNITTED COMPONENT WITH A TONGUE

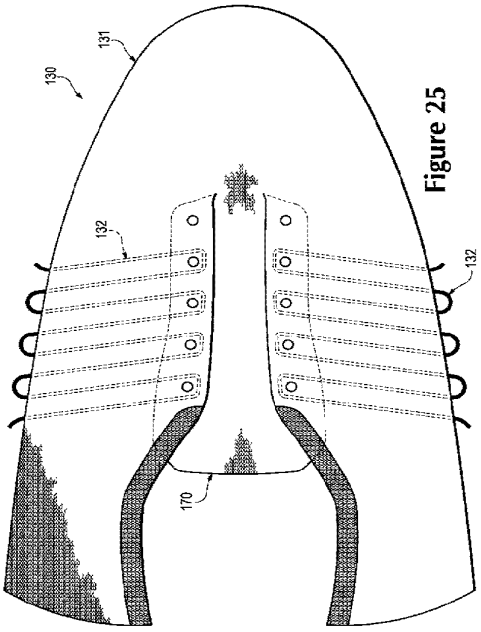


Figure 25

(57) Abstract: Articles of footwear may have an upper that includes a knit element and a tongue. The knit element defines a portion of an exterior surface and an opposite interior surface of the upper, with the interior surface defining a void for receiving a foot. The tongue is formed of unitary knit construction with the knit element and extends through a throat area of the upper. Methods of manufacturing a knitted component for an article of footwear may include knitting a tongue. The tongue is held on needles of a knitting machine. A first portion of a knit element is formed with the knitting machine while the tongue is held on the needles. The tongue is then joined to the first portion of the knit element. Additionally, a second portion of the knit element is formed with the knitting machine.

WO 2013/126313 A2

UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*

ARTICLE OF FOOTWEAR INCORPORATING A KNITTED COMPONENT WITH A TONGUE

BACKGROUND

[01] Conventional articles of footwear generally include two primary elements, an upper and a sole structure. The upper is secured to the sole structure and forms a void on the interior of the footwear for comfortably and securely receiving a foot. The sole structure is secured to a lower area of the upper, thereby being positioned between the upper and the ground. In athletic footwear, for example, the sole structure may include a midsole and an outsole. The midsole often includes a polymer foam material that attenuates ground reaction forces to lessen stresses upon the foot and leg during walking, running, and other ambulatory activities. Additionally, the midsole may include fluid-filled chambers, plates, moderators, or other elements that further attenuate forces, enhance stability, or influence the motions of the foot. The outsole is secured to a lower surface of the midsole and provides a ground-engaging portion of the sole structure formed from a durable and wear-resistant material, such as rubber. The sole structure may also include a sockliner positioned within the void and proximal a lower surface of the foot to enhance footwear comfort.

[02] The upper generally extends over the instep and toe areas of the foot, along the medial and lateral sides of the foot, under the foot, and around the heel area of the foot. In some articles of footwear, such as basketball footwear and boots, the upper may extend upward and around the ankle to provide support or protection for the ankle. Access to the void on the interior of the upper is generally provided by an ankle opening in a heel region of the footwear. A lacing system is often incorporated into the upper to adjust the fit of the upper, thereby permitting entry and removal of the foot from the void within the upper. The lacing system also

permits the wearer to modify certain dimensions of the upper, particularly girth, to accommodate feet with varying dimensions. In addition, the upper may include a tongue that extends under the lacing system to enhance adjustability of the footwear, and the upper may incorporate a heel counter to limit movement of the heel.

[03] A variety of material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) are conventionally utilized in manufacturing the upper. In athletic footwear, for example, the upper may have multiple layers that each include a variety of joined material elements. As examples, the material elements may be selected to impart stretch-resistance, wear-resistance, flexibility, air-permeability, compressibility, comfort, and moisture-wicking to different areas of the upper. In order to impart the different properties to different areas of the upper, material elements are often cut to desired shapes and then joined together, usually with stitching or adhesive bonding. Moreover, the material elements are often joined in a layered configuration to impart multiple properties to the same areas. As the number and type of material elements incorporated into the upper increases, the time and expense associated with transporting, stocking, cutting, and joining the material elements may also increase. Waste material from cutting and stitching processes also accumulates to a greater degree as the number and type of material elements incorporated into the upper increases. Moreover, uppers with a greater number of material elements may be more difficult to recycle than uppers formed from fewer types and numbers of material elements. By decreasing the number of material elements utilized in the upper, therefore, waste may be decreased while increasing the manufacturing efficiency and recyclability of the upper.

SUMMARY

[04] Various configurations of an article of footwear may have an upper and a sole structure secured to the upper. The upper includes a knit element and a tongue. The knit element defines a portion of an exterior surface of the upper and an opposite interior surface of the upper, with the interior surface defining a void for receiving a foot. The tongue is formed of unitary knit construction with the knit element and extends through a throat area of the upper.

[05] Methods of manufacturing a knitted component for an article of footwear may include knitting a tongue with a knitting machine. The tongue is held on needles of the knitting machine. A first portion of a knit element is formed with the knitting machine while the tongue is held on the needles. The tongue is then joined to the first portion of the knit element. Additionally, a second portion of the knit element is formed with the knitting machine.

[06] Methods of knitting may also include providing a knitting pattern with a modifiable field. The modifiable field is updated with data representing a first alphanumeric character. A first component with a knit structure of the first alphanumeric character is formed. The modifiable field is updated with data representing a second alphanumeric character, the second alphanumeric character being different than the first alphanumeric character. Additionally, a second component with a knit structure of the second alphanumeric character is formed.

[07] The advantages and features of novelty characterizing aspects of the invention are pointed out with particularity in the appended claims. To gain an improved understanding of the advantages and features of novelty, however, reference may be made to the following descriptive matter and accompanying figures that describe and illustrate various configurations and concepts related to the invention.

FIGURE DESCRIPTIONS

[08] The foregoing Summary and the following Detailed Description will be better understood when read in conjunction with the accompanying figures.

[09] Figure 1 is a perspective view of an article of footwear.

[10] Figure 2 is a lateral side elevational view of the article of footwear.

[11] Figure 3 is a medial side elevational view of the article of footwear.

[12] Figures 4A-4C are cross-sectional views of the article of footwear, as defined by section lines 4A-4C in Figures 2 and 3.

[13] Figure 5 is a top plan view of a first knitted component that forms a portion of an upper of the article of footwear.

[14] Figure 6 is a bottom plan view of the first knitted component.

[15] Figures 7A-7E are cross-sectional views of the first knitted component, as defined by section lines 7A-7E in Figure 5.

[16] Figures 8A and 8B are plan views showing knit structures of the first knitted component.

[17] Figure 9 is a top plan view of a second knitted component that may form a portion of the upper of the article of footwear.

[18] Figure 10 is a bottom plan view of the second knitted component.

[19] Figure 11 is a schematic top plan view of the second knitted component showing knit zones.

[20] Figures 12A-12E are cross-sectional views of the second knitted component, as defined by section lines 12A-12E in Figure 9.

[21] Figures 13A-13H are loop diagrams of the knit zones.

[22] Figures 14A-14C are top plan views corresponding with Figure 5 and depicting further configurations of the first knitted component.

[23] Figure 15 is a perspective view of a knitting machine.

[24] Figures 16-18 are elevational views of a combination feeder from the knitting machine.

[25] Figure 19 is an elevational view corresponding with Figure 16 and showing internal components of the combination feeder.

[26] Figures 20A-20C are elevational views corresponding with Figure 19 and showing the operation of the combination feeder.

[27] Figures 21A-21I are schematic perspective views of a knitting process utilizing the combination feeder and a conventional feeder.

[28] Figures 22A-22C are schematic cross-sectional views of the knitting process showing positions of the combination feeder and the conventional feeder.

[29] Figure 23 is a schematic perspective view showing another aspect of the knitting process.

[30] Figure 24 is a perspective view of another configuration of the knitting machine.

[31] Figure 25 is a top plan view of the first knitted component with a first knitted tongue.

[32] Figure 26 is a partial top plan view of the first knitted component with the first knitted tongue.

[33] Figure 27 is a cross-sectional view of the first knitted tongue, as defined by section line 27 in Figure 26.

[34] Figure 28 is a top plan view of the second knitted component with a second knitted tongue.

[35] Figure 29 is a partial top plan view of the second knitted component with the second knitted tongue.

[36] Figure 30 is a cross-sectional view of the second knitted tongue, as defined by section line 30 in Figure 29.

[37] Figure 31 is a top plan view of a third knitted component with a third knitted tongue.

[38] Figure 32 is a partial top plan view of the third knitted component with the third knitted tongue.

[39] Figure 33 is a cross-sectional view of the third knitted tongue, as defined by section line 33 in Figure 32.

[40] Figure 34 is a top plan view of a fourth knitted component with a fourth knitted tongue.

[41] Figure 35 is a cross-sectional view of the fourth knitted component and fourth knitted tongue, as defined by section line 35 in Figure 34.

[42] Figures 36A-36G are schematic elevational views of a knitting process for forming the first knitted component with the first knitted tongue.

[43] Figure 37 is a schematic elevational view depicting a further example step of the knitting process.

[44] Figure 38 is a schematic block diagram of the knitting machine.

[45] Figures 39A-39C are partial top plan views corresponding with Figure 26 and depicting sequential variations in the first knitted tongue.

DETAILED DESCRIPTION

[46] The following discussion and accompanying figures disclose a variety of concepts relating to knitted components and the manufacture of knitted components. Although the knitted components may be utilized in a variety of products, an article of footwear that incorporates one of the knitted components is disclosed below as an example. In addition to footwear, the knitted components may be utilized in other types of apparel (e.g., shirts, pants, socks, jackets, undergarments), athletic equipment (e.g., golf bags, baseball and football gloves, soccer ball restriction structures), containers (e.g., backpacks, bags), and upholstery for furniture (e.g., chairs, couches, car seats). The knitted components may also be utilized in bed coverings (e.g., sheets, blankets), table coverings, towels, flags, tents, sails, and parachutes. The knitted components may be utilized as technical textiles for industrial purposes, including structures for automotive and aerospace applications, filter materials, medical textiles (e.g. bandages, swabs, implants), geotextiles for reinforcing embankments, agrotextiles for crop protection, and industrial apparel that protects or insulates against heat and radiation. Accordingly, the knitted components and other concepts disclosed herein may be incorporated into a variety of products for both personal and industrial purposes.

[47] Footwear Configuration

[48] An article of footwear 100 is depicted in Figures 1-4C as including a sole structure 110 and an upper 120. Although footwear 100 is illustrated as having a general configuration suitable for running, concepts associated with footwear 100 may also be applied to a variety of other athletic footwear types, including baseball shoes, basketball shoes, cycling shoes, football shoes, tennis shoes, soccer shoes, training shoes, walking shoes, and hiking boots, for example. The concepts may also be applied to footwear types that are generally considered to be non-athletic, including dress shoes, loafers, sandals, and work boots.

Accordingly, the concepts disclosed with respect to footwear 100 apply to a wide variety of footwear types.

[49] For reference purposes, footwear 100 may be divided into three general regions: a forefoot region 101, a midfoot region 102, and a heel region 103. Forefoot region 101 generally includes portions of footwear 100 corresponding with the toes and the joints connecting the metatarsals with the phalanges. Midfoot region 102 generally includes portions of footwear 100 corresponding with an arch area of the foot. Heel region 103 generally corresponds with rear portions of the foot, including the calcaneus bone. Footwear 100 also includes a lateral side 104 and a medial side 105, which extend through each of regions 101-103 and correspond with opposite sides of footwear 100. More particularly, lateral side 104 corresponds with an outside area of the foot (i.e. the surface that faces away from the other foot), and medial side 105 corresponds with an inside area of the foot (i.e., the surface that faces toward the other foot). Regions 101-103 and sides 104-105 are not intended to demarcate precise areas of footwear 100. Rather, regions 101-103 and sides 104-105 are intended to represent general areas of footwear 100 to aid in the following discussion. In addition to footwear 100, regions 101-103 and sides 104-105 may also be applied to sole structure 110, upper 120, and individual elements thereof.

[50] Sole structure 110 is secured to upper 120 and extends between the foot and the ground when footwear 100 is worn. The primary elements of sole structure 110 are a midsole 111, an outsole 112, and a sockliner 113. Midsole 111 is secured to a lower surface of upper 120 and may be formed from a compressible polymer foam element (e.g., a polyurethane or ethylvinylacetate foam) that attenuates ground reaction forces (i.e., provides cushioning) when compressed between the foot and the ground during walking, running, or other ambulatory activities. In further configurations, midsole 111 may incorporate plates, moderators, fluid-filled chambers, lasting elements, or motion control members that further

attenuate forces, enhance stability, or influence the motions of the foot, or midsole 21 may be primarily formed from a fluid-filled chamber. Outsole 112 is secured to a lower surface of midsole 111 and may be formed from a wear-resistant rubber material that is textured to impart traction. Sockliner 113 is located within upper 120 and is positioned to extend under a lower surface of the foot to enhance the comfort of footwear 100. Although this configuration for sole structure 110 provides an example of a sole structure that may be used in connection with upper 120, a variety of other conventional or nonconventional configurations for sole structure 110 may also be utilized. Accordingly, the features of sole structure 110 or any sole structure utilized with upper 120 may vary considerably.

[51] Upper 120 defines a void within footwear 100 for receiving and securing a foot relative to sole structure 110. The void is shaped to accommodate the foot and extends along a lateral side of the foot, along a medial side of the foot, over the foot, around the heel, and under the foot. Access to the void is provided by an ankle opening 121 located in at least heel region 103. A lace 122 extends through various lace apertures 123 in upper 120 and permits the wearer to modify dimensions of upper 120 to accommodate proportions of the foot. More particularly, lace 122 permits the wearer to tighten upper 120 around the foot, and lace 122 permits the wearer to loosen upper 120 to facilitate entry and removal of the foot from the void (i.e., through ankle opening 121). In addition, upper 120 includes a tongue 124 that extends under lace 122 and lace apertures 123 to enhance the comfort of footwear 100. In further configurations, upper 120 may include additional elements, such as (a) a heel counter in heel region 103 that enhances stability, (b) a toe guard in forefoot region 101 that is formed of a wear-resistant material, and (c) logos, trademarks, and placards with care instructions and material information.

[52] Many conventional footwear uppers are formed from multiple material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) that are joined through stitching or bonding, for example. In contrast, a majority of upper 120 is formed from a knitted component 130, which extends through each of regions 101-103, along both lateral side 104 and medial side 105, over forefoot region 101, and around heel region 103. In addition, knitted component 130 forms portions of both an exterior surface and an opposite interior surface of upper 120. As such, knitted component 130 defines at least a portion of the void within upper 120. In some configurations, knitted component 130 may also extend under the foot. Referring to Figures 4A-4C, however, a strobel sock 125 is secured to knitted component 130 and an upper surface of midsole 111, thereby forming a portion of upper 120 that extends under sockliner 113.

[53] Knitted Component Configuration

[54] Knitted component 130 is depicted separate from a remainder of footwear 100 in Figures 5 and 6. Knitted component 130 is formed of unitary knit construction. As utilized herein, a knitted component (e.g., knitted component 130) is defined as being formed of "unitary knit construction" when formed as a one-piece element through a knitting process. That is, the knitting process substantially forms the various features and structures of knitted component 130 without the need for significant additional manufacturing steps or processes. Although portions of knitted component 130 may be joined to each other (e.g., edges of knitted component 130 being joined together) following the knitting process, knitted component 130 remains formed of unitary knit construction because it is formed as a one-piece knit element. Moreover, knitted component 130 remains formed of unitary knit construction when other elements (e.g., lace 122, tongue 124, logos, trademarks, placards with care instructions and material information) are added following the knitting process.

[55] The primary elements of knitted component 130 are a knit element 131 and an inlaid strand 132. Knit element 131 is formed from at least one yarn that is manipulated (e.g., with a knitting machine) to form a plurality of intermeshed loops that define a variety of courses and wales. That is, knit element 131 has the structure of a knit textile. Inlaid strand 132 extends through knit element 131 and passes between the various loops within knit element 131. Although inlaid strand 132 generally extends along courses within knit element 131, inlaid strand 132 may also extend along wales within knit element 131. Advantages of inlaid strand 132 include providing support, stability, and structure. For example, inlaid strand 132 assists with securing upper 120 around the foot, limits deformation in areas of upper 120 (e.g., imparts stretch-resistance) and operates in connection with lace 122 to enhance the fit of footwear 100.

[56] Knit element 131 has a generally U-shaped configuration that is outlined by a perimeter edge 133, a pair of heel edges 134, and an inner edge 135. When incorporated into footwear 100, perimeter edge 133 lays against the upper surface of midsole 111 and is joined to strobel sock 125. Heel edges 134 are joined to each other and extend vertically in heel region 103. In some configurations of footwear 100, a material element may cover a seam between heel edges 134 to reinforce the seam and enhance the aesthetic appeal of footwear 100. Inner edge 135 forms ankle opening 121 and extends forward to an area where lace 122, lace apertures 123, and tongue 124 are located. In addition, knit element 131 has a first surface 136 and an opposite second surface 137. First surface 136 forms a portion of the exterior surface of upper 120, whereas second surface 137 forms a portion of the interior surface of upper 120, thereby defining at least a portion of the void within upper 120.

[57] Inlaid strand 132, as noted above, extends through knit element 131 and passes between the various loops within knit element 131. More particularly, inlaid strand 132 is located within the knit structure of knit element 131, which may

have the configuration of a single textile layer in the area of inlaid strand 132, and between surfaces 136 and 137, as depicted in Figures 7A-7D. When knitted component 130 is incorporated into footwear 100, therefore, inlaid strand 132 is located between the exterior surface and the interior surface of upper 120. In some configurations, portions of inlaid strand 132 may be visible or exposed on one or both of surfaces 136 and 137. For example, inlaid strand 132 may lay against one of surfaces 136 and 137, or knit element 131 may form indentations or apertures through which inlaid strand passes. An advantage of having inlaid strand 132 located between surfaces 136 and 137 is that knit element 131 protects inlaid strand 132 from abrasion and snagging.

[58] Referring to Figures 5 and 6, inlaid strand 132 repeatedly extends from perimeter edge 133 toward inner edge 135 and adjacent to a side of one lace aperture 123, at least partially around the lace aperture 123 to an opposite side, and back to perimeter edge 133. When knitted component 130 is incorporated into footwear 100, knit element 131 extends from a throat area of upper 120 (i.e., where lace 122, lace apertures 123, and tongue 124 are located) to a lower area of upper 120 (i.e., where knit element 131 joins with sole structure 110. In this configuration, inlaid strand 132 also extends from the throat area to the lower area. More particularly, inlaid strand repeatedly passes through knit element 131 from the throat area to the lower area.

[59] Although knit element 131 may be formed in a variety of ways, courses of the knit structure generally extend in the same direction as inlaid strands 132. That is, courses may extend in the direction extending between the throat area and the lower area. As such, a majority of inlaid strand 132 extends along the courses within knit element 131. In areas adjacent to lace apertures 123, however, inlaid strand 132 may also extend along wales within knit element 131. More particularly, sections of inlaid strand 132 that are parallel to inner edge 135 may extend along the wales.

[60] As discussed above, inlaid strand 132 passes back and forth through knit element 131. Referring to Figures 5 and 6, inlaid strand 132 also repeatedly exits knit element 131 at perimeter edge 133 and then re-enters knit element 131 at another location of perimeter edge 133, thereby forming loops along perimeter edge 133. An advantage to this configuration is that each section of inlaid strand 132 that extends between the throat area and the lower area may be independently tensioned, loosened, or otherwise adjusted during the manufacturing process of footwear 100. That is, prior to securing sole structure 110 to upper 120, sections of inlaid strand 132 may be independently adjusted to the proper tension.

[61] In comparison with knit element 131, inlaid strand 132 may exhibit greater stretch-resistance. That is, inlaid strand 132 may stretch less than knit element 131. Given that numerous sections of inlaid strand 132 extend from the throat area of upper 120 to the lower area of upper 120, inlaid strand 132 imparts stretch-resistance to the portion of upper 120 between the throat area and the lower area. Moreover, placing tension upon lace 122 may impart tension to inlaid strand 132, thereby inducing the portion of upper 120 between the throat area and the lower area to lay against the foot. As such, inlaid strand 132 operates in connection with lace 122 to enhance the fit of footwear 100.

[62] Knit element 131 may incorporate various types of yarn that impart different properties to separate areas of upper 120. That is, one area of knit element 131 may be formed from a first type of yarn that imparts a first set of properties, and another area of knit element 131 may be formed from a second type of yarn that imparts a second set of properties. In this configuration, properties may vary throughout upper 120 by selecting specific yarns for different areas of knit element 131. The properties that a particular type of yarn will impart to an area of knit element 131 partially depend upon the materials that form the various filaments and fibers within the yarn. Cotton, for example, provides a soft hand,

natural aesthetics, and biodegradability. Elastane and stretch polyester each provide substantial stretch and recovery, with stretch polyester also providing recyclability. Rayon provides high luster and moisture absorption. Wool also provides high moisture absorption, in addition to insulating properties and biodegradability. Nylon is a durable and abrasion-resistant material with relatively high strength. Polyester is a hydrophobic material that also provides relatively high durability. In addition to materials, other aspects of the yarns selected for knit element 131 may affect the properties of upper 120. For example, a yarn forming knit element 131 may be a monofilament yarn or a multifilament yarn. The yarn may also include separate filaments that are each formed of different materials. In addition, the yarn may include filaments that are each formed of two or more different materials, such as a bicomponent yarn with filaments having a sheath-core configuration or two halves formed of different materials. Different degrees of twist and crimping, as well as different deniers, may also affect the properties of upper 120. Accordingly, both the materials forming the yarn and other aspects of the yarn may be selected to impart a variety of properties to separate areas of upper 120.

[63] As with the yarns forming knit element 131, the configuration of inlaid strand 132 may also vary significantly. In addition to yarn, inlaid strand 132 may have the configurations of a filament (e.g., a monofilament), thread, rope, webbing, cable, or chain, for example. In comparison with the yarns forming knit element 131, the thickness of inlaid strand 132 may be greater. In some configurations, inlaid strand 132 may have a significantly greater thickness than the yarns of knit element 131. Although the cross-sectional shape of inlaid strand 132 may be round, triangular, square, rectangular, elliptical, or irregular shapes may also be utilized. Moreover, the materials forming inlaid strand 132 may include any of the materials for the yarn within knit element 131, such as cotton, elastane, polyester, rayon, wool, and nylon. As noted above, inlaid strand 132 may exhibit greater stretch-resistance than knit element 131. As such, suitable materials for

inlaid strands 132 may include a variety of engineering filaments that are utilized for high tensile strength applications, including glass, aramids (e.g., para-aramid and meta-aramid), ultra-high molecular weight polyethylene, and liquid crystal polymer. As another example, a braided polyester thread may also be utilized as inlaid strand 132.

[64] An example of a suitable configuration for a portion of knitted component 130 is depicted in Figure 8A. In this configuration, knit element 131 includes a yarn 138 that forms a plurality of intermeshed loops defining multiple horizontal courses and vertical wales. Inlaid strand 132 extends along one of the courses and alternates between being located (a) behind loops formed from yarn 138 and (b) in front of loops formed from yarn 138. In effect, inlaid strand 132 weaves through the structure formed by knit element 131. Although yarn 138 forms each of the courses in this configuration, additional yarns may form one or more of the courses or may form a portion of one or more of the courses.

[65] Another example of a suitable configuration for a portion of knitted component 130 is depicted in Figure 8B. In this configuration, knit element 131 includes yarn 138 and another yarn 139. Yarns 138 and 139 are plated and cooperatively form a plurality of intermeshed loops defining multiple horizontal courses and vertical wales. That is, yarns 138 and 139 run parallel to each other. As with the configuration in Figure 8A, inlaid strand 132 extends along one of the courses and alternates between being located (a) behind loops formed from yarns 138 and 139 and (b) in front of loops formed from yarns 138 and 139. An advantage of this configuration is that the properties of each of yarns 138 and 139 may be present in this area of knitted component 130. For example, yarns 138 and 139 may have different colors, with the color of yarn 138 being primarily present on a face of the various stitches in knit element 131 and the color of yarn 139 being primarily present on a reverse of the various stitches in knit element 131. As another example, yarn 139 may be formed from a yarn that is softer and more

comfortable against the foot than yarn 138, with yarn 138 being primarily present on first surface 136 and yarn 139 being primarily present on second surface 137.

[66] Continuing with the configuration of Figure 8B, yarn 138 may be formed from at least one of a thermoset polymer material and natural fibers (e.g., cotton, wool, silk), whereas yarn 139 may be formed from a thermoplastic polymer material. In general, a thermoplastic polymer material melts when heated and returns to a solid state when cooled. More particularly, the thermoplastic polymer material transitions from a solid state to a softened or liquid state when subjected to sufficient heat, and then the thermoplastic polymer material transitions from the softened or liquid state to the solid state when sufficiently cooled. As such, thermoplastic polymer materials are often used to join two objects or elements together. In this case, yarn 139 may be utilized to join (a) one portion of yarn 138 to another portion of yarn 138, (b) yarn 138 and inlaid strand 132 to each other, or (c) another element (e.g., logos, trademarks, and placards with care instructions and material information) to knitted component 130, for example. As such, yarn 139 may be considered a fusible yarn given that it may be used to fuse or otherwise join portions of knitted component 130 to each other. Moreover, yarn 138 may be considered a non-fusible yarn given that it is not formed from materials that are generally capable of fusing or otherwise joining portions of knitted component 130 to each other. That is, yarn 138 may be a non-fusible yarn, whereas yarn 139 may be a fusible yarn. In some configurations of knitted component 130, yarn 138 (i.e., the non-fusible yarn) may be substantially formed from a thermoset polyester material and yarn 139 (i.e., the fusible yarn) may be at least partially formed from a thermoplastic polyester material.

[67] The use of plated yarns may impart advantages to knitted component 130. When yarn 139 is heated and fused to yarn 138 and inlaid strand 132, this process may have the effect of stiffening or rigidifying the structure of knitted

component 130. Moreover, joining (a) one portion of yarn 138 to another portion of yarn 138 or (b) yarn 138 and inlaid strand 132 to each other has the effect of securing or locking the relative positions of yarn 138 and inlaid strand 132, thereby imparting stretch-resistance and stiffness. That is, portions of yarn 138 may not slide relative to each other when fused with yarn 139, thereby preventing warping or permanent stretching of knit element 131 due to relative movement of the knit structure. Another benefit relates to limiting unraveling if a portion of knitted component 130 becomes damaged or one of yarns 138 is severed. Also, inlaid strand 132 may not slide relative to knit element 131, thereby preventing portions of inlaid strand 132 from pulling outward from knit element 131. Accordingly, areas of knitted component 130 may benefit from the use of both fusible and non-fusible yarns within knit element 131.

[68] Another aspect of knitted component 130 relates to a padded area adjacent to ankle opening 121 and extending at least partially around ankle opening 121. Referring to Figure 7E, the padded area is formed by two overlapping and at least partially coextensive knitted layers 140, which may be formed of unitary knit construction, and a plurality of floating yarns 141 extending between knitted layers 140. Although the sides or edges of knitted layers 140 are secured to each other, a central area is generally unsecured. As such, knitted layers 140 effectively form a tube or tubular structure, and floating yarns 141 may be located or inlaid between knitted layers 140 to pass through the tubular structure. That is, floating yarns 141 extend between knitted layers 140, are generally parallel to surfaces of knitted layers 140, and also pass through and fill an interior volume between knitted layers 140. Whereas a majority of knit element 131 is formed from yarns that are mechanically-manipulated to form intermeshed loops, floating yarns 141 are generally free or otherwise inlaid within the interior volume between knitted layers 140. As an additional matter, knitted layers 140 may be at least partially formed from a stretch yarn. An advantage of this configuration is that knitted layers will effectively compress floating yarns 141 and provide an

elastic aspect to the padded area adjacent to ankle opening 121. That is, the stretch yarn within knitted layers 140 may be placed in tension during the knitting process that forms knitted component 130, thereby inducing knitted layers 140 to compress floating yarns 141. Although the degree of stretch in the stretch yarn may vary significantly, the stretch yarn may stretch at least one-hundred percent in many configurations of knitted component 130.

[69] The presence of floating yarns 141 imparts a compressible aspect to the padded area adjacent to ankle opening 121, thereby enhancing the comfort of footwear 100 in the area of ankle opening 121. Many conventional articles of footwear incorporate polymer foam elements or other compressible materials into areas adjacent to an ankle opening. In contrast with the conventional articles of footwear, portions of knitted component 130 formed of unitary knit construction with a remainder of knitted component 130 may form the padded area adjacent to ankle opening 121. In further configurations of footwear 100, similar padded areas may be located in other areas of knitted component 130. For example, similar padded areas may be located as an area corresponding with joints between the metatarsals and proximal phalanges to impart padding to the joints. As an alternative, a terry loop structure may also be utilized to impart some degree of padding to areas of upper 120.

[70] Based upon the above discussion, knitted component 130 imparts a variety of features to upper 120. Moreover, knitted component 130 provides a variety of advantages over some conventional upper configurations. As noted above, conventional footwear uppers are formed from multiple material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) that are joined through stitching or bonding, for example. As the number and type of material elements incorporated into an upper increases, the time and expense associated with transporting, stocking, cutting, and joining the material elements may also increase. Waste material from cutting and stitching processes also accumulates

to a greater degree as the number and type of material elements incorporated into the upper increases. Moreover, uppers with a greater number of material elements may be more difficult to recycle than uppers formed from fewer types and numbers of material elements. By decreasing the number of material elements utilized in the upper, therefore, waste may be decreased while increasing the manufacturing efficiency and recyclability of the upper. To this end, knitted component 130 forms a substantial portion of upper 120, while increasing manufacturing efficiency, decreasing waste, and simplifying recyclability.

[71] Further Knitted Component Configurations

[72] A knitted component 150 is depicted in Figures 9 and 10 and may be utilized in place of knitted component 130 in footwear 100. The primary elements of knitted component 150 are a knit element 151 and an inlaid strand 152. Knit element 151 is formed from at least one yarn that is manipulated (e.g., with a knitting machine) to form a plurality of intermeshed loops that define a variety of courses and wales. That is, knit element 151 has the structure of a knit textile. Inlaid strand 152 extends through knit element 151 and passes between the various loops within knit element 151. Although inlaid strand 152 generally extends along courses within knit element 151, inlaid strand 152 may also extend along wales within knit element 151. As with inlaid strand 132, inlaid strand 152 imparts stretch-resistance and, when incorporated into footwear 100, operates in connection with lace 122 to enhance the fit of footwear 100.

[73] Knit element 151 has a generally U-shaped configuration that is outlined by a perimeter edge 153, a pair of heel edges 154, and an inner edge 155. In addition, knit element 151 has a first surface 156 and an opposite second surface 157. First surface 156 may form a portion of the exterior surface of upper 120, whereas second surface 157 may form a portion of the interior surface of upper 120, thereby defining at least a portion of the void within upper 120. In many

configurations, knit element 151 may have the configuration of a single textile layer in the area of inlaid strand 152. That is, knit element 151 may be a single textile layer between surfaces 156 and 157. In addition, knit element 151 defines a plurality of lace apertures 158.

[74] Similar to inlaid strand 132, inlaid strand 152 repeatedly extends from perimeter edge 153 toward inner edge 155, at least partially around one of lace apertures 158, and back to perimeter edge 153. In contrast with inlaid strand 132, however, some portions of inlaid strand 152 angle rearwards and extend to heel edges 154. More particularly, the portions of inlaid strand 152 associated with the most rearward lace apertures 158 extend from one of heel edges 154 toward inner edge 155, at least partially around one of the most rearward lace apertures 158, and back to one of heel edges 154. Additionally, some portions of inlaid strand 152 do not extend around one of lace apertures 158. More particularly, some sections of inlaid strand 152 extend toward inner edge 155, turn in areas adjacent to one of lace apertures 158, and extend back toward perimeter edge 153 or one of heel edges 154.

[75] Although knit element 151 may be formed in a variety of ways, courses of the knit structure generally extend in the same direction as inlaid strands 152. In areas adjacent to lace apertures 158, however, inlaid strand 152 may also extend along wales within knit element 151. More particularly, sections of inlaid strand 152 that are parallel to inner edge 155 may extend along wales.

[76] In comparison with knit element 151, inlaid strand 152 may exhibit greater stretch-resistance. That is, inlaid strand 152 may stretch less than knit element 151. Given that numerous sections of inlaid strand 152 extend through knit element 151, inlaid strand 152 may impart stretch-resistance to portions of upper 120 between the throat area and the lower area. Moreover, placing tension upon lace 122 may impart tension to inlaid strand 152, thereby inducing the portions of upper 120 between the throat area and the lower area to lay against the foot.

Additionally, given that numerous sections of inlaid strand 152 extend toward heel edges 154, inlaid strand 152 may impart stretch-resistance to portions of upper 120 in heel region 103. Moreover, placing tension upon lace 122 may induce the portions of upper 120 in heel region 103 to lay against the foot. As such, inlaid strand 152 operates in connection with lace 122 to enhance the fit of footwear 100.

[77] Knit element 151 may incorporate any of the various types of yarn discussed above for knit element 131. Inlaid strand 152 may also be formed from any of the configurations and materials discussed above for inlaid strand 132. Additionally, the various knit configurations discussed relative to Figures 8A and 8B may also be utilized in knitted component 150. More particularly, knit element 151 may have areas formed from a single yarn, two plated yarns, or a fusible yarn and a non-fusible yarn, with the fusible yarn joining (a) one portion of the non-fusible yarn to another portion of the non-fusible yarn or (b) the non-fusible yarn and inlaid strand 152 to each other.

[78] A majority of knit element 131 is depicted as being formed from a relatively untextured textile and a common or single knit structure (e.g., a tubular knit structure). In contrast, knit element 151 incorporates various knit structures that impart specific properties and advantages to different areas of knitted component 150. Moreover, by combining various yarn types with the knit structures, knitted component 150 may impart a range of properties to different areas of upper 120. Referring to Figure 11, a schematic view of knitted component 150 shows various zones 160-169 having different knit structures, each of which will now be discussed in detail. For purposes of reference, each of regions 101-103 and sides 104 and 105 are shown in Figure 11 to provide a reference for the locations of knit zones 160-169 when knitted component 150 is incorporated into footwear 100.

[79] A tubular knit zone 160 extends along a majority of perimeter edge 153 and through each of regions 101-103 on both of sides 104 and 105. Tubular knit zone 160 also extends inward from each of sides 104 and 105 in an area approximately located at an interface regions 101 and 102 to form a forward portion of inner edge 155. Tubular knit zone 160 forms a relatively untextured knit configuration. Referring to Figure 12A, a cross-section through an area of tubular knit zone 160 is depicted, and surfaces 156 and 157 are substantially parallel to each other. Tubular knit zone 160 imparts various advantages to footwear 100. For example, tubular knit zone 160 has greater durability and wear resistance than some other knit structures, especially when the yarn in tubular knit zone 160 is plated with a fusible yarn. In addition, the relatively untextured aspect of tubular knit zone 160 simplifies the process of joining strobel sock 125 to perimeter edge 153. That is, the portion of tubular knit zone 160 located along perimeter edge 153 facilitates the lasting process of footwear 100. For purposes of reference, Figure 13A depicts a loop diagram of the manner in which tubular knit zone 160 is formed with a knitting process.

[80] Two stretch knit zones 161 extend inward from perimeter edge 153 and are located to correspond with a location of joints between metatarsals and proximal phalanges of the foot. That is, stretch zones extend inward from perimeter edge in the area approximately located at the interface regions 101 and 102. As with tubular knit zone 160, the knit configuration in stretch knit zones 161 may be a tubular knit structure. In contrast with tubular knit zone 160, however, stretch knit zones 161 are formed from a stretch yarn that imparts stretch and recovery properties to knitted component 150. Although the degree of stretch in the stretch yarn may vary significantly, the stretch yarn may stretch at least one-hundred percent in many configurations of knitted component 150.

[81] A tubular and interlock tuck knit zone 162 extends along a portion of inner edge 155 in at least midfoot region 102. Tubular and interlock tuck knit zone 162 also

forms a relatively untextured knit configuration, but has greater thickness than tubular knit zone 160. In cross-section, tubular and interlock tuck knit zone 162 is similar to Figure 12A, in which surfaces 156 and 157 are substantially parallel to each other. Tubular and interlock tuck knit zone 162 imparts various advantages to footwear 100. For example, tubular and interlock tuck knit zone 162 has greater stretch resistance than some other knit structures, which is beneficial when lace 122 places tubular and interlock tuck knit zone 162 and inlaid strands 152 in tension. For purposes of reference, Figure 13B depicts a loop diagram of the manner in which tubular and interlock tuck knit zone 162 is formed with a knitting process.

[82] A 1x1 mesh knit zone 163 is located in forefoot region 101 and spaced inward from perimeter edge 153. 1x1 mesh knit zone has a C-shaped configuration and forms a plurality of apertures that extend through knit element 151 and from first surface 156 to second surface 157, as depicted in Figure 12B. The apertures enhance the permeability of knitted component 150, which allows air to enter upper 120 and moisture to escape from upper 120. For purposes of reference, Figure 13C depicts a loop diagram of the manner in which 1x1 mesh knit zone 163 is formed with a knitting process.

[83] A 2x2 mesh knit zone 164 extends adjacent to 1x1 mesh knit zone 163. In comparison with 1x1 mesh knit zone 163, 2x2 mesh knit zone 164 forms larger apertures, which may further enhance the permeability of knitted component 150. For purposes of reference, Figure 13D depicts a loop diagram of the manner in which 2x2 mesh knit zone 164 is formed with a knitting process.

[84] A 3x2 mesh knit zone 165 is located within 2x2 mesh knit zone 164, and another 3x2 mesh knit zone 165 is located adjacent to one of stretch zones 161. In comparison with 1x1 mesh knit zone 163 and 2x2 mesh knit zone 164, 3x2 mesh knit zone 165 forms even larger apertures, which may further enhance the permeability of knitted component 150. For purposes of reference, Figure 13E

depicts a loop diagram of the manner in which 3x2 mesh knit zone 165 is formed with a knitting process.

[85] A 1x1 mock mesh knit zone 166 is located in forefoot region 101 and extends around 1x1 mesh knit zone 163. In contrast with mesh knit zones 163-165, which form apertures through knit element 151, 1x1 mock mesh knit zone 166 forms indentations in first surface 156, as depicted in Figure 12C. In addition to enhancing the aesthetics of footwear 100, 1x1 mock mesh knit zone 166 may enhance flexibility and decrease the overall mass of knitted component 150. For purposes of reference, Figure 13F depicts a loop diagram of the manner in which 1x1 mock mesh knit zone 166 is formed with a knitting process.

[86] Two 2x2 mock mesh knit zones 167 are located in heel region 103 and adjacent to heel edges 154. In comparison with 1x1 mock mesh knit zone 166, 2x2 mock mesh knit zones 167 forms larger indentations in first surface 156. In areas where inlaid strands 152 extend through indentations in 2x2 mock mesh knit zones 167, as depicted in Figure 12D, inlaid strands 152 may be visible and exposed in a lower area of the indentations. For purposes of reference, Figure 13G depicts a loop diagram of the manner in which 2x2 mock mesh knit zones 167 are formed with a knitting process.

[87] Two 2x2 hybrid knit zones 168 are located in midfoot region 102 and forward of 2x2 mock mesh knit zones 167. 2x2 hybrid knit zones 168 share characteristics of 2x2 mesh knit zone 164 and 2x2 mock mesh knit zones 167. More particularly, 2x2 hybrid knit zones 168 form apertures having the size and configuration of 2x2 mesh knit zone 164, and 2x2 hybrid knit zones 168 form indentations having the size and configuration of 2x2 mock mesh knit zones 167. In areas where inlaid strands 152 extend through indentations in 2x2 hybrid knit zones 168, as depicted in Figure 12E, inlaid strands 152 are visible and exposed. For purposes of reference, Figure 13H depicts a loop diagram of the manner in which 2x2 hybrid knit zones 168 are formed with a knitting process.

[88] Knitted component 150 also includes two padded zones 169 having the general configuration of the padded area adjacent to ankle opening 121 and extending at least partially around ankle opening 121, which was discussed above for knitted component 130. As such, padded zones 169 are formed by two overlapping and at least partially coextensive knitted layers, which may be formed of unitary knit construction, and a plurality of floating yarns extending between the knitted layers.

[89] A comparison between Figures 9 and 10 reveals that a majority of the texturing in knit element 151 is located on first surface 156, rather than second surface 157. That is, the indentations formed by mock mesh knit zones 166 and 167, as well as the indentations in 2x2 hybrid knit zones 168, are formed in first surface 156. This configuration has an advantage of enhancing the comfort of footwear 100. More particularly, this configuration places the relatively untextured configuration of second surface 157 against the foot. A further comparison between Figures 9 and 10 reveals that portions of inlaid strand 152 are exposed on first surface 156, but not on second surface 157. This configuration also has an advantage of enhancing the comfort of footwear 100. More particularly, by spacing inlaid strand 152 from the foot by a portion of knit element 151, inlaid strands 152 will not contact the foot.

[90] Additional configurations of knitted component 130 are depicted in Figures 14A-14C. Although discussed in relation to kitted component 130, concepts associated with each of these configurations may also be utilized with knitted component 150. Referring to Figure 14A, inlaid strands 132 are absent from knitted component 130. Although inlaid strands 132 impart stretch-resistance to areas of knitted component 130, some configurations may not require the stretch-resistance from inlaid strands 132. Moreover, some configurations may benefit from greater stretch in upper 120. Referring to Figure 14B, knit element 131 includes two flaps 142 that are formed of unitary knit construction with a

remainder of knit element 131 and extend along the length of knitted component 130 at perimeter edge 133. When incorporated into footwear 100, flaps 142 may replace strobel sock 125. That is, flaps 142 may cooperatively form a portion of upper 120 that extends under sockliner 113 and is secured to the upper surface of midsole 111. Referring to Figure 14C, knitted component 130 has a configuration that is limited to midfoot region 102. In this configuration, other material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) may be joined to knitted component 130 through stitching or bonding, for example, to form upper 120.

[91] Based upon the above discussion, each of knitted components 130 and 150 may have various configurations that impart features and advantages to upper 120. More particularly, knit elements 131 and 151 may incorporate various knit structures and yarn types that impart specific properties to different areas of upper 120, and inlaid strands 132 and 152 may extend through the knit structures to impart stretch-resistance to areas of upper 120 and operate in connection with lace 122 to enhance the fit of footwear 100.

[92] Knitting Machine And Feeder Configurations

[93] Although knitting may be performed by hand, the commercial manufacture of knitted components is generally performed by knitting machines. An example of a knitting machine 200 that is suitable for producing either of knitted components 130 and 150 is depicted in Figure 15. Knitting machine 200 has a configuration of a V-bed flat knitting machine for purposes of example, but either of knitted components 130 and 150 or aspects of knitted components 130 and 150 may be produced on other types of knitting machines.

[94] Knitting machine 200 includes two needle beds 201 that are angled with respect to each other, thereby forming a V-bed. Each of needle beds 201 include a plurality of individual needles 202 that lay on a common plane. That is, needles

202 from one needle bed 201 lay on a first plane, and needles 202 from the other needle bed 201 lay on a second plane. The first plane and the second plane (i.e., the two needle beds 201) are angled relative to each other and meet to form an intersection that extends along a majority of a width of knitting machine 200. As described in greater detail below, needles 202 each have a first position where they are retracted and a second position where they are extended. In the first position, needles 202 are spaced from the intersection where the first plane and the second plane meet. In the second position, however, needles 202 pass through the intersection where the first plane and the second plane meet.

[95] A pair of rails 203 extend above and parallel to the intersection of needle beds 201 and provide attachment points for multiple standard feeders 204 and combination feeders 220. Each rail 203 has two sides, each of which accommodates either one standard feeder 204 or one combination feeder 220. As such, knitting machine 200 may include a total of four feeders 204 and 220. As depicted, the forward-most rail 203 includes one combination feeder 220 and one standard feeder 204 on opposite sides, and the rearward-most rail 203 includes two standard feeders 204 on opposite sides. Although two rails 203 are depicted, further configurations of knitting machine 200 may incorporate additional rails 203 to provide attachment points for more feeders 204 and 220.

[96] Due to the action of a carriage 205, feeders 204 and 220 move along rails 203 and needle beds 201, thereby supplying yarns to needles 202. In Figure 15, a yarn 206 is provided to combination feeder 220 by a spool 207. More particularly, yarn 206 extends from spool 207 to various yarn guides 208, a yarn take-back spring 209, and a yarn tensioner 210 before entering combination feeder 220. Although not depicted, additional spools 207 may be utilized to provide yarns to feeders 204.

[97] Standard feeders 204 are conventionally-utilized for a V-bed flat knitting machine, such as knitting machine 200. That is, existing knitting machines

incorporate standard feeders 204. Each standard feeder 204 has the ability to supply a yarn that needles 202 manipulate to knit, tuck, and float. As a comparison, combination feeder 220 has the ability to supply a yarn (e.g., yarn 206) that needles 202 knit, tuck, and float, and combination feeder 220 has the ability to inlay the yarn. Moreover, combination feeder 220 has the ability to inlay a variety of different strands (e.g., filament, thread, rope, webbing, cable, chain, or yarn). Accordingly, combination feeder 220 exhibits greater versatility than each standard feeder 204.

[98] As noted above, combination feeder 220 may be utilized when inlaying a yarn or other strand, in addition to knitting, tucking, and floating the yarn. Conventional knitting machines, which do not incorporate combination feeder 220, may also inlay a yarn. More particularly, conventional knitting machines that are supplied with an inlay feeder may also inlay a yarn. A conventional inlay feeder for a V-bed flat knitting machine includes two components that operate in conjunction to inlay the yarn. Each of the components of the inlay feeder are secured to separate attachment points on two adjacent rails, thereby occupying two attachment points. Whereas an individual standard feeder 204 only occupies one attachment point, two attachment points are generally occupied when an inlay feeder is utilized to inlay a yarn into a knitted component. Moreover, whereas combination feeder 220 only occupies one attachment point, a conventional inlay feeder occupies two attachment points.

[99] Given that knitting machine 200 includes two rails 203, four attachment points are available in knitting machine 200. If a conventional inlay feeder were utilized with knitting machine 200, only two attachment points would be available for standard feeders 204. When using combination feeder 220 in knitting machine 200, however, three attachment points are available for standard feeders 204. Accordingly, combination feeder 220 may be utilized when inlaying a yarn or

other strand, and combination feeder 220 has an advantage of only occupying one attachment point.

[100] Combination feeder 220 is depicted individually in Figures 16-19 as including a carrier 230, a feeder arm 240, and a pair of actuation members 250. Although a majority of combination feeder 220 may be formed from metal materials (e.g., steel, aluminum, titanium), portions of carrier 230, feeder arm 240, and actuation members 250 may be formed from polymer, ceramic, or composite materials, for example. As discussed above, combination feeder 220 may be utilized when inlaying a yarn or other strand, in addition to knitting, tucking, and floating a yarn. Referring to Figure 16 specifically, a portion of yarn 206 is depicted to illustrate the manner in which a strand interfaces with combination feeder 220.

[101] Carrier 230 has a generally rectangular configuration and includes a first cover member 231 and a second cover member 232 that are joined by four bolts 233. Cover members 231 and 232 define an interior cavity in which portions of feeder arm 240 and actuation members 250 are located. Carrier 230 also includes an attachment element 234 that extends outward from first cover member 231 for securing feeder 220 to one of rails 203. Although the configuration of attachment element 234 may vary, attachment element 234 is depicted as including two spaced protruding areas that form a dovetail shape, as depicted in Figure 17. A reverse dovetail configuration on one of rails 203 may extend into the dovetail shape of attachment element 234 to effectively join combination feeder 220 to knitting machine 200. It should also be noted that second cover member 234 forms a centrally-located and elongate slot 235, as depicted in Figure 18.

[102] Feeder arm 240 has a generally elongate configuration that extends through carrier 230 (i.e., the cavity between cover members 231 and 232) and outward from a lower side of carrier 230. In addition to other elements, feeder arm 240 includes an actuation bolt 241, a spring 242, a pulley 243, a loop 244, and a dispensing area 245. Actuation bolt 241 extends outward from feeder arm 240

and is located within the cavity between cover members 231 and 232. One side of actuation bolt 241 is also located within slot 235 in second cover member 232, as depicted in Figure 18. Spring 242 is secured to carrier 230 and feeder arm 240. More particularly, one end of spring 242 is secured to carrier 230, and an opposite end of spring 242 is secured to feeder arm 240. Pulley 243, loop 244, and dispensing area 245 are present on feeder arm 240 to interface with yarn 206 or another strand. Moreover, pulley 243, loop 244, and dispensing area 245 are configured to ensure that yarn 206 or another strand smoothly passes through combination feeder 220, thereby being reliably-supplied to needles 202. Referring again to Figure 16, yarn 206 extends around pulley 243, through loop 244, and into dispensing area 245. In addition, yarn 206 extends out of a dispensing tip 246, which is an end region of feeder arm 240, to then supply needles 202.

[103] Each of actuation members 250 includes an arm 251 and a plate 252. In many configurations of actuation members 250, each arm 251 is formed as a one-piece element with one of plates 252. Whereas arms 251 are located outside of carrier 230 and at an upper side of carrier 230, plates 252 are located within carrier 250. Each of arms 251 has an elongate configuration that defines an outside end 253 and an opposite inside end 254, and arms 251 are positioned to define a space 255 between both of inside ends 254. That is, arms 251 are spaced from each other. Plates 252 have a generally planar configuration. Referring to Figure 19, each of plates 252 define an aperture 256 with an inclined edge 257. Moreover, actuation bolt 241 of feeder arm 240 extends into each aperture 256.

[104] The configuration of combination feeder 220 discussed above provides a structure that facilitates a translating movement of feeder arm 240. As discussed in greater detail below, the translating movement of feeder arm 240 selectively positions dispensing tip 246 at a location that is above or below the intersection of needle beds 201. That is, dispensing tip 246 has the ability to reciprocate

through the intersection of needle beds 201. An advantage to the translating movement of feeder arm 240 is that combination feeder 220 (a) supplies yarn 206 for knitting, tucking, and floating when dispensing tip 246 is positioned above the intersection of needle beds 201 and (b) supplies yarn 206 or another strand for inlaying when dispensing tip 246 is positioned below the intersection of needle beds 201. Moreover, feeder arm 240 reciprocates between the two positions depending upon the manner in which combination feeder 220 is being utilized.

[105] In reciprocating through the intersection of needle beds 201, feeder arm 240 translates from a retracted position to an extended position. When in the retracted position, dispensing tip 246 is positioned above the intersection of needle beds 201. When in the extended position, dispensing tip 246 is positioned below the intersection of needle beds 201. Dispensing tip 246 is closer to carrier 230 when feeder arm 240 is in the retracted position than when feeder arm 240 is in the extended position. Similarly, dispensing tip 246 is further from carrier 230 when feeder arm 240 is in the extended position than when feeder arm 240 is in the retracted position. In other words, dispensing tip 246 moves away from carrier 230 when in the extended position, and dispensing tip 246 moves closer to carrier 230 when in the retracted position.

[106] For purposes of reference in Figures 16-20C, as well as further figures discussed later, an arrow 221 is positioned adjacent to dispensing area 245. When arrow 221 points upward or toward carrier 230, feeder arm 240 is in the retracted position. When arrow 221 points downward or away from carrier 230, feeder arm 240 is in the extended position. Accordingly, by referencing the position of arrow 221, the position of feeder arm 240 may be readily ascertained.

[107] The natural state of feeder arm 240 is the retracted position. That is, when no significant forces are applied to areas of combination feeder 220, feeder arm remains in the retracted position. Referring to Figures 16-19, for example, no

forces or other influences are shown as interacting with combination feeder 220, and feeder arm 240 is in the retracted position. The translating movement of feeder arm 240 may occur, however, when a sufficient force is applied to one of arms 251. More particularly, the translating movement of feeder arm 240 occurs when a sufficient force is applied to one of outside ends 253 and is directed toward space 255. Referring to Figures 20A and 20B, a force 222 is acting upon one of outside ends 253 and is directed toward space 255, and feeder arm 240 is shown as having translated to the extended position. Upon removal of force 222, however, feeder arm 240 will return to the retracted position. It should also be noted that Figure 20C depicts force 222 as acting upon inside ends 254 and being directed outward, and feeder arm 240 remains in the retracted position.

[108] As discussed above, feeders 204 and 220 move along rails 203 and needle beds 201 due to the action of carriage 205. More particularly, a drive bolt within carriage 205 contacts feeders 204 and 220 to push feeders 204 and 220 along needle beds 201. With respect to combination feeder 220, the drive bolt may either contact one of outside ends 253 or one of inside ends 254 to push combination feeder 220 along needle beds 201. When the drive bolt contacts one of outside ends 253, feeder arm 240 translates to the extended position and dispensing tip 246 passes below the intersection of needle beds 201. When the drive bolt contacts one of inside ends 254 and is located within space 255, feeder arm 240 remains in the retracted position and dispensing tip 246 is above the intersection of needle beds 201. Accordingly, the area where carriage 205 contacts combination feeder 220 determines whether feeder arm 240 is in the retracted position or the extended position.

[109] The mechanical action of combination feeder 220 will now be discussed. Figures 19-20B depict combination feeder 220 with first cover member 231 removed, thereby exposing the elements within the cavity in carrier 230. By comparing Figure 19 with Figures 20A and 20B, the manner in which force 222 induces

feeder arm 240 to translate may be apparent. When force 222 acts upon one of outside ends 253, one of actuation members 250 slides in a direction that is perpendicular to the length of feeder arm 240. That is, one of actuation members 250 slides horizontally in Figures 19-20B. The movement of one of actuation members 250 causes actuation bolt 241 to engage one of inclined edges 257. Given that the movement of actuation members 250 is constrained to the direction that is perpendicular to the length of feeder arm 240, actuation bolt 241 rolls or slides against inclined edge 257 and induces feeder arm 240 to translate to the extended position. Upon removal of force 222, spring 242 pulls feeder arm 240 from the extended position to the retracted position.

[110] Based upon the above discussion, combination feeder 220 reciprocates between the retracted position and the extended position depending upon whether a yarn or other strand is being utilized for knitting, tucking, or floating or being utilized for inlaying. Combination feeder 220 has a configuration wherein the application of force 222 induces feeder arm 240 to translate from the retracted position to the extended position, and removal of force 222 induces feeder arm 240 to translate from the extended position to the retracted position. That is, combination feeder 220 has a configuration wherein the application and removal of force 222 causes feeder arm 240 to reciprocate between opposite sides of needle beds 201. In general, outside ends 253 may be considered actuation areas, which induce movement in feeder arm 240. In further configurations of combination feeder 220, the actuation areas may be in other locations or may respond to other stimuli to induce movement in feeder arm 240. For example, the actuation areas may be electrical inputs coupled to servomechanisms that control movement of feeder arm 240. Accordingly, combination feeder 220 may have a variety of structures that operate in the same general manner as the configuration discussed above.

[111] Knitting Process

[112] The manner in which knitting machine 200 operates to manufacture a knitted component will now be discussed in detail. Moreover, the following discussion will demonstrate the operation of combination feeder 220 during a knitting process. Referring to Figure 21A, a portion of knitting machine 200 that includes various needles 202, rail 203, standard feeder 204, and combination feeder 220 is depicted. Whereas combination feeder 220 is secured to a front side of rail 203, standard feeder 204 is secured to a rear side of rail 203. Yarn 206 passes through combination feeder 220, and an end of yarn 206 extends outward from dispensing tip 246. Although yarn 206 is depicted, any other strand (e.g., filament, thread, rope, webbing, cable, chain, or yarn) may pass through combination feeder 220. Another yarn 211 passes through standard feeder 204 and forms a portion of a knitted component 260, and loops of yarn 211 forming an uppermost course in knitted component 260 are held by hooks located on ends of needles 202.

[113] The knitting process discussed herein relates to the formation of knitted component 260, which may be any knitted component, including knitted components that are similar to knitted components 130 and 150. For purposes of the discussion, only a relatively small section of knitted component 260 is shown in the figures in order to permit the knit structure to be illustrated. Moreover, the scale or proportions of the various elements of knitting machine 200 and knitted component 260 may be enhanced to better illustrate the knitting process.

[114] Standard feeder 204 includes a feeder arm 212 with a dispensing tip 213. Feeder arm 212 is angled to position dispensing tip 213 in a location that is (a) centered between needles 202 and (b) above an intersection of needle beds 201. Figure 22A depicts a schematic cross-sectional view of this configuration. Note that needles 202 lay on different planes, which are angled relative to each other.

That is, needles 202 from needle beds 201 lay on the different planes. Needles 202 each have a first position and a second position. In the first position, which is shown in solid line, needles 202 are retracted. In the second position, which is shown in dashed line, needles 202 are extended. In the first position, needles 202 are spaced from the intersection where the planes upon which needle beds 201 lay meet. In the second position, however, needles 202 are extended and pass through the intersection where the planes upon which needle beds 201 meet. That is, needles 202 cross each other when extended to the second position. It should be noted that dispensing tip 213 is located above the intersection of the planes. In this position, dispensing tip 213 supplies yarn 211 to needles 202 for purposes of knitting, tucking, and floating.

[115] Combination feeder 220 is in the retracted position, as evidenced by the orientation of arrow 221. Feeder arm 240 extends downward from carrier 230 to position dispensing tip 246 in a location that is (a) centered between needles 202 and (b) above the intersection of needle beds 201. Figure 22B depicts a schematic cross-sectional view of this configuration. Note that dispensing tip 246 is positioned in the same relative location as dispensing tip 213 in Figure 22A.

[116] Referring now to Figure 21B, standard feeder 204 moves along rail 203 and a new course is formed in knitted component 260 from yarn 211. More particularly, needles 202 pulled sections of yarn 211 through the loops of the prior course, thereby forming the new course. Accordingly, courses may be added to knitted component 260 by moving standard feeder 204 along needles 202, thereby permitting needles 202 to manipulate yarn 211 and form additional loops from yarn 211.

[117] Continuing with the knitting process, feeder arm 240 now translates from the retracted position to the extended position, as depicted in Figure 21C. In the extended position, feeder arm 240 extends downward from carrier 230 to position dispensing tip 246 in a location that is (a) centered between needles 202 and (b)

below the intersection of needle beds 201. Figure 22C depicts a schematic cross-sectional view of this configuration. Note that dispensing tip 246 is positioned below the location of dispensing tip 246 in Figure 22B due to the translating movement of feeder arm 240.

[118] Referring now to Figure 21D, combination feeder 220 moves along rail 203 and yarn 206 is placed between loops of knitted component 260. That is, yarn 206 is located in front of some loops and behind other loops in an alternating pattern. Moreover, yarn 206 is placed in front of loops being held by needles 202 from one needle bed 201, and yarn 206 is placed behind loops being held by needles 202 from the other needle bed 201. Note that feeder arm 240 remains in the extended position in order to lay yarn 206 in the area below the intersection of needle beds 201. This effectively places yarn 206 within the course recently formed by standard feeder 204 in Figure 21B.

[119] In order to complete inlaying yarn 206 into knitted component 260, standard feeder 204 moves along rail 203 to form a new course from yarn 211, as depicted in Figure 21E. By forming the new course, yarn 206 is effectively knit within or otherwise integrated into the structure of knitted component 260. At this stage, feeder arm 240 may also translate from the extended position to the retracted position.

[120] Figures 21D and 21E show separate movements of feeders 204 and 220 along rail 203. That is, Figure 21D shows a first movement of combination feeder 220 along rail 203, and Figure 21E shows a second and subsequent movement of standard feeder 204 along rail 203. In many knitting processes, feeders 204 and 220 may effectively move simultaneously to inlay yarn 206 and form a new course from yarn 211. Combination feeder 220, however, moves ahead or in front of standard feeder 204 in order to position yarn 206 prior to the formation of the new course from yarn 211.

[121] The general knitting process outlined in the above discussion provides an example of the manner in which inlaid strands 132 and 152 may be located in knit elements 131 and 151. More particularly, knitted components 130 and 150 may be formed by utilizing combination feeder 220 to effectively insert inlaid strands 132 and 152 into knit elements 131. Given the reciprocating action of feeder arm 240, inlaid strands may be located within a previously formed course prior to the formation of a new course.

[122] Continuing with the knitting process, feeder arm 240 now translates from the retracted position to the extended position, as depicted in Figure 21F. Combination feeder 220 then moves along rail 203 and yarn 206 is placed between loops of knitted component 260, as depicted in Figure 21G. This effectively places yarn 206 within the course formed by standard feeder 204 in Figure 21E. In order to complete inlaying yarn 206 into knitted component 260, standard feeder 204 moves along rail 203 to form a new course from yarn 211, as depicted in Figure 21H. By forming the new course, yarn 206 is effectively knit within or otherwise integrated into the structure of knitted component 260. At this stage, feeder arm 240 may also translate from the extended position to the retracted position.

[123] Referring to Figure 21H, yarn 206 forms a loop 214 between the two inlaid sections. In the discussion of knitted component 130 above, it was noted that inlaid strand 132 repeatedly exits knit element 131 at perimeter edge 133 and then re-enters knit element 131 at another location of perimeter edge 133, thereby forming loops along perimeter edge 133, as seen in Figures 5 and 6. Loop 214 is formed in a similar manner. That is, loop 214 is formed where yarn 206 exits the knit structure of knitted component 260 and then re-enters the knit structure.

[124] As discussed above, standard feeder 204 has the ability to supply a yarn (e.g., yarn 211) that needles 202 manipulate to knit, tuck, and float. Combination

feeder 220, however, has the ability to supply a yarn (e.g., yarn 206) that needles 202 knit, tuck, or float, as well as inlaying the yarn. The above discussion of the knitting process describes the manner in which combination feeder 220 inlays a yarn while in the extended position. Combination feeder 220 may also supply the yarn for knitting, tucking, and floating while in the retracted position. Referring to Figure 21I, for example, combination feeder 220 moves along rail 203 while in the retracted position and forms a course of knitted component 260 while in the retracted position. Accordingly, by reciprocating feeder arm 240 between the retracted position and the extended position, combination feeder 220 may supply yarn 206 for purposes of knitting, tucking, floating, and inlaying. An advantage to combination feeder 220 relates, therefore, to its versatility in supplying a yarn that may be utilized for a greater number of functions than standard feeder 204

[125] The ability of combination feeder 220 to supply yarn for knitting, tucking, floating, and inlaying is based upon the reciprocating action of feeder arm 240. Referring to Figures 22A and 22B, dispensing tips 213 and 246 are at identical positions relative to needles 220. As such, both feeders 204 and 220 may supply a yarn for knitting, tucking, and floating. Referring to Figure 22C, dispensing tip 246 is at a different position. As such, combination feeder 220 may supply a yarn or other strand for inlaying. An advantage to combination feeder 220 relates, therefore, to its versatility in supplying a yarn that may be utilized for knitting, tucking, floating, and inlaying.

[126] Further Knitting Process Considerations

[127] Additional aspects relating to the knitting process will now be discussed. Referring to Figure 23, the upper course of knitted component 260 is formed from both of yarns 206 and 211. More particularly, a left side of the course is formed from yarn 211, whereas a right side of the course is formed from yarn 206. Additionally, yarn 206 is inlaid into the left side of the course. In order to form this configuration, standard feeder 204 may initially form the left side of the

course from yarn 211. Combination feeder 220 then lays yarn 206 into the right side of the course while feeder arm 240 is in the extended position. Subsequently, feeder arm 240 moves from the extended position to the retracted position and forms the right side of the course. Accordingly, combination feeder may inlay a yarn into one portion of a course and then supply the yarn for purposes of knitting a remainder of the course.

[128] Figure 24 depicts a configuration of knitting machine 200 that includes four combination feeders 220. As discussed above, combination feeder 220 has the ability to supply a yarn (e.g., yarn 206) for knitting, tucking, floating, and inlaying. Given this versatility, standard feeders 204 may be replaced by multiple combination feeders 220 in knitting machine 200 or in various conventional knitting machines.

[129] Figure 8B depicts a configuration of knitted component 130 where two yarns 138 and 139 are plated to form knit element 131, and inlaid strand 132 extends through knit element 131. The general knitting process discussed above may also be utilized to form this configuration. As depicted in Figure 15, knitting machine 200 includes multiple standard feeders 204, and two of standard feeders 204 may be utilized to form knit element 131, with combination feeder 220 depositing inlaid strand 132. Accordingly, the knitting process discussed above in Figures 21A-21I may be modified by adding another standard feeder 204 to supply an additional yarn. In configurations where yarn 138 is a non-fusible yarn and yarn 139 is a fusible yarn, knitted component 130 may be heated following the knitting process to fuse knitted component 130.

[130] The portion of knitted component 260 depicted in Figures 21A-21I has the configuration of a rib knit textile with regular and uninterrupted courses and wales. That is, the portion of knitted component 260 does not have, for example, any mesh areas similar to mesh knit zones 163-165 or mock mesh areas similar to mock mesh knit zones 166 and 167. In order to form mesh knit zones 163-165

in either of knitted components 150 and 260, a combination of a racked needle bed 201 and a transfer of stitch loops from front to back needle beds 201 and back to front needle beds 201 in different racked positions is utilized. In order to form mock mesh areas similar to mock mesh knit zones 166 and 167, a combination of a racked needle bed and a transfer of stitch loops from front to back needle beds 201 is utilized.

[131] Courses within a knitted component are generally parallel to each other. Given that a majority of inlaid strand 152 follows courses within knit element 151, it may be suggested that the various sections of inlaid strand 152 should be parallel to each other. Referring to Figure 9, for example, some sections of inlaid strand 152 extend between edges 153 and 155 and other sections extend between edges 153 and 154. Various sections of inlaid strand 152 are, therefore, not parallel. The concept of forming darts may be utilized to impart this non-parallel configuration to inlaid strand 152. More particularly, courses of varying length may be formed to effectively insert wedge-shaped structures between sections of inlaid strand 152. The structure formed in knitted component 150, therefore, where various sections of inlaid strand 152 are not parallel, may be accomplished through the process of darting.

[132] Although a majority of inlaid strands 152 follow courses within knit element 151, some sections of inlaid strand 152 follow wales. For example, sections of inlaid strand 152 that are adjacent to and parallel to inner edge 155 follow wales. This may be accomplished by first inserting a section of inlaid strand 152 along a portion of a course and to a point where inlaid strand 152 is intended to follow a wale. Inlaid strand 152 is then kicked back to move inlaid strand 152 out of the way, and the course is finished. As the subsequent course is being formed, inlay strand 152 is again kicked back to move inlaid strand 152 out of the way at the point where inlaid strand 152 is intended to follow the wale, and the course is finished. This process is repeated until inlaid strand 152 extends a desired

distance along the wale. Similar concepts may be utilized for portions of inlaid strand 132 in knitted component 130.

[133] A variety of procedures may be utilized to reduce relative movement between (a) knit element 131 and inlaid strand 132 or (b) knit element 151 and inlaid strand 152. That is, various procedures may be utilized to prevent inlaid strands 132 and 152 from slipping, moving through, pulling out, or otherwise becoming displaced from knit elements 131 and 151. For example, fusing one or more yarns that are formed from thermoplastic polymer materials to inlaid strands 132 and 152 may prevent movement between inlaid strands 132 and 152 and knit elements 131 and 151. Additionally, inlaid strands 132 and 152 may be fixed to knit elements 131 and 151 when periodically fed to knitting needles as a tuck element. That is, inlaid strands 132 and 152 may be formed into tuck stitches at points along their lengths (e.g., once per centimeter) in order to secure inlaid strands 132 and 152 to knit elements 131 and 151 and prevent movement of inlaid strands 132 and 152.

[134] Following the knitting process described above, various operations may be performed to enhance the properties of either of knitted components 130 and 150. For example, a water-repellant coating or other water-resisting treatment may be applied to limit the ability of the knit structures to absorb and retain water. As another example, knitted components 130 and 150 may be steamed to improve loft and induce fusing of the yarns. As discussed above with respect to Figure 8B, yarn 138 may be a non-fusible yarn and yarn 139 may be a fusible yarn. When steamed, yarn 139 may melt or otherwise soften so as to transition from a solid state to a softened or liquid state, and then transition from the softened or liquid state to the solid state when sufficiently cooled. As such, yarn 139 may be utilized to join (a) one portion of yarn 138 to another portion of yarn 138, (b) yarn 138 and inlaid strand 132 to each other, or (c) another element (e.g., logos, trademarks, and placards with care instructions and material

information) to knitted component 130, for example. Accordingly, a steaming process may be utilized to induce fusing of yarns in knitted components 130 and 150.

[135] Although procedures associated with the steaming process may vary greatly, one method involves pinning one of knitted components 130 and 150 to a jig during steaming. An advantage of pinning one of knitted components 130 and 150 to a jig is that the resulting dimensions of specific areas of knitted components 130 and 150 may be controlled. For example, pins on the jig may be located to hold areas corresponding to perimeter edge 133 of knitted component 130. By retaining specific dimensions for perimeter edge 133, perimeter edge 133 will have the correct length for a portion of the lasting process that joins upper 120 to sole structure 110. Accordingly, pinning areas of knitted components 130 and 150 may be utilized to control the resulting dimensions of knitted components 130 and 150 following the steaming process.

[136] The knitting process described above for forming knitted component 260 may be applied to the manufacture of knitted components 130 and 150 for footwear 100. The knitting process may also be applied to the manufacture of a variety of other knitted components. That is, knitting processes utilizing one or more combination feeders or other reciprocating feeders may be utilized to form a variety of knitted components. As such, knitted components formed through the knitting process described above, or a similar process, may also be utilized in other types of apparel (e.g., shirts, pants, socks, jackets, undergarments), athletic equipment (e.g., golf bags, baseball and football gloves, soccer ball restriction structures), containers (e.g., backpacks, bags), and upholstery for furniture (e.g., chairs, couches, car seats). The knitted components may also be utilized in bed coverings (e.g., sheets, blankets), table coverings, towels, flags, tents, sails, and parachutes. The knitted components may be utilized as technical textiles for industrial purposes, including structures for automotive and

aerospace applications, filter materials, medical textiles (e.g. bandages, swabs, implants), geotextiles for reinforcing embankments, agrotextiles for crop protection, and industrial apparel that protects or insulates against heat and radiation. Accordingly, knitted components formed through the knitting process described above, or a similar process, may be incorporated into a variety of products for both personal and industrial purposes.

[137] Knitted Components With Tongues

[138] In footwear 100, tongue 124 is separate from knitted component 130 and joined to knitted component 130, possibly with stitching, an adhesive, or thermal bonding. Moreover, tongue 124 is discussed as being added to knitted component 130 following the knitting process. As depicted in Figures 25 and 26, however, knitted component 130 includes a knitted tongue 170 that is formed of unitary knit construction with knit element 131. That is, knit element 131 and tongue 170 are formed as a one-piece element through a knitting process, which will be discussed in greater detail below. Although tongue 124 or another tongue may be joined to knit element 131 after knitted component 130 is formed, tongue 170 or another knitted tongue may be formed during the knitting process and of unitary knit construction with a portion of knitted component 130.

[139] Tongue 170 is located within a throat area (i.e., where lace 122 and lace apertures 123 are located) of knitted component 130 and extends along the throat area. When incorporated into footwear 100, for example, tongue 170 extends from a forward portion of the throat area to ankle opening 121. As with knit element 131, tongue 170 is depicted as being formed from a relatively untextured textile and a common or single knit structure. Tongue 170 is also depicted in Figure 27 as having a generally planar configuration. Examples of knit structures that may impart this configuration for tongue 170, as well as knit element 131, are any of the various knit structures in knit zones 160-162 discussed above. In further configurations, however, apertures may be formed in

areas of tongue 170 by utilizing the knit structures of mesh knit zones 163-165, indentations may be formed in areas of tongue 170 by utilizing the knit structures of mock mesh knit zones 166 or 167, or a combination of apertures and indentations may be formed in areas of tongue 170 by utilizing the knit structure of hybrid knit zone 168. Additionally, areas of tongue 170 may have a padded aspect when formed to have layers and floating yarns, for example, that are similar to padded zone 169. Accordingly, the untextured and planar aspect of tongue 170 is shown for purposes of example, and various features may be imparted through the use of different knit structures.

[140] Referring to Figures 28 and 29, a knitted tongue 175 is depicted as being formed of unitary knit construction with knit element 151 of knitted component 150. Tongue 175 has the same general shape as tongue 170, but may have a padded aspect with greater thickness. More particularly, tongue 175 is depicted in Figure 30 as including two overlapping and at least partially coextensive knitted layers 176, which may be formed of unitary knit construction, and a plurality of yarn loops 177 located between layers 176. Although the sides or edges of layers 176 are secured or knit to each other, a central area is generally unsecured. As such, layers 176 effectively form a tube or tubular structure, and yarn loops 177 are located between and extend outward from one of layers 176. In effect, yarn loops 177 fill an interior volume between layers 176 and impart a compressible or padded aspect to tongue 175. It should also be noted that each of layers 176 and yarn loops 177 may be formed of unitary knit construction during the knitting process that forms knitted component 150.

[141] Another knitted component 180 is depicted in Figure 31 as including a knit element 181, an inlaid strand 182, and a knitted tongue 183. With the exception of the presence of tongue 183, knitted component 180 has a general structure of a knitted component disclosed in U.S. Patent Application Publication 2010/0154256 to Dua, which is incorporated herein by reference. Tongue 183 is

formed of unitary knit construction with knit element 181 and includes various knit structures. Referring to Figure 32, for example, peripheral areas of tongue 183 exhibit an untextured configuration that may have any of the various knit structures in knit zones 160-162. At least two areas of tongue 183 incorporate apertures and may have any of the various knit structures in mesh knit zones 163-165. Referring to Figure 33, a central area of tongue 183 has a compressible or padded aspect that includes two overlapping and at least partially coextensive knitted layers 184, which may be formed of unitary knit construction, and a plurality of floating yarns 185 extending between layers 184. The central area of tongue 183 may exhibit, therefore, the knit structure of padded zone 169. Although the sides or edges of layers 184 are secured to each other, a central area is generally unsecured. As such, layers 184 effectively form a tube or tubular structure, and floating yarns 185 may be located or inlaid between layers 184 to pass through the tubular structure. That is, floating yarns 185 extend between layers 184, are generally parallel to surfaces of layers 184, and also pass through and fill an interior volume between layers 184. Whereas a majority of tongue 183 is formed from yarns that are mechanically-manipulated to form intermeshed loops, floating yarns 185 are generally free or otherwise inlaid within the interior volume between layers 184. As an additional matter, layers 184 may be at least partially formed from a stretch yarn to impart the advantages discussed above for knitted layers 140 and floating yarns 141.

[142] Tongue 183 provides an example of the manner in which various knit structures may be utilized. As discussed above, the peripheral areas of tongue 183 exhibit an untextured configuration, two areas of tongue 183 incorporate apertures, and the central area of tongue 183 includes knitted layers 184 and floating yarns 185 to provide a compressible or padded aspect. Mock mesh knit structures and hybrid knit structures may also be utilized. Accordingly, various knit structures may be incorporated into tongue 183 or any other knitted tongue (e.g., tongues 170 and 175) to impart different properties or aesthetics.

[143] Tongue 170 is secured to a forward portion of the throat area of knit element 131. That is, tongue 170 is joined through knitting to knit element 131 in a portion of the throat area that is closest to forefoot region 101 in footwear 100. Each of tongues 175 and 183 are respectively secured or knit to a similar position in knitted components 150 and 180. Referring to Figures 34 and 35, however, a knitted tongue 190 is secured along a length of the throat area of a configuration of knitted component 131 that does not include inlaid strand 132 or lace apertures 123. More particularly, edges of tongue 190 are knit to an area of knit element 131 that is spaced outward from inner edge 135. Accordingly, any of the configurations of tongues 170, 175, 183, and 190 may be secured (e.g., through unitary knit construction) to various locations in the throat areas of knitted components 130, 150, and 180.

[144] Advantages of constructing tongue 170 during the knitting process and of unitary knit construction are more efficient manufacture and common properties. More particularly, manufacturing efficiency may be increased by forming more of knitted component 130 during the knitting process and eliminating various steps (e.g., making a separate tongue, securing the tongue) that are often performed manually. Tongue 170 and knit element 131 may also have common properties when formed from the same yarn (or type of yarn) or with similar knit structures. For example, utilizing the same yarn in both of tongue 170 and knit element 131 imparts similar durability, strength, stretch, wear-resistance, biodegradability, thermal, and hydrophobic properties. In addition to physical properties, utilizing the same yarn in both of tongue 170 and knit element 131 may impart common aesthetic or tactile properties, such as color, sheen, and texture. Utilizing the same knit structures in both of tongue 170 and knit element 131 may also impart common physical properties and aesthetic properties. These advantages may also be present when at least a portion of knit element 131 and at least a portion of tongue 170 are formed from a common yarn (or type of yarn) or with common knit structures.

[145] Tongue 175 includes yarn loops 177 between layers 176, and tongue 183 includes floating yarns 185 between layers 184. A benefit of yarn loops 177 and floating yarns 185 is that compressible or padded areas are formed. In addition to yarn loops 177 and floating yarns 185, other types of free yarn sections may be utilized. For purposes of the present application, "free yarn sections" or variants thereof is defined as segments or portions of yarns that are not directly forming intermeshed loops (e.g., that define courses and wales) of a knit structure, such as floating yarns, inlaid yarns, terry loops, ends of yarns, and cut segments of yarn, for example. Moreover, it should be noted that free yarn sections may be one portion of an individual yarn, with other portions of the yarn forming intermeshed loops of the knit structure, For example, the portion of a yarn forming terry loops (e.g., the free yarn sections) may be between portions of the yarn forming intermeshed loops of a knit structure. As an alternative to free yarn sections, foam materials or other types of compressible materials may be utilized within either of tongues 175 and 183.

[146] As a final matter, although tongue 170 is disclosed in combination with knitted component 130, tongue 170 may also be utilized with knitted components 150 and 180, as well as other knitted components. Similarly, tongues 175, 183, and 190 may be utilized with any of knitted components 130, 150, and 180, as well as other knitted components. The combinations disclosed herein are, therefore, for purposes of example and other combinations may also be utilized. Moreover, the specific configurations of tongues 170, 175, 183, and 190 are also meant to provide examples and may also vary significantly. For example, the position of layers 184 and floating yarns 185 may be enlarged, moved to a periphery of tongue 183, or removed from tongue 183. Accordingly, the various combinations and configurations are intended to provide examples, and other combinations and configurations may also be utilized.

[147] Tongue Knitting Process

[148] The manner in which knitting machine 200 operates to manufacture a knitted component with a tongue will now be discussed in detail. Moreover, the following discussion will demonstrate the manner in which knit element 131 and tongue 170 are formed of unitary knit construction, but similar processes may be utilized for other knitted components and tongues. Referring to Figures 36A-36G, a portion of knitting machine 200 is schematically-depicted as including needle beds 201, one rail 203, one standard feeder 204, and one combination feeder 220. It should be understood that although knitted component 130 is formed between needle beds 201, knitted component 130 is shown adjacent to needle beds 201 to (a) be more visible during discussion of the knitting process and (b) show the position of portions of knitted component 130 relative to each other and needle beds 201. Also, although one rail 203, one standard feeder 204, and one combination feeder 220 are depicted, additional rails 203, standard feeders 204, and combination feeders 220 may be utilized. Accordingly, the general structure of knitting machine 200 is simplified for purposes of explaining the knitting process.

[149] Initially, a portion of tongue 170 is formed by knitting machine 200, as depicted in Figure 36A. In forming this portion of tongue 170, standard feeder 204 repeatedly moves along rail 203 and various courses are formed from at least yarn 211. More particularly, needles 202 pull sections of yarn 211 through loops of a prior course, thereby forming another course. This action continues until tongue 170 is substantially formed, as depicted in Figure 36B. It should be noted at this stage that although tongue 170 is depicted as being formed from one yarn 211, additional yarns may be incorporated into tongue 170 from further standard feeders 204. For example, a fusible yarn may be incorporated into at least the upper or final course of tongue 170 to assist with ensuring that tongue 170 is properly joined or knitted with knit element 131. Additionally, at least the final

course of tongue 170 may include cross-tuck stitches with a relatively tight or dense knit to ensure that tongue 170 remains properly positioned on needles 202 during later stages of the knitting process.

[150] Knitting machine 200 now begins the process of forming knit element 131, as depicted in Figure 36C, in accordance with the knitting process discussed previously. As the knitting process continues, combination feeder 220 inlays yarn 206 to form inlaid strand 132, as depicted in Figure 36D, also in accordance with the knitting process discussed previously. Through a comparison of Figures 36C and 36D, tongue 170 remains stationary relative to needle beds 201, but knit element 131 moves downward and may overlap tongue 170 as successive courses are formed in knit element 131. This continues until a course is formed that is intended to join tongue 170 to knit element 131. More particularly, tongue 170 remains stationary relative to needle beds 201 as portions of knitted component 131 are formed. At the point depicted in Figure 36E, however, a course is formed that (a) extends across the final course of tongue 170, which includes the cross-tuck stitches, and (b) joins with the final course of tongue 170. In effect, this course joins tongue 170 to knit element 131. At this stage, therefore, knit element 131 and tongue 170 are effectively formed of unitary knit construction.

[151] Once tongue 170 is joined to knit element 131, knitting machine 200 continues the process of forming courses, thereby forming more of knit element 131, as depicted in Figure 36F. Given that tongue 170 is now joined to knit element 131, tongue 170 moves downward with knit element 131 as successive courses are formed, as seen through a comparison of Figures 36E and 36F. Moving forward, knitting machine 200 continues the process of forming courses in knit element 131 until knitted component 130 is substantially formed, as depicted in Figure 36G.

[152] Now that the general process associated with forming knitted component 130 to include tongue 170 is presented, additional aspects of the knitting process will be discussed. As noted above, a fusible yarn may be incorporated into at least the final course of tongue 170 to assist with ensuring that tongue 170 is properly joined or knitted with knit element 131. In some knitting processes, the yarn forming the final course of tongue 170 is cut. By incorporating the fusible yarn into the final course of tongue 170, the knit structure at the interface of tongue 170 with knit element 131 may be strengthened. That is, melting of the fusible yarn will fuse or otherwise join the sections of yarn at the interface and prevent unraveling of the cut yarn.

[153] Also as noted above, at least the final course of tongue 170 may include cross-tuck stitches with a relatively tight or dense knit to ensure that tongue 170 remains properly positioned on needles 202 during later stages of the knitting process. During a majority of the knitting process that forms knit element 131, tongue 170 remains stationary relative to needle beds 201. Movement, vibration, or other actions of knitting machine 200 may, however, dislodge portions of the final course from needles 202, thereby forming dropped stitches. By forming cross-tuck stitches with a relatively tight or dense knit, fewer dropped stitches are formed. Moreover, if dropped stitches are formed, the fusible yarn within the final course will fuse or otherwise join the dropped stitches within the knit structure.

[154] Once tongue 170 is knit, various needles 202 hold tongue 170 in position while knit element 131 is formed. In effect, the needles 202 that hold tongue 170 are unavailable for further knitting until tongue 170 is joined with knit element 131. As a result, only those needles 202 located beyond the edges (i.e., to the right and to the left) of tongue 170 are available for forming knit element 131. The final course of tongue 170 should, therefore, have equal or less width than the distance between opposite sides of inner edge 135 in the area where tongue 170 is joined with knit element 131. In other words, the design of knitted component

130 should account for (a) the length of the final course of tongue 170 and (b) the number of needles 202 that are reserved for holding tongue 170 while knit element 131 is formed.

[155] In the knitting process discussed above, both tongue 170 and knit element 131 are formed from yarn 211. Whereas tongue 170 remains stationary relative to needle beds 201 through a portion of the knitting process, portions of knit element 131 move downward as successive courses are formed. Given that a segment of yarn 211 may extend from the final course of tongue 170 to the first course of knit element 131 (i.e., the bottom edges of knit element 131), this segment of yarn should have sufficient length to account for the downward movement of the first course of knit element 131. In effect, a comparison of Figures 36C-36E, demonstrates that the first course of knit element 131 moves downward and away from the final course of tongue 170 as knit element 131 is formed. Accordingly, if a segment of yarn 211 extends from the final course of tongue 170 to the first course of knit element 131, this segment of yarn should have sufficient length to account for the growing distance between the final course of tongue 170 and the first course of knit element 131.

[156] Although various methods may be employed to account for the growing distance between the final course of tongue 170 and the first course of knit element 131, Figure 37 depicts an expansion section 195 as being formed following the formation of tongue 170. Expansion section 195 may then be cast off of needles 202. As the distance between the final course of tongue 170 and the first course of knit element 131 increases, expansion section 195 may unravel and lengthen. That is, unraveling of expansion section 195 may be used to effectively lengthen the section of yarn 211 between the final course of tongue 170 and the first course of knit element 131. In some configurations, expansion section 195 may be formed as a jersey fabric to facilitate unraveling.

[157] The various Figures 36A-36G show knitted component 130 as being formed independently. In some knitting processes, however, a waste element is knit prior to forming knitted component 130. The waste element engages various rollers that provide a downward force upon knitted component 130. The downward force ensures that courses move away from needles 202 as later courses are formed.

[158] Based upon the above discussion, knit element 131 and tongue 170 may be formed of unitary knit construction through a single knitting process. As described, tongue 170 is formed first and remains stationary upon needle beds 201 as knit element 131 is formed. After a course is formed that joins knit element 131 and tongue 170, knit element 131 and tongue 170 move downward together as further portions of knit element 131 are formed.

[159] Sequential Alterations

[160] Knitting machine 200 includes, among other elements, a knitting mechanism 270, a pattern 280, and a computing device 290, as schematically-depicted in Figure 38. Knitting mechanism 270 includes many of the mechanical components of knitting machine 200 (e.g., needles 202, feeders 204 and 220, carriage 205) that mechanically-manipulate yarns 206 and 211 to form a knitted component (e.g., knitted component 130). Pattern 280 includes data on the knitted component, including the yarns that are utilized for each stitch, the type of knit structures formed by each stitch, and the specific needles 202 and feeders 204 and 220 that are used for each stitch, for example. The operation of knitting machine 200 is governed by computing device 290, which reads data from pattern 280 and directs the corresponding operation of knitting mechanism 270.

[161] Multiple and substantially identical knitted components may be formed by knitting machine 200. More particularly, computing device 290 may repeatedly read pattern 280 and direct knitting mechanism 270 to form substantially identical

knitted components. In general, therefore, each knitted component that is formed will be substantially identical to other knitted components that are formed based upon a particular pattern 280. Referring to Figures 39A-39C, however, three versions of tongue 170 are shown. Whereas Figure 39A depicts tongue 170 as including a knit structure (e.g., yarns with different colors) with alphanumeric characters that form "1 OF 100," Figures 39B and 39C respectively depict tongue 170 as including knit structures with alphanumeric characters that form "2 OF 100" and "3 OF 100."

[162] One manner of accomplishing the sequential alterations of the type shown in Figures 39A-39C is to create multiple patterns. In effect, each of the configurations of tongue 170 shown in Figures 39A-39C may have a different pattern. As an alternative, an application (e.g., software) run by computing device 290 may alter pattern 280 while each successive tongue 170 is formed to provide sequential alterations. For example, pattern 280 may include a modifiable field 281, which is an area of pattern 280 that can be updated or changed by computing device 290. For purposes of reference, portions of pattern 280 that correspond with "1," "2," and "3" in Figures 39A-39C may be governed by modifiable field 281. Computing device 290 may include a counter, for example, that updates modifiable field 281 with each successive knitted component that is formed. Accordingly, sequential alterations of pattern 280 may be automated through the use of an application run by computing device 290, thereby rectifying the need for different patterns 280 for each sequential variation of tongue 170.

[163] In operation, pattern 280 with modifiable field 281 is provided by an operator, designer, or manufacturer, for example. Computing device 290 may either form a first knitted component with a default setting for modifiable field 281 or may update modifiable field 281 according to other instructions or data. As such, for example, tongue 170 of Figure 39A may be knitted with "1 OF 100." Computing

device 290 now updates modifiable field 281 with data representing another alphanumeric character, possibly a sequential alphanumeric character when computing device 290 includes a counter, and tongue 170 of Figure 39B may be knitted with "2 OF 100." The procedure repeats and computing device 290 updates modifiable field 281 with data representing another alphanumeric character and tongue 170 of Figure 39C may be knitted with "3 OF 100." Accordingly, modifiable field of pattern 280 may be repeatedly updated with data representing different alphanumeric characters, possibly sequential alphanumeric characters.

[164] The invention is disclosed above and in the accompanying figures with reference to a variety of configurations. The purpose served by the disclosure, however, is to provide an example of the various features and concepts related to the invention, not to limit the scope of the invention. One skilled in the relevant art will recognize that numerous variations and modifications may be made to the configurations described above without departing from the scope of the present invention, as defined by the appended claims.

CLAIMS

1. A method of manufacturing a knitted component for an article of footwear, the method comprising:

knitting a tongue with a knitting machine;

holding the tongue on needles of the knitting machine;

knitting a first portion of a knit element with the knitting machine while the tongue is held on the needles;

joining the tongue to the first portion of the knit element; and

knitting a second portion of the knit element with the knitting machine.

2. The method recited in claim 1, further including a step of selecting the knitting machine to be a flat knitting machine.

3. The method recited in claim 1, further including a step of knitting an expansion section following the step of knitting the tongue, and wherein the step of knitting the first portion of the knit element includes unraveling the expansion section.

4. The method recited in claim 1, wherein the step of knitting the tongue includes forming a course of the tongue to include at least one of (a) a fusible yarn and (b) cross-tuck stitches.

5. The method recited in claim 1, wherein the step of joining the tongue includes forming a course with the knitting machine that joins the tongue to the knit element.

6. A method of manufacturing a knitted component for an article of footwear, the method comprising:

knitting a tongue with a knitting machine;

knitting a first portion of a knit element with the knitting machine, the tongue being stationary with respect to a needle bed of the knitting machine during knitting of the first portion of the knit element, and the first portion of the knit element moving with respect to the tongue during knitting of the first portion of the knit element;

forming a course with the knitting machine that joins the tongue to the knit element; and

knitting a second portion of the knit element with the knitting machine, the tongue and the first portion of the knit element moving together during knitting of the second portion of the knit element.

7. The method recited in claim 6, further including a step of selecting the knitting machine to be a flat knitting machine.

8. The method recited in claim 6, further including a step of knitting an expansion section following the step of knitting the tongue, and wherein the step of knitting the first portion of the knit element includes unraveling the expansion section.

9. The method recited in claim 6, wherein the step of knitting the tongue includes forming a final course of the tongue to include at least one of (a) a fusible yarn and (b) cross-tuck stitches.

10. A method of knitting comprising:

providing a knitting pattern with a modifiable field;

updating the modifiable field with data representing a first alphanumeric character;

knitting a first component with a knit structure of the first alphanumeric character;

updating the modifiable field with data representing a second alphanumeric character, the second alphanumeric character being different than the first alphanumeric character; and

knitting a second component with a knit structure of the second alphanumeric character.

11. The method recited in claim 10, wherein the second alphanumeric character is sequential from the first alphanumeric character.

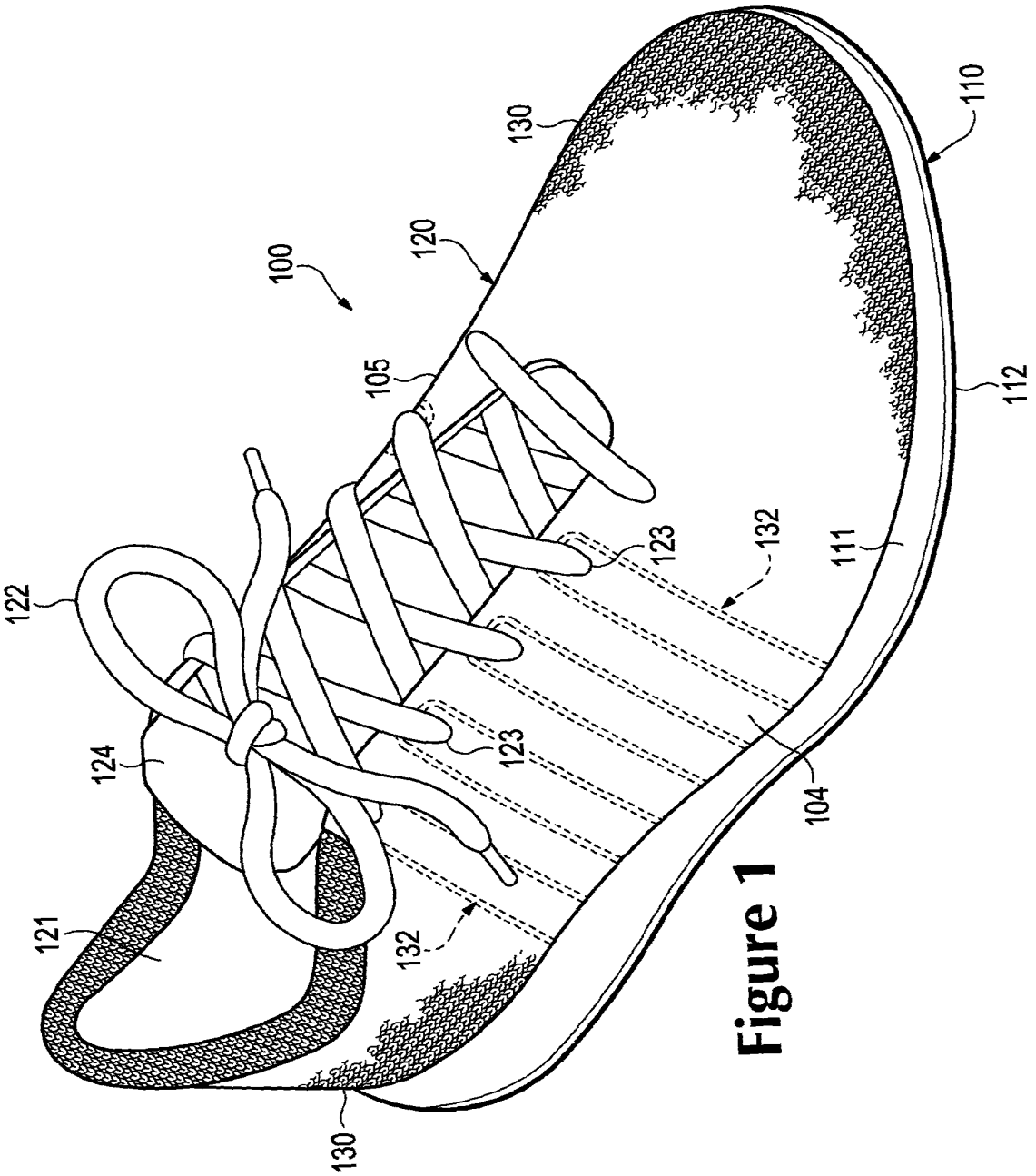


Figure 1

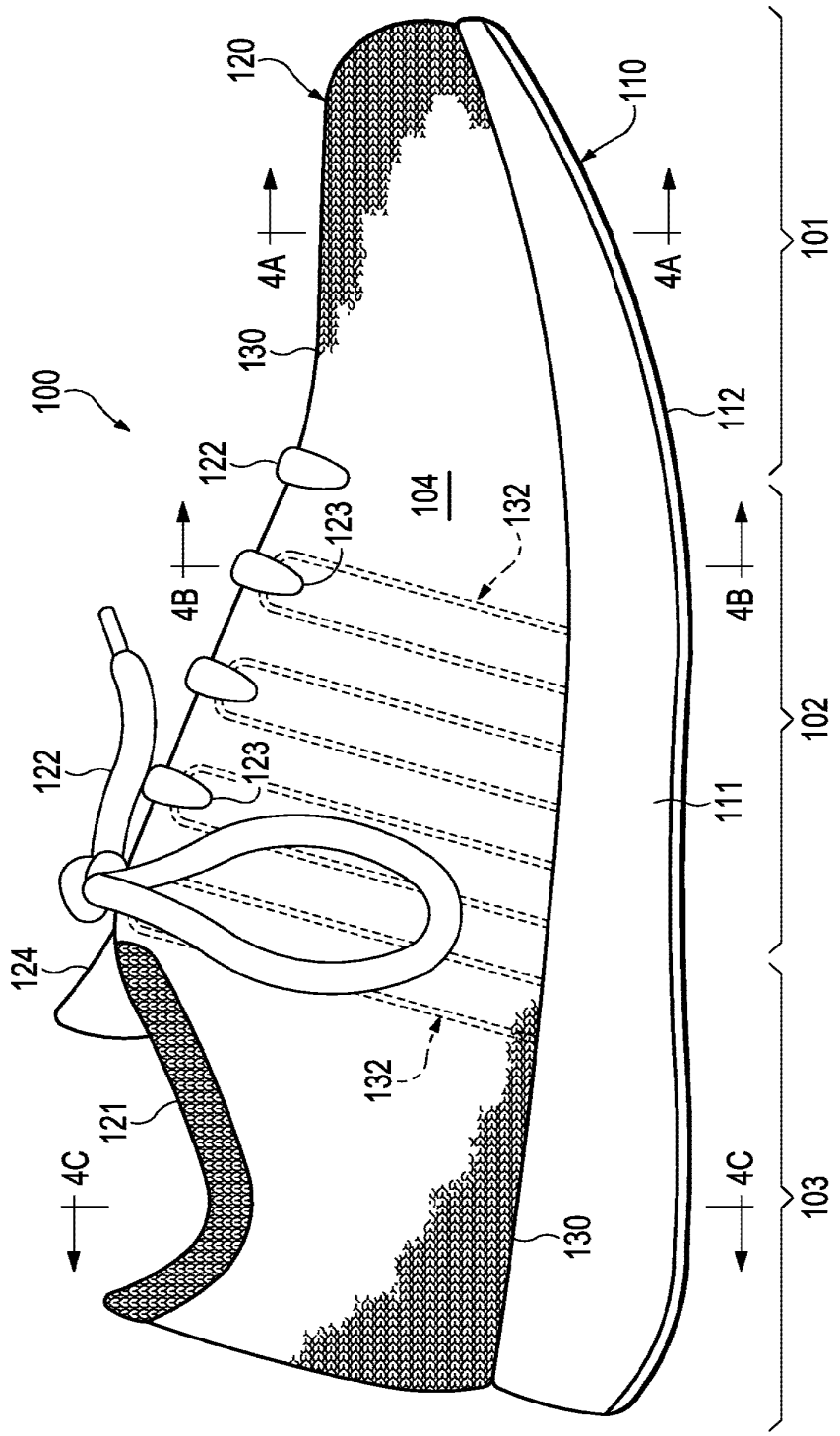

120
110
4A
4A
101
130
100
112
122
104
132
123
4B
4B
102
122
123
111
124
132
121
4C
4C
103
130

Figure 2

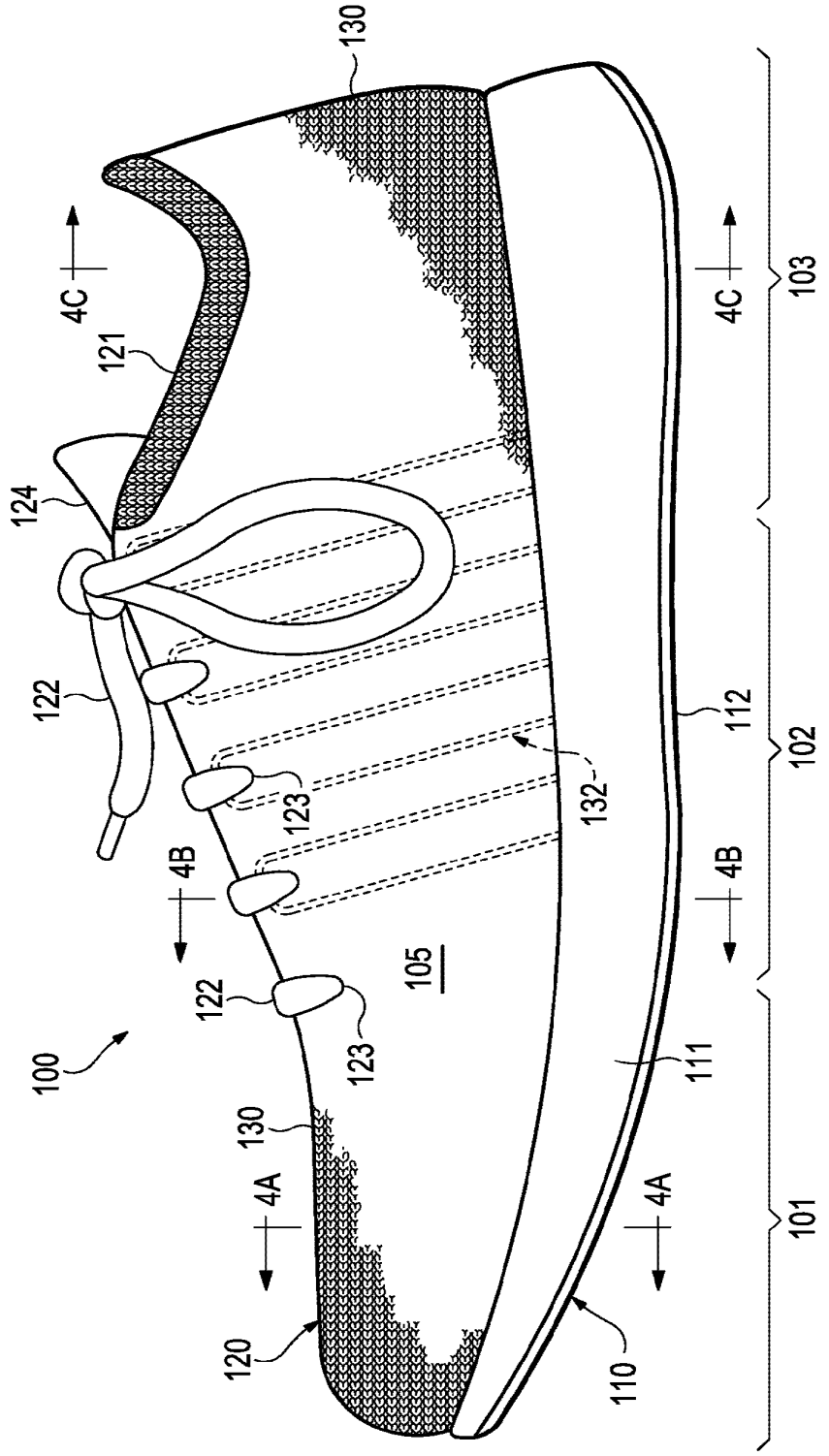

130
4C
121
124
122
123
4B
105
132
112
102
103
100
111
101
4A
120
110

Figure 3

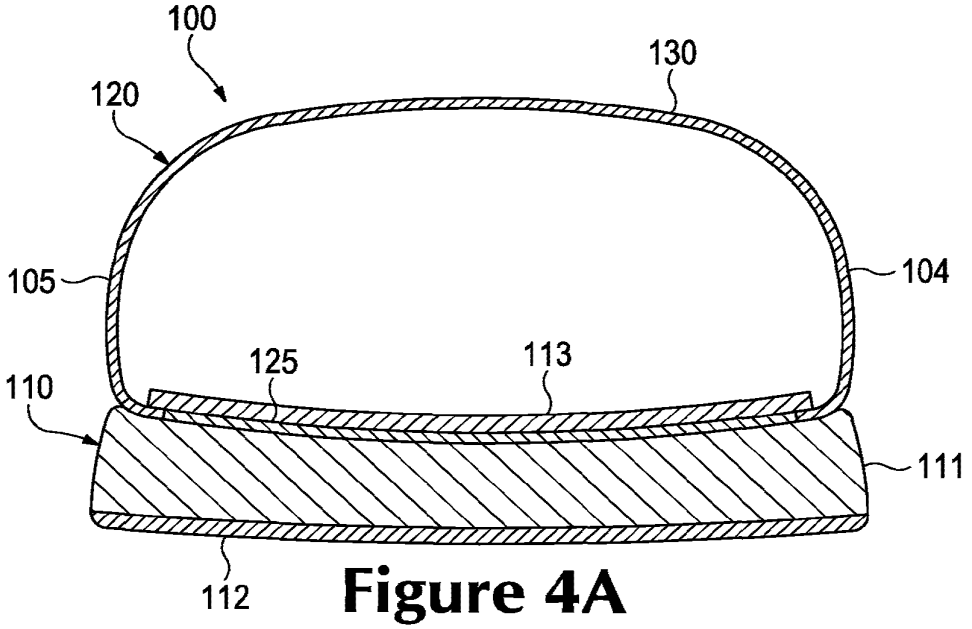


Figure 4A

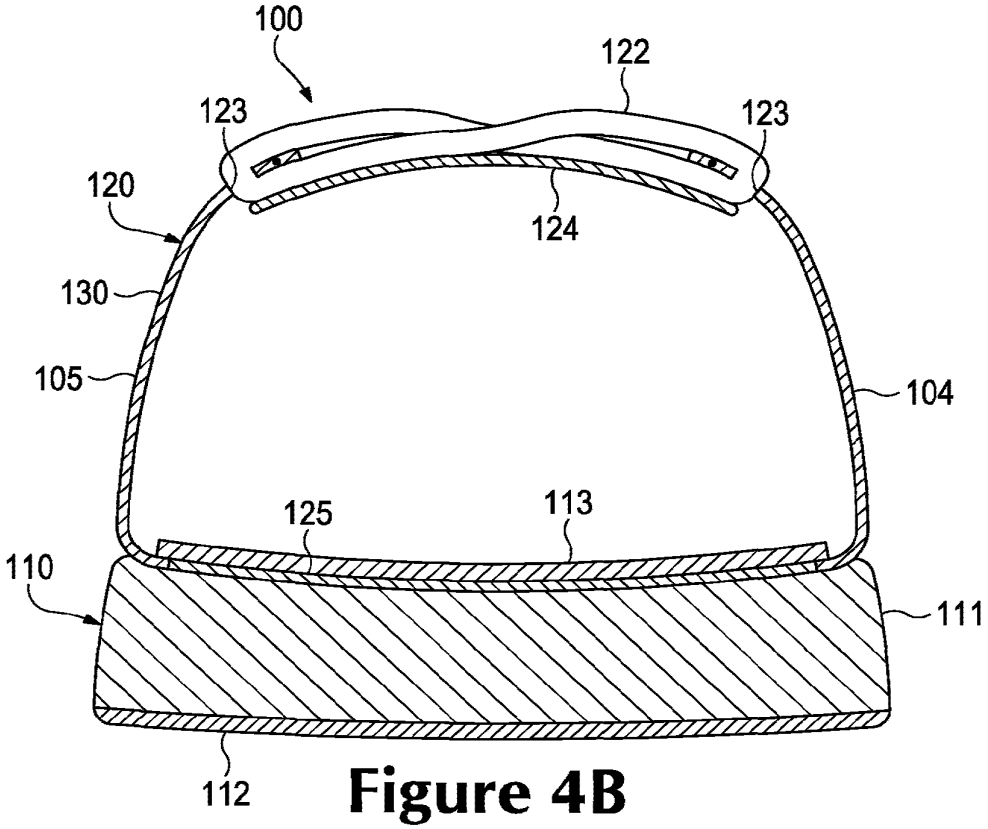


Figure 4B

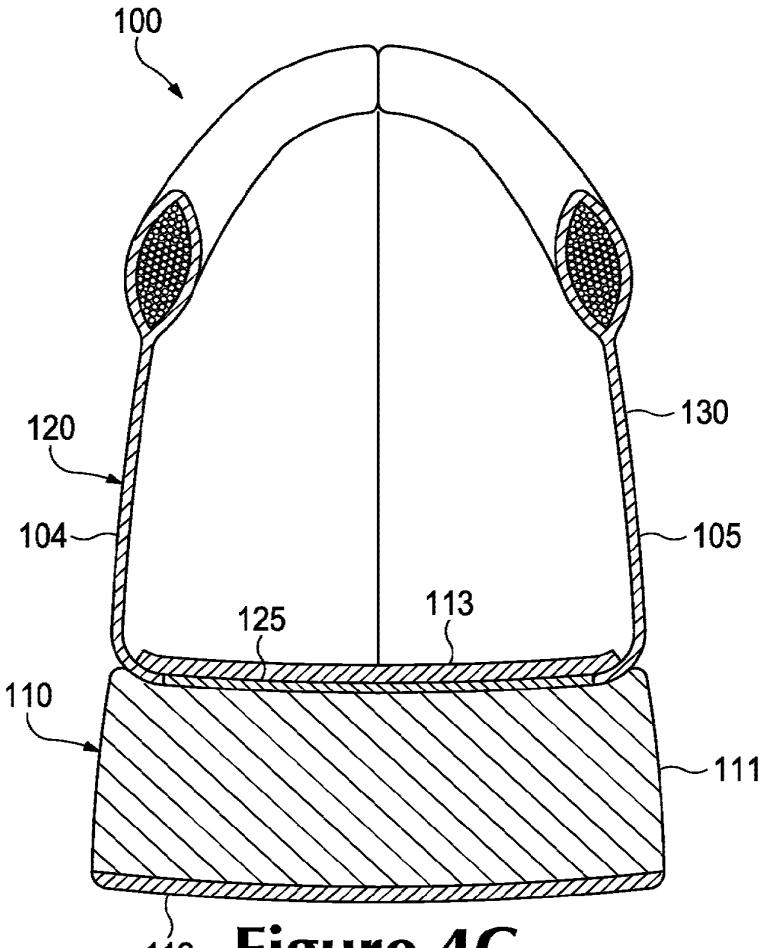
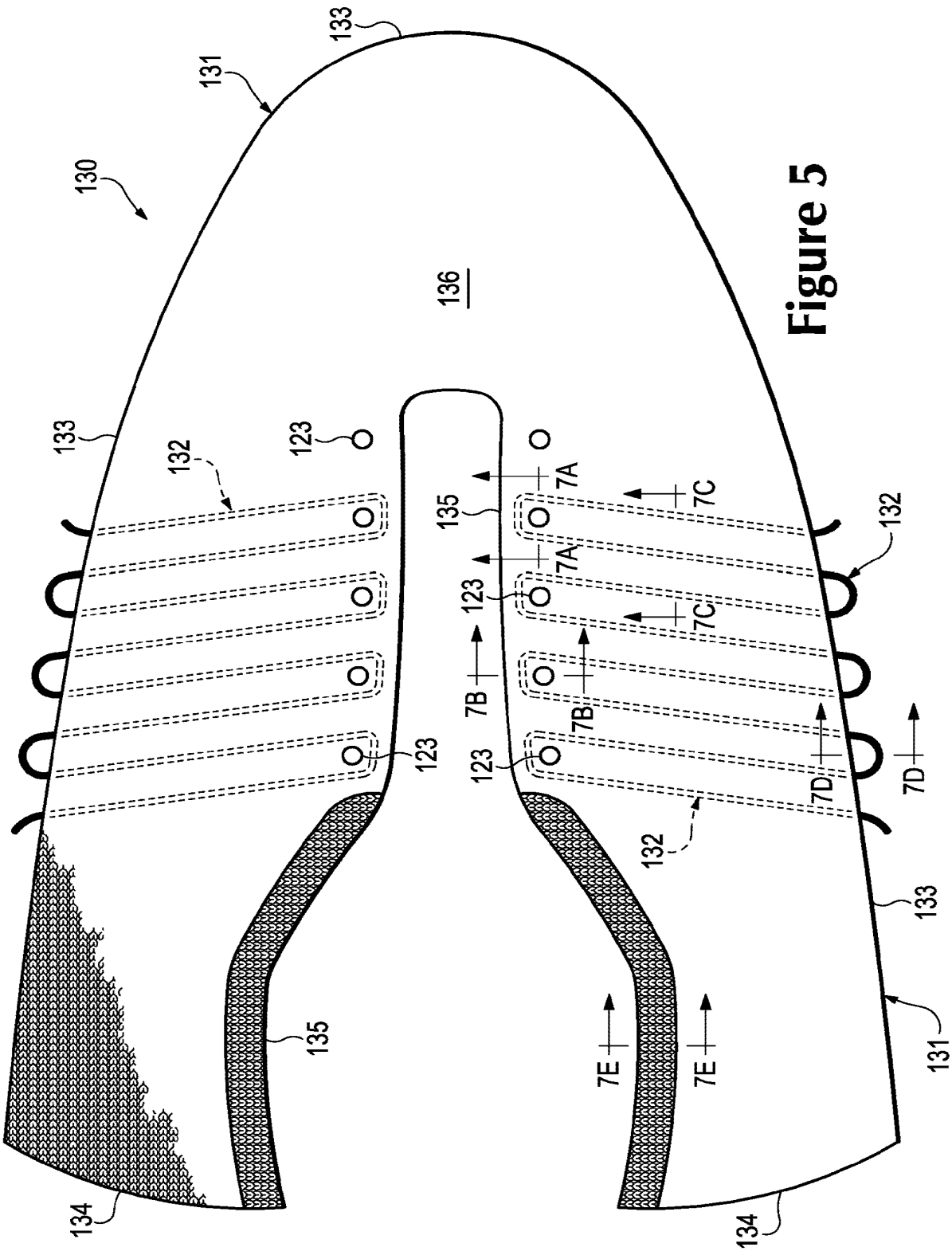


Figure 4C



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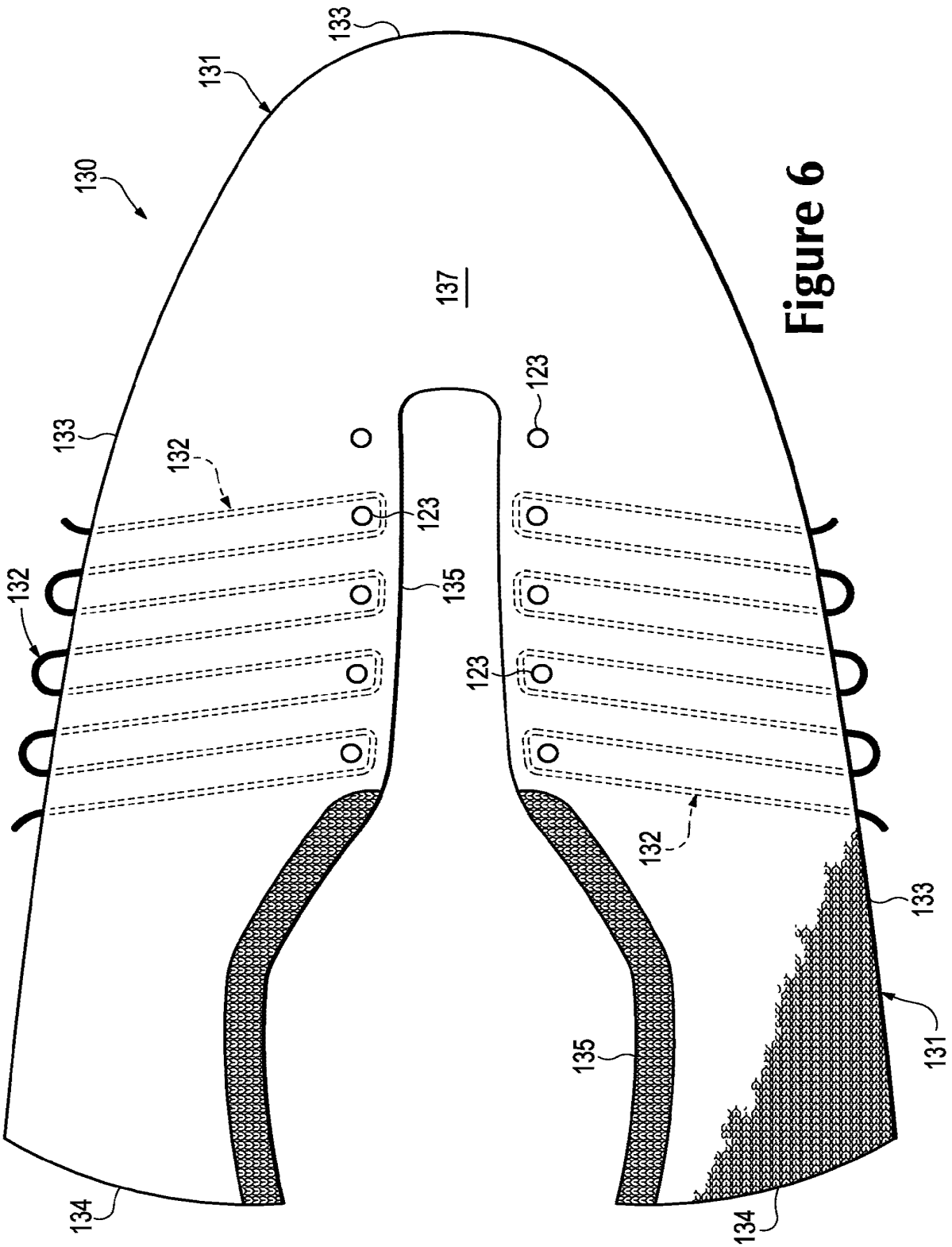


Figure 6

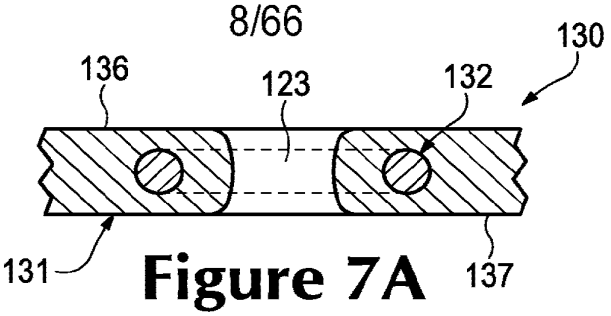
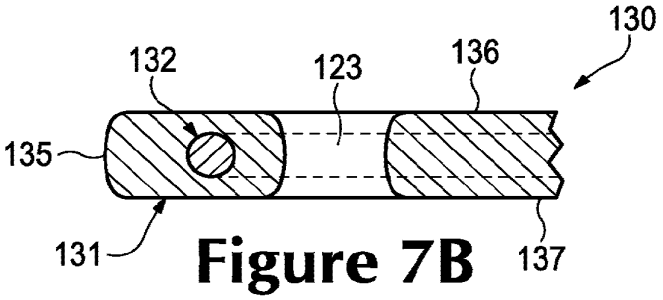


Figure 7A



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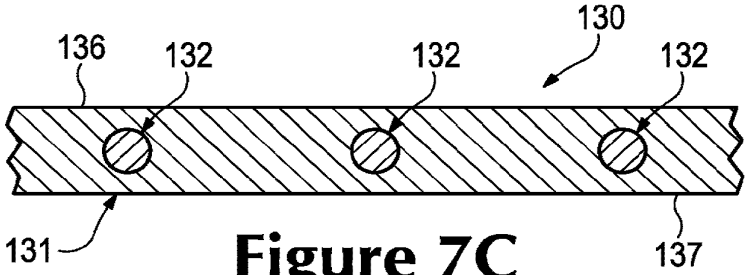

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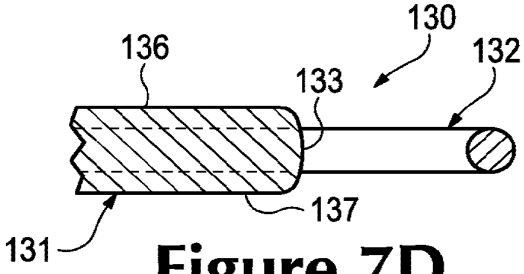

Figure 7D

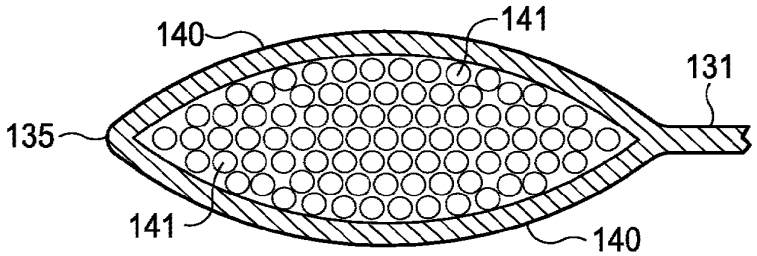

Figure 7E

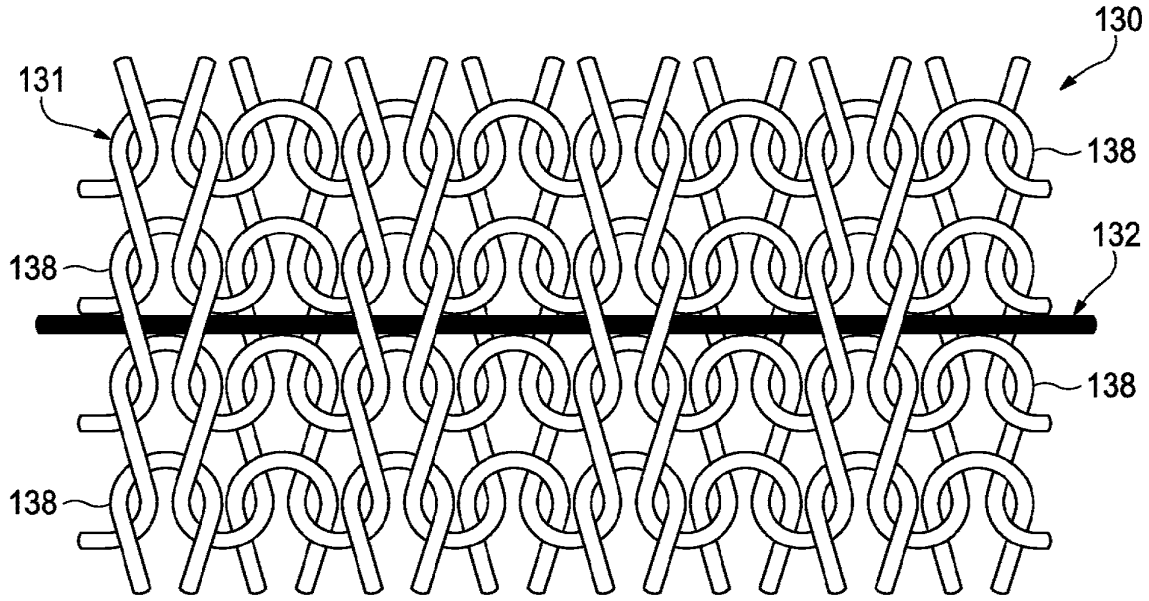

Figure 8A

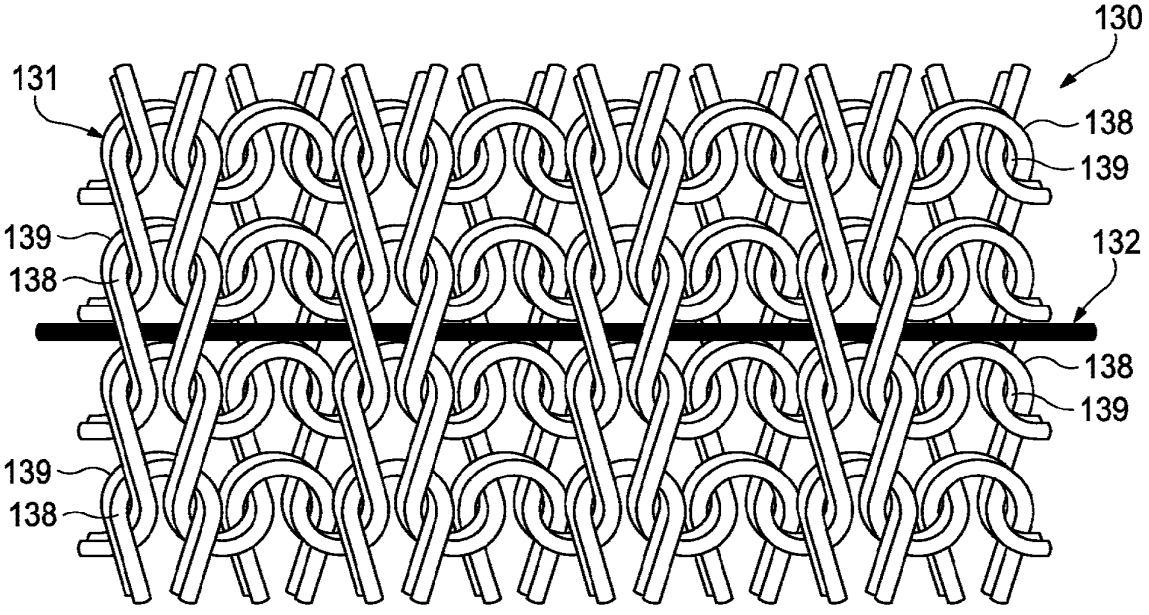

Figure 8B

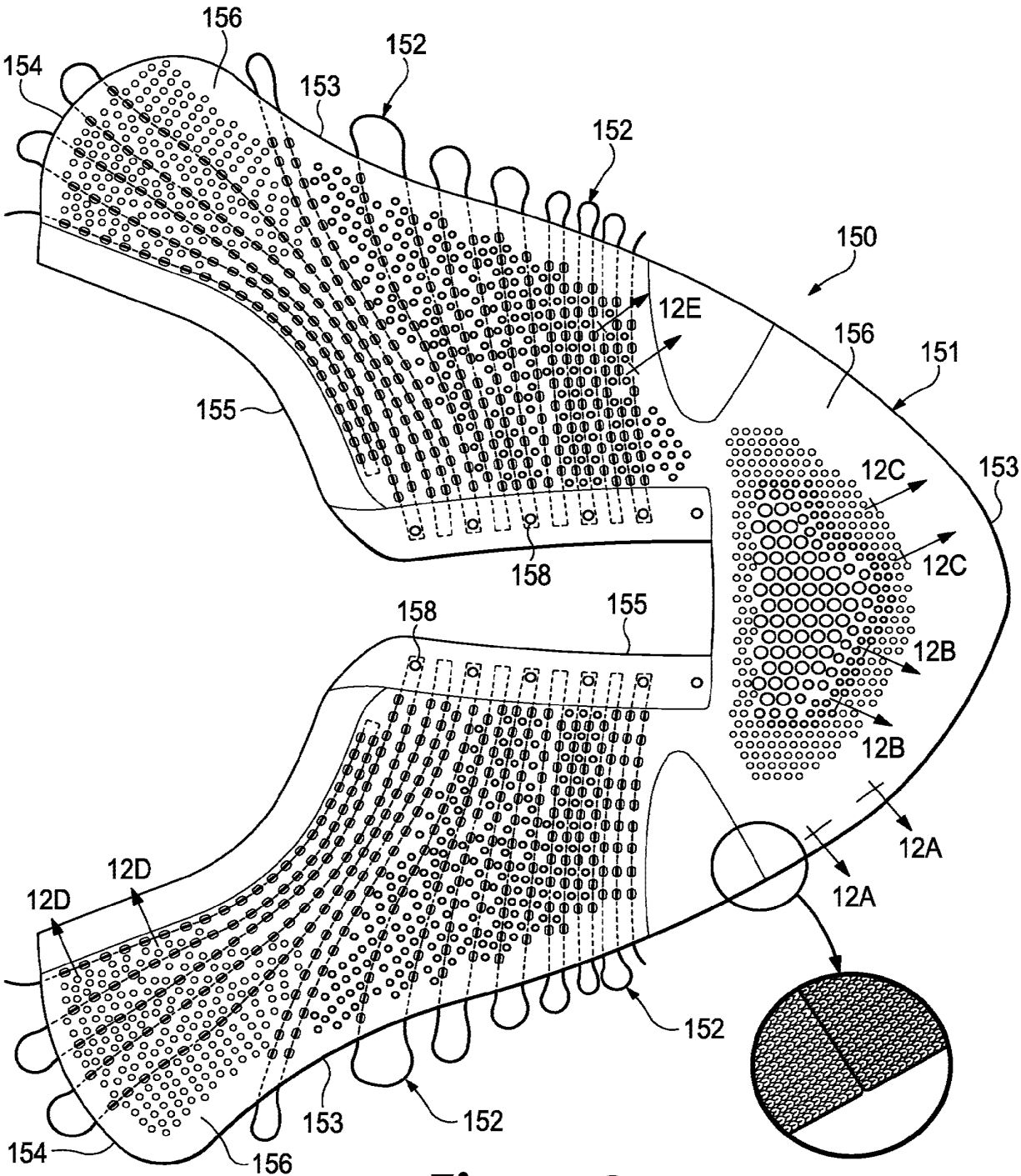
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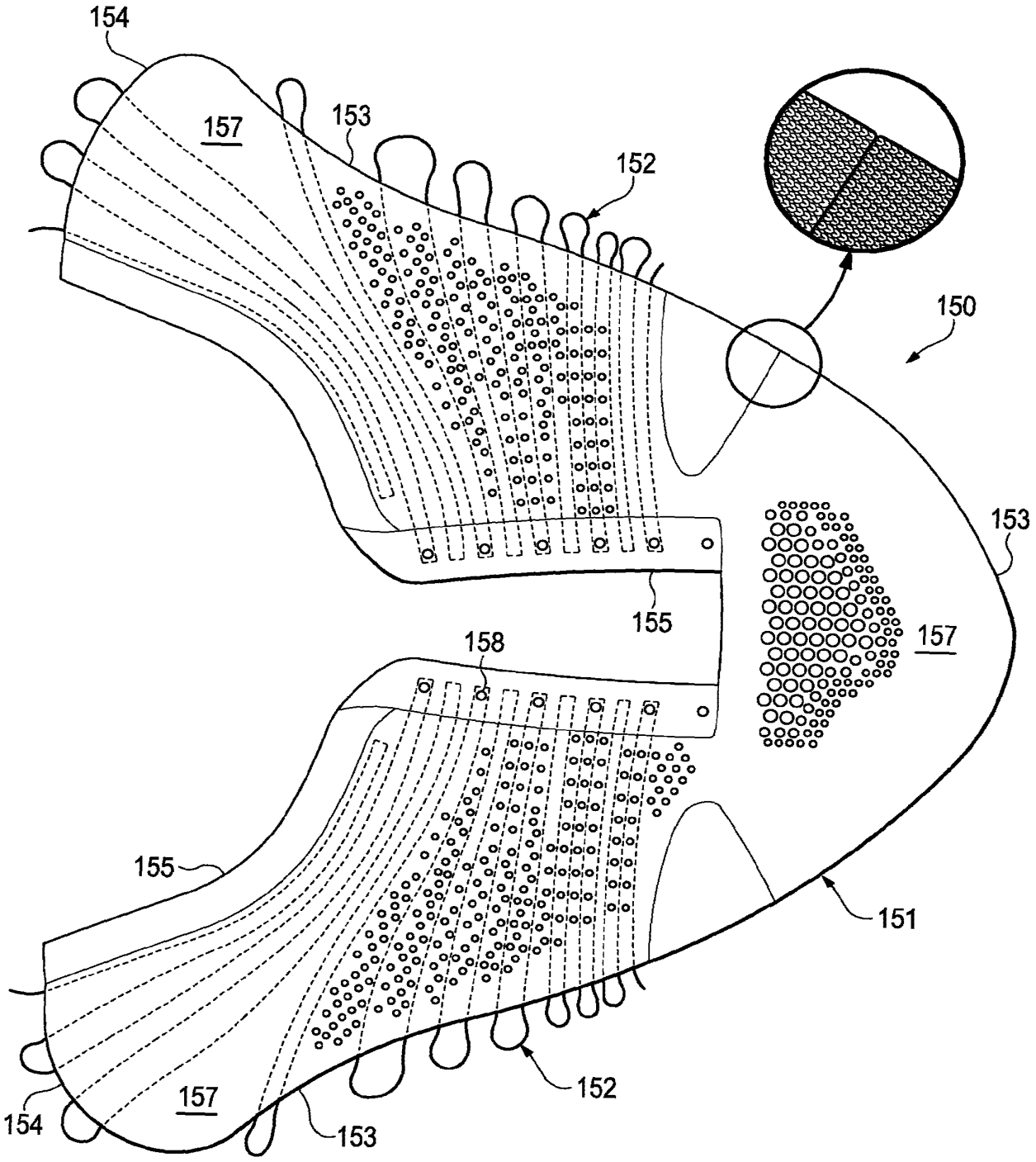
Figure 9



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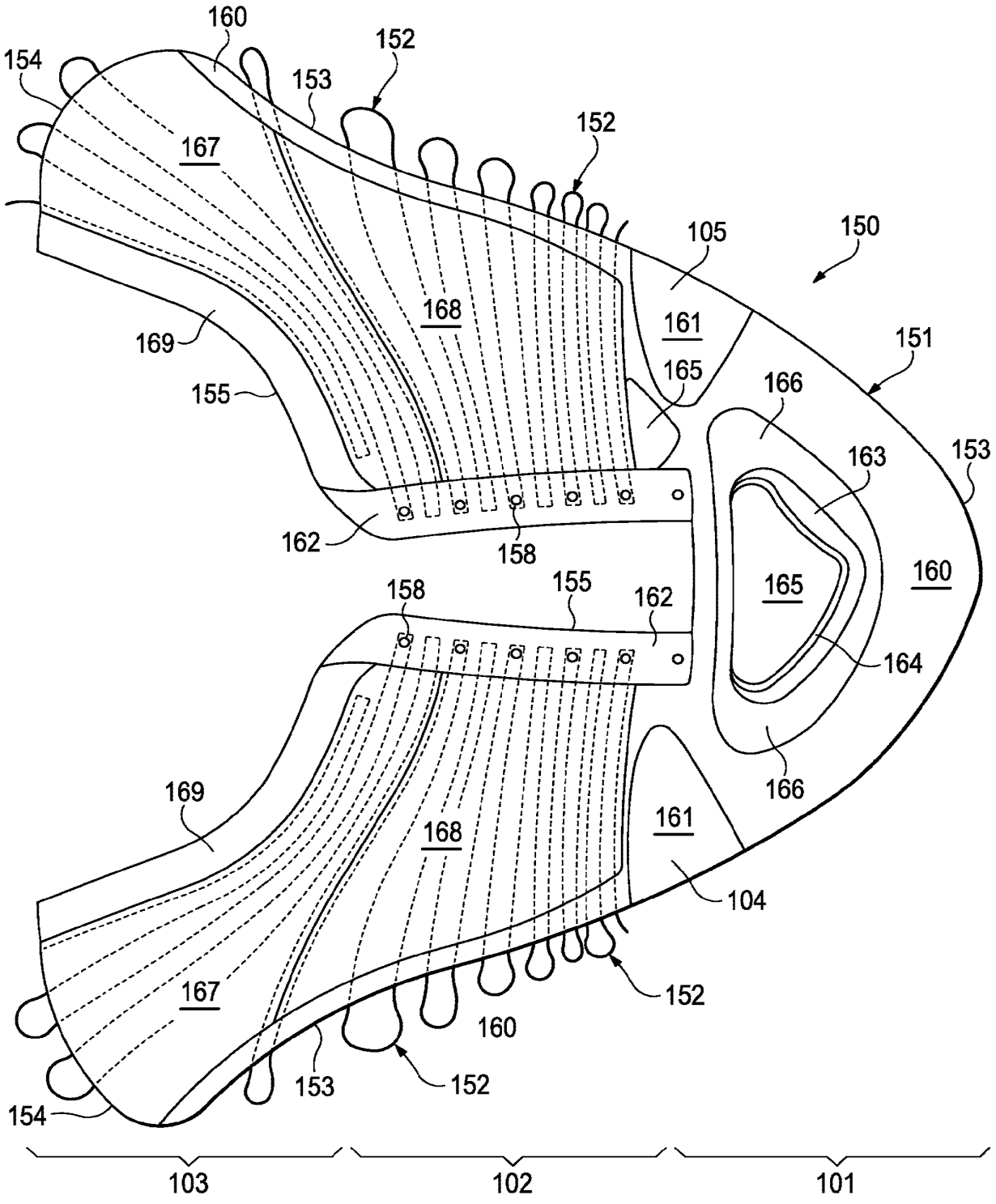
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Figure 11

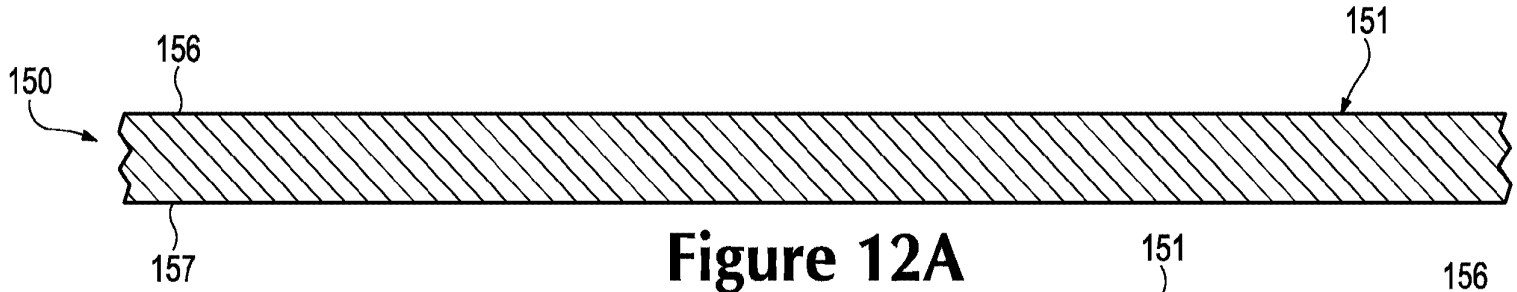


Figure 12A

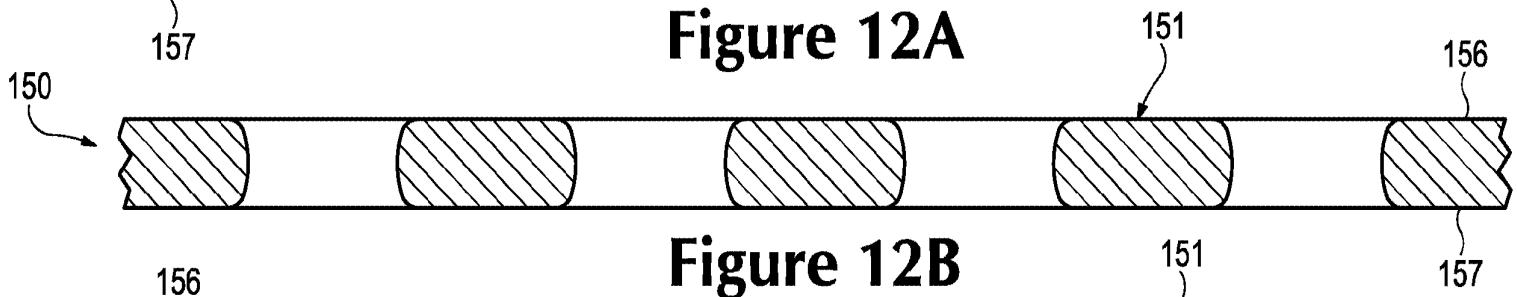


Figure 12B

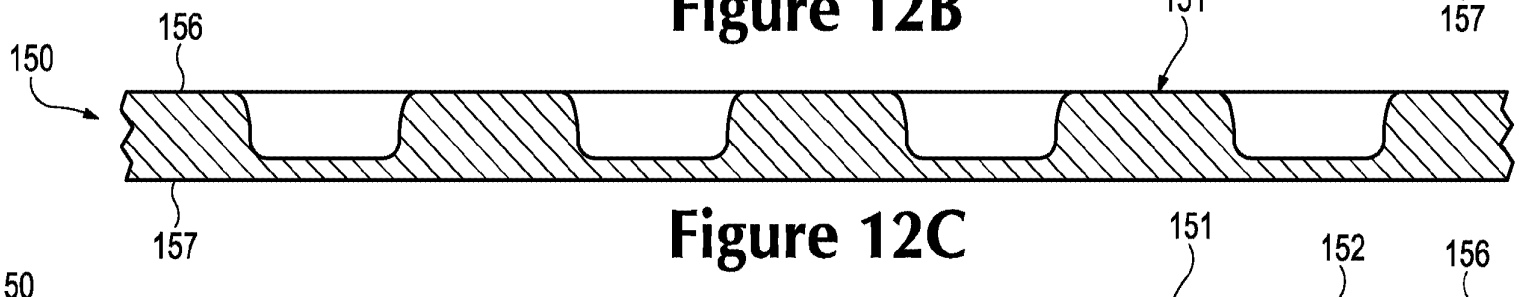


Figure 12C

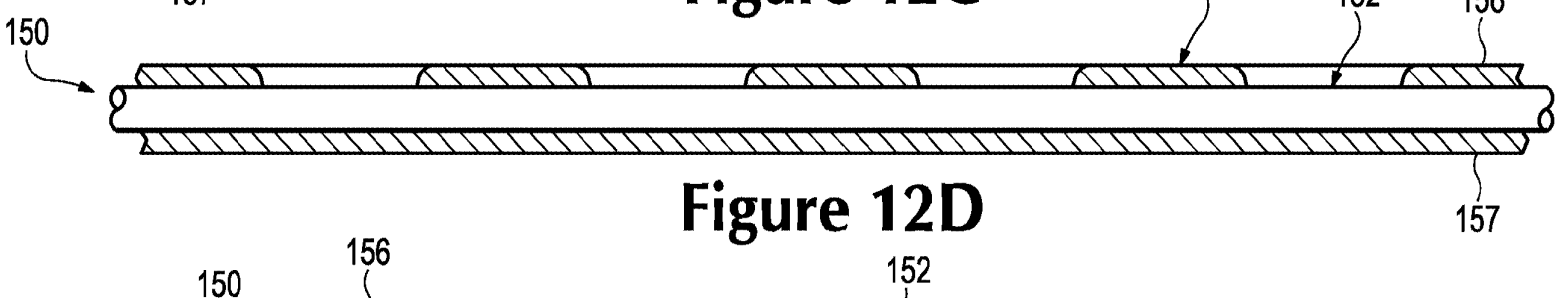


Figure 12D

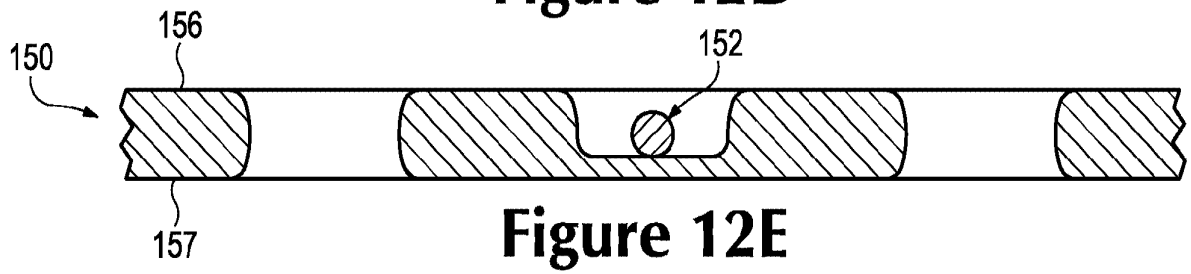


Figure 12E

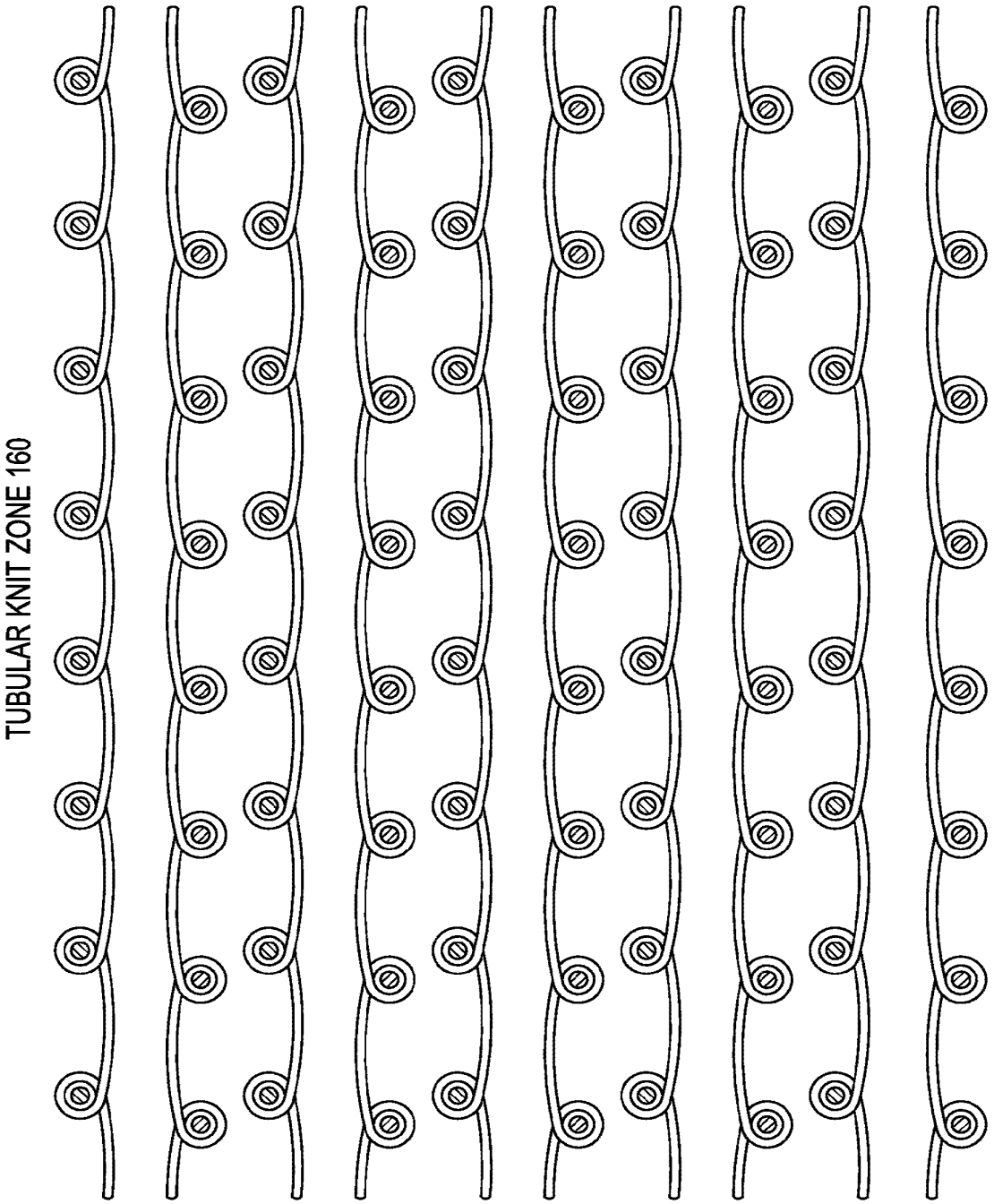


Figure 13A

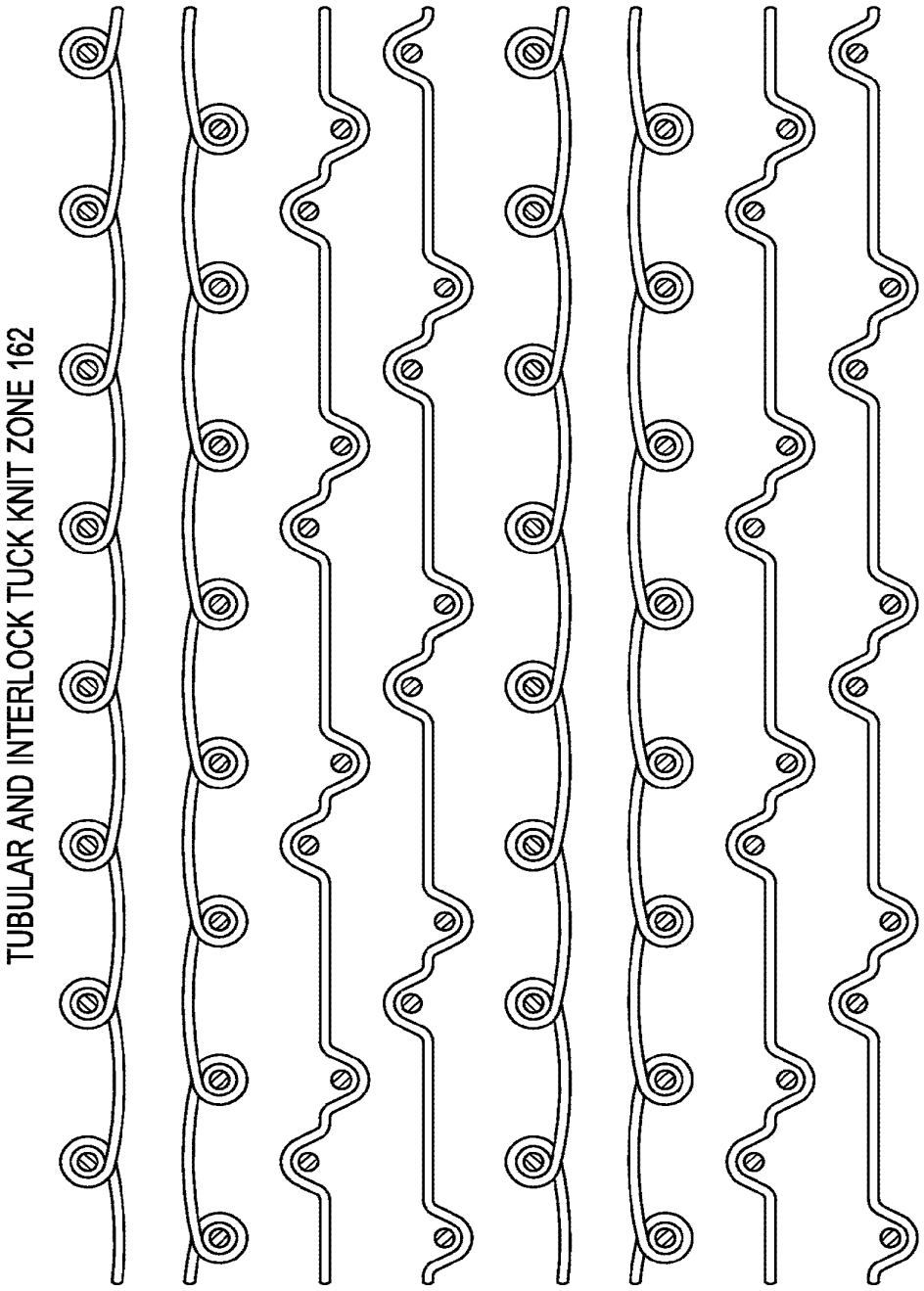
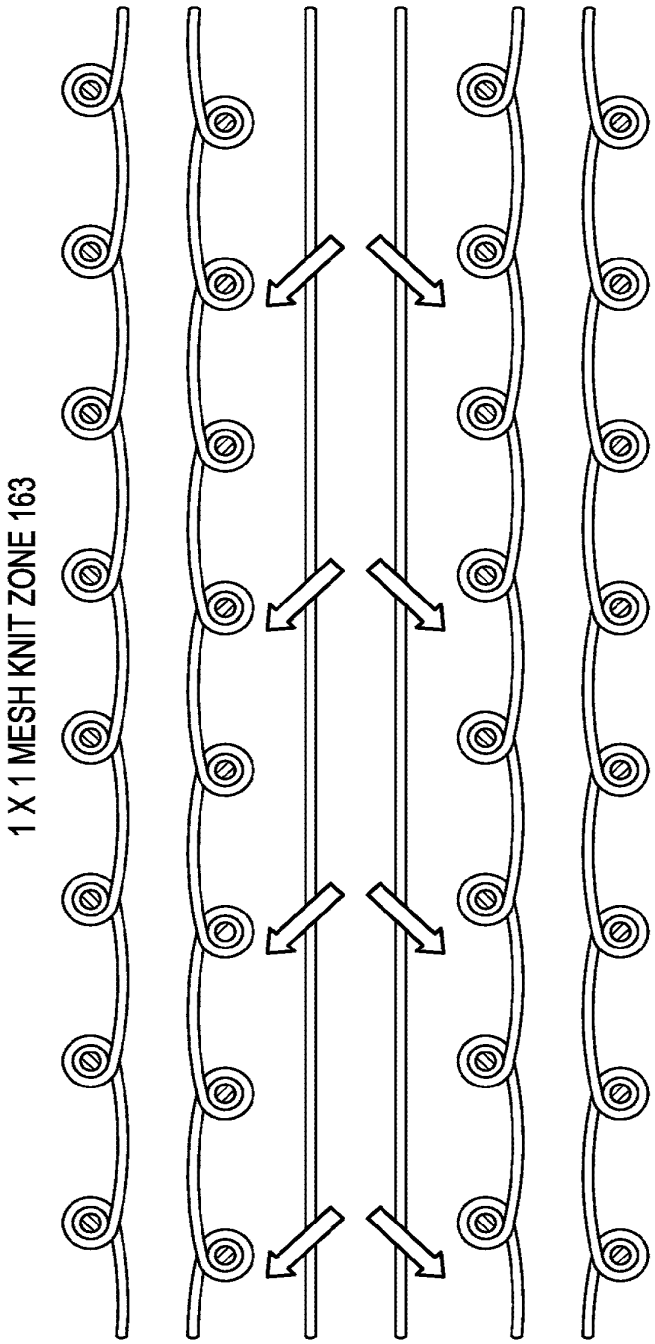


Figure 13B



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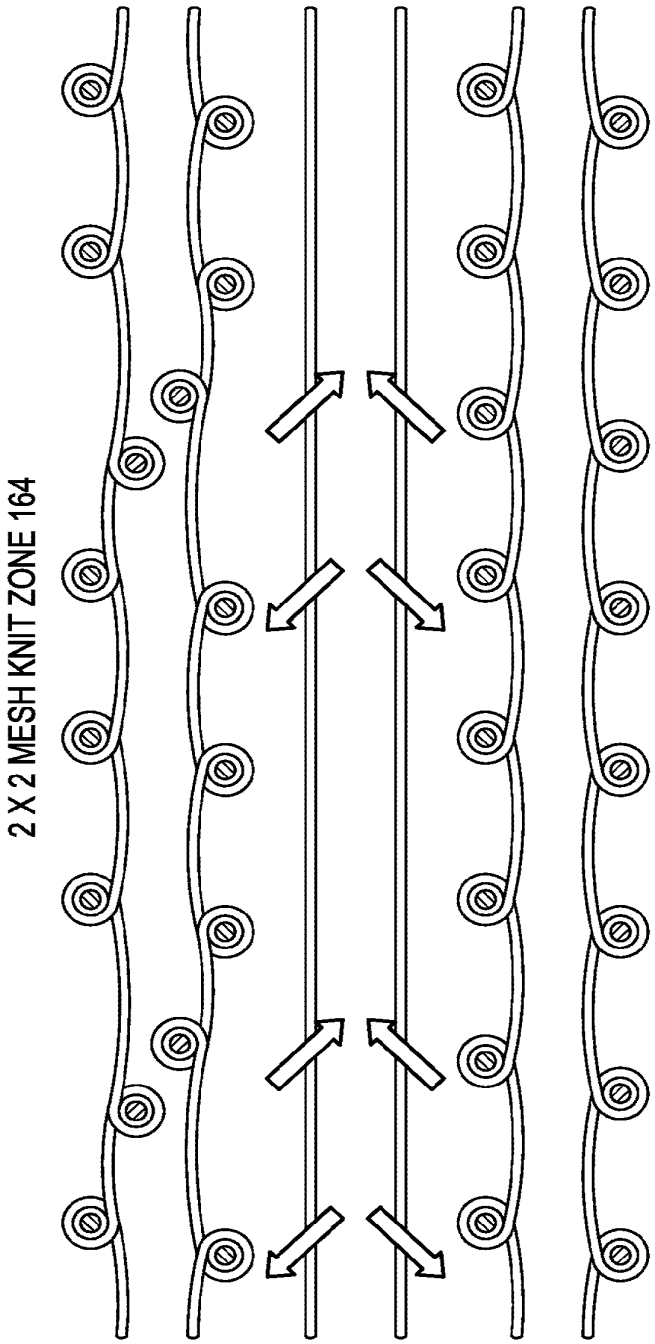

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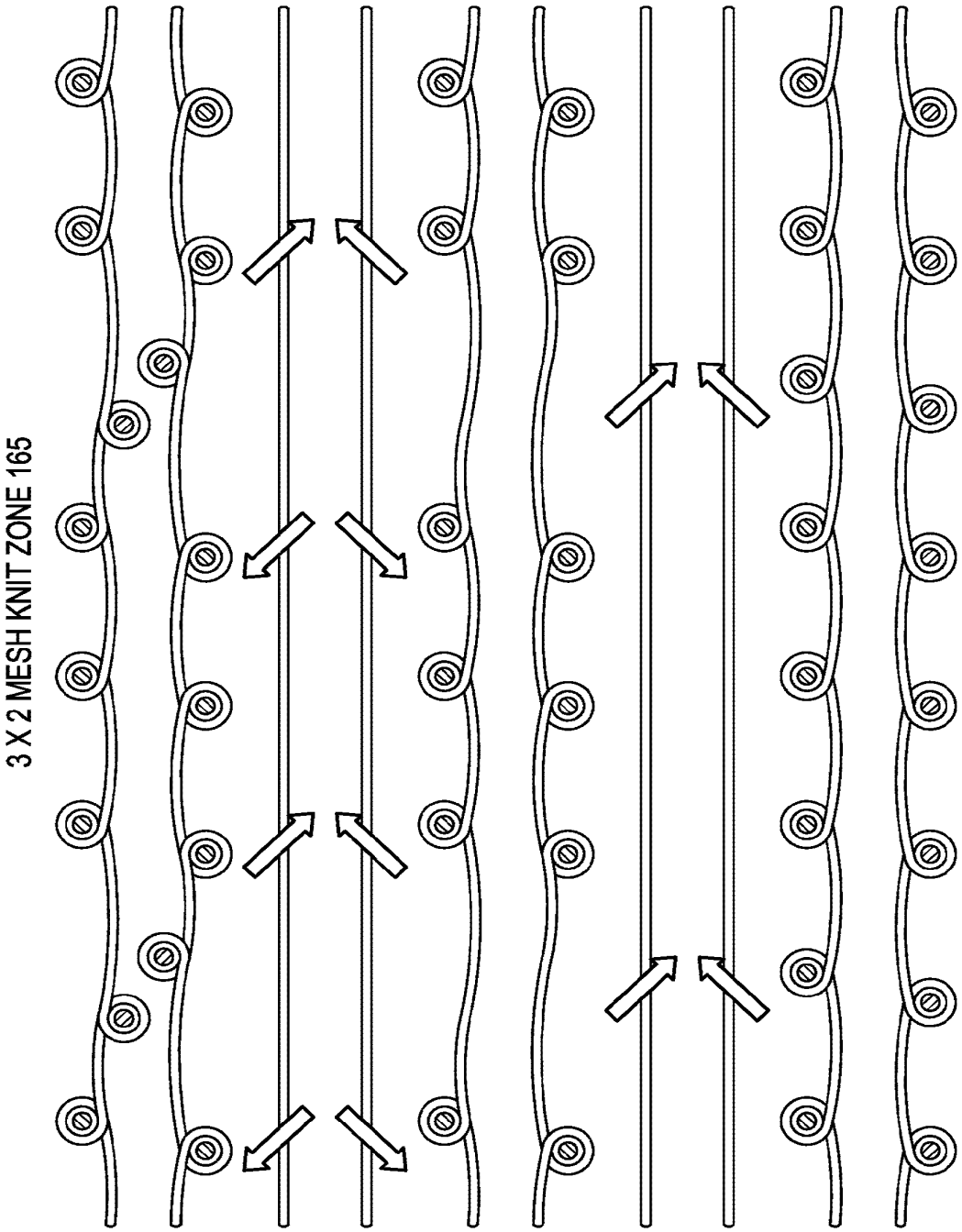

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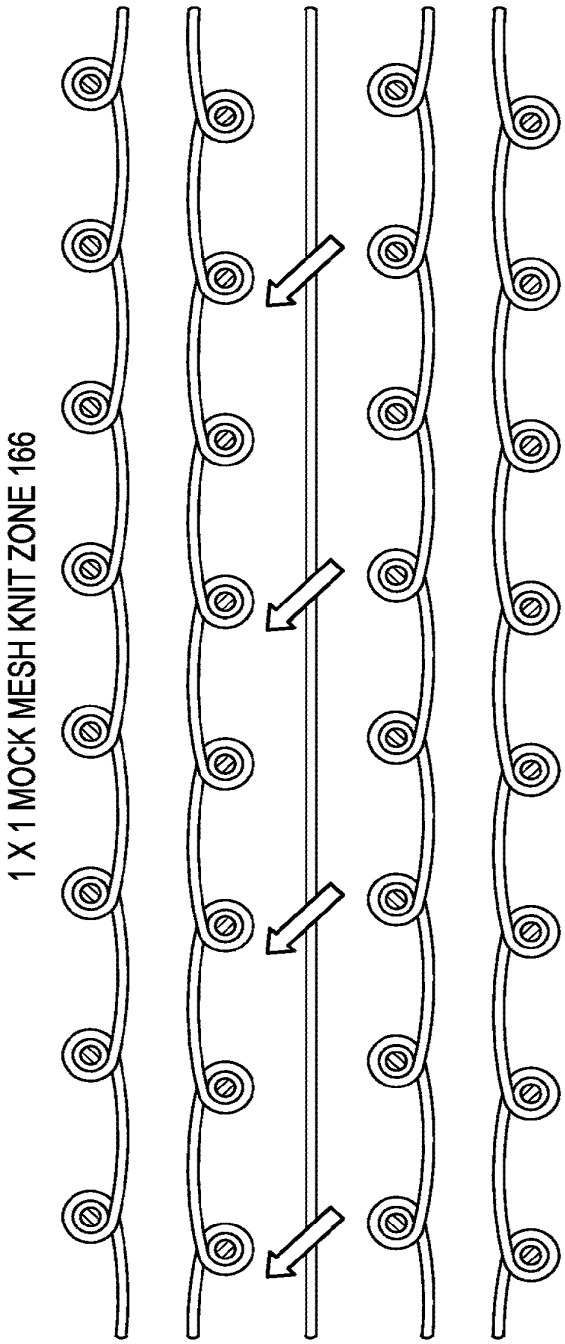


Figure 13F

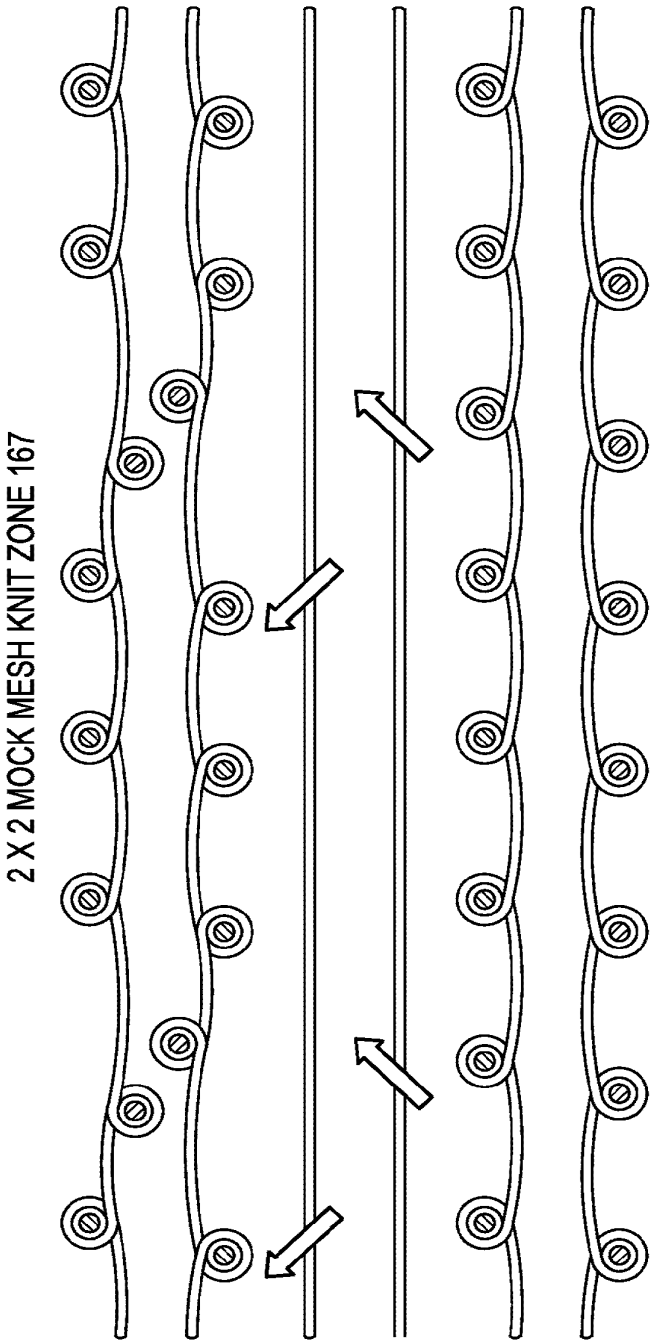


Figure 13G

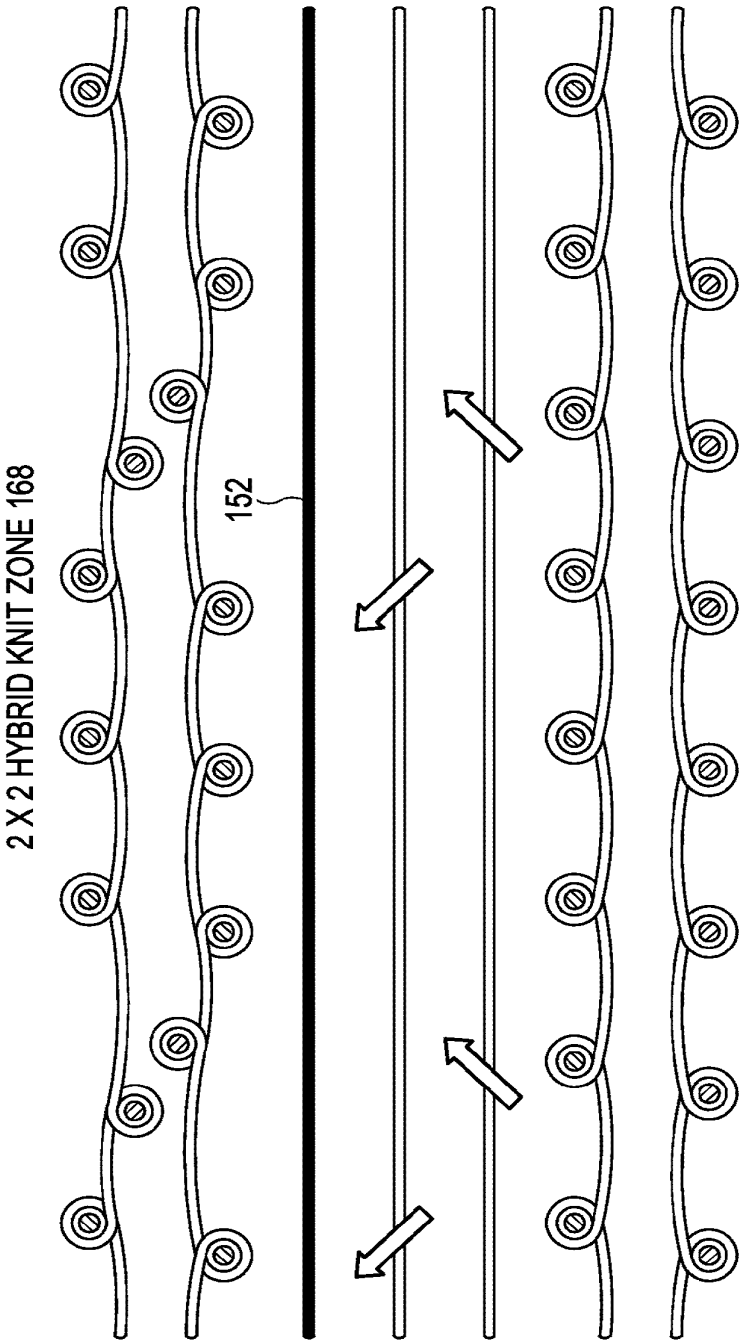


Figure 13H

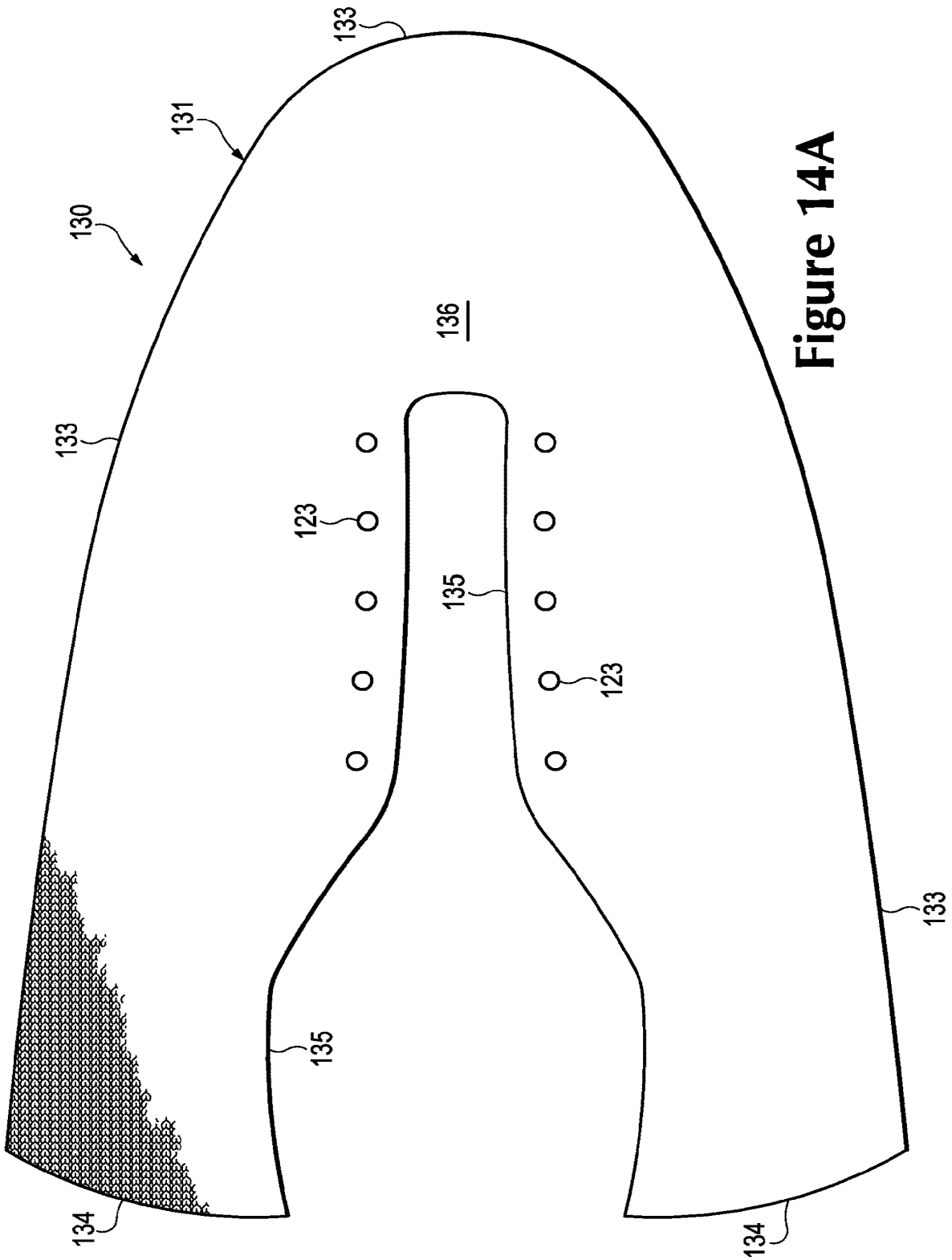


Figure 14A

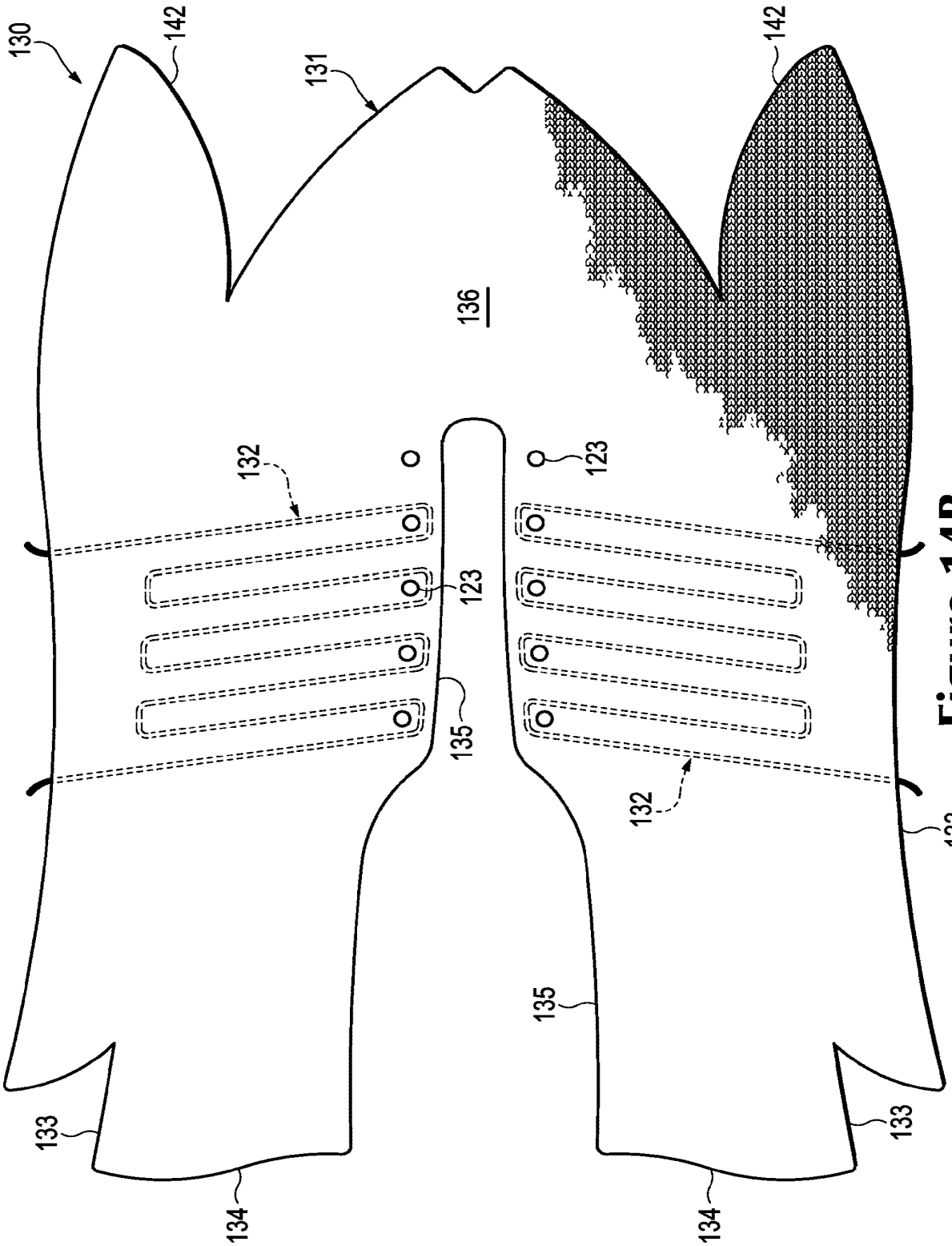


Figure 14B

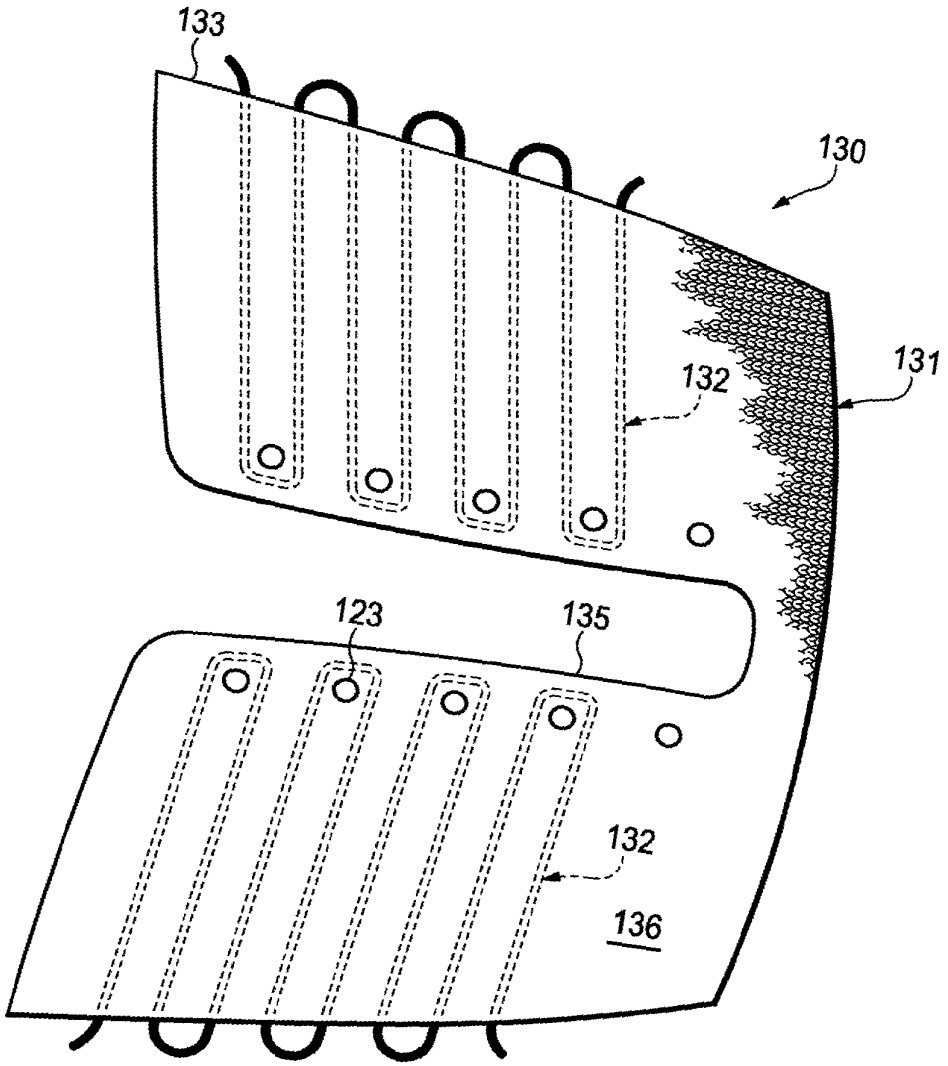
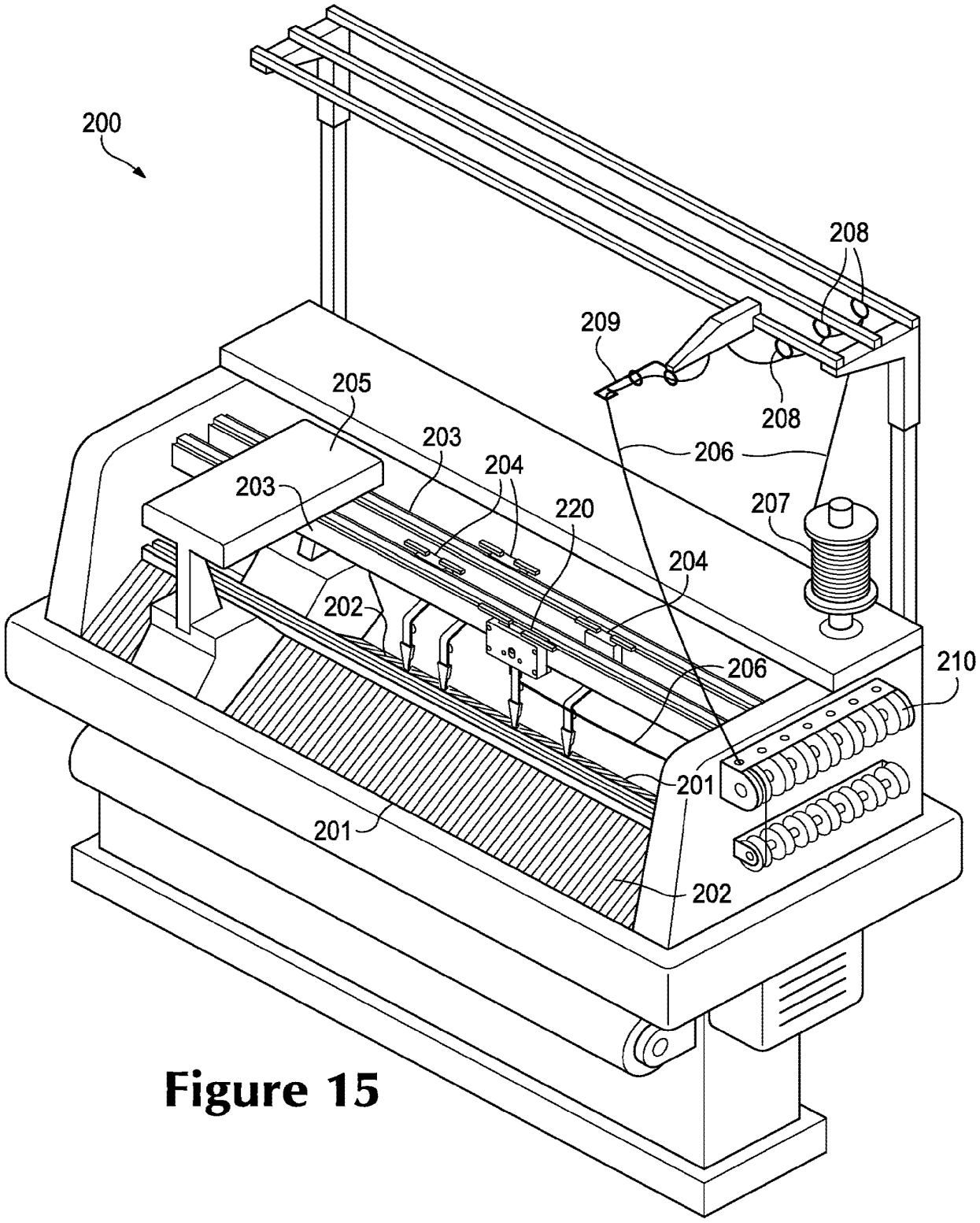


Figure 14C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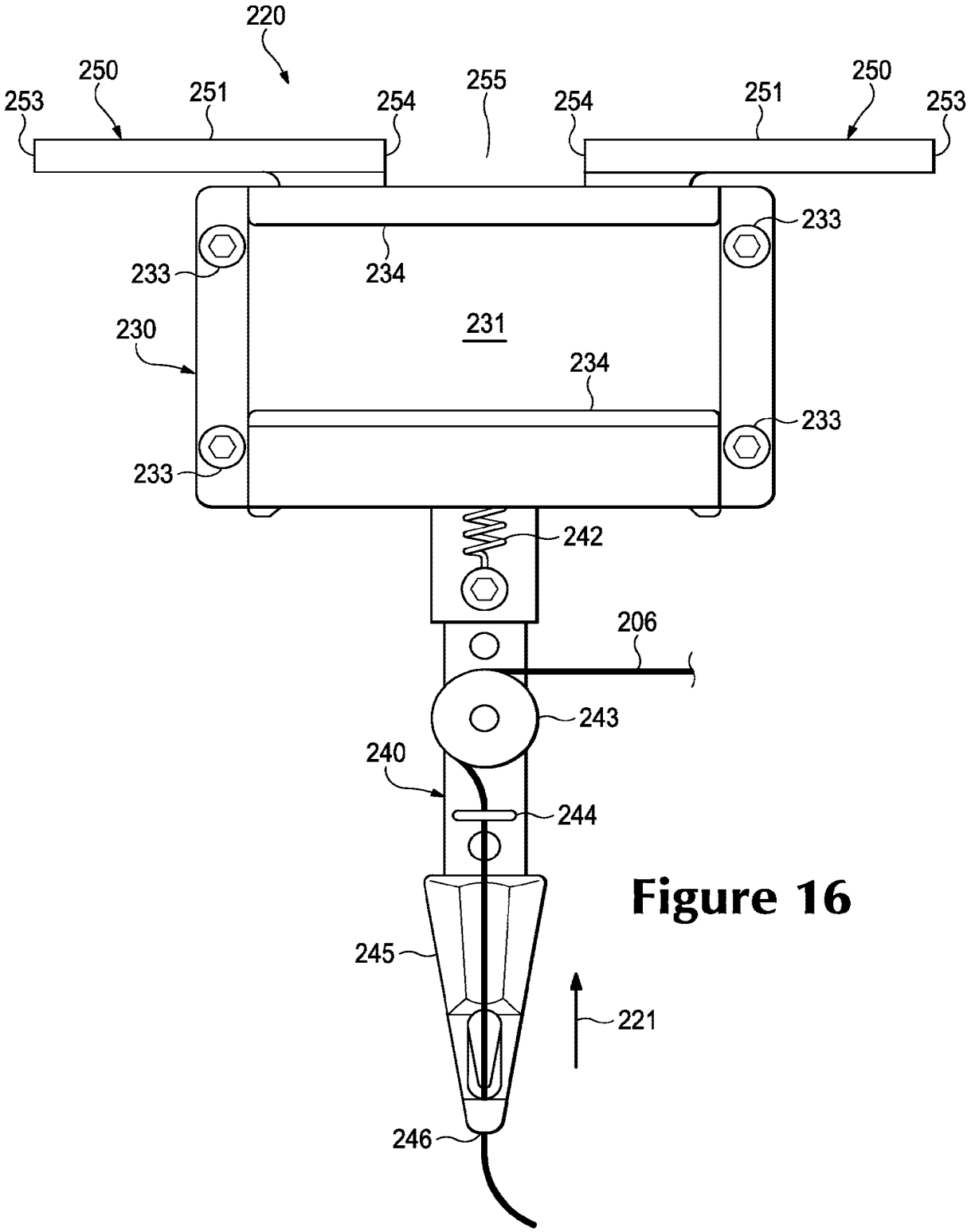
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Figure 16

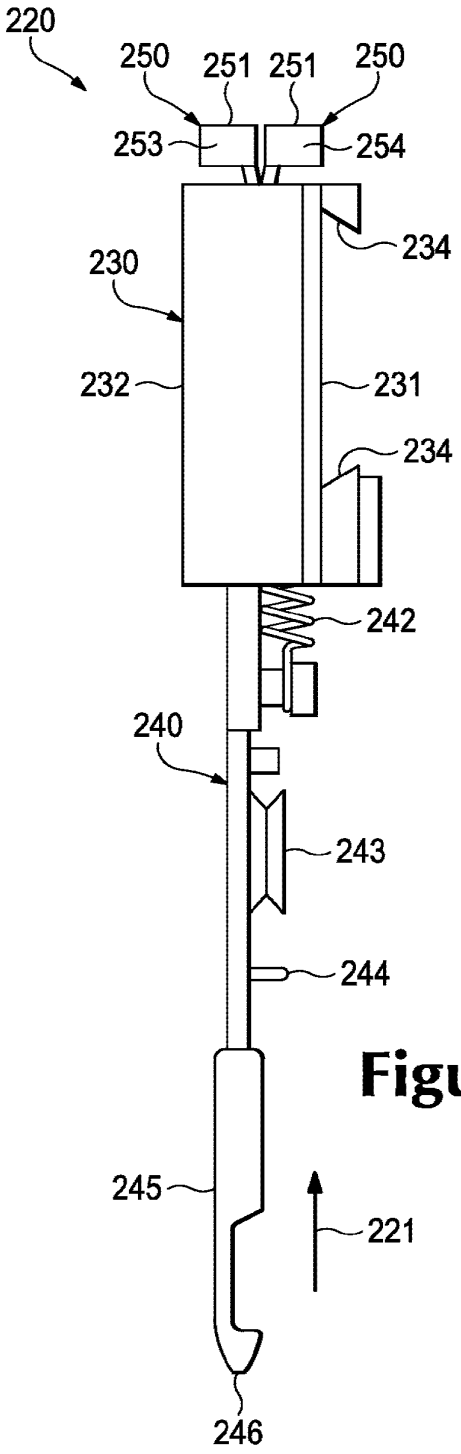
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Figure 17

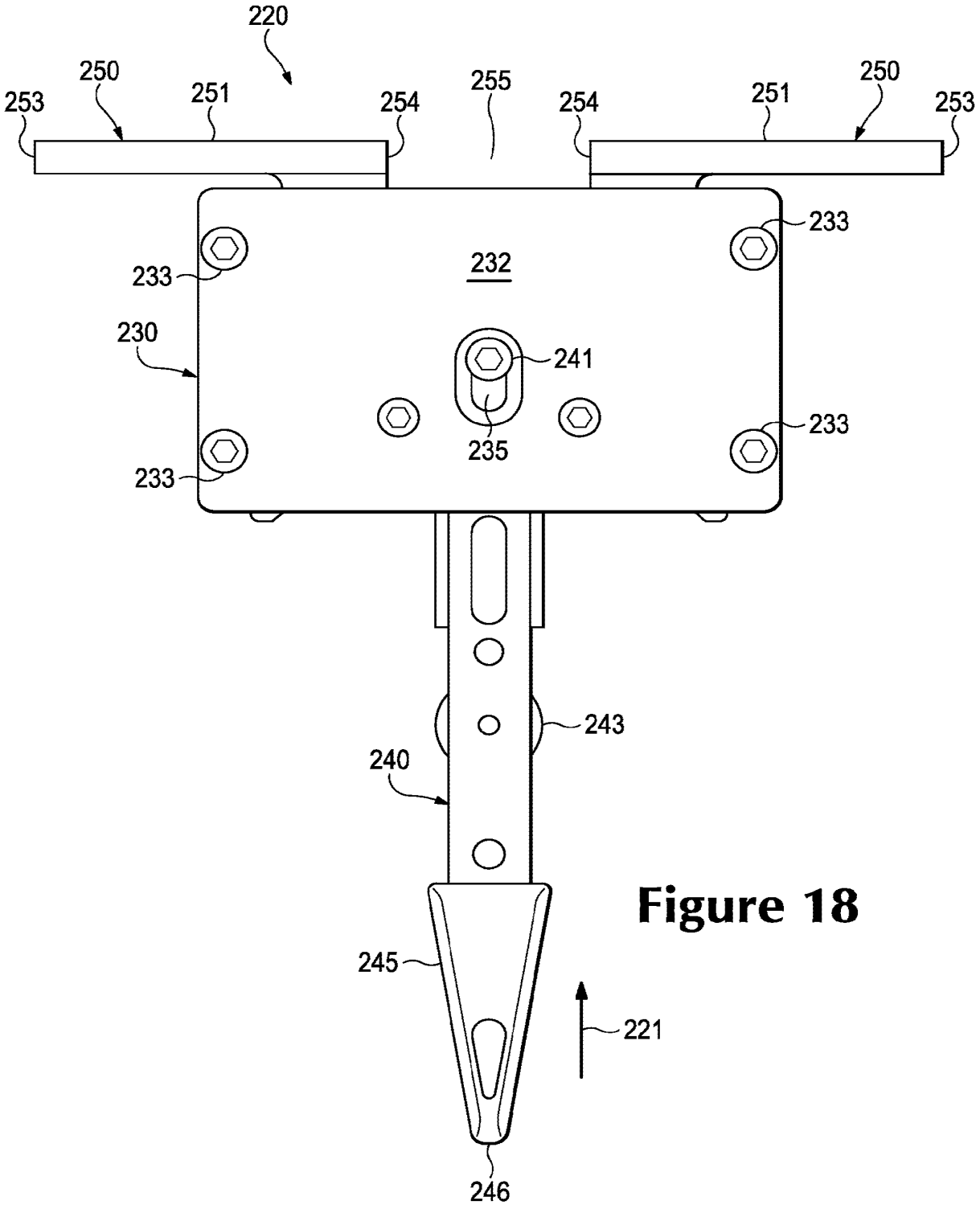
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Figure 18

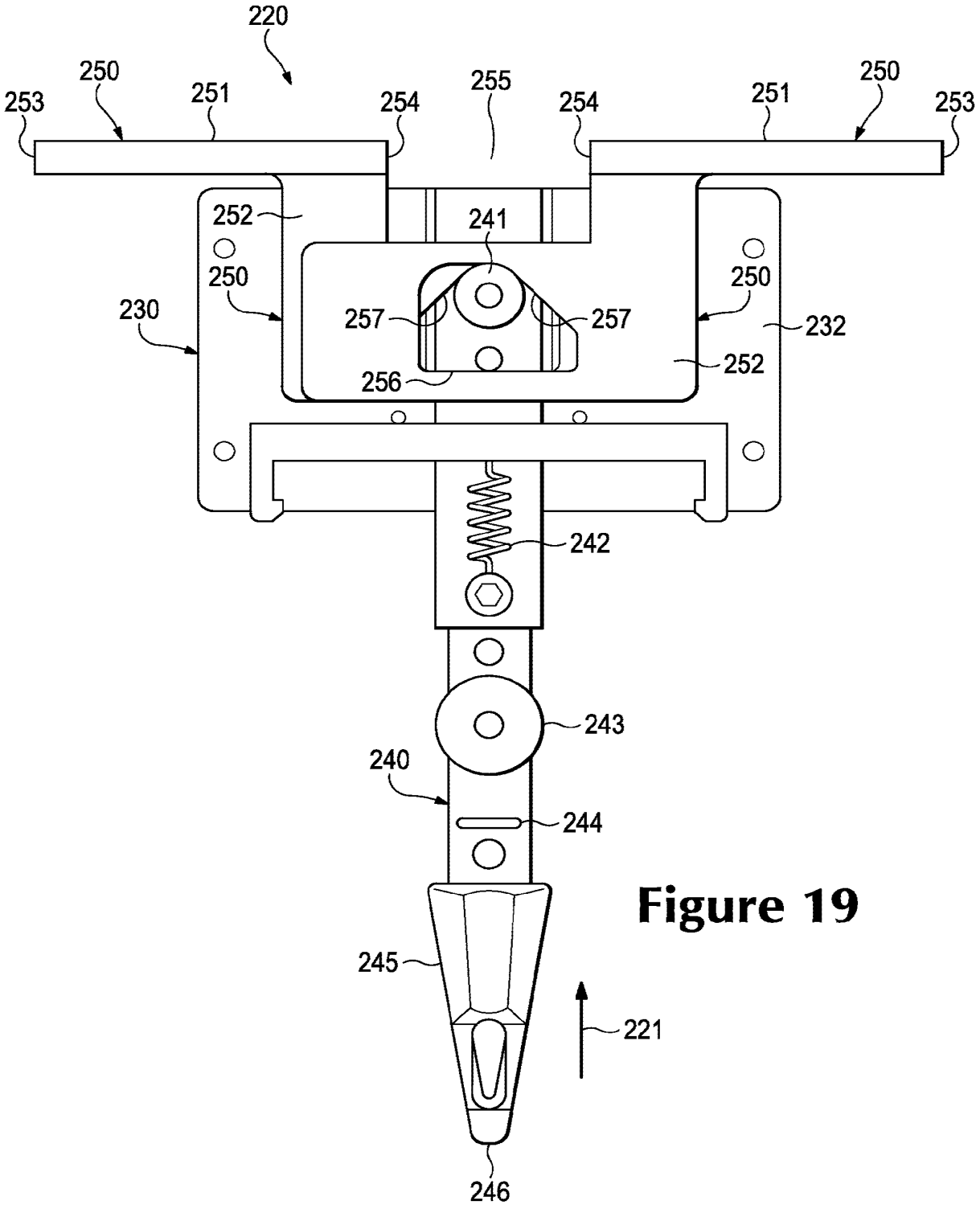
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Figure 19

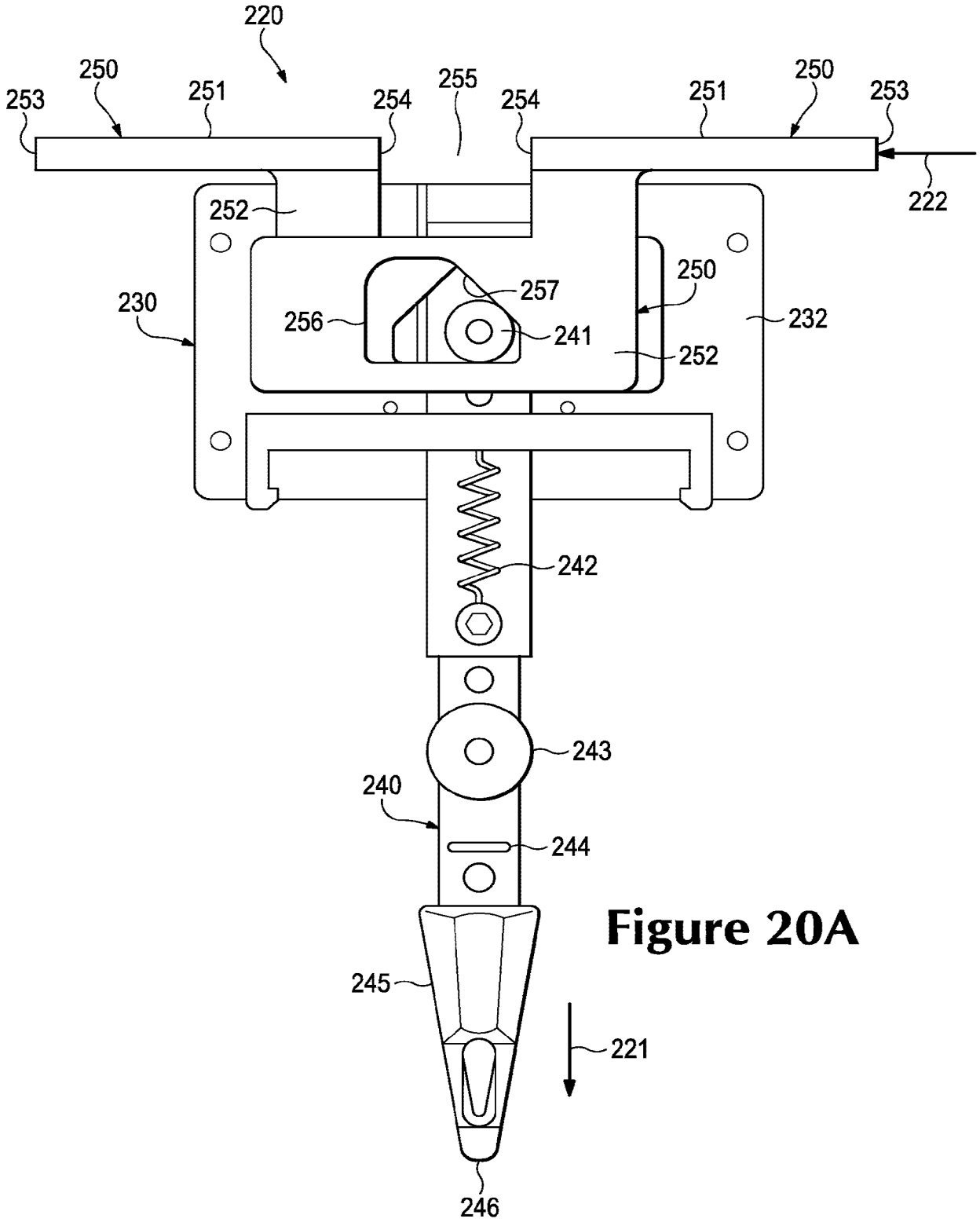
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Figure 20A

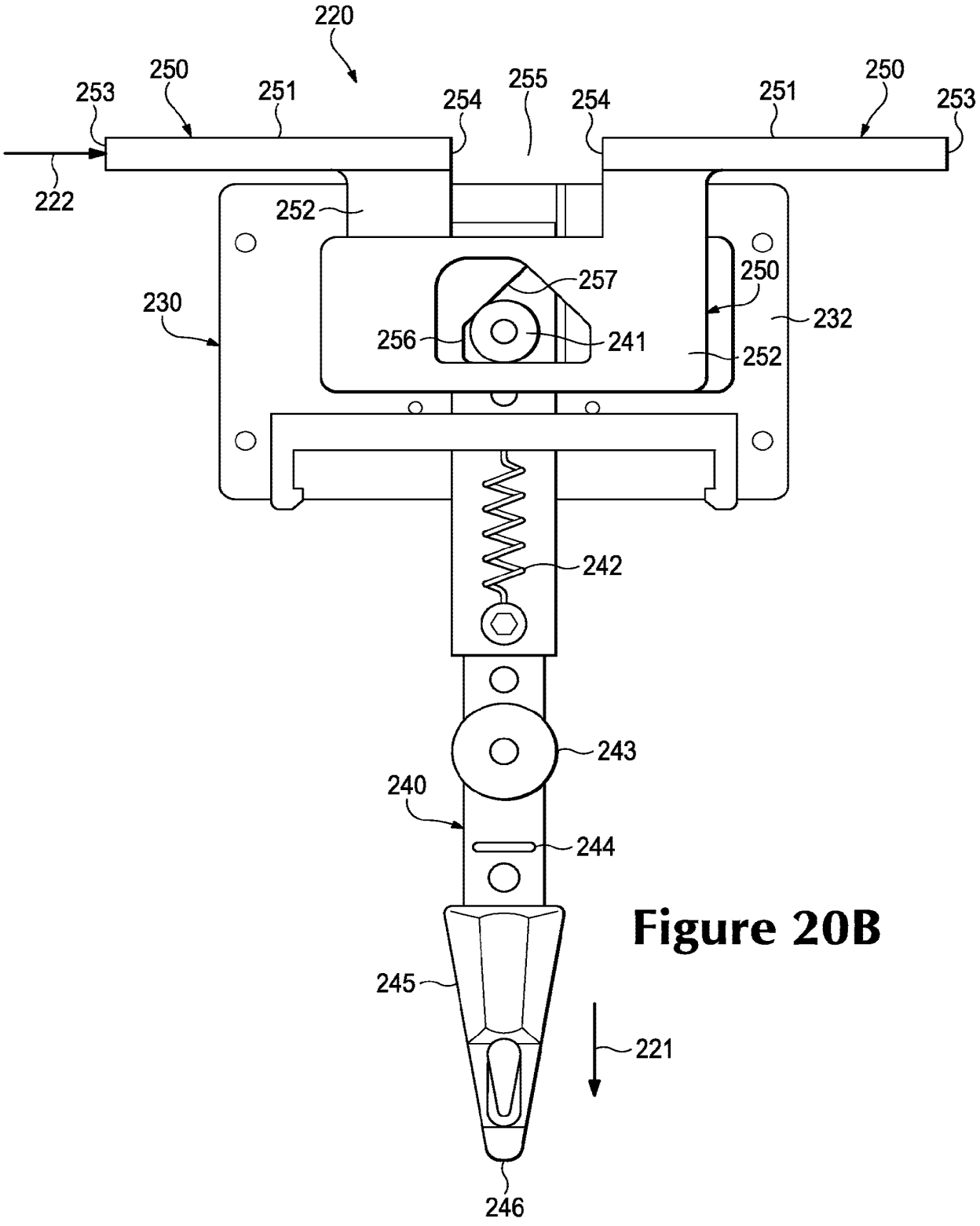
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Figure 20B

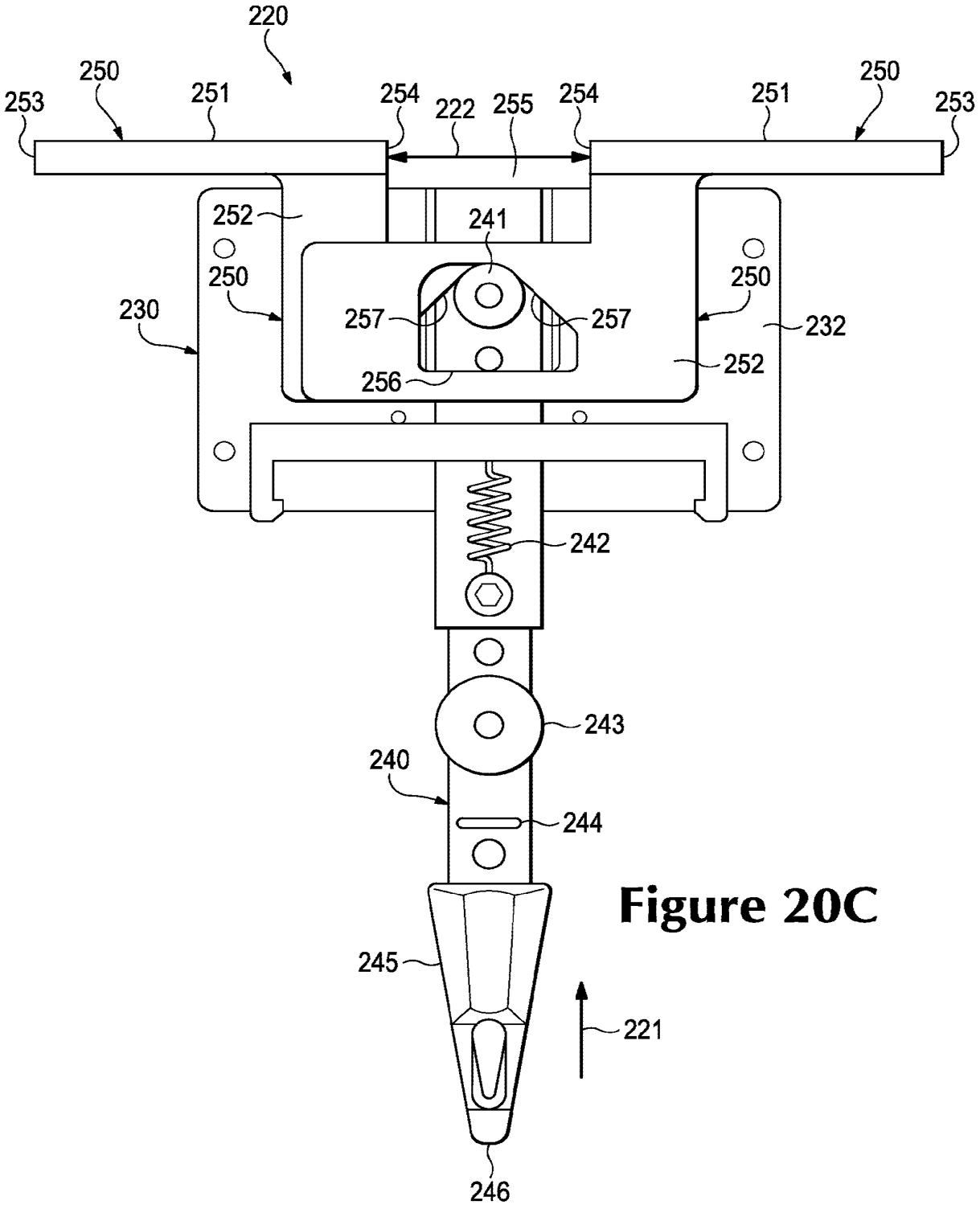
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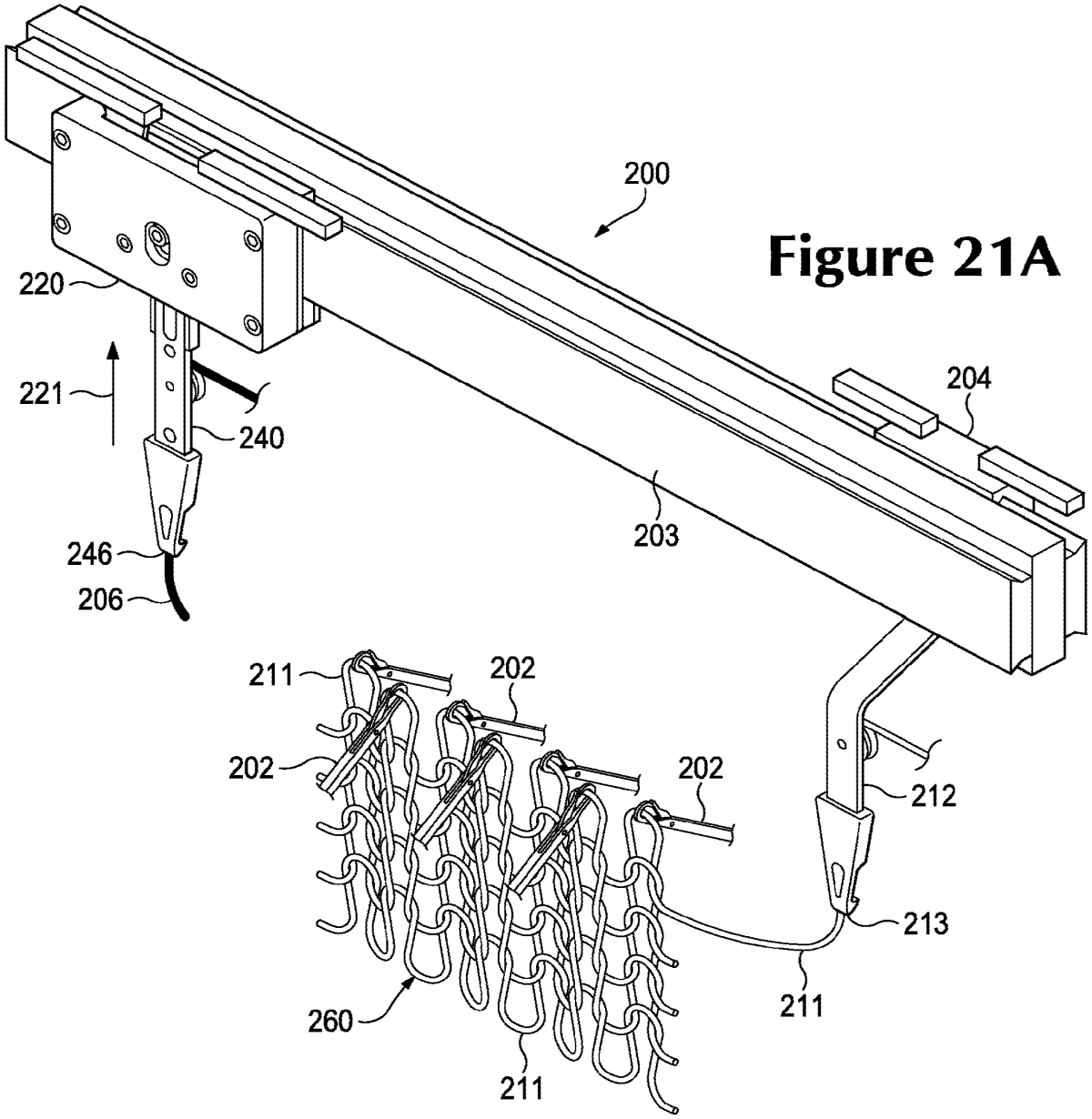
Figure 20C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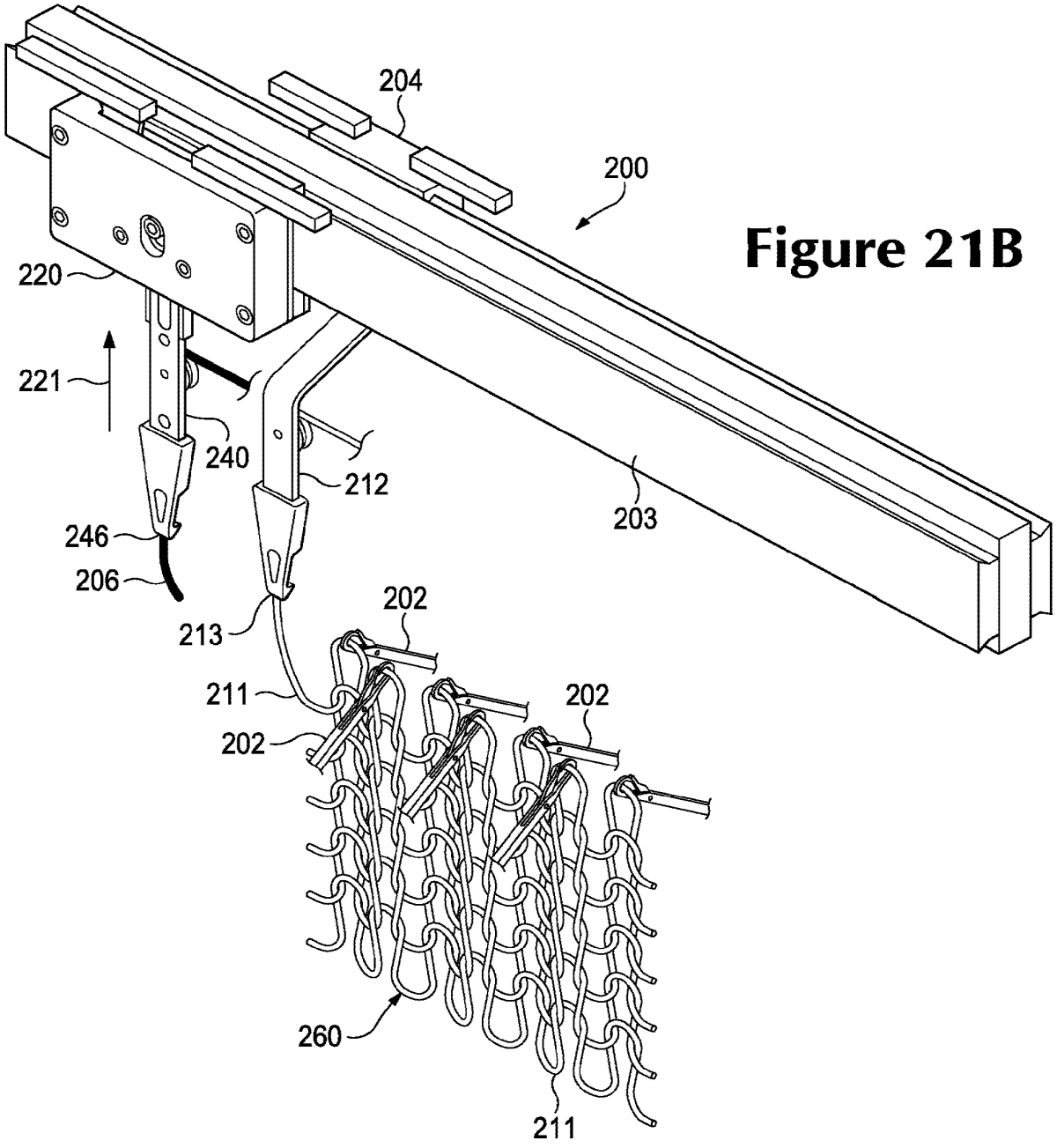
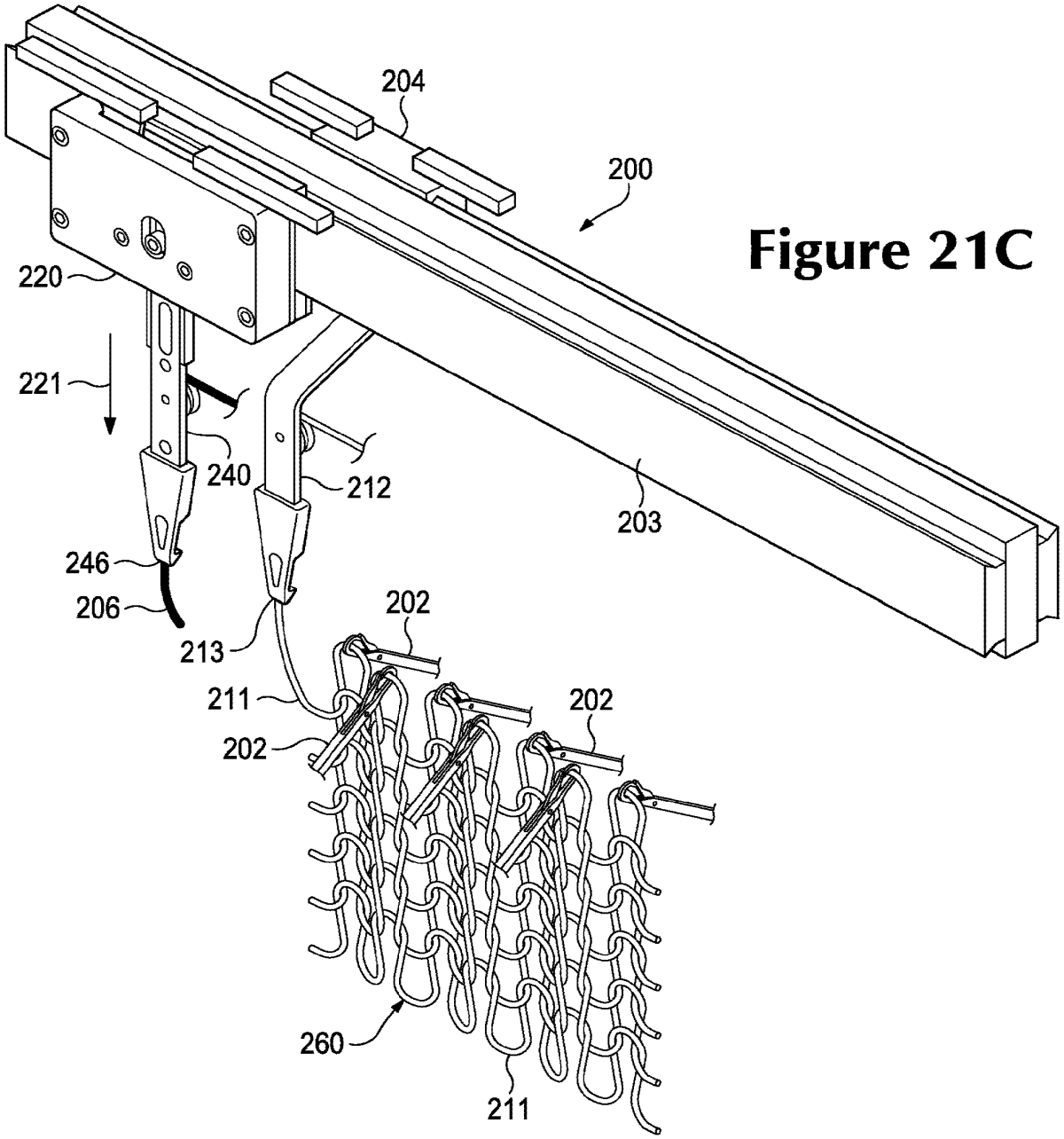


Figure 21B



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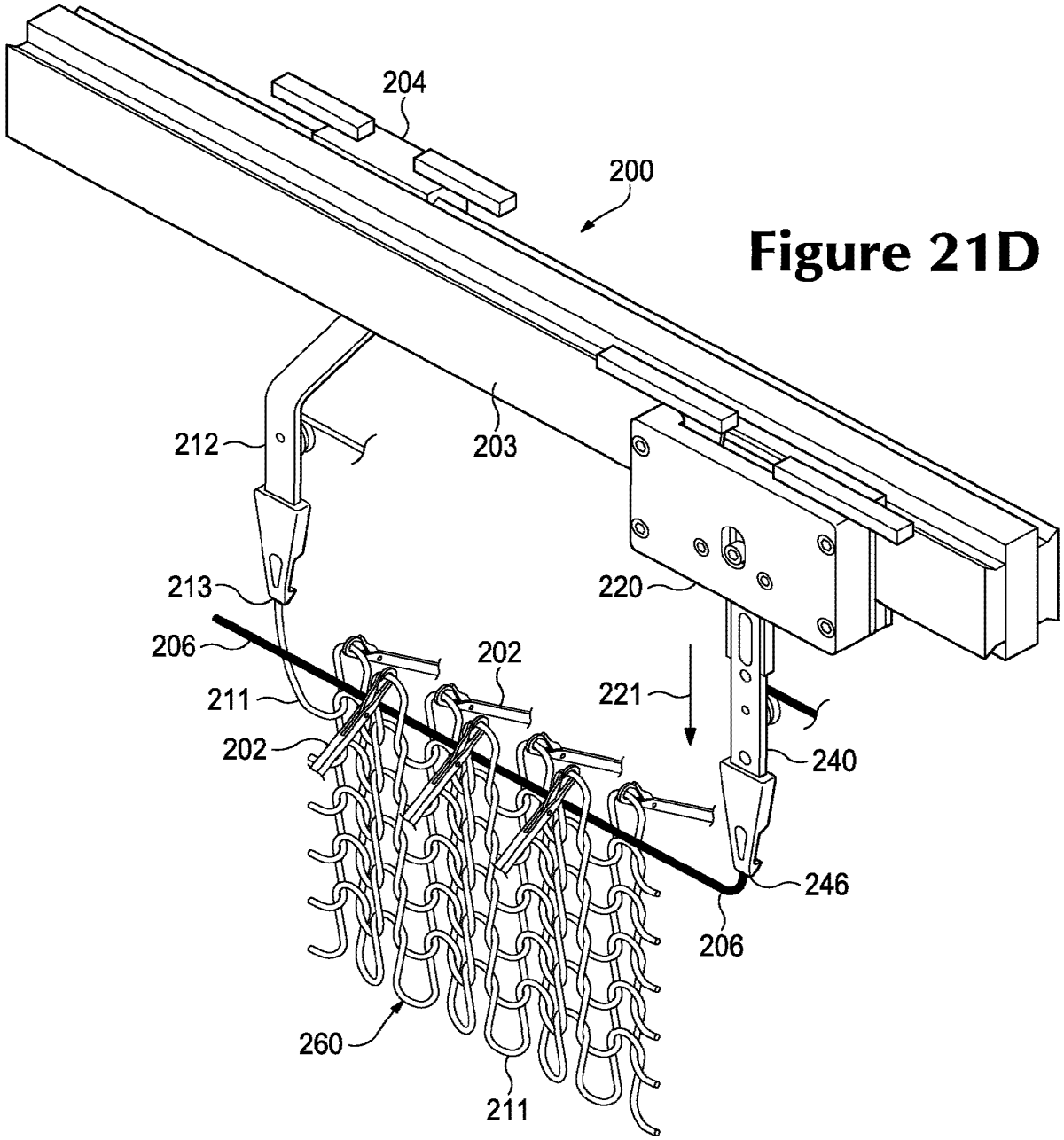
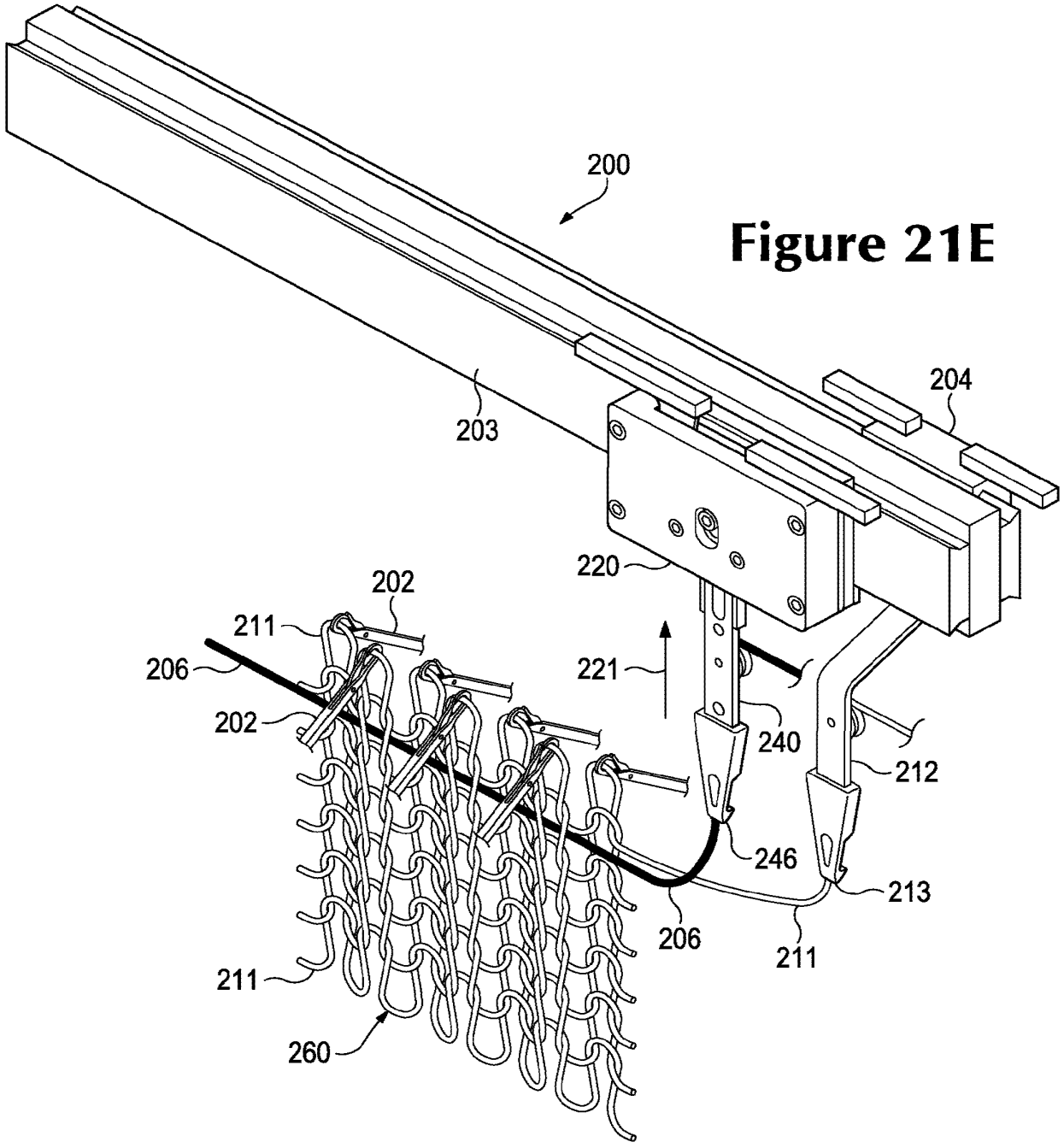


Figure 21D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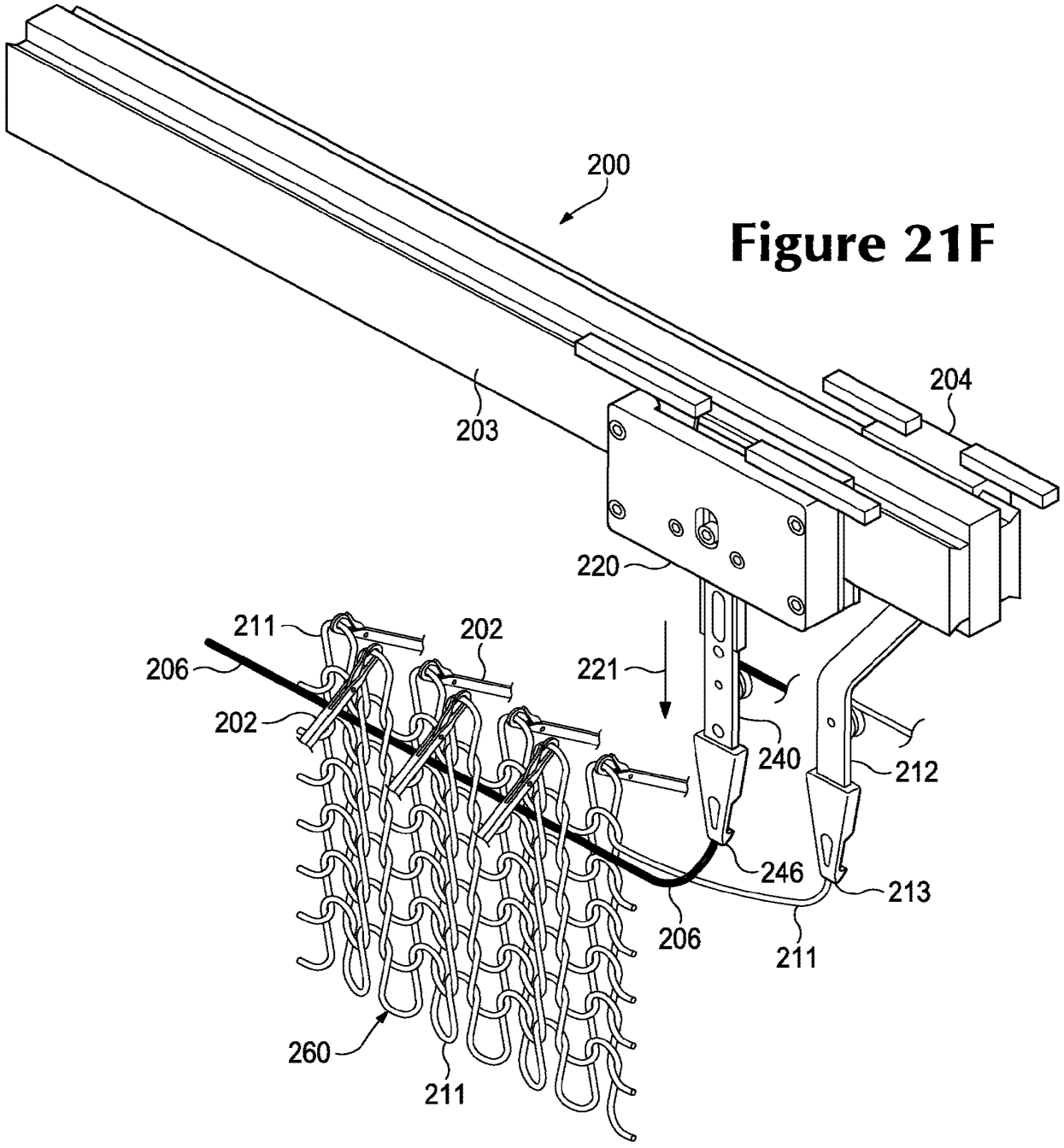
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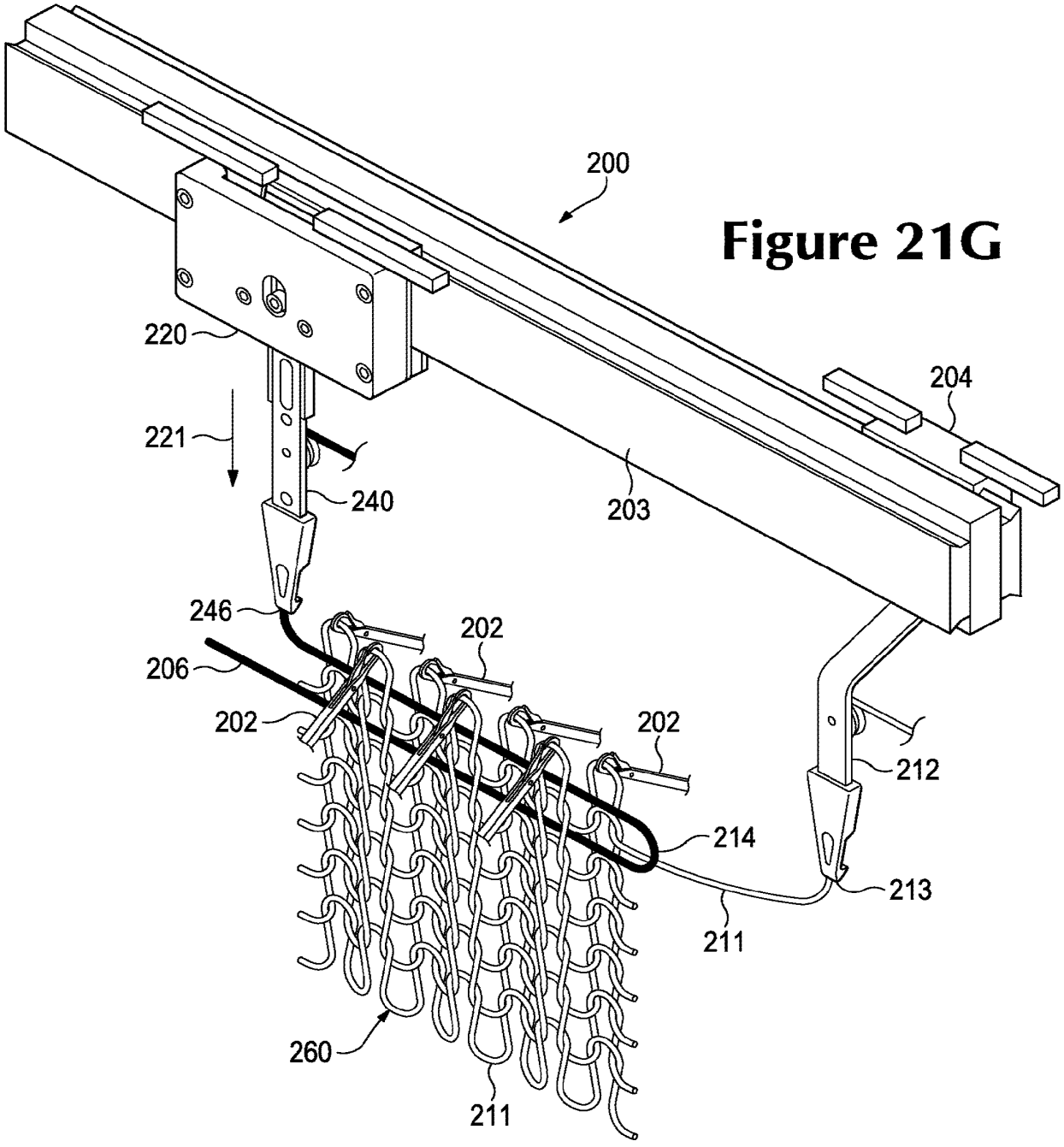
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Figure 21G

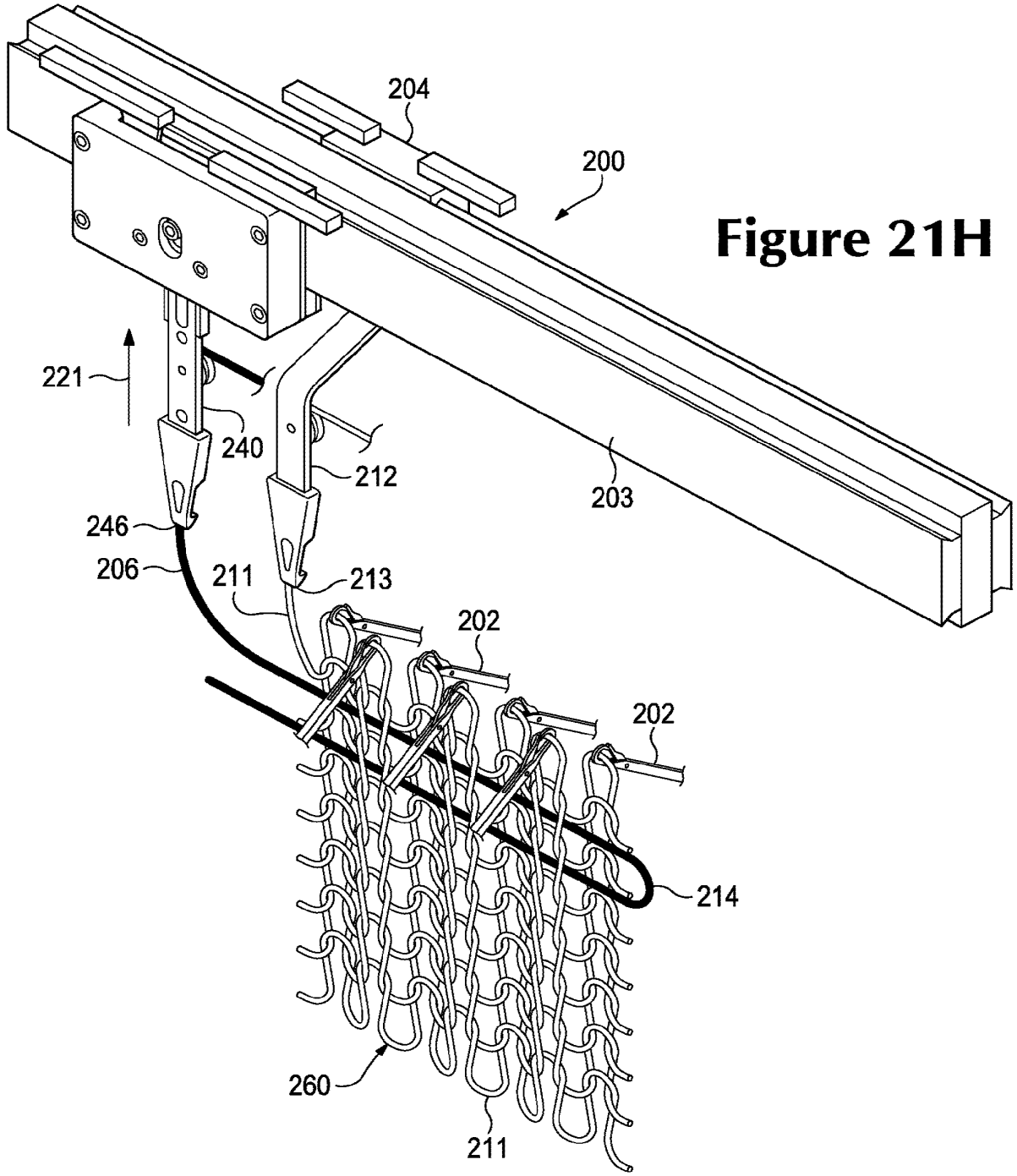

Figure 21H

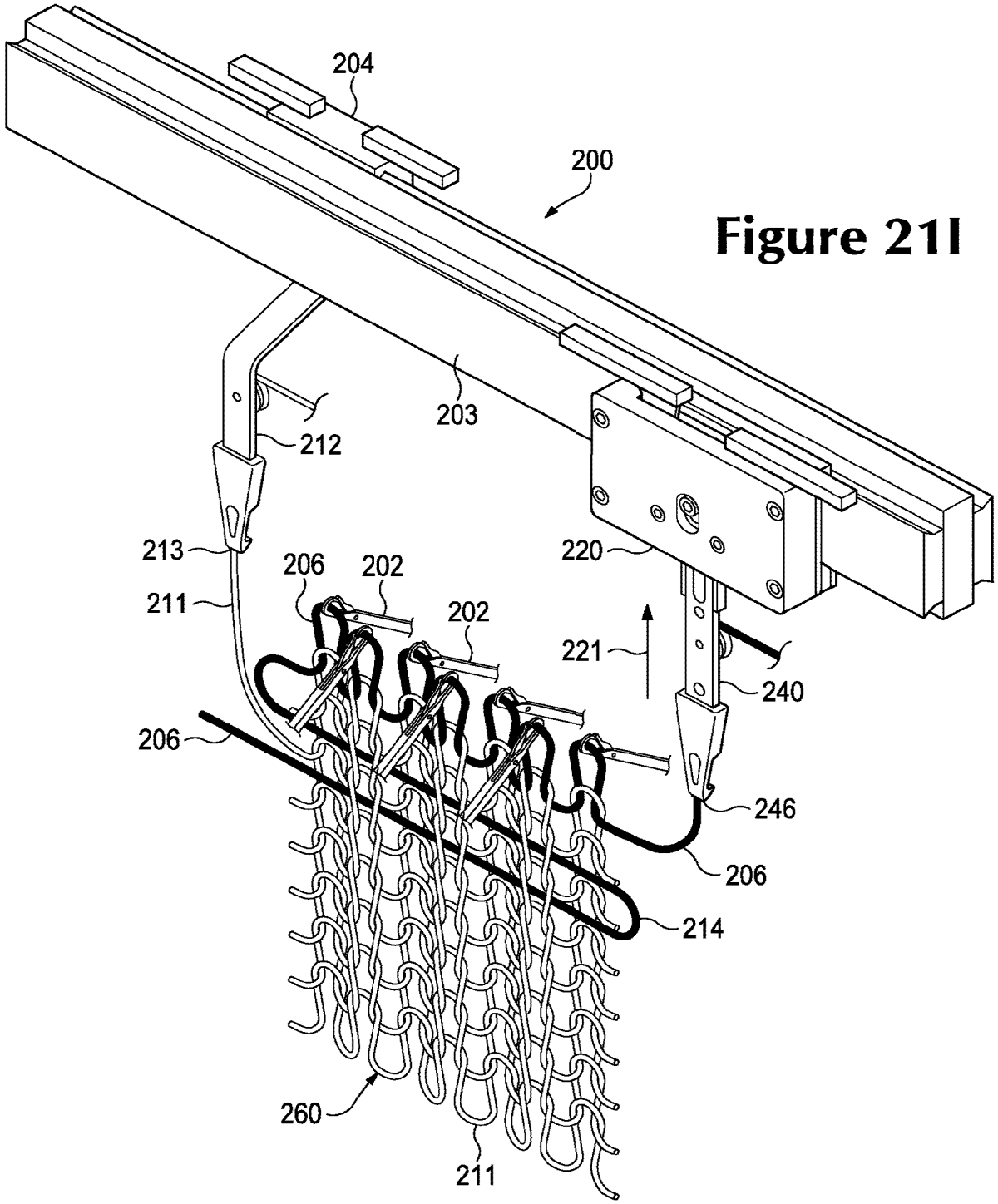
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Figure 21I

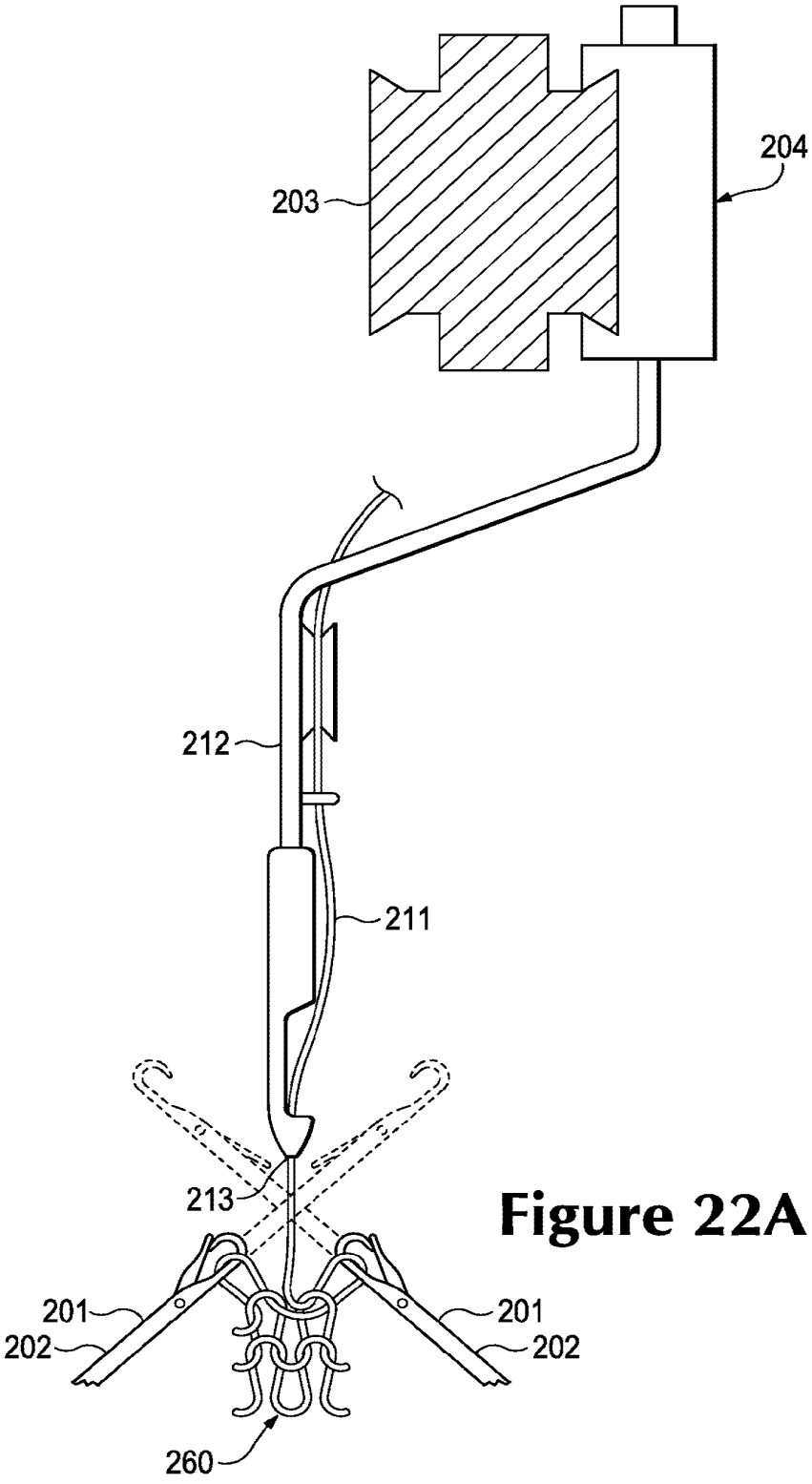

Figure 22A

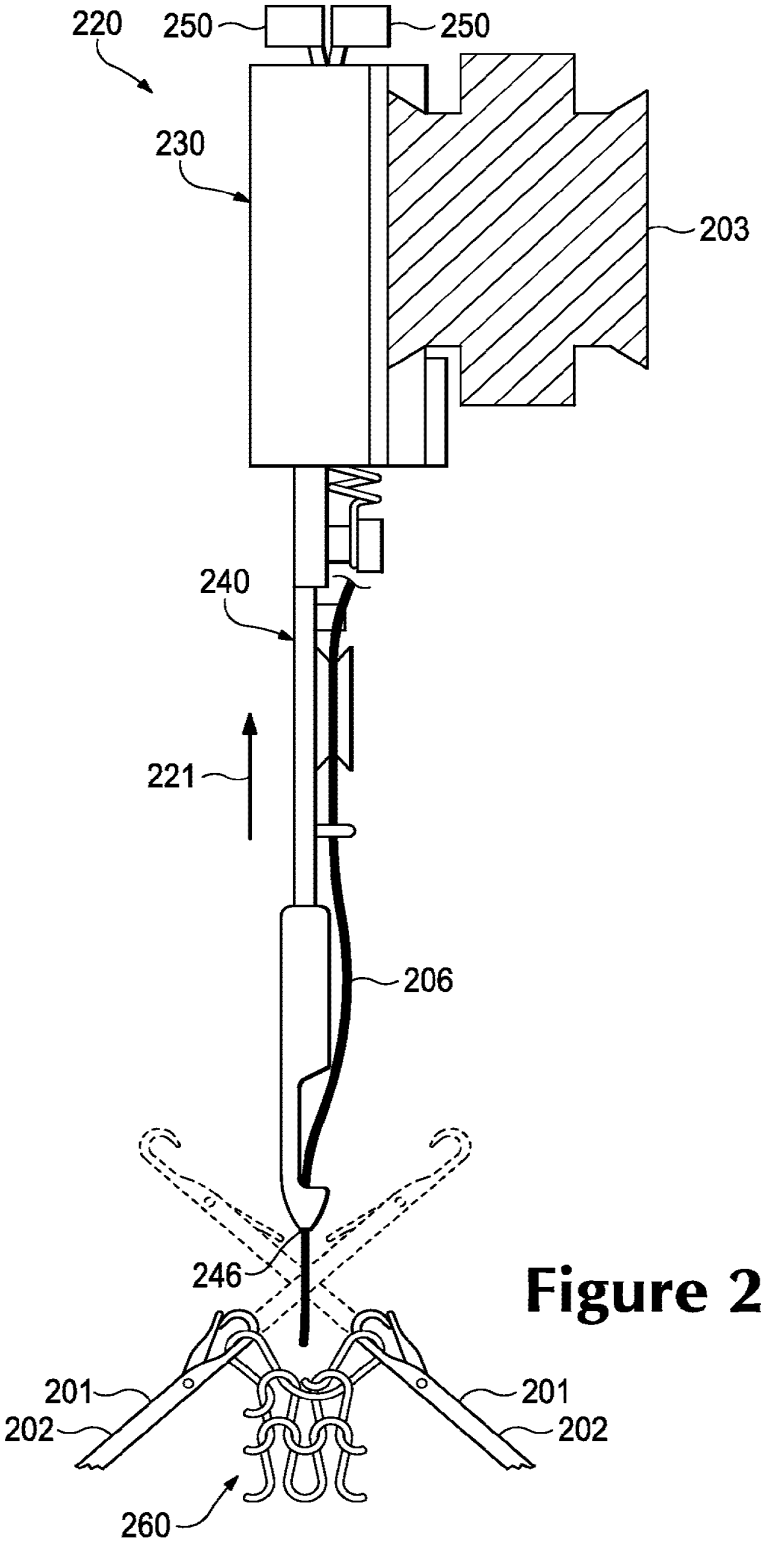

Figure 22B

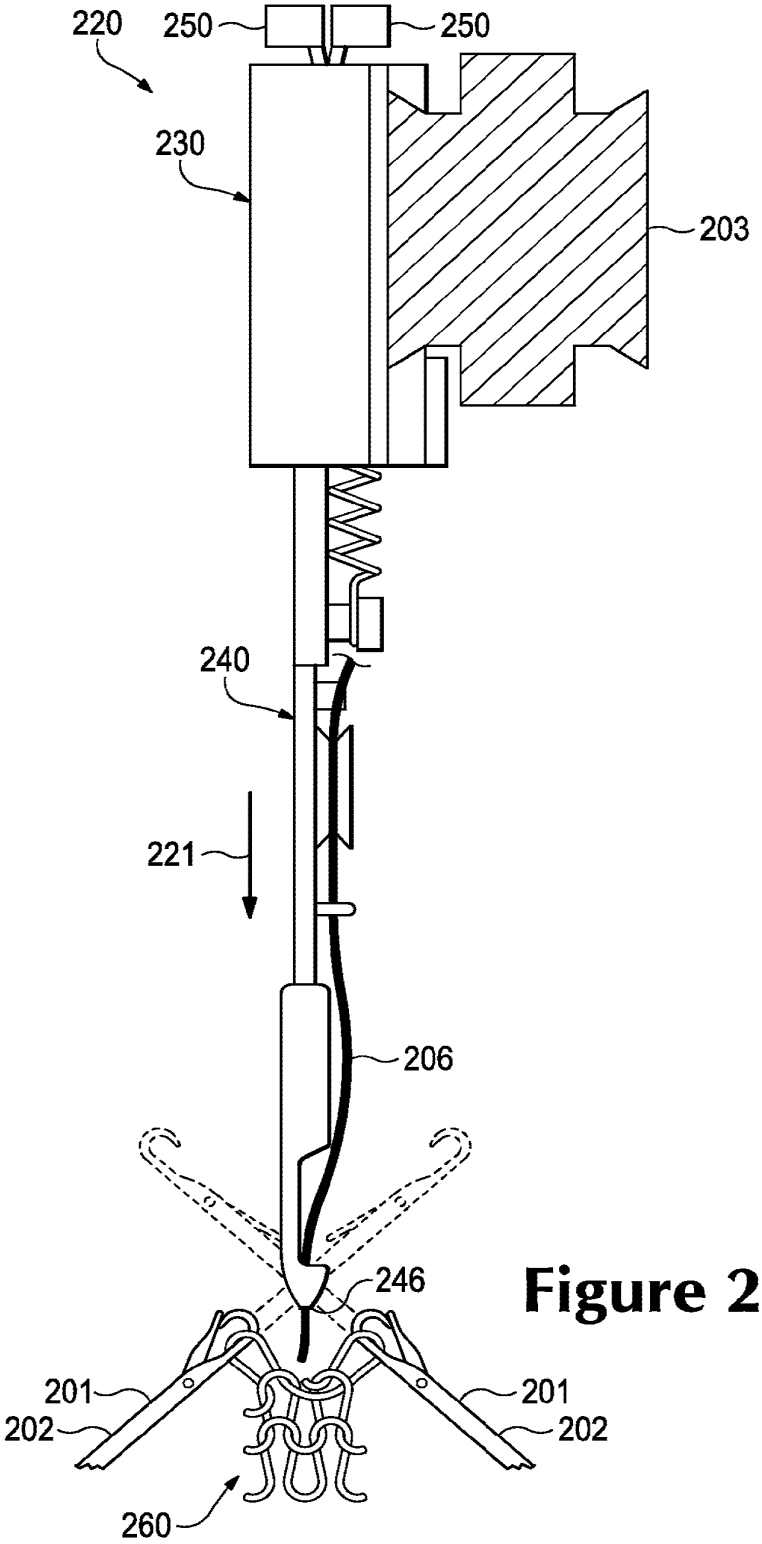

Figure 22C