Simplex fabric is in demand as a result of its smooth surface, soft handle, elegant drape and extensibility, all of which make it suitable for moulded brassiere cups. To meet this demand with up-to-date technology, *Karl Mayer* have produced a double needle bar raschel with two latch needle bars and four guide bars that can knit the fabric at a maximum rate of 500 courses per minute on each needle bar in E 32 gauge and a width of 4318 mm (170 inches). Maximum stitch density is 32 stitches/cm. The machine can also knit ultra-fine spacer fabrics [1–3].

29.5 The double needle bar raschel

The double needle bar raschel, as designed by *Redgate*, later developed into a general-purpose machine, mainly knitting shawls and scarves. At first, the needle bars were arranged back-to-back alternately, as on rib weft knitting machines, but they were soon placed exactly behind each other for convenience of guide bar swinging. Between six and eight guide bars were employed, together with various attachments such as a fall-plate, a crepeing motion (which could disengage one needle bar for a pre-selected number of courses), a switching device for moving the guide bar push-rod from one track of the pattern chain to another, and simple weft inlay or insertion. The front needle bar could be replaced with a point bar for making plush and pile structures or removed altogether so that the back needle bar could knit single-faced fabrics driven by a new set of cams, which doubled its knitting speed.

Improvements in weft knitting and single-bed warp knitting machinery left the double needle bed raschel isolated as a slow, coarse-gauge and very cumbersome type of machine until comparatively recently. However, the arrangement of the elements and knitting action of the raschel is less complex than that of the simplex machine, thus offering greater possibilities for adaptation and modification in order to knit special structures at economical speeds, so it is in this direction that developments have occurred.

29.5.1 The conventional knitting action

On the conventional double needle bar machine, each needle bar in turn is active only for half of the 360 degrees of the knitting cycle. Holding-down sinkers are therefore unnecessary as the other needle bar is in the low inactive position and will restrain the fabric loops.

Figure 29.4 shows the knitting action on the front needle bar; a similar action occurs on the back needle bar (for simplicity, only one guide bar is illustrated).

(*a*) *The front needle bar rise.* The front needle bar is raised to clear the previous course of overlaps from the latches whilst the back needle bar holds the fabric loops.
(*b*) *The overlap.* The guide bar swings through between the needles to the front of the machine. It is shogged for the overlap and then swings back.
(*c*) *The knock-over and underlap.* As the needle bar descends to knock-over, the guide bar performs the underlap shog.
(*d*) *The third swing of the guide bar.* The guide bar now swings over the front needle bar in order to allow the back needle bar to rise and begin its knitting cycle.

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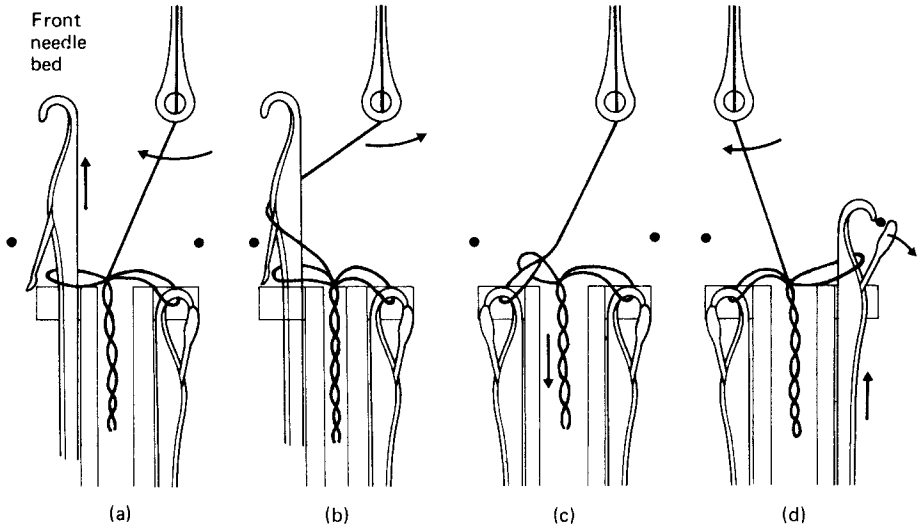


Fig. 29.4 Knitting action of a double needle bar raschel.

In order to increase knitting speeds on modern machines, the 180-degree dwell period of each needle bar has either been reduced or eliminated. In the latter case, one needle bar is rising as the other is falling so that the two needle bars are almost continuously moving in opposition, thus effectively doubling the knitting speed. Some machines also have a counter needle bar motion so that the needle bars and trick-plates move towards the guide bars and thus reduce the guide bar swing. As the needle bar in these cases has only a short dwell period and sometimes separate fabric sections are being knitted on each needle bar, holding-down sinkers are necessary.

29.5.2 Double needle bar raschel products

In the past, double needle bar raschels of 24-gauge and coarser were used to knit fancy fabrics in woollen yarn for baby-wear, nightwear and knitwear. Two such structures were *rib* and *crepe*. In the former, certain needles were never overlapped, whereas the latter is actually a knop fabric produced by taking the back needle bar out of action for between two and four courses to hold its loops whilst the front bar continues to knit. Fabrics of this type have faced increasing competition from the improved design possibilities now offered by flat weft knitting machines.

Two other structures that occasionally achieve a limited success in underwear or outerwear are *waffle* fabric and *Brynje* string vest, both of which were originally developed in the early 1950s as thermal underwear fabrics for US forces serving in cold climates. Both are produced with two half-threaded guide bars although two other guide bars are often also used to produce the selvedge edges for making up. In 24 gauge, 22/1 NeB combed cotton would be a suitable yarn count.

String vest is a double-faced net structure with the underlaps hidden inside. Because it is a double needle bed fabric, the net openings are only half as large as the lapping movement representation.

Waffle fabric is a solid fabric composed of a series of open pockets alternately

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placed on both sides of the fabric. Each guide bar makes overlaps over two needles, which draws their two adjacent wales together thus leaving a gap between every two wales. Gaps on one side are opposite the two connected wales on the other. This arrangement would give the fabric the appearance of a 2×2 rib but after five courses, the lapping movement is changed causing the gaps and connected wales to change positions.

29.5.3 Length-sequenced articles

Some raschel double needle bed products are in the form of articles, a number of which can be simultaneously knitted side-by-side across the needle bed. These articles have a length repeat composed of sections of fabric where the lapping cycle of one or more of the guide bars has been altered. The sequence involves a pattern-change device for counting the number of repeat lapping cycles in each section and for initiating a changeover of guide bar push-rod control from scanning links in one chain track on to those in another track, in order to alter the lapping repeat for a particular guide bar. By this method, a guide bar may be controlled from a choice of two or more chain tracks, each having a short, simple repeat of chain links that may be used any number of times, instead of being controlled from one track of an excessively long and expensive chain containing links for every repeat cycle throughout the length of article.

The principle of '*pattern changing*' is used in the production of a scarf with knitted-in fringes on each end. Lapping for the scarf section is taken from one set of chain tracks and lapping for the fringe section from another. Each guide bar shogging lever may be controlled from either of two pattern chain drums; the upper drum chain tracks may produce the simple lapping repeat for the scarf section whilst the lapping for the fringe section is achieved by switching the shogging control to the chain tracks of the lower drum.

The scarf fabric is knitted as a continuous strip of double-faced fabric with the fringe sections composed of two-wale wide strips, each unconnected by underlaps to its neighbour. Each scarf piece is separated from the next by cutting through the centre of the fringe section and seaming the cut ends to secure them. The simple tricot lapping movement produces the width-wise elasticity required for scarves.

29.5.4 Tubular articles

A seamless tube of fabric may be knitted on a rectilinear double needle bed raschel in a similar manner to on a V-bed flat weft knitting machine. Each bed knits separate single-faced fabrics that are joined together only by underlaps of other partly-threaded guide bars between the beds at the two opposing selvedge needles at each edge. The underlaps may be arranged to be the same as for the needle beds, thus producing a seamless join to the fabric tube.

Figure 29.5 illustrates the basic principles using a base structure of single tricot lapping and four guide bars. The front bar laps only the front bed, the back bar laps only the back bed, and the two middle bars are threaded with only one thread to each complete one selvedge join.

In the first underlap movement towards the *right*, the warp threads will rotate anticlockwise by one needle space in producing the tube on the machine beds. Underlapping on the front bed will be towards the *right*. The right-hand selvedge

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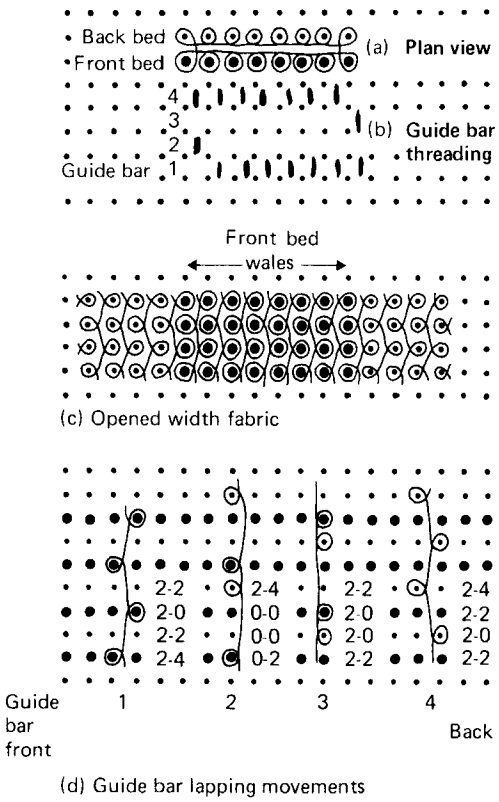


Fig. 29.5 Lapping diagram and notation of a seamless tube knitted on a double needle bar raschel.

bar will underlap across from the front to the back bed. The back bar will underlap towards the *left* and the left-hand selvedge bar will underlap across from the back to the front bed. In the next underlap movement, the direction of lapping will be reversed for each of the guide bars, by a clockwise movement.

As one selvedge bar is always overlapping one needle in each bed, the threading of the front and back bars must be one less than the number of needles knitting the fabric in that bed. Two selvedge guide bars are required because when one is overlapping the front bed in a particular cycle, the other is overlapping the back bed.

Whilst knitting the tube, no guide bar must overlap on both the front and back beds during the same cycle, otherwise a single-thickness double-faced stitch is produced. If the base movement is a two-needle underlap, two selvedge threads will cross over the beds at each selvedge and each will require a separate guide bar. If the base movement was full tricot, a minimum of eight guide bars would be required, two for each bed and two for each selvedge. Inlay net or part-sett threaded net lapping movements may be used to produce tubes in a similar manner.

Some of the first tubular fabrics produced were for *vests* or for *fishnet stockings*, knitting eight to twelve tubes side by side. In 1967, the American *Kidde Cocker*

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company introduced the *Fashion Master* machine for knitting panty-hose and body stockings. By changing the lapping movement of an extra four bars that are lapping in the centre of the fabric, the large tube for the body portion can be divided into two smaller tubes with two of the bars joining two opposing needles across the needle beds for the inner selvedge of one leg, and the other two joining the adjacent needles for the other leg, thus knitting a bifurcated article. Graduating stiffening is achieved by infinitely-variable control of the fabric take-down and warp let-off, a shifting control moves the guide bar push-rods onto other chain tracks when required, and reinforcement is achieved by double-needle overlapping. For approximately two years, hosiery produced on these machines was highly popular.

The *Karl Mayer* HDR 16 EEW machine was introduced in 1970 for producing a range of simple garments such as seamless panties, brassieres and pocketings. The technique used, which has undergone continuous development, is to form the tube across the knitting width rather than down the wales. Although this causes the article in use to have its courses in a vertical direction, this is no major disadvantage and the possibilities for achieving simple shaping are considerably improved.

Figure 29.6 illustrates the production of a strip of briefs fabric; it is only necessary to cut through the centre of the connecting joins to separate each article from the next. These joins of short length are, in effect, knitted side seams, so the briefs are turned inside out after knitting to hide this seam. The first side seam is produced by guides lapping across between the two beds to form a solid double-faced fabric section. Guide bars inlaying on the left selvedge form the knitted-in waist band which is produced on each bed because the guide bars lap on the two needle beds separately in order to produce the waist opening on the left and the first leg opening on the right. Half-way through the courses for the sequence, the right selvedge needles are joined together for a number of courses to complete the first leg opening and close the crotch section of the brief. Single-bed fabric knitting then continues for the second leg after which the bars knit between the beds to form the second side seam and then commence the sequence for the next brief.

On a 75-inch (190 cm) wide machine, three brief fabric strips can be knitted side by side giving a production of 360 briefs per hour. It is possible to achieve a cotton terry effect on the inside if desired. Upper and lower pattern chain drums are employed to control the guide bar shogging levers and these drums may have a split drive and chain stop facilities to further economise on links and provide greater versatility in lapping movements. The double needle bar raschel in 12–16 gauge has proved particularly useful for the production of *packing sacks* for fruit and vegetables made from polyolefin in fibrillated tape or mono-filament form [4,5]. The base structure is usually a pillar stitch inlay that provides a secure non-slip construction (Fig. 29.7). The polyolefin sheets may, if necessary, be fed directly into the back of the machine where they are split into separate ends without the need for warping.

The sacks are knitted sideways at a rate of 250 courses per minute on each bed in a similar manner to the briefs. Their depth can thus be varied according to the number of needles knitting in each section. The two fabrics are joined together at the top and bottom to form the side seams and at one selvedge to form the bottom of the sack. At the open end, a draw-thread may be knitted into each side of the fabric and separation of the sacks from the continuous warp knitted strip is achieved afterwards with a hot wire.

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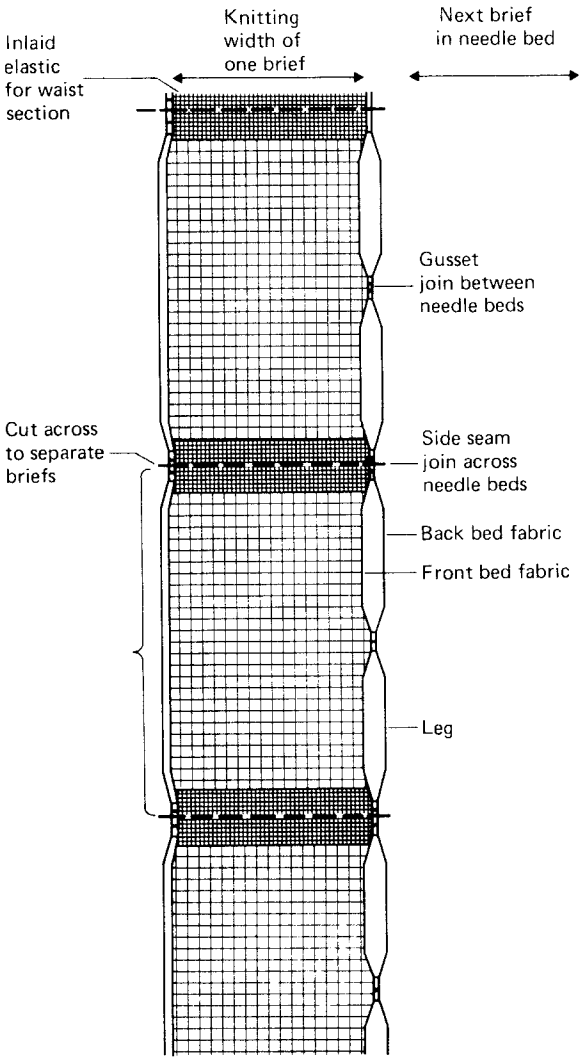


Fig. 29.6 The principle of knitting tights on a double needle bar raschel.

29.5.5 Pile fabrics

There are two main groups of pile fabrics produced on double-bar raschels: cut pile and point pile. *Cut pile* is achieved by knitting a separate base fabric on each needle bed but joining the two together by the lapping movement of the pile, which is later slit to produce the two cut pile fabrics. *Point* or *looped pile* is produced by replacing the front bar needles by a point or pin bar around which the pile yarns are overlapped. For security, the pile yarn may be overlapped in the base fabric on the needle bar or it may be inlaid to economise on yarn and produce a lighter-weight fabric.

Cut pile fabrics are employed for a wide range of high pile end-uses such as simulated fur and skin fabrics, upholstery and coat linings. The *Karl Mayer* HDR 5PLM is designed specifically for this type of fabric. Its raschel gauges range from 18 to

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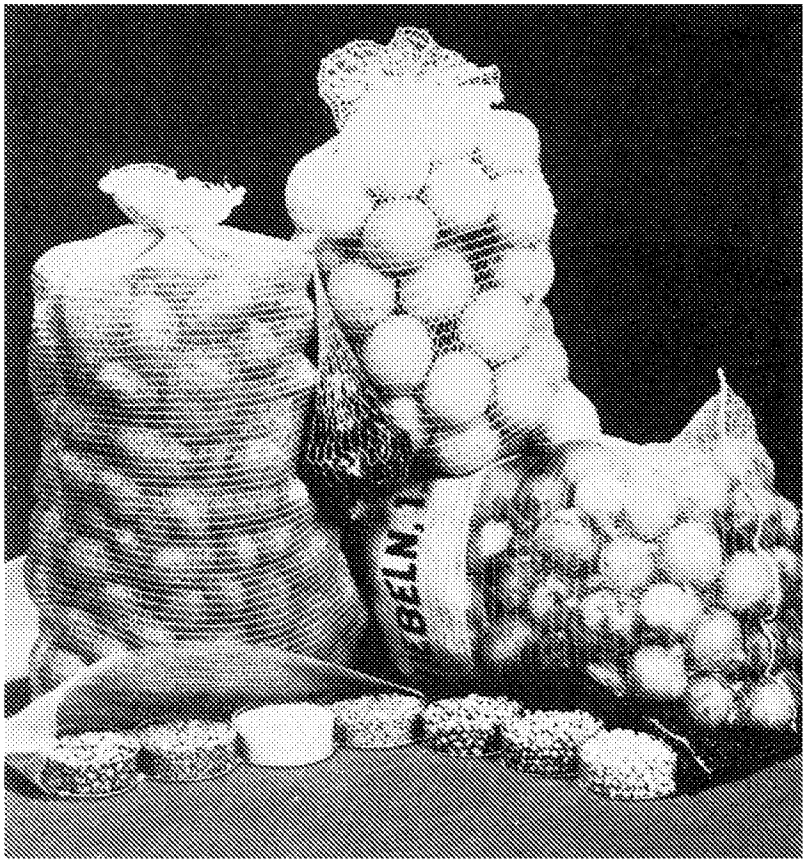


Fig. 29.7 Fruit and vegetable sacks knitted on double needle bar raschel machines [Karl Mayer].

36, with 32 being most common, in widths of 75–180 inches (190–457 cm) and speeds of approximately 250–300 cpm per needle bar (five-times faster than weaving). The fabric made from polyester yarns weighs between 300 and 600 g/m^2 and is particularly used for automotive upholstery.

Each bed knits alternately and has a cam-shaft, needle bar, trick-plate, sinker bar and two guide bars with no swinging action. The needle bar and trick-plate swing through the two guide bars to produce the base structure on that particular needle bed. The middle (pile) guide bar has normal swinging facilities for lapping the pile alternately on each needle bed. As the pile is severed in the centre, its height is half the distance between the two trick-plates; this distance may be altered to give a range of pile heights between 2.5 and 30 mm.

Figure 29.8 shows a simple three guide bar construction and Fig. 29.9, a more popular construction using five guide bars. By lapping the pile yarn into two wales, any irregularity in the yarn is disguised.

The effect produced is determined by a combination of type of fibre, denier, lapping movement and finishing process sequences whose operations may include one or more of the following: raising, cropping, setting, dyeing or printing, and electro-polishing.

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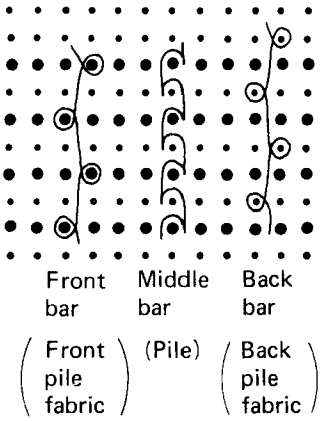


Fig. 29.8 Notation for a three guide bar cut plush.

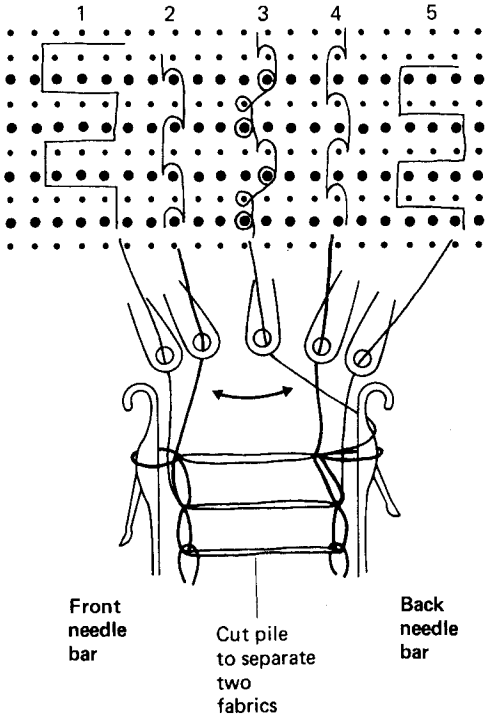


Fig. 29.9 Notation for a five guide bar cut plush.

In point pile, the loops lie at right angles to the base fabric and on some machines the points are sharpened or contain rotating cutting blades for cutting the pile loops. The structures are particularly suitable for floor coverings and carpeting. On a five guide bar machine in 12 gauge, the front two bars might knit pillar stitches in opposition, threaded with spun polyester; the inlay might be supplied by 2/10 NeK spun polyester from the back bar; whilst the two middle bars might supply 5/400 denier

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textured polyester for the pile, overlapping the points and laying-in on the needle bar.

Using an eight-link-per-course cycle, the overlap for the points occurs between the first two links, the overlap for the pillar stitches on the needle bar occurs between the second two links, whilst the last four links allow the points and needles to descend for knock-over and for the underlap inlay on the back bar.

An unusual use is three guide bar structure for the artificial turf, *Astro-turf* [6], whose pile is composed of four, six or eight ends of 500 denier dope-dyed nylon ribbon on a nylon polyester knitted and inlaid base fabric.

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30

Technical textiles

A *technical textile* is a textile that has been developed to meet the exacting specified high-performance requirements of a particular end-use other than conventional clothing and furnishings. In many cases, specially developed technical yarns are employed to support and reinforce the fabric properties [1].

30.1 Markets for technical textiles

According to Professor S. Anand of Bolton Institute, England, technical textiles account for approximately 21 per cent of all textiles. The main markets are: traditional industrial fabrics, for example, canvas, tents, etc. (43%); transportation and automotive (23%); leisure (12%); geotextiles (10%); medical textiles (10%); and protective apparel (2%).

Two-thirds of *automotive materials* go into 'interior trim' for seat covers, roof and door liners, and carpets, where woven fabrics still dominate [2]. Other uses include tyres, air bags and filters.

Although non-woven and woven fabrics account for the majority of technical textiles, warp knitted and, to a lesser extent, weft knitted structures have captured some special end-use markets. These are particularly where certain properties such as drapability, mouldability, knitting to shape, open-work, extensibility, strength, lightness of weight and cost are at a premium and can be tailored to requirements.

30.2 The properties of warp knitted structures

Warp knitting offers:

- Higher production rates than for weaving.
- A wide variety of fabric constructions.
- Large working widths.

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- A low stress rate on the yarn that facilitates careful handling of fibres such as glass, aramide and carbon (particularly when using weft-insertion techniques).
- Conventional warp knitted structures that can be directionally structured.
- Three-dimensional structures that can be knitted on double needle bar raschels.
- With weft insertion, uni-axial, bi-axial, multi-axial and composite structures that can be manufactured on single needle bar raschels.

30.3 End-uses for technical textiles

Possible specific applications for technical textiles are as follows:

- *Geotextiles* – Drainage, filter, and membrane material, road and tunnel reinforcement, erosion protection.
- *Tarpaulins, coverings* – Air-inflated structures, tarpaulins, roof coverings, temperature-resistant sails, back-lit advertising signs.
- *Safety textiles* – Heat and flame-resistant protective clothing for civil and military purposes, fluorescent safety clothing, inflatable life rafts, bullet-proof vests, helmets, sun protection blinds, radiation protection, parachutes, oil trap mats. (Bullet-proof vest fabric can be knitted on a *Karl Mayer* E 18 raschel machine with a magazine weft insertion and three guide bars. The front bar is threaded with 80 dtex polyester guide bars and laps 1–0/2–3. The other two bars 'interweave' with the front bar using the evasion technique 00/11/00/22 and



Fig. 30.1 EQT full-body competition swimsuit [Adidas].

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00/22/00/11 (Chapter 27). These, together with the weft insertion mechanism, are threaded with 840 dtex aramid.

- *Industrial Textiles* – Filter fabrics, conveyor belts, adhesive tapes.
- *Medical Textiles* – Plasters, tapes, gauze, artificial arteries, bandages, dialysis filters, elastic net bandages, blankets and covers. (Small-diameter, single cylinder machines are ideal for weft knitting tubular stretch bandages from cotton yarn with inlaid elastic yarn [3]).
- *Composites* – Composites for buildings, aerospace, automobiles, boats.
- *Active Sportswear* – Clothing and equipment (Fig. 30.1).
- *Nets* – Fabrics for construction, agriculture, for safety, weather and pest protection, blinds, fences, storage nets, sacks, fish nets [4].

30.4 Geotextiles

Geotextiles are polymer fabrics used in the construction of roads, drains, harbour works, and breakwaters, and for land reclamation and many other civil engineering purposes (Fig. 30.2).

The geotextiles market requires bulk quantities of material. Warp-knitted weft-insertion geotextiles offer the following advantages when compared to woven geotextiles:

1 Strength-for-strength, they are lighter than woven geotextiles using the same yarn. This makes for easier handling and laying on site; thus transport and labour costs are less in real terms.
2 Knitted geotextiles have exceptional tear strength. Additional strength can be designed and built-in to the weft direction such that a bi-axial high tensile, high strength warp/weft geotextile becomes a reality; e.g. 500 k Nm warp and 500 k Nm weft.
3 Knitted geotextiles can incorporate an additional fabric to form a true composite geotextile, the fabric being simply knitted-in.
4 The individual yarns in the warp knitted weft-insertion geotextile are straight when incorporated, so they are able to take-up the strain immediately on loading. Those in woven geotextiles are interlaced [5,6].

30.5 Knitted wire

Rhodius GmbH of Bavaria specialise in the knitting of yarns or fibres composed of metal and of speciality material such as glass and aramid [7]. In the car industry, knitted wire components are used as filters in air-bag systems, as vibration dampeners, and for thermal insulation and noise reduction purposes. Knitted wire fabrics prove very efficient particularly in terms of elasticity, corrosion, thermal resistance and long service life.

30.6 The advantages of warp knitted nets

Warp knitted nets have knot-free joints giving greater strength and lower weights; extremely open fabric uses very little yarn; fabric density is adjustable and can be adjusted to the requirements of sunlight.

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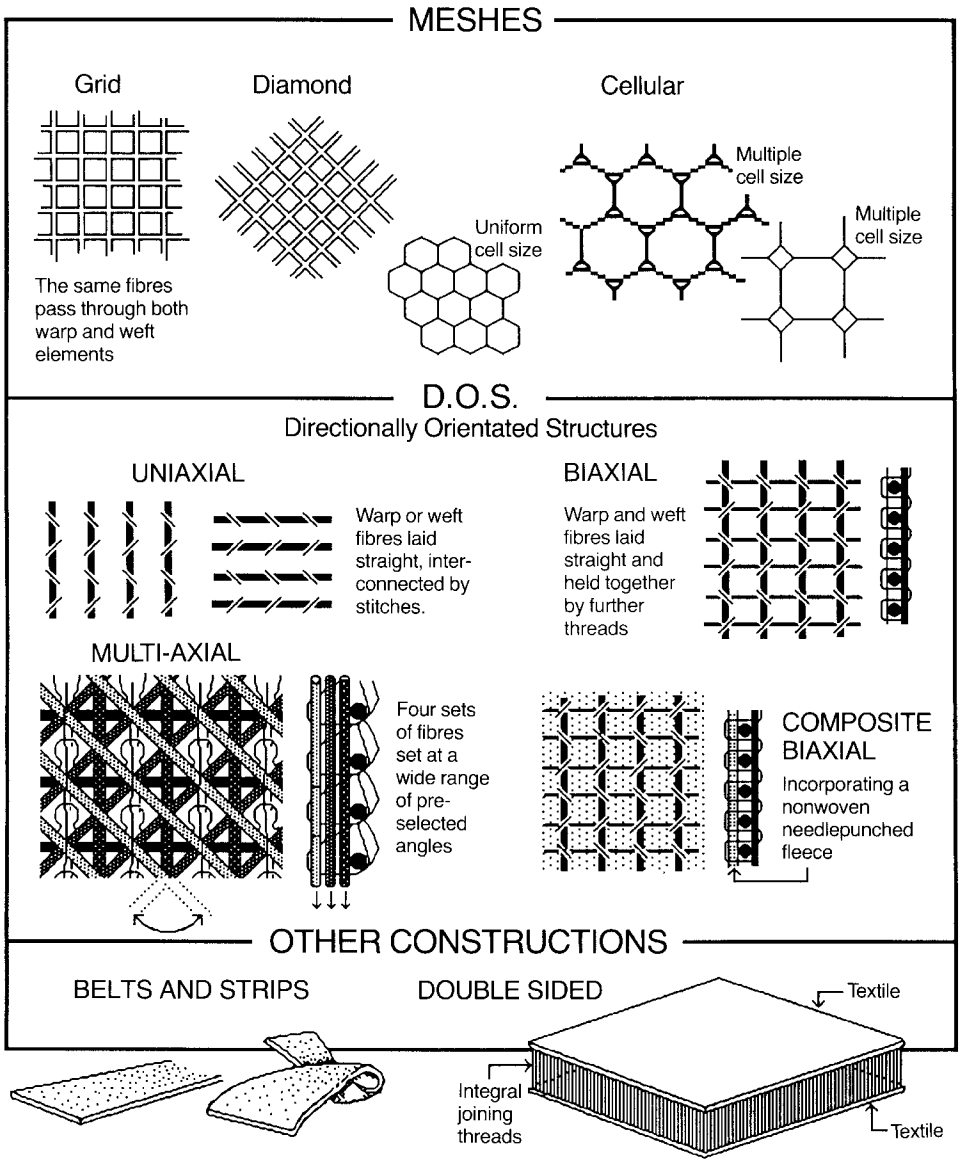


Fig. 30.2 Directionally-structured fibre (DSF) geotextile constructions [*The Karl Mayer Guide to Geotextiles*, P R Ranilor and S Raz (1989), Karl Mayer, Germany].

Warp knitting technology is more versatile than any other fabric producing technique for manufacturing nets. Different sizes and shapes of net openings can be produced. They are dimensionally stable, slip-resistant, and do not require a stabilising finish.

Karl Mayer have an eight-guide bar raschel for knitting medium-weight nets in E 6 to E 9, in a yarn count range of dtex 3000 to 6000, at a speed of 400 to 500

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courses per minute. It has six stitch-forming bars (4 ground, 2 selvedge, and 2 inlay guide bars).

30.7 Composites

Composites are products formed by combining two or more discrete physical phases, usually a solid matrix and a fibrous reinforcing material. The reinforcing component often consists of or is made up from high–tenacity fibres as the strain-resistant structure, and is surrounded by a polymer matrix that acts as a rigidising adhesive holding the fibrous component(s) in place.

Such composites are used for high-performance parts having low specific weight. One objective is to replace metallic materials. Fibres with high tenacity can be used simultaneously with low-stretch, high-modular filament yarns. These include glass fibres, carbon, and aramide. The strength of the composite is also determined by the position of the yarns and the angle at which they are inserted into the matrix.

30.8 Warp knitted multi-axial weft insertion fabrics

Multi-axial layered fabrics are structures fixed by a stitch system retaining the several parallel yarn layers (Fig. 30.3). The yarn layers may have different orientations, differing yarn densities of the individual layers, and may include fibre webs and fleeces, film tapes, foams, etc.

Due to the drawn and parallel yarn layers, multi-axial layered fabrics are particularly suitable for bonding by resinous or polymeric materials to produce fibre-polymer composites.

The *Liba Copcentra* tricot machine has a multi-axial, magazine weft-insertion. It has been developed to stitch bond composite fibre mats at high production rates. The feeding conveyor is approximately 15-metres long and is located at the back of the machine. Each creel-supplied yarn sheet layer is laid across or along the width of the conveyor at a specified angle. The continuous mat of yarn layers is conveyed

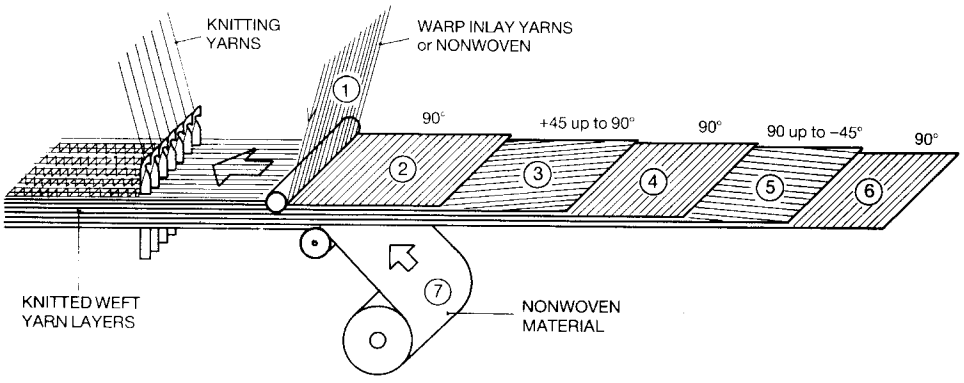


Fig. 30.3 Principle of the LIBA multi-axial magazine weft insertion warp knitting machine. Up to 6 yarn layers and one fleece layer are possible [LIBA].

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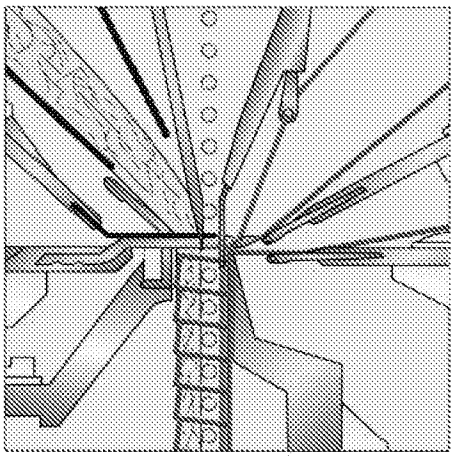
through the knitting machine where the compound needles, supplied with warp threads, stitch through and stabilise the structure.

The standard arrangement uses 5 weft-insertion systems of which 3 systems supply parallel weft and 2 systems supply diagonal weft. Each diagonal weft thread layer can be laid at any adjustable angle from 60–45 degrees (or 90–45 degrees on request). The density of each layer can be varied and is not dependent upon the gauge. Non-woven webs can be fed into the knitting zone above or below the yarn conveyor; two guide bars can be used for stitch forming. The machine has a working width up to 245 inches (622 cm) in a gauge range of E 6 to E 24, and has a production speed of 1200 courses per minute.

30.9 Stitch bonding or web knitting

Warp knitting machine builders *Karl Mayer* build a range of *Malimo* stitch bonding machines (Fig. 30.4) [8]. Whereas warp and weft knitting construct fabrics from yarns, stitch bonding constructs fabrics from a medium such as a fibrous web using purely mechanical means. It is therefore a highly-productive method of producing textile substrates for industrial end-uses.

Using horizontally-mounted compound needles, the medium can be pierced by the pointed needle heads, so it is ideal for the production of textile composites. It is stitch-bonded either right through the structure or only on one surface in order to stabilise it. Dependent upon the model, additional yarns or fibres may or may



Stitch-bonding elements:
Compound needle
Closing wire
Guide needle 1st guide bar
Guide needle 2nd guide bar
Knocking-over sinker
Backing rail
Retaining pin
Warp yarn guide needle

Fig. 30.4 Malimo stitch bonding machine knitting head [Karl Mayer].

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not be supplied to the needles. Yarn layers, webs, films or materials such as glass fibres, rockwool, or re-cycled products can be processed

Malimo web processing techniques include *Maliwatt*, *Malivlies*, *Kunit*, and *Multiknit*. The *Malimo* machines operate with one or two guide bars and offer parallel weft and multi-axial alternatives. Pile and fleece can be produced on the *Malipol* (pile yarn feed) and *Voltex* (pile web feed) machines.

The *Karl Mayer Maliwatt* stitch-bonding machine is a high-performance machine for plain stitch-bonding of loose or pre-bonded fibrous webs, as well as of substrates of various materials within a wide range of thicknesses and weights per unit area.

The advantage of mechanical bonding is that it occurs in a single process without the use of chemicals. The resultant fabric can be used in a moulded resin laminate for boats, cars and sports equipment.

A special version of the machine for processing fibreglass into a web has now been developed. The fibreglass is fed to a chopper behind the machine. This cuts the glass fibres into pre-determined lengths (25–100 mm). The chopped strands are randomly arranged in the form of a mat on a conveyor belt that feeds to the stitch forming area where they are bonded by means of a quilted seam. The mat is used to make reinforced plastic mouldings such as safety helmets and vehicle bodywork.

Working widths range from 2900 mm to 6150 mm and gauges from E 3.5 to E 22.

30.10 Spacer fabrics

A *spacer fabric* is a double-faced fabric knitted on a double needle bar machine. The distance between the two surfaces is retained after compression by the resilience of the pile yarn (usually mono-filament) that passes between them.

One reason for the development of spacer fabrics was an attempt to replace toxic, laminated-layer foam with a single, synthetic fibre type fabric, thus facilitating future re-cycling (Fig. 30.5).

Spacer fabrics are manufactured according to their function and have three variable components: fabric construction, yarn material and finishing. The hollow centre of the fabric may be filled with solid, liquid or gaseous materials (air can be used for insulation). Yarns with good moisture transportation properties may also be employed.

Partly-threaded guide bars can produce open-hole structures on each surface and air circulation can occur in the two millimetre space between the two surfaces. An important advantage is the low weight in proportion to the large volume.

The compression resistance can be adjusted by using different yarn counts in the rigid, synthetic mono-filament spacer yarns that connect the two surfaces of the fabric. Additional spacer yarns can be used where the choice of type of yarn determines properties such as moisture transport, absorbency, compression resistance, drapability, and thermal conductivity. The spacing can be up to 60 mm and widths up to 4400 mm. Fine fabrics knitted on E 32 raschels range in thickness between 1 and 4 mm.

End-uses for spacer fabrics include moulded bra cups, padding, and linings [9]. Medical applications are also being investigated [10].

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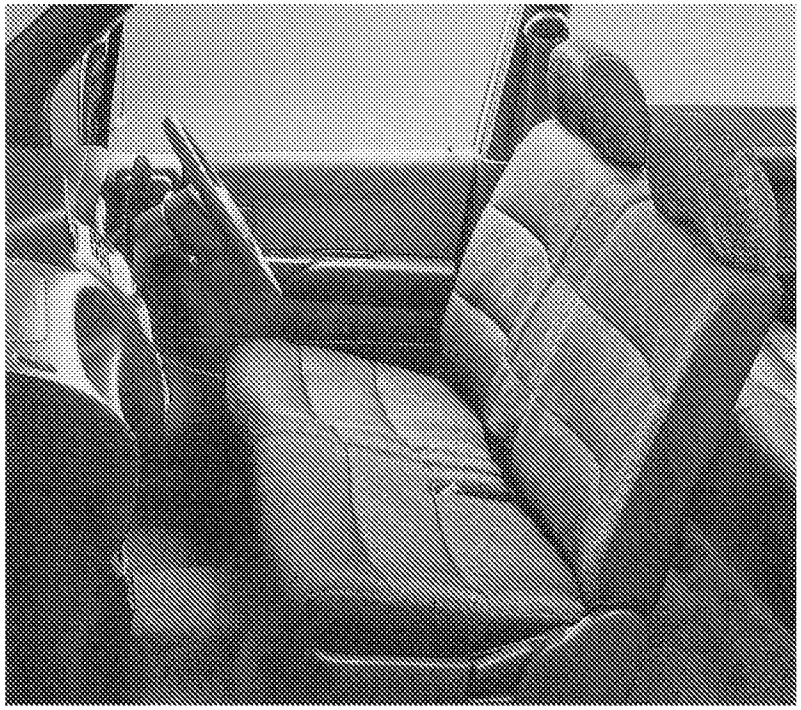


Fig. 30.5 Raschel-knitted spacer structure used for car seat covers of the Daihatsu Move 'Aero Down Custom' model. The front is formed as an openwork mesh structure and the back as a dense structure, so that the air circulates freely in the space between, and the driver and passengers are guaranteed an optimum microclimate [*Kettenwirk-Praxis* (3/99), 40].

30.11 Circular warp knitting

Tubular, seamless, extensible nets for fishnet patterned stockings, fruit sacks, and medical support bandages can be knitted on simple, small-diameter circular warp knitting machines. The vertical latch needles are fixed to the needle cylinder, collectively rising and falling with it. They are in a conical arrangement so the hooks form a smaller circle than the stems. The warp yarn is supplied through guide-eyes drilled in a ring. The ring turns to overlap the hooks when the needles are raised and produces underlaps at the back of the needles when they are lowered. For a simple balanced net, two full rings are used.

For more complex designs, up to 4 additional patterning rings may be employed. *Tritex* (Barwell, Leicester, UK) are supporting the development of a new prototype machine [11].

The rings can be cam-driven or electronically-controlled. At 80 per cent efficiency, approximately 100 metres of fabric will be knitted per hour. The stitch length is controlled by the positive warp let-off mechanism.

30.12 V-bed technical fabrics

In *v-bed weft knitting*, the *Stoll* approach emphasises made-to-measure quick prefabrication of complex two- or three-dimensionally shaped articles (Figures 30.6 and

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Skechers EX1013-p. 1017
Skechers v Nike

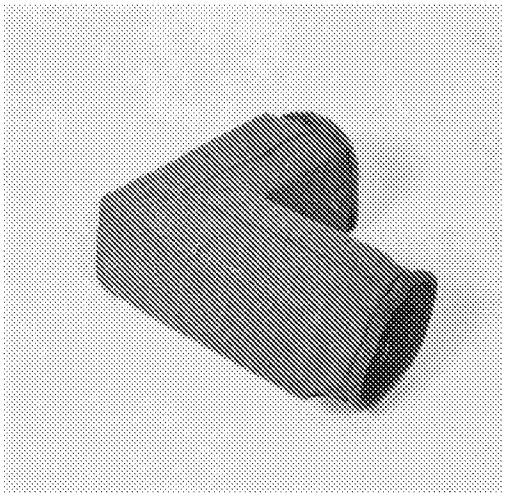


Fig. 30.6 Tube connection with rectangular cross-section [Stoll, from *Knitting Technique,* Vol. 13 (1991), 2, 124].

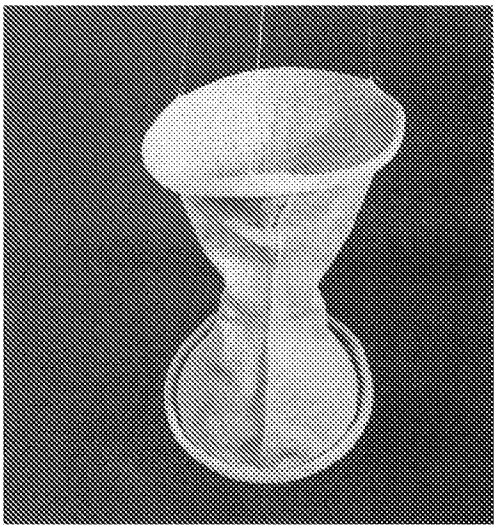


Fig. 30.7 Funnel-shaped tube connection in Kevlar [Stoll, from *Knitting Technique*, Vol. 13 (1991), 1, 123].

30.7), including the knitting of a wide range of materials such as metals in fibre or filament form. Examples of end-uses include upholstery for office furniture, one-piece seat-heating circuits, helmets, catalytic converters, pressure tanks made of composite materials, and support bandages that are knitted to size and shape [12,13].

There is no doubt that when used as a type of reinforced material, weft knitted fabrics have their disadvantage in mechanical properties (low resistance and modulus) due to the loop construction used, but in cases where elasticity, flexibility and high energy absorption are required, weft knitted fabrics have their advantages.

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Compared with other techniques that have been used for the production of 3D fabrics, the advantages of flat knitting are as follows:

- It is a flexible manufacturing process.
- The change of fabric structures and forms is very fast.
- The change of yarn types in the same structure is also possible.
- Possibility of knitting to shape without cutting waste or making-up time.
- Complicated shapes can be developed [14,15].

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Appendix

Textbook availability

Information on current textile books and periodicals in-print including free catalogue entitled 'Textile Titles of the World' available from: Blackwells Bookshops, 21 Blenheim Terrace, Woodhouse Lane, Leeds LS2 9HJ Tel: 0113 243 2446 Fax: 0113 243 0661 E-mail: leeds@blackwellsbookshops.co.uk

Further information

Textile Technology Catalogue, Woodhead Publishing, Abington Hall, Abington, Cambridge CB1 6AH,
International Directory and Review 2000, and

Textile Terms and Definitions, Published by The Textile Institute St James's Buildings, Fourth Floor, Oxford St, Manchester M1 6FQ

Technical dictionary for knitwear and hosiery production (German/English/Italian), Eva Lesykova, Meisenbach GmbH, Hainstrasse 18, D-96047, Bamberg, Germany.

RAZ, S., *Flat Knitting*, Universal Maschinen Fabrik (Meisenbach 1993). Based on the Universal flat knitting range of machines, the book covers manually as well as mechanically and electronically controlled machines, computer controls and pattern preparation and programming.

RAZ, S., *Flat Knitting – The new generation* (1991), Meisenbach GmbH. Based particularly on the Stoll CMS range of flat machines, the book progresses from elementary principles through to programming and advanced design.

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WILKINS, C., *Warp knit machine elements* (1997).

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REISFELD, A., *The history of warp knit arts and trades* (1999) American Society of Knitting Technologists, New York, US.

Knitting International (formerly the Hosiery Trade Journal) published monthly by World Textile Publications Ltd, 1 Longlands St., Bradford W. Yorks., UK, BD1 2TP.

Knitting Technology (formerly *Knitting Technique*, formerly English edition of *Wirkerei und Strickerei*), Meisenbach GmbH, POBox 2069, D-96011 Bamberg, Germany.

Kettenwirk-Praxis (with English translations). Published quarterly by Karl Mayer Textilmaschinenfabrik GmbH, Postbox 1120, D-63166 Obertshausen, Germany. Provides a comprehensive explanation of up to date practices and developments in warp knitting.

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Clothing
Technology
Clothing Technology
Clothing Technology
EUROPA
LEHRMITTEL

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Preface
to 6th edition

This is a vocational book, directed primarily at students of the clothing industry: sewing, cutting, garment assembly, men's and women's tailoring. However, it will also be found useful in courses for supervisors and technicians, and as a general reference work.

A key feature of the book is its concise and compact design – a prerequisite for summarising such a wide range of material in a single volume. Each page is complete in itself. Particular emphasis has been laid on providing a simple layout and straightforward language, which students will find easy to grasp. Numerous colour diagrams are an effective aid to the comprehension of some of the more difficult topics. These coloured illustrations are a particularly useful feature of the chapters on Fabric Descriptions and the History of Clothing.

The book is organised largely according to the different technological sectors, but teaching requirements have also been kept in mind. There are eleven chapters:

> Fibres, Yarns, Fabrics, Textile Finishing, Fabric Descriptions, Leather and Fur, Clothing Manufacture, Organisation of Clothing Manufacture, Product Design, Product Groups, History of Clothing.

The arrangement of topics conforms to the educational guidelines and the current curricula for courses in vocational technology in the German Federal States. An important objective of this publication was to present the extensive body of knowledge as a coherent whole. At all stages, account is taken of the latest scientific findings and the practical experience of the industry, as well as any relevant DIN standards.

Since publication of the fifth edition, there have been many suggestions for improvements, there have been new technical developments, and there have been changes in the student curricula. Therefore, the whole book has been thoroughly reviewed, revised and rearranged where necessary. Some additional fabrics have been included in the section on Fabric Descriptions. The Organisation of Clothing Manufacture has been significantly broadened. Additional Product Groups have been introduced. The sections on Health and Safety and Quality Assurance have been rewritten and expanded. The History of Clothing has been extended to include the Nineties and the Turn of the Century.

At this point we would like to give special thanks to the companies and associations listed on page 291 for their assistance in the clarification of questions and for the provision of pictorial material. We are especially indebted to *Ludwig Brauser* and *Malte Lütjens* as well as *Sonja Langer Korsch* (leather and fur), *Erich Stürner* (knitted fabrics), *Tuula Salo* and *Hannes Döllel* (fashion drawings) and *Rainer Endisch* (organisation of clothing manufacture) for their helpful suggestions.

Many clothing companies today employ offshore manufacturing. In this situation, it is useful to note that "Fachwissen Bekleidung" has been translated into English (Clothing Technology) and from there into several other European languages. Maybe this can provide some stimulus to intra- and extra-European communication via the language of technology. The new generation will need competence in both language and technology to succeed in an era of global market competition.

We would welcome any suggestions for improving or supplementing the material in this book.

Metzingen, Autumn 2000 — Editor and authors

Petitioner adidas AG - Exhibit 1013 - Page 2

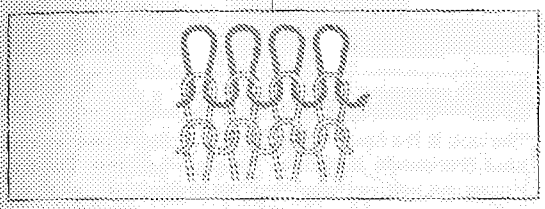
3.3.1 Classification of Knitted Fabrics

Definition after ISO 7839: 1984

Knitted fabrics are made from interlocking loops, formed from a single yarn or from many.
They are classified into weft knitted and warp knitted fabrics.

KNITTED FABRICS

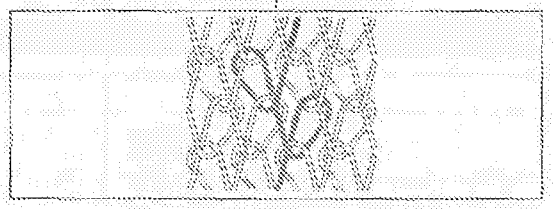
WEFT KNITTED



Characteristics

- May be made from a single yarn.
- The yarn is fed crosswise to the length of the fabric.
- Can be unravelled; may ladder.
- Knitting needles can work sequentially or all together.

WARP KNITTED



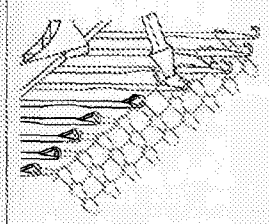
Characteristics

- Requires a full warp sheet.
- The loop-forming yarns are fed in the direction of the length of the fabric.
- Can not be unravelled, usually does not ladder.
- Knitting needles always work together as a unit.

Production

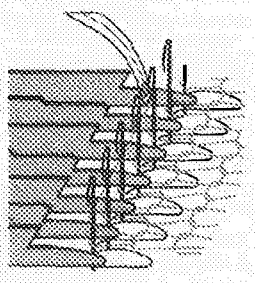
WEFT KNITTED FABRICS

Sequential needles:
Loops are formed in sequence across the width of the fabric. Machines can be flat or circular. Needles are usually of the latch type.



1: Sequential loop formation on a flat machine

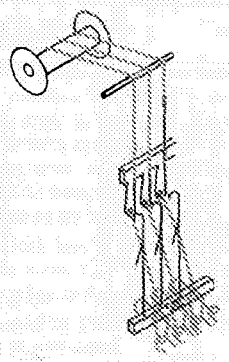
Simultaneous needles:
All of the needles are moved together or the needles are stationary and the fabric is moved. Machines can be flat or circular. Needles are usually of the bearded type.



2: Simultaneous loop formation

WARP KNITTED FABRICS

Warp knitting:
Warp knitting uses one or more warp sheets. Each yarn is looped around a needle and the needles are all moved together. The needles may be of the bearded, latch, or compound type. Warp knitting machines with latch or compound needles are called raschel machines and the material they make is called raschel fabric.



3: Loop formation on a warp knitting machine

Petitioner adidas AG - Exhibit 1013 - Page 3 of 3 - p. 1029
Skechers v Nike

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.
51-1864		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2009/056795	14/09/2009	18/12/2008
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 7 sheets.

☐ 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:
      ☒ 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. ☐ **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,**
   ☒ 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,**
   ☐ the text is approved as submitted by the applicant
   ☒ the text has been established, according to Rule 38.2(b), 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
      ☒ 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

Box No. IV Text of the abstract (Continuation of item 5 of the first sheet)

An article of footwear (10) has an upper (30) that includes a knitted component and a sole structure (20) secured to the upper. The knitted component may define a tube (42) formed of unitary knit construction, and a strand (43) 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.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2009/056795

A. CLASSIFICATION OF SUBJECT MATTER
INV. A43C1/04 A43B23/02 A43B7/20

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)
A43C 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 practical, 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 2008/110048 A1 (DUA BHUPESH [US] ET AL) 15 May 2008 (2008-05-15) the whole document	1-22
X	US 2005/284000 A1 (KERNS MARK [US]) 29 December 2005 (2005-12-29)	1,5
A	the whole document	10,15,22
A	US 7 347 011 B2 (DUA BHUPESH [US] ET AL DUA BHUPESH [US] ET AL) 25 March 2008 (2008-03-25) the whole document	1-22
A	US 6 910 288 B2 (DUA BHUPESH [US]) 28 June 2005 (2005-06-28) the whole document	1-22

-/--

[X] Further documents are listed in the continuation of Box C.

[X] 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 document 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
10 December 2009	20/04/2010

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	Herry, Manuel

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2009/056795

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 931 762 B1 (DUA BHUPESH [US]) 23 August 2005 (2005-08-23) the whole document -----	1-22

Skechers EX1013-p. 1033
Skechers v Nike

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/056795

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.:
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:

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:

see additional sheet

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.:

1-22

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.

Skechers EX1013-p. 1034
Skechers v Nike

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-22

Independent claims 1, 5, 10, 15 and 22 specify that the knitted component defines a tubular structure, and that the yarn or strand extends through at least a portion of the tube. With these features a simple tubular structure is provided with a yarn or strand, which can be applied, for instance, to receive a lace.

---

2. claims: 23-35, 41-42

Independent claims 23, 29, 32 and 41 specify the provision of two knitted layers in the footwear upper, with a plurality of yarns located between these layers, the yarns floating or extending between the knitted layers to which they are secured. These features provide improved cushioning properties at selected areas of the footwear upper.

---

3. claims: 36-40

Independent claim 36 specifies that the knitted component includes at least one yarn incorporating a thermoplastic polymer, an area being heated to fuse the yarn. These features provide a method for reinforcing particular areas of the upper.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2009/056795

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008110048 A1	15-05-2008	CN 101583294 A	18-11-2009
		EP 2079336 A1	22-07-2009
		WO 2008060928 A1	22-05-2008
US 2005284000 A1	29-12-2005	EP 1778039 A2	02-05-2007
		WO 2006001966 A2	05-01-2006
US 7347011 B2	25-03-2008	CN 1925763 A	07-03-2007
		TW 279198 B	21-04-2007
		US 2008196181 A1	21-08-2008
		US 2005193592 A1	08-09-2005
		WO 2005092134 A1	06-10-2005
US 6910288 B2	28-06-2005	AT 448703 T	15-12-2009
		AU 2003299627 A1	29-07-2004
		CA 2510558 A1	22-07-2004
		EP 1571938 A1	14-09-2005
		ES 2335988 T3	07-04-2010
		JP 4376792 B2	02-12-2009
		JP 2006511306 T	06-04-2006
		WO 2004060093 A1	22-07-2004
		US 2004118018 A1	24-06-2004
US 6931762 B1	23-08-2005	US 2005115284 A1	02-06-2005

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/US2009/056795	14.09.2009	18.12.2008

International Patent Classification (IPC) or both national classification and IPC
INV. A43C1/04 A43B23/02 A43B7/20

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.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:	Date of completion of this opinion	Authorized Officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465	see form PCT/ISA/210	Herry, Manuel Telephone No. +49 89 2399-8666

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. 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. 23-42

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. 23-42

☐ 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. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has, within the applicable time limit:

   ☐ paid additional fees

   ☐ paid additional fees under protest and, where applicable, the protest fee

   ☐ paid additional fees under protest but the applicable protest fee was not paid

   ☒ not paid additional fees

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

   ☐ complied with

   ☒ not complied with for the following reasons:

   see separate sheet

4. Consequently, this report has been established in respect of the following parts of the international application:

   ☐ all parts.

   ☒ the parts relating to claims Nos. 1-22

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	4, 13-14, 19
	No:	Claims	1-3, 5-12, 15-18, 20-22
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-22
Industrial applicability (IA)	Yes:	Claims	1-22
	No:	Claims	

2. Citations and explanations

see separate sheet

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

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

ITEM III:

The subject-matter of claims 23-42 has not been searched, following an objection of lack unity (see also ITEM IV of the present communication). Consequently, no opinion is given as to the novelty and inventive step of the subject-matter of these claims.

ITEM IV:

Independent claims 1, 5, 10, 15, 22, 23, 29, 32, 36 and 41 have in common that they relate to an article of footwear or to a method for manufacturing it, the article of footwear having an upper, the upper having a knitted component, the knitted component comprising a yarn or a strand (claim 36), or the knitted component being associated with the yarn or strand (other independent claims).

However, this concept is known for instance from US 2008/110048 A1 (par.9: "the upper includes a knitted element formed from at least one mechanically manipulated yarn"), and can thus not constitute a "single general inventive concept" (Rule 13.1 PCT) linking the independent claims of the present application.

The authorized officer is of the opinion that the following groups of inventions are not linked by a single inventive concept (Rule 13.1 PCT):

• independent claims 1, 5, 10, 15 and 22 specify that the knitted component defines a tubular structure, and that the yarn or strand extends through at least a portion of the tube. With these features a simple tubular structure is provided with a yarn or strand, which can be applied, for instance, to receive a lace.

• independent claims 23, 29, 32 and 41 specify the provision of two knitted layers in the footwear upper, with a plurality of yarns located between these layers, the yarns floating or extending between the knitted layers to which they are secured. These features provide improved cushioning properties at selected areas of the footwear upper.

• independent claim 36 specifies that the knitted component includes at least one yarn incorporating a thermoplastic polymer, an area being heated to fuse the yarn. These features provide a method for reinforcing particular areas of the upper.

These features of each of these groups of claims have no equivalent in the other groups of claims. Hence the authorized officer considers that these claims, which are expressed by different "special technical features" (Rule 13.2 PCT), relate to separate inventions.

ITEM V:

Concerning independent claim 1:

In the present application the term "yarn" or "strand", "having a configuration of a one-dimensional material" is intended to encompass all generally elongate materials exhibiting a length that is substantially greater than a width and a thickness (see p.9, par.26). This wording covers the lace elements of US 2008/110048 A1 (fig.1).

US 2008/110048 A1 (**D1**: figures) discloses an article of footwear having an upper and a sole structure secured to the upper, the upper comprising:

- a knitted component defining a tubular structure (44, 54, 45) formed of unitary knit construction (par.41-42); and

- a yarn (33) having a configuration of a one-dimensional material (figs.), the yarn extending through at least a portion of a length of the tube (figs.).

It has thus to be concluded that the subject-matter of claim 1 is not new (Article 33(2) PCT).

The applicant's attention is drawn to the fact, that all the features of claim 1 are also known from US 2005/284000 A1 (**D2**: figs.; par.15-17).

Concerning independent claim 5:

D1 (fig.4B) and D2 (fig.3) specify that the tubes are formed by two adjacent, partially coextensive knitted layers.

The subject-matter of claim 5 is thus not new (Article 33(2) PCT).

Concerning independent claim 10:

The strands of D1 extend through two adjacent tubes and form loops at the ends (fig.4B and par.52).

It has thus to be concluded that the subject-matter of claim 10 is not new (Article 33(2) PCT).

Concerning independent claim 15:

One strand of D1 extends through two adjacent tubes and forms loops at the ends (fig.4B and par.52), whereby a lace extends through the loops (figs.).

The subject-matter of claim 15 is thus not new (Article 33(2) PCT).

Concerning independent claim 22:

For the same reasons the subject-matter of claim 22 is not considered to be new (Article 33(2) PCT).

Concerning dependent claims 2-4, 6-9, 11-14 and 16-21:

Dependent claims are only allowable if they refer to an independent claim fulfilling the requirements of novelty and inventive step. These dependent claims do not seem to contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, since these features are either known from the documents cited in the Search Report (see D1 and D2), or they appear to come within the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen (claims 4, 13-14 and 19).

ITEM VII:

In order to render the claims more intelligible, appropriate reference signs in parentheses should be placed in the claims (PCT Guidelines, 5.11).

ITEM VIII:

Although claims 1, 5, 10, 15 and 22 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness.

Moreover, lack of clarity of the claims as a whole arises, since the plurality of independent claims makes it difficult, if not impossible, to determine the matter for which protection is sought, and places an undue burden on others seeking to establish the extent of the protection.

Hence, these claims do not meet the requirements of Article 6 PCT.

In order to overcome the above-mentioned objections, it appears appropriate to file an amended set of claims defining the relevant subject-matter in terms of one independent claim in each category, followed by dependent claims covering features that are merely optional (Rule 6.4 PCT).

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
Kuzara, Byron S.
PLUMSEA LAW GROUP, LLC
10411 Motor City Drive, Suite 320
Bethesda, MD 20817
ETATS-UNIS D'AMERIQUE

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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 51-2576	Date of mailing *(day/month/year)* 1 October 2012 (01-10-2012) **FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US2012/028576	International filing date *(day/month/year)* 9 March 2012 (09-03-2012)
Applicant NIKE INTERNATIONAL LTD.	

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.

   Where? 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 the 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. 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. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

   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 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.

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	WALLENIUS, Tanja Tel: +49 (0)89 2399-7794

PATENT COOPERATION TREATY

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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.
51-2576		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2012/028576	09/03/2012	15/03/2011
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 4 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. [ ] **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. 21d
      [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/US2012/028576

A. CLASSIFICATION OF SUBJECT MATTER
INV. D04B15/56 D04B1/12
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)
D04B

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 5 623 840 A (ROELL FRIEDRICH [DE]) 29 April 1997 (1997-04-29) column 1, line 28 - column 4, line 11; figures 1-9	1-7, 9-13,16, 17, 19-21, 23-30
X	EP 1 602 762 A1 (SHIMA SEIKI MFG [JP]) 7 December 2005 (2005-12-07) paragraph [0002] - paragraph [0013]; figures 1-6	6,9-13
X	US 5 031 423 A (IKENAGA KATSUYOSHI [JP]) 16 July 1991 (1991-07-16) column 2, line 10 - line 5; figures 1-13	1-4

-/--

[X] Further documents are listed in the continuation of Box C.

[X] 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
20 September 2012	01/10/2012

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	Zirkler, Stefanie

1

Form PCT/ISA/210 (second sheet) (April 2005)

Skechers EX1013 p.2048
Skechers v Nike

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2012/028576

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 018 837 A (DUBIED & CIE SA E) 24 October 1979 (1979-10-24) page 1, line 6 - page 2, line 47; figures 1-6	1-4
X	EP 0 898 002 A2 (SHIMA SEIKI MFG [JP]) 24 February 1999 (1999-02-24) paragraph [0001] - paragraph [0008]; figures 1-12	1-4

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

Skechers EX1003 p. 2049
Skechers v Nike

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2012/028576

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5623840 A	29-04-1997	US 5615562 A	01-04-1997
		US 5623840 A	29-04-1997
EP 1602762 A1	07-12-2005	CN 1764751 A	26-04-2006
		EP 1602762 A1	07-12-2005
		JP 4163212 B2	08-10-2008
		KR 20060014025 A	14-02-2006
		US 2006144096 A1	06-07-2006
		WO 2004076732 A1	10-09-2004
US 5031423 A	16-07-1991	NONE	
GB 2018837 A	24-10-1979	CH 620953 A5	31-12-1980
		DE 2910532 A1	25-10-1979
		FR 2422752 A1	09-11-1979
		GB 2018837 A	24-10-1979
		IT 1165643 B	22-04-1987
		JP 54138650 A	27-10-1979
		US 4237706 A	09-12-1980
EP 0898002 A2	24-02-1999	CN 1209476 A	03-03-1999
		DE 69812503 D1	30-04-2003
		DE 69812503 T2	02-10-2003
		EP 0898002 A2	24-02-1999
		JP 3044370 B2	22-05-2000
		JP 11061606 A	05-03-1999
		TW 421681 B	11-02-2001
		US 6021651 A	08-02-2000

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

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see form PCT/ISA/220

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WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Applicant's or agent's file reference see form PCT/ISA/220	Date of mailing *(day/month/year)* see form PCT/ISA/210 (second sheet) **FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2012/028576	09.03.2012	15.03.2011

International Patent Classification (IPC) or both national classification and IPC
INV. D04B15/56 D04B1/12

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 D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465	see form PCT/ISA/210	Zirkler, Stefanie Telephone No. +49 89 2399-2056

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. 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	2, 3, 8-11, 14, 15, 18, 22-24, 31-40
	No:	Claims	1, 4-7, 12, 13, 16, 17, 19-21, 25-30
Inventive step (IS)	Yes:	Claims	8, 14, 15, 18, 22, 31-40
	No:	Claims	1-7, 9-13, 16, 17, 19-21, 23-30
Industrial applicability (IA)	Yes:	Claims	1-40
	No:	Claims	

2. Citations and explanations

see separate sheet

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

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item VIII

Certain observations on the international application

1 **Claim 1** is not clear, because it is not sufficiently clear what is meant by "*inlaying a strand along one of the courses*" and what kind of movement the feeder arm makes to switch between the extended and the retracted position **(Article 6 PCT)**.

2 **Claim 4** is not clear, because it is not clear, what is meant by "*a first side*" and "*an opposite second side of the needle bed*" and how these sides are related to the retracted and the extended position **(Article 6 PCT)**.

3 Although **claims 6, 12, 16 and 20** have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and/or in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of **Article 6 PCT**.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1 US 5 623 840 A

D2 EP 1 602 762 A1

D3 US 5 031 423 A

D4 GB 2 018 837 A

D5 EP 0 898 002 A2

1 The present application does not meet the criteria of **Article 33(1) PCT** for the following reasons:

1.1 The subject-matter of independent claims 1, 6, 12, 16, 20 and 26 corresponds in substance to a method of knitting disclosed by document D1 (the references in parentheses applying to document D1) that comprises utilizing a combination feeder to supply a yarn for knitting, tucking, and floating, and utilizing the combination feeder to inlay the yarn (column 1, lines 48 to 53 and column 1, line 67 to column 2, line 4); wherein a feeder arm of the combination feeder is reciprocated between an extended position and a retracted position, the combination feeder inlaying the yarn along the courses when the feeder arm is in the extended position (column 2, lines 47 to 52).

Hence, the subject-matter of independent claims 1, 6, 12, 16, 20 and 26 is not new (Articles 33(1) and 33(2) PCT).

1.2 Additionally, also documents D3 to D5 are novelty-destroying for the unclear subject-matter of independent claim 1 and document D2 is novelty-destroying for the subject-matter of independent claims 6 and 12 **(Articles 33(1) and 33 (2) PCT).**

1.3 Moreover, documents D1 to D5 are novelty-destroying for the subject-matter of dependent claims 4, 5, 7, 13, 17, 19, 21, 25, 27, 28, 29 and 30 **(Articles 33 (1) and 33(2) PCT).**

1.4 Dependent claims 2, 3, 9, 10, 11, 23 and 24 do not contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT with respect to inventive step, the additional features of claims 2, 3, 9, 10, 11, 23 and 24 being merely straightforward possibilities (choice of material) which are already suggested by documents D2 and which the skilled person would select, in accordance with the circumstances, without the exercise of inventive skill, in order to solve the respective problem posed.

Thus, the subject-matter of claims 2, 3, 9, 10, 11, 23 and 24 cannot be considered to involve an inventive step (Articles 33(1) and 33(3) PCT).

2 The subject-matter of independent **claims 31 and 39** as well as the combination of the features of dependent **claims 8, 14, 15, 18, 22, 32-38 and 40** is not known from the available prior art, as none of the cited documents

discloses "*dispensing a tip of the second feeder from a position that is on one side of an area where the needles cross each other to an opposite side of the area where the needles cross each other*".

The problem to be solved by this additional feature may be regarded as how to ensure that the same feeder is able to supply a yarn for knitting, tucking and floating as well as for inlaying a yarn into a knit component.

This feature is not rendered obvious by the cited documents.

Re Item VII

Certain defects in the international application

1 None of the independent claims is in the two-part form in accordance with **Rule 6.3(b) PCT**.

2 Contrary to the requirements of **Rule 5.1(a)(ii) PCT**, the relevant background art disclosed in documents D1 to D5 is not mentioned in the description, nor are these documents identified therein.

3 In **claim 11** "marching" seems to rather mean "machine".

Possible steps after receipt of the international search report (ISR) and written opinion of the International Searching Authority (WO-ISA)

General information	For all international applications filed on or after 01/01/2004 the competent ISA will establish an ISR. It is accompanied by the WO-ISA. Unlike the former written opinion of the IPEA (Rule 66.2 PCT), the WO-ISA is not meant to be responded to, but to be taken into consideration for further procedural steps. This document explains about the possibilities.
Amending claims under Art. 19 PCT	Within 2 months after the date of mailing of the ISR and the WO-ISA the applicant may file amended claims under Art. 19 PCT directly with the International Bureau of WIPO. The PCT reform of 2004 did not change this procedure. For further information please see Rule 46 PCT as well as form PCT/ISA/220 and the corresponding Notes to form PCT/ISA/220.
Filing a demand for international preliminary examination	In principle, the WO-ISA will be considered as the written opinion of the IPEA. This should, in many cases, make it unnecessary to file a demand for international preliminary examination. If the applicant nevertheless wishes to file a demand this must be done before expiry of 3 months after the date of mailing of the ISR/WO-ISA or 22 months after priority date, whichever expires later (Rule 54bis PCT). Amendments under Art. 34 PCT can be filed with the IPEA as before, normally at the same time as filing the demand (Rule 66.1 (b) PCT). If a demand for international preliminary examination is filed and no comments/amendments have been received the WO-ISA will be transformed by the IPEA into an IPRP (International Preliminary Report on Patentability) which would merely reflect the content of the WO-ISA. The demand can still be withdrawn (Art. 37 PCT).
Filing informal comments	After receipt of the ISR/WO-ISA the applicant may file informal comments on the WO-ISA directly with the International Bureau of WIPO. These will be communicated to the designated Offices together with the IPRP (International Preliminary Report on Patentability) at 30 months from the priority date. Please also refer to the next box.
End of the international phase	At the end of the international phase the International Bureau of WIPO will transform the WO-ISA or, if a demand was filed, the written opinion of the IPEA into the IPRP, which will then be transmitted together with possible informal comments to the designated Offices. The IPRP replaces the former IPER (international preliminary examination report).
Relevant PCT Rules and more information	Rule 43 PCT, Rule 43bis PCT, Rule 44 PCT, Rule 44bis PCT, PCT Newsletter 12/2003, OJ 11/2003, OJ 12/2003

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
Kuzara, Byron S.
PLUMSEA LAW GROUP, LLC
10411 Motor City Drive, Suite 320
Bethesda, MD 20817
ETATS-UNIS D'AMERIQUE

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NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

DOCKETED
OCT 31 2012

(PCT Rule 44.1)

Applicant's or agent's file reference 51-2575	Date of mailing *(day/month/year)* 19 October 2012 (19-10-2012)
International application No. PCT/US2012/028559	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
Applicant NIKE INTERNATIONAL LTD.	International filing date *(day/month/year)* 9 March 2012 (09-03-2012)

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.

   Where? 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 the 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. 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. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

   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 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.

Name and mailing address of the International Searching Authority European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040 Fax: (+31-70) 340-3016	Authorized officer SMYTH-WALKER, Lisa Tel: +49 (0)89 2399-6947

Form PCT/ISA/220 (July 2010)

PATENT COOPERATION TREATY

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PLUMSEA LAW GROUP

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.
51-2575		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2012/028559	09/03/2012	15/03/2011
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 3 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. [ ] **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. 16
      [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/US2012/028559

A. CLASSIFICATION OF SUBJECT MATTER
INV. D04B15/56 D04B1/12
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)
D04B

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	EP 1 602 762 A1 (SHIMA SEIKI MFG [JP]) 7 December 2005 (2005-12-07) paragraph [0013] - paragraph [0030]; figures 1-6	1-16
X	EP 0 898 002 A2 (SHIMA SEIKI MFG [JP]) 24 February 1999 (1999-02-24) paragraph [0026] - paragraph [0056]; figures 1-12	1-8, 13-16
X	US 5 031 423 A (IKENAGA KATSUYOSHI [JP]) 16 July 1991 (1991-07-16) column 3, line 35 - column 4, line 38; figures 1-5	1,2,4-7, 13-16
X	EP 1 972 706 A1 (SHIMA SEIKI MFG [JP]) 24 September 2008 (2008-09-24) paragraph [0025] - paragraph [0040]; figures 1-6	17-23

[ ] Further documents are listed in the continuation of Box C.

[X] 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
12 October 2012	19/10/2012

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	Zirkler, Stefanie

1

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2012/028559

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1602762 A1	07-12-2005	CN 1764751 A	26-04-2006
		EP 1602762 A1	07-12-2005
		JP 4163212 B2	08-10-2008
		KR 20060014025 A	14-02-2006
		US 2006144096 A1	06-07-2006
		WO 2004076732 A1	10-09-2004
EP 0898002 A2	24-02-1999	CN 1209476 A	03-03-1999
		DE 69812503 D1	30-04-2003
		DE 69812503 T2	02-10-2003
		EP 0898002 A2	24-02-1999
		JP 3044370 B2	22-05-2000
		JP 11061606 A	05-03-1999
		TW 421681 B	11-02-2001
		US 6021651 A	08-02-2000
US 5031423 A	16-07-1991	NONE	
EP 1972706 A1	24-09-2008	CN 101310056 A	19-11-2008
		EP 1972706 A1	24-09-2008
		WO 2007058275 A1	24-05-2007

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

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PDF
OCT. 31 2012
ISR

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43*bis*.1)

Applicant's or agent's file reference see form PCT/ISA/220	Date of mailing *(day/month/year)* see form PCT/ISA/210 (second sheet) **FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2012/028559	09.03.2012	15.03.2011

International Patent Classification (IPC) or both national classification and IPC
INV. D04B15/56 D04B1/12

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 D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465	see form PCT/ISA/210	Zirkler, Stefanie Telephone No. +49 89 2399-2056

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. 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	
	No:	Claims	1-23
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-23
Industrial applicability (IA)	Yes:	Claims	1-23
	No:	Claims	

2. Citations and explanations

see separate sheet

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

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item VIII

Certain observations on the international application

1 The claims are not clear, because they lack conciseness and as such do not meet the requirements of **Article 6 PCT**: **Claims 1, 5, 8, 13, 17 and 20** have been drafted as separate independent claims although they all seem to comprise the subject-matter of claim 1 and as such should have been drafted as dependent claims.

2 **Claim 5** is not clear, because as no "*first side of the carrier*" has been defined it is not clear what is supposed to be meant by "*the second side of the carrier*" (**Article 6 PCT**).

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1 EP 1 602 762 A1

D2 EP 0 898 002 A2

D3 US 5 031 423 A

D4 EP 1 972 706 A1

1 The present application does not meet the criteria of **Article 33(1) PCT** for the following reasons:

1.1 Document D1 discloses (the reference signs in parentheses applying to document D1):

A feeder (Fig. 1) for a knitting machine, the feeder comprising:

a carrier (Fig. 1 (15)) that includes an attachment mechanism for securing the feeder to the knitting machine; and

a feeder arm (Fig. 1 (20)) extending outward from the carrier, the feeder arm including a dispensing area (Fig. 1 (21)) for supplying a strand to the knitting machine, the feeder arm having a retracted position (Fig. 1) and an extended position (Fig. 2), the dispensing area being closer to the carrier in the retracted position than in the extended position.

Hence, the subject-matter of independent claim 1 is not new (Articles 33 (1) and 33(2) PCT).

1.2 Furthermore, document D1 discloses a feeder arm that additionally comprises

at least one actuation member (Fig. 1 (2)) for translating the feeder arm from the retracted to the extended position that is at least partially located exterior of the carrier;

a pair of actuation arms (Fig. 1 (5a), (5b)) each having an outside end and an opposite inside end and being positioned to define a space between their inside ends, wherein a force upon one of the outside ends causes the feeder arm to translate from the retracted to the extended position;

as well as a knitting machine comprising a rail for the attachment of a feeder according to claim 1 and a needle bed ([0001]).

Hence the subject-matter of independent claims 5, 8 and 13 is not new (Articles 33(1) and 33(2) PCT).

1.3 Additionally, also documents D2 and D3 are novelty-destroying for the subject-matter of **independent claims 1, 5, 8 and 13 (Articles 33(1) and 33 (2) PCT)**.

1.4 Moreover documents D1 to D3 are also novelty-destroying for the subject-matter of **dependent claims 2 to 4, 6, 7, 9 to 12 and 14 to 16 (Articles 33(1) and 33(2) PCT)**.

1.5 Document D4 discloses (the reference signs in parentheses applying to document D4):

A knitting machine (Fig. 2) comprising:

a needle bed (Fig. 2 (22), (23)) that includes a plurality of needles, a first portion of the needles being located on a first plane, and a second portion of the needles being located on a second plane, the needles being movable from a first position (Fig. 2, right needle) to a second position (Fig. 2, left needle), the needles being spaced from an intersection of the first plane and the

second plane when in the first position, and the needles passing through the intersection of the first plane and the second plane when in the second position; and

at least one feeder (Fig. 2 (24)) that is movable along the needle bed, the feeder including a feeder arm with a dispensing tip for supplying a strand, the dispensing tip being movable from a retracted position that is located above the intersection of the first plane and the second plane (Fig. 3) to an extended position that is located below the intersection of the first plane and the second plane (Fig. 2).

Hence, the subject-matter of independent claim 17 is not new (Articles 33(1) and 33(2) PCT).

1.6 The subject-matter of **independent claim 20** corresponds in substance to that of independent claim 17 and can therefore also not be considered novel **(Articles 33(1) and 33(2) PCT)**.

1.7 Moreover document D4 is also novelty-destroying for the subject-matter of **dependent claims 18, 19 and 21 to 23 (Articles 33(1) and 33(2) PCT)**.

Re Item VII

Certain defects in the international application

1 None of independent claims 1, 5, 8, 13, 17 and 20 has been drafted in the two-part form in accordance with **Rule 6.3(b) PCT**.

2 Contrary to the requirements of **Rule 5.1(a)(ii) PCT**, the relevant background art disclosed in documents D1 to D4 is not mentioned in the description, nor are these documents identified therein.

Possible steps after receipt of the international search report (ISR) and written opinion of the International Searching Authority (WO-ISA)

General information	For all international applications filed on or after 01/01/2004 the competent ISA will establish an ISR. It is accompanied by the WO-ISA. Unlike the former written opinion of the IPEA (Rule 66.2 PCT), the WO-ISA is not meant to be responded to, but to be taken into consideration for further procedural steps. This document explains about the possibilities.
Amending claims under Art. 19 PCT	Within 2 months after the date of mailing of the ISR and the WO-ISA the applicant may file amended claims under Art. 19 PCT directly with the International Bureau of WIPO. The PCT reform of 2004 did not change this procedure. For further information please see Rule 46 PCT as well as form PCT/ISA/220 and the corresponding Notes to form PCT/ISA/220.
Filing a demand for international preliminary examination	In principle, the WO-ISA will be considered as the written opinion of the IPEA. This should, in many cases, make it unnecessary to file a demand for international preliminary examination. If the applicant nevertheless wishes to file a demand this must be done before expiry of 3 months after the date of mailing of the ISR/WO-ISA or 22 months after priority date, whichever expires later (Rule 54bis PCT). Amendments under Art. 34 PCT can be filed with the IPEA as before, normally at the same time as filing the demand (Rule 66.1 (b) PCT). If a demand for international preliminary examination is filed and no comments/amendments have been received the WO-ISA will be transformed by the IPEA into an IPRP (International Preliminary Report on Patentability) which would merely reflect the content of the WO-ISA. The demand can still be withdrawn (Art. 37 PCT).
Filing informal comments	After receipt of the ISR/WO-ISA the applicant may file informal comments on the WO-ISA directly with the International Bureau of WIPO. These will be communicated to the designated Offices together with the IPRP (International Preliminary Report on Patentability) at 30 months from the priority date. Please also refer to the next box.
End of the international phase	At the end of the international phase the International Bureau of WIPO will transform the WO-ISA or, if a demand was filed, the written opinion of the IPEA into the IPRP, which will then be transmitted together with possible informal comments to the designated Offices. The IPRP replaces the former IPER (international preliminary examination report).
Relevant PCT Rules and more information	Rule 43 PCT, Rule 43bis PCT, Rule 44 PCT, Rule 44bis PCT, PCT Newsletter 12/2003, OJ 11/2003, OJ 12/2003

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

To:
Kuzara, Byron S.
PLUMSEA LAW GROUP, LLC
10411 Motor City Drive, Suite 320
Bethesda, MD 20817
ETATS-UNIS D'AMERIQUE

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PLUMSEA LAW GROUP

Date of mailing *(day/month/year)*	17 October 2012 (17-10-2012)
Applicant's or agent's file reference 51-2574	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US2012/028534	International filing date *(day/month/year)* 9 March 2012 (09-03-2012)

Applicant

NIKE INTERNATIONAL LTD.

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.

   Where? 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 the 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. 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. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

   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 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.

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

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PATENT COOPERATION TREATY

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NOV 09 2012
ISR

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.
51-2574		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2012/028534	09/03/2012	15/03/2011
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 7 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,**
   [ ] the text is approved as submitted by the applicant
   [X] 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+8B
      [ ] as suggested by the applicant
      [ ] as selected by this Authority, because the applicant failed to suggest a figure
      [X] 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/US2012/028534

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.: 11-40
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/US2012/028534

A. CLASSIFICATION OF SUBJECT MATTER
INV. A43B1/04 A43C1/00 A43B23/02
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 A43C

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 2010/154256 A1 (DUA BHUPESH [US]) 24 June 2010 (2010-06-24) paragraphs [0004], [0022] - [0032], [0043] claims 36, 37 figures 1-6, 7C	1-10
A	US 2004/118018 A1 (DUA BHUPESH [US]) 24 June 2004 (2004-06-24) paragraphs [0011] - [0013], [0030], [0031], [0036], [0037], [0050] - [0058] figures 1, 3D-6B	1,2
A	EP 1 437 057 A1 (MIZUNO KK [JP]) 14 July 2004 (2004-07-14) paragraphs [0006], [0022], [0023], [0036] - [0039] figures 1-5	1,2,10

-/--

[X] Further documents are listed in the continuation of Box C. [X] 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
10 October 2012	17/10/2012

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	Been, Mathieu

1

Form PCT/ISA/210 (second sheet) (April 2005)

Skechers EX1013 p. 1072
Skechers v Nike

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2012/028534

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 785 558 A (SHIOMURA KAZUHIKO [JP]) 22 November 1988 (1988-11-22) column 1, line 47 - line 68 column 2, line 26 - column 3, line 15 figures 1-4 -----	1
A	US 2008/110048 A1 (DUA BHUPESH [US] ET AL) 15 May 2008 (2008-05-15) paragraphs [0038] - [0041], [0052] figures 1-8E -----	1,9,10

1

Skechers EX1013 p. 2073
Skechers v Nike

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2012/028534

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2010154256 A1	24-06-2010	CN 102271548 A	07-12-2011
		EP 2378910 A1	26-10-2011
		JP 2012512698 A	07-06-2012
		US 2010154256 A1	24-06-2010
		WO 2010080182 A1	15-07-2010
US 2004118018 A1	24-06-2004	AT 448703 T	15-12-2009
		AU 2003299627 A1	29-07-2004
		CA 2510558 A1	22-07-2004
		EP 1571938 A1	14-09-2005
		ES 2335988 T3	07-04-2010
		JP 4376792 B2	02-12-2009
		JP 2006511306 A	06-04-2006
		US 2004118018 A1	24-06-2004
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		DE 602004000536 T2	21-12-2006
		EP 1437057 A1	14-07-2004
		ES 2262039 T3	16-11-2006
		JP 4505212 B2	21-07-2010
		JP 2004230151 A	19-08-2004
		US 2005081402 A1	21-04-2005
US 4785558 A	22-11-1988	JP 63025004 U	18-02-1988
		US 4785558 A	22-11-1988
US 2008110048 A1	15-05-2008	CN 101583294 A	18-11-2009
		EP 2079336 A1	22-07-2009
		JP 2010508994 A	25-03-2010
		US 2008110048 A1	15-05-2008
		US 2010269372 A1	28-10-2010
		US 2010281631 A1	11-11-2010
		WO 2008060928 A1	22-05-2008

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 11-40

The present application contains 40 claims, of which six are independent. There is no clear distinction between the independent claims because of overlapping scope. There are so many 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 corresponding to claims 1 to 10.

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 Guideline C-VI, 8.2), should the problems which led to the Article 17(2) declaration be overcome.

Box No. IV Text of the abstract (Continuation of item 5 of the first sheet)

ARTICLE OF FOOTWEAR INCORPORATING A KNITTED COMPONENT
An article of footwear (100) may include an upper (120) incorporating a knitted component (130). An inlaid strand (132) extends through the knitted component. A combination feeder (220) may be utilized to inlay the strand within the knitted component.

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

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PLUMSEA LAW GROUP

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/US2012/028534	09.03.2012	15.03.2011

International Patent Classification (IPC) or both national classification and IPC
INV. A43B1/04 A43C1/00 A43B23/02

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	Been, Mathieu Telephone No. +31 70 340-3932

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. 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. 11-40

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. 11-40

☐ 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	6-8
	No:	Claims	1-5, 9, 10
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-10
Industrial applicability (IA)	Yes:	Claims	1-10
	No:	Claims	

2. Citations and explanations

see separate sheet

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 40 claims, of which six are independent. There is no clear distinction between the independent claims because of overlapping scope. There are so many 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 corresponding to claims 1 to 10.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1 US 2010/154256 A1 (DUA BHUPESH [US]) 24 June 2010 (2010-06-24)

D2 US 2004/118018 A1 (DUA BHUPESH [US]) 24 June 2004 (2004-06-24)

D3 EP 1 437 057 A1 (MIZUNO KK [JP]) 14 July 2004 (2004-07-14)

D4 US 4 785 558 A (SHIOMURA KAZUHIKO [JP]) 22 November 1988 (1988-11-22)

D5 US 2008/110048 A1 (DUA BHUPESH [US] ET AL) 15 May 2008 (2008-05-15)

2 The present application does not meet the criteria of Article 33(2) PCT, because the subject-matter of claim 1 is not new.

2.1 Document D1 discloses (see paragraphs [0004], [0022] - [0032], [0043]; claims 36, 37; figures 1-6, 7C; the references in parentheses applying to this document) an article of footwear (10) having an upper (30) and a sole structure (20) secured to the upper, the upper including a knitted component

(40, 42) comprising a first yarn and a second yarn that are knitted together to form an area of the knitted component (paragraphs 4, 43), the first yarn being at least partially formed from a thermoplastic polymer material (paragraph 43, claim 36), and the second yarn being entirely formed from at least one of a thermoset polymer material and natural fibers (paragraph 43 in combination with document US6910288 cited in this paragraph); and an inlaid strand (43) extending through the area of the knitted component (42).

2.2 It appears that all the technical features of independent claim 1 are known from document D1 and the subject-matter of said claim can therefore not be regarded as new (Article 33(1) and (2) PCT).

3 Dependent claims 2 to 10 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty or inventive step. The reasons therefore are that the additional features of claims 2 to 5, 9 and 10 are directly known from document D1 (Article 33(2) PCT).

3.1 Furthermore, dependent claims 6 to 8 do not appear to contain any additional features which involve an inventive step when combined with the subject-matter of any claim to which they refer (Article 33(3) PCT), as the additional features of claims 6 to 8 concerning a third yarn stretching at least one-hundred percent are a combination of features obvious to the person skilled in the art in consideration of the disclosure of document D1 in combination with the common general knowledge of the skilled person.

Re Item VII

Certain defects in the international application

4 Independent claim 1 is 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 document D1 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).

5 The features of claims 1 to 10 are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

6 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in document D1 is not mentioned in the description, nor is this document identified therein.

Possible steps after receipt of the international search report (ISR) and written opinion of the International Searching Authority (WO-ISA)

General information	For all international applications filed on or after 01/01/2004 the competent ISA will establish an ISR. It is accompanied by the WO-ISA. Unlike the former written opinion of the IPEA (Rule 66.2 PCT), the WO-ISA is not meant to be responded to, but to be taken into consideration for further procedural steps. This document explains about the possibilities.
Amending claims under Art. 19 PCT	Within 2 months after the date of mailing of the ISR and the WO-ISA the applicant may file amended claims under Art. 19 PCT directly with the International Bureau of WIPO. The PCT reform of 2004 did not change this procedure. For further information please see Rule 46 PCT as well as form PCT/ISA/220 and the corresponding Notes to form PCT/ISA/220.
Filing a demand for international preliminary examination	In principle, the WO-ISA will be considered as the written opinion of the IPEA. This should, in many cases, make it unnecessary to file a demand for international preliminary examination. If the applicant nevertheless wishes to file a demand this must be done before expiry of 3 months after the date of mailing of the ISR/WO-ISA or 22 months after priority date, whichever expires later (Rule 54bis PCT). Amendments under Art. 34 PCT can be filed with the IPEA as before, normally at the same time as filing the demand (Rule 66.1 (b) PCT). If a demand for international preliminary examination is filed and no comments/amendments have been received the WO-ISA will be transformed by the IPEA into an IPRP (International Preliminary Report on Patentability) which would merely reflect the content of the WO-ISA. The demand can still be withdrawn (Art. 37 PCT).
Filing informal comments	After receipt of the ISR/WO-ISA the applicant may file informal comments on the WO-ISA directly with the International Bureau of WIPO. These will be communicated to the designated Offices together with the IPRP (International Preliminary Report on Patentability) at 30 months from the priority date. Please also refer to the next box.
End of the international phase	At the end of the international phase the International Bureau of WIPO will transform the WO-ISA or, if a demand was filed, the written opinion of the IPEA into the IPRP, which will then be transmitted together with possible informal comments to the designated Offices. The IPRP replaces the former IPER (international preliminary examination report).
Relevant PCT Rules and more information	Rule 43 PCT, Rule 43bis PCT, Rule 44 PCT, Rule 44bis PCT, PCT Newsletter 12/2003, OJ 11/2003, OJ 12/2003

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 51-2574	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2012/028534	International filing date *(day/month/year)* 09 March 2012 (09.03.2012)	Priority date *(day/month/year)* 15 March 2011 (15.03.2011)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant NIKE INTERNATIONAL LTD.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	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 Article 35(2) with regard to novelty, inventive step or 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

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 17 September 2013 (17.09.2013)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Agnès Wittmann-Regis e-mail: pt06.pct@wipo.int

Form PCT/IB/373 (January 2004)

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/US2012/028534	09.03.2012	15.03.2011

International Patent Classification (IPC) or both national classification and IPC
INV. A43B1/04 A43C1/00 A43B23/02

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	Been, Mathieu Telephone No. +31 70 340-3932

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. 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. 11-40

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. 11-40

☐ 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	6-8
	No:	Claims	1-5, 9, 10
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-10
Industrial applicability (IA)	Yes:	Claims	1-10
	No:	Claims	

2. Citations and explanations

see separate sheet

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 40 claims, of which six are independent. There is no clear distinction between the independent claims because of overlapping scope. There are so many 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 corresponding to claims 1 to 10.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1 US 2010/154256 A1 (DUA BHUPESH [US]) 24 June 2010 (2010-06-24)

D2 US 2004/118018 A1 (DUA BHUPESH [US]) 24 June 2004 (2004-06-24)

D3 EP 1 437 057 A1 (MIZUNO KK [JP]) 14 July 2004 (2004-07-14)

D4 US 4 785 558 A (SHIOMURA KAZUHIKO [JP]) 22 November 1988 (1988-11-22)

D5 US 2008/110048 A1 (DUA BHUPESH [US] ET AL) 15 May 2008 (2008-05-15)

2 The present application does not meet the criteria of Article 33(2) PCT, because the subject-matter of claim 1 is not new.

2.1 Document D1 discloses (see paragraphs [0004], [0022] - [0032], [0043]; claims 36, 37; figures 1-6, 7C; the references in parentheses applying to this document) an article of footwear (10) having an upper (30) and a sole structure (20) secured to the upper, the upper including a knitted component

(40, 42) comprising a first yarn and a second yarn that are knitted together to form an area of the knitted component (paragraphs 4, 43), the first yarn being at least partially formed from a thermoplastic polymer material (paragraph 43, claim 36), and the second yarn being entirely formed from at least one of a thermoset polymer material and natural fibers (paragraph 43 in combination with document US6910288 cited in this paragraph); and an inlaid strand (43) extending through the area of the knitted component (42).

2.2 It appears that all the technical features of independent claim 1 are known from document D1 and the subject-matter of said claim can therefore not be regarded as new (Article 33(1) and (2) PCT).

3 Dependent claims 2 to 10 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty or inventive step. The reasons therefore are that the additional features of claims 2 to 5, 9 and 10 are directly known from document D1 (Article 33(2) PCT).

3.1 Furthermore, dependent claims 6 to 8 do not appear to contain any additional features which involve an inventive step when combined with the subject - matter of any claim to which they refer (Article 33(3) PCT), as the additional features of claims 6 to 8 concerning a third yarn stretching at least one-hundred percent are a combination of features obvious to the person skilled in the art in consideration of the disclosure of document D1 in combination with the common general knowledge of the skilled person.

Re Item VII

Certain defects in the international application

4 Independent claim 1 is 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 document D1 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).

5 The features of claims 1 to 10 are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

6 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in document D1 is not mentioned in the description, nor is this document identified therein.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 51-2576	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2012/028576	International filing date *(day/month/year)* 09 March 2012 (09.03.2012)	Priority date *(day/month/year)* 15 March 2011 (15.03.2011)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant NIKE INTERNATIONAL LTD.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	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 Article 35(2) with regard to novelty, inventive step or 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

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 17 September 2013 (17.09.2013)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Philippe Bécamel e-mail: pt03.pct@wipo.int

Form PCT/IB/373 (January 2004)

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/US2012/028576	09.03.2012	15.03.2011

International Patent Classification (IPC) or both national classification and IPC
INV. D04B15/56 D04B1/12

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 D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465	see form PCT/ISA/210	Zirkler, Stefanie Telephone No. +49 89 2399-2056

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. 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	2, 3, 8-11, 14, 15, 18, 22-24, 31-40
	No:	Claims	1, 4-7, 12, 13, 16, 17, 19-21, 25-30
Inventive step (IS)	Yes:	Claims	8, 14, 15, 18, 22, 31-40
	No:	Claims	1-7, 9-13, 16, 17, 19-21, 23-30
Industrial applicability (IA)	Yes:	Claims	1-40
	No:	Claims	

2. Citations and explanations

see separate sheet

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

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item VIII

Certain observations on the international application

1 **Claim 1** is not clear, because it is not sufficiently clear what is meant by "*inlaying a strand along one of the courses*" and what kind of movement the feeder arm makes to switch between the extended and the retracted position **(Article 6 PCT)**.

2 **Claim 4** is not clear, because it is not clear, what is meant by "*a first side*" and "*an opposite second side of the needle bed*" and how these sides are related to the retracted and the extended position **(Article 6 PCT)**.

3 Although **claims 6, 12, 16 and 20** have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and/or in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of **Article 6 PCT**.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1 US 5 623 840 A

D2 EP 1 602 762 A1

D3 US 5 031 423 A

D4 GB 2 018 837 A

D5 EP 0 898 002 A2

1 The present application does not meet the criteria of **Article 33(1) PCT** for the following reasons:

1.1 The subject-matter of independent claims 1, 6, 12, 16, 20 and 26 corresponds in substance to a method of knitting disclosed by document D1 (the references in parentheses applying to document D1) that comprises utilizing a combination feeder to supply a yarn for knitting, tucking, and floating, and utilizing the combination feeder to inlay the yarn (column 1, lines 48 to 53 and column 1, line 67 to column 2, line 4); wherein a feeder arm of the combination feeder is reciprocated between an extended position and a retracted position, the combination feeder inlaying the yarn along the courses when the feeder arm is in the extended position (column 2, lines 47 to 52).

Hence, the subject-matter of independent claims 1, 6, 12, 16, 20 and 26 is not new (Articles 33(1) and 33(2) PCT).

1.2 Additionally, also documents D3 to D5 are novelty-destroying for the unclear subject-matter of independent claim 1 and document D2 is novelty-destroying for the subject-matter of independent claims 6 and 12 **(Articles 33(1) and 33 (2) PCT).**

1.3 Moreover, documents D1 to D5 are novelty-destroying for the subject-matter of dependent claims 4, 5, 7, 13, 17, 19, 21, 25, 27, 28, 29 and 30 **(Articles 33 (1) and 33(2) PCT).**

1.4 Dependent claims 2, 3, 9, 10, 11, 23 and 24 do not contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT with respect to inventive step, the additional features of claims 2, 3, 9, 10, 11, 23 and 24 being merely straightforward possibilities (choice of material) which are already suggested by documents D2 and which the skilled person would select, in accordance with the circumstances, without the exercise of inventive skill, in order to solve the respective problem posed.

Thus, the subject-matter of claims 2, 3, 9, 10, 11, 23 and 24 cannot be considered to involve an inventive step (Articles 33(1) and 33(3) PCT).

2 The subject-matter of independent **claims 31 and 39** as well as the combination of the features of dependent **claims 8, 14, 15, 18, 22, 32-38 and 40** is not known from the available prior art, as none of the cited documents

discloses "*dispensing a tip of the second feeder from a position that is on one side of an area where the needles cross each other to an opposite side of the area where the needles cross each other*".

The problem to be solved by this additional feature may be regarded as how to ensure that the same feeder is able to supply a yarn for knitting, tucking and floating as well as for inlaying a yarn into a knit component.

This feature is not rendered obvious by the cited documents.

Re Item VII

Certain defects in the international application

1 None of the independent claims is in the two-part form in accordance with **Rule 6.3(b) PCT**.

2 Contrary to the requirements of **Rule 5.1(a)(ii) PCT**, the relevant background art disclosed in documents D1 to D5 is not mentioned in the description, nor are these documents identified therein.

3 In **claim 11** "marching" seems to rather mean "machine".

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2007/084013

A. CLASSIFICATION OF SUBJECT MATTER
INV. A43B23/02 A43C1/04 D04B7/00

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 A43C D04B

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 practical, search terms used)
EPO-Internal, WPI Data, PAJ

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)	1,7,8
Y	paragraph [0025]; figure 1	2-6,9,10
X	US 2005/284000 A1 (KERNS MARK [US]) 29 December 2005 (2005-12-29)	11-20
Y	paragraphs [0005], [0006], [0015] - [0017]; figures	2-6,9, 10,22-33
X	US 2005/193592 A1 (DUA BHUPESH [US] ET AL) 8 September 2005 (2005-09-08) cited in the application	21
Y	paragraph [0044]	22-33
A	US 4 785 558 A (SHIOMURA KAZUHIKO [JP]) 22 November 1988 (1988-11-22) the whole document	1,11,21

☐ 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 document 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
26 March 2008	04/04/2008

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, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Cianci, Sabino

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2007/084013

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 2005284000 A1	29-12-2005	EP 1778039 A2	02-05-2007
		WO 2006001966 A2	05-01-2006
US 2005193592 A1	08-09-2005	CN 1925763 A	07-03-2007
		TW 279198 B	21-04-2007
		WO 2005092134 A1	06-10-2005
US 4785558 A	22-11-1988	JP 63025004 U	18-02-1988

Form PCT/ISA/210 (patent family annex) (April 2005)

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/US2007/084013	08.11.2007	10.11.2006

International Patent Classification (IPC) or both national classification and IPC
INV. A43B23/02 A43C1/04 D04B7/00

Applicant
NIKE, INC.

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 or 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.

3. For further details, see notes to 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 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	see form PCT/ISA/210	Cianci, Sabino Telephone No. +31 70 340-4655

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 and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

      ☐ a sequence listing

      ☐ table(s) related to the sequence listing

   b. format of material:

      ☐ on paper

      ☐ in electronic form

   c. time of filing/furnishing:

      ☐ contained in the international application as filed.

      ☐ filed together with the international application in electronic form.

      ☐ furnished 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 and/or table relating thereto 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. 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	2-6,9,10,22-33
	No:	Claims	1,7,8,11-21
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-33
Industrial applicability (IA)	Yes:	Claims	1-33
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item V.

1 Reference is made to the following documents:
D1 : US 2005/115284 A1 (DUA BHUPESH [US]) 2 June 2005 (2005-06-02)
D2 : US 2005/284000 A1 (KERNS MARK [US]) 29 December 2005 (2005-12-29)
D3 : US 2005/193592 A1 (DUA BHUPESH [US] ET AL) 8 September 2005 (2005-09-08) cited in the application

2 INDEPENDENT CLAIM 1

2.1 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.
Document D1 discloses (the references in parentheses applying to this document) an article of footwear having an upper and a sole structure secured to the upper, the upper comprising a knitted element (31) formed from at least one mechanically manipulated yarn, the knitted element having an area with a first layer and a second layer (see para. 25) at least partially coextensive with the first layer, the first layer being formed of unitary construction with the second layer (see para. 25), and the second layer being joined to the first layer at opposite sides of the second layer (see fig. 1 and para. 25).

3 INDEPENDENT CLAIM 11

3.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 11 is not new in the sense of Article 33(2) PCT.
Document D2 discloses (the references in parentheses applying to this document) an article of footwear having an upper and a sole structure, the upper comprising:
a knitted element formed from at least one mechanically manipulated yarn, the knitted element having a lateral side and an opposite medial side, the knitted element defining at least one lateral channel located on the lateral side and at least one medial channel located on the medial side, each of the lateral channel and the medial channel being formed of unitary construction with the knitted element from the at

least one mechanically manipulated yarn (see figures 1 and 3);
at least one lace element extending through the lateral channel and the medial channel, the lace element being less stretchable than the knitted element, and the lace element defining areas for receiving a lace (see fig. 1 and para. 5,6).

4 INDEPENDENT CLAIM 21

4.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 21 is not new in the sense of Article 33(2) PCT.
Document D3 discloses (the references in parentheses applying to this document) a method for manufacturing an article of footwear comprising flat knitting a textile element (which is widely known and used, see para. 44), and incorporating the textile element into the article of footwear (see the whole disclosure of D3).

5 DEPENDENT CLAIMS 2-10, 12-20, 22-33
Dependent claims 2-10, 12-20, 22-33 do not contain any 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 (Article 33(2) and (3) PCT).

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 005745.01042	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2007/084013	International filing date *(day/month/year)* 08 November 2007 (08.11.2007)	Priority date *(day/month/year)* 10 November 2006 (10.11.2006)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant NIKE, INC.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	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 Article 35(2) with regard to novelty, inventive step or 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

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 12 May 2009 (12.05.2009)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Ellen Moyse e-mail: pt02.pct@wipo.int

Form PCT/IB/373 (January 2004)

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/US2007/084013	08.11.2007	10.11.2006

International Patent Classification (IPC) or both national classification and IPC
INV. A43B23/02 A43C1/04 D04B7/00

Applicant
NIKE, INC.

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 or 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.

3. For further details, see notes to 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 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	see form PCT/ISA/210	Cianci, Sabino Telephone No. +31 70 340-4655

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 and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

      ☐ a sequence listing

      ☐ table(s) related to the sequence listing

   b. format of material:

      ☐ on paper

      ☐ in electronic form

   c. time of filing/furnishing:

      ☐ contained in the international application as filed.

      ☐ filed together with the international application in electronic form.

      ☐ furnished 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 and/or table relating thereto 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. 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	2-6,9,10,22-33
	No:	Claims	1,7,8,11-21
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-33
Industrial applicability (IA)	Yes:	Claims	1-33
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item V.

1 Reference is made to the following documents:
D1 : US 2005/115284 A1 (DUA BHUPESH [US]) 2 June 2005 (2005-06-02)
D2 : US 2005/284000 A1 (KERNS MARK [US]) 29 December 2005 (2005-12-29)
D3 : US 2005/193592 A1 (DUA BHUPESH [US] ET AL) 8 September 2005 (2005-09-08) cited in the application

2 INDEPENDENT CLAIM 1

2.1 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.
Document D1 discloses (the references in parentheses applying to this document) an article of footwear having an upper and a sole structure secured to the upper, the upper comprising a knitted element (31) formed from at least one mechanically manipulated yarn, the knitted element having an area with a first layer and a second layer (see para. 25) at least partially coextensive with the first layer, the first layer being formed of unitary construction with the second layer (see para. 25), and the second layer being joined to the first layer at opposite sides of the second layer (see fig. 1 and para. 25).

3 INDEPENDENT CLAIM 11

3.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 11 is not new in the sense of Article 33(2) PCT.
Document D2 discloses (the references in parentheses applying to this document) an article of footwear having an upper and a sole structure, the upper comprising:
a knitted element formed from at least one mechanically manipulated yarn, the knitted element having a lateral side and an opposite medial side, the knitted element defining at least one lateral channel located on the lateral side and at least one medial channel located on the medial side, each of the lateral channel and the medial channel being formed of unitary construction with the knitted element from the at

least one mechanically manipulated yarn (see figures 1 and 3);
at least one lace element extending through the lateral channel and the medial channel, the lace element being less stretchable than the knitted element, and the lace element defining areas for receiving a lace (see fig. 1 and para. 5,6).

4 INDEPENDENT CLAIM 21

4.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 21 is not new in the sense of Article 33(2) PCT.
Document D3 discloses (the references in parentheses applying to this document) a method for manufacturing an article of footwear comprising flat knitting a textile element (which is widely known and used, see para. 44), and incorporating the textile element into the article of footwear (see the whole disclosure of D3).

5 DEPENDENT CLAIMS 2-10, 12-20, 22-33
Dependent claims 2-10, 12-20, 22-33 do not contain any 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 (Article 33(2) and (3) PCT).

Skechers EX1013-p. 1112
Skechers v Nike

Electronic Acknowledgement Receipt

EFS ID:	18454768
Application Number:	14087169
International Application Number:	
Confirmation Number:	5123
Title of Invention:	Article Of Footwear Having A Flat Knit Upper Construction Or Other Upper Construction
First Named Inventor/Applicant Name:	Bhupesh Dua
Customer Number:	57618
Filer:	Eric M. Gibson/Jose Espejo
Filer Authorized By:	Eric M. Gibson
Attorney Docket Number:	51-3770
Receipt Date:	13-MAR-2014
Filing Date:	22-NOV-2013
Time Stamp:	09:44:29
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)	2014-03-13_51-3770_IDS.pdf	61595 3687cfe9003d997506c9f1130f802db79a5daaf5	no	18

Warnings:	
Information:	

This is not an USPTO supplied IDS fillable form					
2	Foreign Reference	2014-03-13_51-3770_IDS_01_DE19728848A1.pdf	355348 828dd72391b1ff088d66e0f9ee910b9aa302d56a	no	8
Warnings:					
Information:					
3	Foreign Reference	2014-03-13_51-3770_IDS_02_EP0448714.pdf	4706170 e65bea6110db961eb0a30f9aaea58fa45e7b0197	no	23
Warnings:					
Information:					
4	Foreign Reference	2014-03-13_51-3770_IDS_03_EP1233091A1.pdf	420197 acaa3522d0d3ad43dd12ece320ab845f57ddf9b7	no	8
Warnings:					
Information:					
5	Foreign Reference	2014-03-13_51-3770_IDS_04_WO0231247A1.pdf	982580 45ac327a6fa1fe948cc99c6ccf108c14b256561d	no	22
Warnings:					
Information:					
6	Foreign Reference	2014-03-13_51-3770_IDS_05_JPH11302943A.pdf	217323 961d2e337306f3e5b43bbaee5c3e8d730ff7bed3	no	5
Warnings:					
Information:					
7	Foreign Reference	2014-03-13_51-3770_IDS_06_DE19738433A1.pdf	146099 61b2b4636226520372f4e3bbc57b1677aac99b25	no	2
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Information:					
8	Foreign Reference	2014-03-13_51-3770_IDS_07_EP0758693A1.pdf	571302 fe92fb0ce9cadfb3d27b87d675f07c8aa1535f54	no	9
Warnings:					
Information:					
9	Foreign Reference	2014-03-13_51-3770_IDS_08_NL7304678A.pdf	363489 7292b53008aab5c505398a3d1cd96b924f858163	no	6
Warnings:					
Information:					
10	Foreign Reference	2014-03-13_51-3770_IDS_09_DE1084173B.pdf	162295 c20b0e34485c9e707f158c9ba88713584a0cc45e	no	2

Warnings:					
Information:					
11	Foreign Reference	2014-03-13_51-3770_IDS_10_WO0032861A1.pdf	494341 2f225206ae068a00d9fa48b5de5abd3c93447d7a	no	14
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Information:					
12	Foreign Reference	2014-03-13_51-3770_IDS_11_GB538865A.pdf	1320396 229a43f9fc5c304c99970ddaf2e6cffd5c37d615	no	14
Warnings:					
Information:					
13	Foreign Reference	2014-03-13_51-3770_IDS_12_EP0728860A1.pdf	1315568 0ee241ff854126377aebd78161bc24bd87b02450	no	17
Warnings:					
Information:					
14	Foreign Reference	2014-03-13_51-3770_IDS_13_JPH08109553A.pdf	644300 6749ee054fb36eba514e9ec70422383d18327c81	no	10
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Information:					
15	Foreign Reference	2014-03-13_51-3770_IDS_14_FR2171172A1.pdf	434837 9ca72dd51f38ac343a851d19430bcf611dc9298b	no	9
Warnings:					
Information:					
16	Foreign Reference	2014-03-13_51-3770_IDS_15_GB1603487A.pdf	2733841 0b3215fcd596392d94eabb2b7fff9c69993571eb	no	36
Warnings:					
Information:					
17	Foreign Reference	2014-03-13_51-3770_IDS_16_JPH06113905.pdf	721354 bc03cd752d9faf7237e7decbb969d250c211dc98	no	12
Warnings:					
Information:					
18	Foreign Reference	2014-03-13_51-3770_IDS_17_WO9003744.pdf	1973778 e2f3bdcb78db814fb1dde34ceb4342eb4e773c1b	no	53
Warnings:					
Information:					
19	Foreign Reference	2014-03-13_51-3770_IDS_18_DE870963C.pdf	114492 ede13e88ec4b1c99967219712d66fb3833592e7	no	3

Warnings:					
Information:					
20	Foreign Reference	2014-03-13_51-3770_IDS_19_EP0279950A2.pdf	643311 7621efe9e26736be32abd1c0d12e08faab5bc929	no	6
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Information:					
21	Foreign Reference	2014-03-13_51-3770_IDS_20_EP0898002A2.pdf	808914 fd4390a20f17d1ba51772accf8a7d1be163c766a	no	20
Warnings:					
Information:					
22	Foreign Reference	2014-03-13_51-3770_IDS_21_EP1437057A1.pdf	664901 9273c49c440faf0458589887f9dd7345a4b1cac5	no	13
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Information:					
23	Foreign Reference	2014-03-13_51-3770_IDS_22_EP1563752A1.pdf	304138 3a432231f4b3d4e90aae7ca573ca129d77899814	no	7
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Information:					
24	Foreign Reference	2014-03-13_51-3770_IDS_23_EP1602762A1.pdf	772205 9a899a9c6c69d4f7447a3c34bb784f6a3bb2c187	no	15
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Information:					
25	Foreign Reference	2014-03-13_51-3770_IDS_24_EP1972706A1.pdf	922919 96876318e74ce5479b8a23c8adb3b6f38a34f7b2	no	20
Warnings:					
Information:					
26	Foreign Reference	2014-03-13_51-3770_IDS_25_GB2018837A.pdf	237563 348acab80c622256bed21be55c82e3e63ee6e9e0	no	5
Warnings:					
Information:					
27	Non Patent Literature	2014-03-13_51-3770_IDS_26_Declaration_Frederick.pdf	10407685 8b41733b071f05d5fec2873a0ea93bbd318888c2	no	178
Warnings:					
Information:					
28	Non Patent Literature	2014-03-13_51-3770_IDS_27_Spencer_Knitting_Tech.pdf	7842912 fe160df360e69d1a0f66ca644dc42a1372afe958	no	413

Warnings:					
Information:					
29	Non Patent Literature	2014-03-13_51-3770_IDS_28_Eberle_Clothing_Tech.pdf	422220 2b26e8e741236f03bda5a4317f3e9945481c88fa	no	3
Warnings:					
Information:					
30	Non Patent Literature	2014-03-13_51-3770_IDS_29_PCTUS2009056795_ISR_WO.pdf	540832 6a22470ce171317b708d5102b5ecc6fc001f7af0	no	16
Warnings:					
Information:					
31	Non Patent Literature	2014-03-13_51-3770_IDS_30_PCTUS2012028576_ISR_WO.pdf	592555 843602ccd3a24e58a0312596e770f16a1c4555d5	no	12
Warnings:					
Information:					
32	Non Patent Literature	2014-03-13_51-3770_IDS_31_PCTUS2012028559_ISR_WO.pdf	600169 82511de3a0f74e7b92c0bfc76504095835aac503	no	11
Warnings:					
Information:					
33	Non Patent Literature	2014-03-13_51-3770_IDS_32_PCTUS2012028534_ISR_WO.pdf	778915 884a7d1078f39ce19502cb21890509f1e59567f2	no	16
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34	Non Patent Literature	2014-03-13_51-3770_IDS_33_PCTUS2012028534_IPRP.pdf	259391 fad6aae45dc590960e3bc0e70048d5508f999ace	no	8
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Information:					
35	Non Patent Literature	2014-03-13_51-3770_IDS_34_PCTUS2012028576_IPRP.pdf	234830 7a4d47408c782efc3d7b62db5d040d3924bcea3c	no	7
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Information:					
36	Non Patent Literature	2014-03-13_51-3770_IDS_35_PCTUS2007084013_ISR.pdf	277913 0a829778a32d753373a2b3035a0482d4158807ab	no	7
Warnings:					
Information:					
37	Non Patent Literature	2014-03-13_51-3770_IDS_36_PCTUS2007084013_IPER.pdf	237500 601589a82c6314ecbed84b083328805820866b124	no	6

Warnings:	
Information:	
Total Files Size (in bytes):	44288178

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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.

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/087,169	11/22/2013	Bhupesh Dua	51-3770

CONFIRMATION NO. 5123

POA ACCEPTANCE LETTER

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

OC000000067175664

Date Mailed: 03/20/2014

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/12/2014.

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.

/tnnguyen/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Skechers EX1013-p. 1119
Skechers v Nike

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/087,169	11/22/2013	Bhupesh Dua	51-3770

CONFIRMATION NO. 5123

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

PUBLICATION NOTICE

OC000000068837201

Title: Article Of Footwear Having A Flat Knit Upper Construction Or Other Upper Construction

Publication No.US-2014-0150295-A1
Publication Date:06/05/2014

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Skechers EX1013-p. 1120
Skechers v Nike

PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14087169
Filing Date	2013-11-22
First Named Inventor	Bhupesh Dua
Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3770

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					

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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							☐

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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]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14087169
	Filing Date	2013-11-22
	First Named Inventor	Bhupesh Dua
	Art Unit	3765
	Examiner Name	Larry D. Worrell Jr.
	Attorney Docket Number	51-3770

	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	14087169
Filing Date	2013-11-22
First Named Inventor	Bhupesh Dua
Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3770

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)	2014-08-11
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.**

Fabdesigns, Inc.
4963 Haskell Avenue
Encino, CA 91436
Re: Update as requested 12/12/13

December 23, 2013

Dear Patty Hong,

Enclosed your will find the updates to the patents that you've sent me to review. We sincerely value our continued relationship with Nike. As I stated, much of these goes against our mutual NDA signed on June 1, 2013 and presses to force our own IP into markets that we did not agree to purposely and would not agree to now.

We are giving Nike notice that this is not acceptable, nor permitted under our mutual NDA.

We'd like a response to these patent revisions within 30 days as to how they will be correct. We also request that the patent 8490299 be corrected, which I have continuously protested since the moment I learned of it and notified Nike legal promptly well before it was granted.

I'd also like full copies of previous patents that my name was attached to though I was never given anything more than the front page and the US application page. I would like to know what Nike claims I invented.

I have been extremely patient, forthcoming, and accommodating to everything Nike has ever requested.

If I don't hear from you or your office, I'm assuming that you are filing without my signature or permission to use my IP in complete contradiction to the mutual NDA of June 2010, and will need to take other actions which I should not have to.

Sincerely,



Bruce Huffa

RECEIVED
DEC 24 2013
PUMSEA LAW GROUP

Fabdesigns, Inc.
4963 Haskell Avenue
Encino, CA 91436
Re: Update as requested 12/12/13

December 23, 2013

Dear Patty Hong,

Thank you for sending the current batch of patents.

We sincerely value our continued relationship with Nike. I'm having several issues with signing the agreement pages of these documents as there are many items with them that are not true, and some cases we can not support complete inaccuracies. **(See below 'Notes on Agreements page)** Face pages are fine.

From Agreements Page 1:

> NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, WE, the aforesaid, Daniel A. Podhajny and Bruce Huffa, by these presents do confirm that We did (under the law of the jurisdiction(s) where the invention was conceived, reduced to practice and made, under the NIKE Employee Invention and Secrecy Agreement and/or under some other agreement with NIKE, Inc. including such a sale, assignment or transfer) sell, assign and transfer or, if not already done so, do sell, assign and transfer unto NIKE, Inc., its successors, legal representatives and assigns, the full, exclusive and worldwide right in and to said invention as described in said application, in and to the aforesaid application and in and to any Patents, Design Registrations, Industrial Models, Industrial

Concerns about preexisting knowledge:
We have no problem supporting Nike for defending the Flyknit. The fact is we created it from nothing Nike had existing and worked diligently 40 hours weekly at Nike premises to make it happen, as well as contributed much outside efforts and knowledge that Nike did not pay for. The know how and techniques all had to come from somewhere else – outside Nike, predating our relationship with Nike, and that somewhere was our previous experience, education, extreme expertise in fully fashioned manufacturing processes, and in many cases from our own studio resources and on our own time, and out of our own pockets.

However, the wording in these agreement documents also appears to use our technology, know-how, and library against us, to limit us beyond footwear and into other markets on many of these patents, stating that we developed them <u>at Nike</u>, and agree to sell, assign, and transfer our techniques for creating fabrics in just about every industry, and this is not something we would support. We respectfully and specifically cite our Mutual NDA Agreement / Service Agreement signed by Bruce Kilgore of Nike, Bruce Huffa of Fabdesigns, Inc., effective June 1, 2010, section 4.1. And these depart significantly from what we agree our IP would be used for on a royalty free basis as described deliverables in the 'Schedule A – deliverables section' of the same agreement. We did not agree to Nike patenting our IP into other industries, nor preventing us from transacting our normal engineering practice.

We drew on our own know how, machine builder's libraries, existing stitch technology, our mechanical, electronic, and machine knowledge to make that functional design happen for Nike's team and with very little, if any assistance from Nike team members. As I showed you on my own computer, I built many of these stitch techniques, most of which do NOT exist in the sweater

industry where the current Nike Knit team came from, but in the technical textile knitting world, and left it in the computer system as a palette of techniques that not only used previously as building blocks, but also to draw on for NEW shoe designs. Many of these stitch techniques I am now seeing identified as 'inventions'. Many of these are not NEW to the technical knitting industry and many are my own working short cuts and techniques that I incorporated into the designs to create efficiencies and faster production times. Having others claim them, is not OK.

I am very much a humble person, but the simple fact is that there would be no Nike Flyknit shoe without the outside, off the clock contributions we made that were not part of the paid for performance of services per our Services Agreement for 40 hours per week and were incorporated into Nike's products. We're concerned that some of these patents, specifically 51-3279 are reaching beyond the specific footwear scope we carved out in this Services Agreements and into our other business areas. **(See notes below)**

Concerns about transferring work that was not paid for hire on anything other than the royalty free use basis as we'd previously signed & agreed for footwear only:
We have no desire to sell, assign, or transfer our know-how and library forever more to Nike in all these other business areas, especially for items where we did much of this work on our own time, with our own resources, and without compensation or collaboration from Nike. Much of this has been our working stitch library of techniques for many years prior to our relationship with Nike. We will need your help to find some other wording that is agreeable and appropriate for the true circumstances of how some of these items from our own IP, and from efforts we undertook in our own time, with our own resources, and without any compensation from Nike, came into the possession of Nike's knit team, and subsequently to your desk to patent.

When you visited, if you learned anything about us, we hope it was that we have complete integrity, are transparent, loyal, and will do what we can to help defend Nike in a professional capacity in regards to these technical claims. We have not discussed any of these issues outside of Nike, and you their law team, nor have we disputed anything with the U.S. Patent office, as we are hoping to resolve some of these issues to both Nike's education as to what the ripple effect of these over reaching patents may incite in the industry, Nike's education of the technical knitting industry, and the IP protection of both their interests and ours, and in maintaining a unified front in combating potential knock offs and infringers in the footwear industry that could potentially erode Nike's Flyknit platform. We have been, are, and intend to remain loyal to this commitment.

We understand that there is still a valid part of the 2010 mutual NDA in place and that Nike is using the work I completed in my own time, without Nike resources, as well as certain information I left there, on the royalty free basis discussed in the 2010 NDA Agreement specifically for shoes– not for exclusive use in patenting for other markets without my permission and certainly not for other employees to sift through and attach their names. We were very specific with Nike in our agreements that our IP and royalty free use of our developments that Nike did not pay for was for footwear use ONLY. You speak of this 'duty to Nike' that we have. This is a two way street per our mutual NDA. Nike also has a duty to protect our own IP we left there for Nike to incorporate into its' products.

We have been knitting complex projects as a livelihood for several decades and strongly object to Nike using the IP that we left behind, and the technical concepts, swatches, parts and ideas that we developed on our own time, with our own resources - royalty free for anything other than shoes. 'Shoes only', footwear, was our agreement from the beginning of our Nike relationship and specified in our 2008 agreement for testing the machinery over the course of 6 months, as

well as the 2010 agreement. We also strongly object to Nike patenting any techniques or IP that we used prior to our Nike relationship or that was brought in as a demonstration of our capabilities, and that of the machines. This includes apparel patents we've seen filed.

The fact is that I contributed many innovations to Nike that I created on my own time and without any compensation, collaboration, or Nike resources, but agreed that Nike can use royalty free if input into Nike shoe products – specific footwear products defined in our "June 1, 2013mutual NDA – Schedule A Deliverables". This IP is for royalty free us in basketball, training and soccer products ONLY. The referenced 'dress shoes, hiking boots, et al.' do not comply with our agreement. Any use in footwear products, or ANY products other than those defined in our mutual agreement without permission of Fabdesigns, Inc. is not acceptable.

1. **Description of Services & Deliverables.**

Throughout the term of this Agreement, Contractor will provide the following Services and Deliverables to NIKE:

- Execute the commercialization and successful launch of the Flyknit Racer III for the NYSEU 13 season.
- Demonstrate that knitting as an effective method of making basketball, training, and soccer products. Products must meet or exceed current performance standards. It is expected that this will drive a new (unique) visual presentation of NIKE products.

The IP, knowledge and know-how that I owned prior falls under protection of the June 2010 mutual NDA, which states that Nike gets to use the parts and techniques that I incorporated into its' products royalty free in these SPECIFIC products – **not** that Nike gets exclusive use anywhere they want as these docs you've asked me to sign state. Signing these documents would negate my 2010 mutual NDA, and I have no interest in doing so.

Concerns about work that was not done on the Nike clock:
In most cases new idea items needed to be in a physical format and placed in front of Bhupesh to garner any attention from Nike. That meant I **had** to do them outside of the P.O. system and on my own time at my expense on speculation that Nike might like the idea. Neither Fabdesigns, Inc. nor I personally was compensated in any way for any hours, ideas, resources, or out of pocket expenses beyond the well spelled out 40 hour weekly budget and project goals, which were executed exclusively on Nike premises. **(See 'example' below)**

As you saw yourself at my studio, I have meticulous documentation of my hours and what was accomplished each week as progress was inspected and supervised by Bhupesh Dua. It was required by Bhupesh to substantiate the P.O.'s and every dollar of invoicing.

I worked on these **(51-3214, 51-3279)** and many other knit projects not related to the Flyknit that you may or may not have seen yet, all in my own time, on my own machinery, and without Nike resources.

I have received no other 'valuable consideration' for my time, resources or efforts on these items that I started and completed on my own time with my own resources. This includes the original idea for inlay cables, and the original ideas, designs for the combination feeder and the resulting cable inlay application, a soccer ball liner and many other contributions I brought into Nike from my Los Angeles knitting studio and were incorporated into its' products.

I have not asked Nike for one penny beyond what Nike paid on invoicing the completed P.O.'s, as Bhupesh would not consider it, even at the time.

Therefore, I will not sign a document stating that I received 'valuable consideration' for my time, resources or efforts on these items, and that I am further agreeing to selling, assigning and transferring to Nike based on this supposed 'received valuable consideration' and in direct opposition to the NDA's signed by Nike and Fabdesigns, Inc.

Concerns about the current Nike Knit Team use of our IP:
We also made it clear to you and Eric Gibson, that we have no problem defending Nike's valid claims, and that to do so we felt it additionally imperative to Nike's success, that these new people on the Nike knit team need to be educated as to what patents are; the difference between patents and copyrights; the difference between functional and design patents; what inventors truly are, and what is a valid claim. Some of them have no formal textile degree; others have only high school or less education. One was only a knitter (machine operator), and we see his name listed on patents, which I created years prior, yet I am the bottom name – and an after thought at that.

I have also had to put up with other people claiming my prior IP and my off site engineering work as their own, the very work I did on my own time, with no Nike resources, and at considerable personal financial sacrifice, not a gain – and all which also would be subject to the mutual NDA we signed with Nike, effective June 1, 2010.

As part of our duty as flat knitting experts loyal to Nike, and per the documents that you've previously required us to sign in order to execute that duty, we feel it is our onus to alert you to these items:

Many of these new fabrication claims existed well before these new people joined Nike or are already public domain prior to even my relationship with Nike. Many are possible and have been commercially available with other types of inlay feeders. These people came from sweaters and of course some or all of this may be new to them, but not everything is new to everyone else in the world. It appears to us that this is a patent frenzy directed toward the flat knitting industry, with people perhaps more eager to get their names recorded on Nike patents, and reach into industries and markets and fabrications to which they have limited or no knowledge and experience, than to validate that there is a legitimate innovation or claim for footwear. Many of them should already know many of these fabrics and techniques as already being in existence. We've been using them for years in many other industries.
(See notes on 51-3279)

Just because some technology is new to them or to Nike, does not make it patentable. It would be Embarrassing for us to be called as expert witnesses to defend Nike under these circumstances, yet that seems to be our duty to Nike. There are already many prominent industry experts who have spoken out in trade forums about these public domain type patents that Nike is claiming for knits, including a truly generic one for a 'weft knitted shoe'. In all sincerity, some of these items should be copyrights on designs or design patents solely for footwear at best, because of how long the stitches have been in public domain, and are considered essential building blocks of the already existing markets, towards which some of these claims are being extended.

Concerns regarding inclusion of previous Nike patents – Pre- June 2008 – making Nike vulnerable to challenge
It is my professional opinion and that of Fabdesigns, Inc. that the technology for this shoe platform is completely different than anything in footwear that has come before it.

Citing sock technology, previous thermoplastic fusible patents, and previous pieced cut and sew weft knit patents that are general, generic, and based on 20, 30 50 year old technology and older

is muddying the Flyknit platform in our opinion and creating a situation where Nike is an easy target for challenge. These previous patents do not belong in the functional patents of the Nike Flyknit. They may be better suited to cite for design patents.

- The Flyknit technology that I built for Nike uses a unitary, integrated structure for the upper.
- The upper is the structure of the shoe.
- The fusible technology is completely different and does not incorporate any of the previous patent technology except for the actual WORD fusible. I built a special digitally manipulated and strategically placed STEAM fusible adhesive that is distributed in specific ways at the yarn/ fiber level and also to which the density of the fusible is distributed in a controlled manner.
- This platform does not use sock technology what so ever, nor any circular knitting. Why is it here at all?
- All previous knit technology known to Nike was completely disregarded by me and thrown to the side as dated, sweater/apparel based, and already in use somewhere. This platform is a completely new and modern 3 D flat knitting technology that no one at Nike had intimate nor hands on knowledge of. It had NEVER been applied to shoes, which we know of. It would be much easier to defend and protect than using 20 year old and older technologies that many others have used and can prove have been used.
- At the time this project commenced, in spring of 2008, the two people at Nike that we've spoken to Bhupesh Dua and Ed Thomas, admittedly had limited knowledge of knitting and barely any hands on experience. Their basis for the sock and previous patents appears to be the dated technology that they've learned at college and through the industry – things that have already been released to public domain. Most were apparel based technology. These dated technical positions are very difficult to defend. Both Ed and Bhupesh had tried with every expert they knew to create a knitted shoe, including Ed's former professor at Philadelphia University, who also taught my wife. With all their sincere efforts, only a sock format was achieved in 9 years of work.
- A line should have been drawn as a clean break in technology, not to use and cite old technology and irrelevant patents in this new platform FOR FUNCTIONAL PATENTS as it creates complications that paint a huge target on Nike, inviting challenge.
- We also feel that a robust IP defense to this Flyknit platform for footwear should include both Design patents and copyrights on all shoes that were produced in development at Nike. This may have prevented the alleged leaks we discussed when you were here, and the existence of a competitive product now directly challenging Nike's Flyknit.
- The design patents could include these old technologies if Nike so choses, that would be their place to connect the IP thread.

Future:

We absolutely will continue to cooperate with Nike and help defend the Nike Flyknit. However, we can not support this new, seemingly aggressive activity to patent the obvious without officially alerting you. We feel we cannot state that we are selling, assigning and transferring things that are public domain, and in so doing, also thwart our livelihood and how we and thousands of others have made a living in engineering 3 D flat knitted textiles for more than thirty years, as the wording currently written into these agreement documents makes clear. Our signed agreement with Nike is to focus on footwear applications, where we feel in our professional opinion, much of these techniques have been lacking.

I hope you understand my reluctance and my opinion that this 'agreement document' attached to these patents is obviously not acceptable to me as written, nor true, and we as a company can not support this agreement document 'as is'. Doing so would limit our right to work in the industry we have since 1978.

This is the first time I have seen full copies of patents that have been submitted to me for a signature. Previously I have only seen the "Inventor Acknowledgements page" and the "Utility Patent Application", both requiring a signature, but I have never been given the patent to review the claims in advance of them being filed. I have also been the very last person to see them – the afterthought – when I am clearly the inventor of this technology and should be lead on many of them. Given what I'm reading in these, I will submit this batch to you and, will request copies of previous patents to review to know exactly what Nike claims that I invented. I've trusted Nike's technical judgment, but after reading these that are fraught with inaccuracies, bad terminology and reaching into other product categories, beyond footwear, that would be subject to my 2010 NDA, I have concerns about what my name and reputation is actually attached to.
If I find any errors, I trust that they would be addressed and corrected for both Nike's defense of the IP and my own.

You will need to find better wording that is more appropriate to the mutual NDA situation and agreeable to both Nike and me, considering what my family, my company and I were put through for the benefit of Nike's knit platform. I imagine there will be many more of these patents and my body of work at Nike was substantial beyond the 60 or more structural shoe designs you saw. Wording will be important to us. We want this to be positive for both of us, as well as the foundation of the Flyknit to be solid and not built on a house of cards or manufactured claims that would do both Nike, me, and Fabdesigns, Inc. harm in the industry.

4.2 NIKE Property. Except as provided in Section 4.1, NIKE will own all intellectual property rights that are included in or created in connection with the Deliverables or Services (collectively, the "Developments") including, without limitation (the "Developments"): (a) all inventions, ideas, developments, designs, methods, know how, or other discoveries, whether or not patentable; (b) all works of authorship fixed in a tangible medium of expression; (c) any word, slogan, symbol, character or sound to be used to identify products or services of NIKE or its affiliates; and (d) any list, database or other commercially valuable assembly of information; and (e) all adaptations, modifications, and derivative works of any of the above. To the extent any Developments qualify under applicable law, they will be "works made for hire." To the extent they do not qualify as "works made for hire," Contractor assigns to NIKE exclusively all present and future right, title and interest in and to the Developments. Upon NIKE's request and at NIKE's cost, Contractor will execute and deliver to NIKE all documents necessary to perfect NIKE's right, title and interest in and to each Development, both domestically and abroad. In addition, Contractor will require all of its employees, subcontractors, and agents engaged in the provision of Services under this Agreement to execute appropriate agreements to (i) ensure that those individuals do not have ownership claims in the Developments and (ii) require those individuals to cooperate with Contractor and NIKE to perfect NIKE's right, title and interest in and to each Development, both domestically and abroad.

I have every intention of performing my duty to defend Nike's Flyknit footwear platform, and cooperate. I have gone through these patents as you requested and done a general scan. Line by line would take longer, as would the due diligence that should be spent on several of these items which are most concerning. In completing this general scan and providing you with 5 to 20 minutes of research per concern, I have spent to date 63 hours of my time providing Nike with its' request.

"Upon Nike's request and at Nike's cost Contractor will execute and deliver to Nike all documents necessary to perfect Nike's right, title and interest in each Development. . . " per my mutual NDA agreement from 2010.

This represents $18,900 of value in my consultation time, not including the visit you and Eric Gibson made in August. (63 hours X $300/hr). $300/hr is my normal and reasonable rate for every client I currently serve that requires expert flat knitting expertise. Kinko's billed me for 640 pages to copy all these so that I might mark them up and highlight. So, for this effort and in future ($18,900 / 640 pages= $29.53), such reviews can be expected to cost the average of $29.50 per page to review, plus any applicable admin fees and shipping.

Nowhere in any of the documents I have, does is state that I must provide all this additional time to Nike at no charge. This is my busiest time of year. I take my commitment to Nike very seriously, and have lost significant revenue in accommodating your requests. I would request also that in future you send a digital copy along with the paper copy to save time and resources.

I also recommend that upon reading my report, that Nike designate a significant amount of due diligence be addressed to investigation of these claims in advance of both filing them and in submitting them to me for review. I believe an ounce of prevention will be worth a pound of cure in defending Nike against the easy challenges some of these claims pose in risks to Nike.

Sincerely,
Bruce Huffa  12|23|13

Here are my report comments:
Note: examples given in this report are 5, 10, 20 minutes of a limited research scope and do not represent an exhaustive search or the suggested due diligence to validate. At this moment these are provided for demonstration purposes only, given my time constraints.

Agreements page: 51-3214, 51-3279.

- This is the first time I have ever see this 'agreement page' on any patent I've signed for Nike.
- In the case of: 51-3214, 51-3279, 51-3345, 51-3723, these items were created in my own time, and at my own expense with 'no valuable consideration' or reimbursement for my time or resources.
- I was not an employee of Nike, but subject to a Services Consulting arrangement from March 2008 that cover only 40 hours of my time on Nike premises for specific weekly goals. A second agreement in June 2010 contained a revised Service contract/Mutual NDA with a flat rate, lease for my equipment and an end strategy of a written job offer. We respectfully and specifically cite schedule A of our Mutual NDA Agreement / Service Agreement signed by Bruce Kilgore of Nike, Bruce Huffa of Fabdesigns, Inc., effective June 1, 2010, and section 4.1.
- I am very much a humble person, but the simple fact is that the Nike Flyknit shoe was born out of financial subsidizing of those efforts by Fabdesigns, Inc., in contributing our own IP which was preexisting, created on our own time, and with our own resources.
- Contract: The knit shoe project was supposedly a temporary 3 month project, 6 months at most, to fit into the down/slow time of our apparel manufacturing business in 2008.
    - Payment terms spelled out at $80/hr per service hour at 40 hours per week; created on March 8, 2008 and signed by Bhupesh Dua.

NIKE, Inc. One Bowerman Drive Beaverton, OR 97005-6453 USA Phone: 503-671-6453 Fax: 503-671-6300 Attn: Nancy Hameed - Legal Department Bhupesh Das	Fabdesigns, Inc. 4963 Haskell Avenue Encino, CA 91436 Phone: 818-784-6767 Fax: 818-784-6720 Attn: Bruce Huffa
By: Bhupesh Das	By: BH
Name: BHUPESH DAS	Name: Bruce Huffa
Title: Sr. MATERIALS ENGINEER	Title: President
Date: March 19, 2008	Date: March 19, 2008

- The Services Agreement was intended for a very limited budget and scope project to last no more than 6 months, at the end of which, this contract was supposed to terminate, and I would go back to my business in Los Angeles.

- The agreement actually describes the relationship with Nike and Stoll America and what their relationship encompasses. Fabdesigns, Inc is a third party, hired to assist Nike in evaluating the suitability of the machine to create a knitted shoe concept, to reach a decision to commit to Stoll for a machine or not.

- Fabdesigns, Inc and Bruce Huffa is a third party to this relationship.

- The Services Agreement was set up solely for me / Bruce Huffa to help Nike as an independent third party, to set up, teach, test and evaluate the Stoll machine for Nike's desire to create a knitted shoe, and perform other related services as agreed during the term of the agreement. This required me to test the machine in Germany for Bhupesh before it was delivered to IHM. The term of this agreement was 120 days and stated nothing about working for Nike 24/7 and giving everything I developed on and off the clock to Nike or anything about giving Nike all the former knowledge, know how and techniques that I had accumulated prior to the relationship, for Nike to patent.

- The scope of this agreement never anticipated a long term relationship, that governed IP or important related topics that should have been/ would have been included beyond the expected 6 month relationship that would and did culminate with the decision sale or leasing of the machinery to Nike, by Stoll America.

NIKE and Stoll America Knitting Machinery, Inc. ("Stoll") have entered into, or intend to enter into, one or more agreements by which Stoll will provide to NIKE certain knitting equipment, accessories, and associated software. CONTRACTOR will assist NIKE in setting up, learning, testing and evaluating the Stoll equipment, and to perform such other related services as the Parties may agree to during the Term of this Agreement (the "Services").

- The relationship between Fabdesigns, Inc and Nike was not intended to endure past the testing and evaluation of the machinery phase. Nor was any product development or engineering service beyond the 6 month machinery evaluation period anticipated or accommodated. The relationship for this evaluation ended as planned.
- At the same time, the other option Nike explored was that if the evaluation proved successful, and Nike saw promise in the knit platform, Nike intended to

extend a job offer to me as a full time employee at $150K on E band as head of their knitting program. I was told they were initiating with this project as the kick off of such a program. In any event, the 6 month time frame to evaluate the machinery was the planned limit of the relationship between Fabdesigns, Inc. / Bruce Huffa described in this contract. A change of relationship status was planned and acted on within the planned time frame.

Services Agreement

This Services Agreement ("Agreement") is between NIKE, Inc., an Oregon corporation with its principal place of business at One Bowerman Drive, Beaverton, OR 97005-6453, on behalf of itself and its affiliated businesses ("NIKE"), and Fabdesigns, Inc., with its principal place of business at 4963 Haskell Avenue, Encino, CA 91436 on behalf of itself and its owners ("CONTRACTOR"). In this Agreement, NIKE and CONTRACTOR may be referred to individually as "a Party" and collectively as "the Parties."

This Agreement is effective as of the 8th day of March, 2008 ("the Effective Date").

NIKE and Stoll America Knitting Machinery, Inc. ("Stoll") have entered into, or intend to enter into, one or more agreements by which Stoll will provide to NIKE certain knitting equipment, accessories, and associated software. CONTRACTOR will assist NIKE in setting up, learning, testing and evaluating the Stoll equipment, and to perform such other related services as the Parties may agree to during the Term of this Agreement (the "Services").

1. **Commencement of Services.**

1.1 CONTRACTOR will commence providing the Services on March 31, 2008, or as soon thereafter as possible. All technicians familiar with Stoll equipment ("Technician" or "Technician") proposed by CONTRACTOR to provide Services must be approved by NIKE before providing Services. Prior to performing the Services, any Technician performing Services must execute and deliver to NIKE the Technician Agreement attached to this Agreement as Exhibit A, the terms of which are hereby incorporated into and made a part of this Agreement.

1.2 A Technician will spend between two and four weeks at Stoll's facilities in Germany to receive specialized training on the Stoll equipment that will be used by NIKE. This training will be considered part of the Services.

1.3 It is understood and agreed that some Services may be provided at CONTRACTOR's premises using CONTRACTOR's facilities, material or equipment. NIKE has no obligation to pay for use of such facilities, material or equipment.

1.4 CONTRACTOR will provide 40 hours per week of Services at times and locations mutually agreed by the Parties.

1.5 In its sole discretion, NIKE may reject a proposed Technician, or terminate continued Services by a Technician at any time, and for any or no reason.

2. **Fees and Expenses.**

2.1 All payment and reimbursement under this Agreement will be in U.S. dollars.

2.2 As full payment for the Services, NIKE will pay CONTRACTOR $3,200 per week based on CONTRACTOR providing not less than 40 hours of Services during the week. Should less than 40 hours of Services be provided in a given week, the payment for the Services provided during that week will be computed based on the following formula: number of hours of Services provided for the week ÷ 40 x $3,200

2.3 CONTRACTOR will invoice NIKE for Services every two weeks. CONTRACTOR's invoice will contain a description, and the number of hours, of Services provided each day. Payment of uncontested invoice amounts will be made by NIKE within thirty (30) days after receipt of CONTRACTOR's invoice.

2.4 In addition to the payment for Services, NIKE will reimburse CONTRACTOR at actual cost (without mark-up or additional fees) only for the following categories of expenses incurred in furtherance of performing the Services. Except for the expenses described below, and any expenses subsequently approved by NIKE in advance in writing, CONTRACTOR will bear its own expenses in connection with providing the Services. Unless subsequently pre-approved in writing, NIKE will only reimburse CONTRACTOR for the following expenses: coach airfare (domestic and overseas), lodging (including any pre-approved hotel room and taxes, but not phone or other charges to the room), $75(US) per diem charge while at Stoll's German facilities, and local transportation (rental car, taxi). NIKE, at its option, either will reimburse CONTRACTOR for such expenses in accordance with NIKE's travel reimbursement policies, or will make arrangements and payments directly to the provider. Any request for reimbursement must be properly documented by CONTRACTOR.

3. Term.

3.1 Unless terminated earlier as set out in this Section 3, the Term of this Agreement starts when the CONTRACTOR begins performing Services for NIKE and it will expire when CONTRACTOR ceases performing the Services.

3.2 NIKE may terminate this Agreement at any time, for any or no reason, immediately upon written notice to CONTRACTOR. Within 30 days prior written notice, CONTRACTOR may terminate this Agreement at any time, for any and no reason, after ninety (90) days following successful completion of the training at Stoll's German facilities. Should CONTRACTOR terminate this Agreement prematurely, or should NIKE terminate this Agreement within 120 days from the Effective Date on account of CONTRACTOR's material breach of this Agreement, then CONTRACTOR will reimburse $7,500 to NIKE as compensation for the training received by CONTRACTOR at Stoll's German facilities.

3.3 In the event of a failure of CONTRACTOR to perform the Services to NIKE's satisfaction, then NIKE may terminate this Agreement immediately.

3.4 In the event NIKE fails to make timely payments or reimbursement as required under this Agreement, CONTRACTOR will give NIKE written notice of such failure with not less than five business days in which to effect cure. In the event NIKE fails to timely cure, then CONTRACTOR, at its sole option, may suspend performance of the Services or terminate the Agreement without further notice and without any financial obligation to NIKE.

4. General Provisions.

4.1 No Publicity. CONTRACTOR shall not disclose to any third party the existence of this Agreement or the monetary value of this Agreement. Without limiting the generality of the foregoing, CONTRACTOR shall not (i) make any public announcement regarding its association with NIKE; or (ii) use NIKE's name, any NIKE trademarks, or any content in which NIKE holds a copyright, or in any client list or other promotional materials, activities, or publications.

4.2 Independent Contractor. Nothing herein creates or is intended to create any employment

(I'm sure Nike legal have the full document. We can supply if you need it)

- Under this contract, for the first couple of billing cycles in Beaverton, I invoiced Nike for the 40 hours on site and the significant extra hours that I applied to this knit shoe project for Nike, plus my travel time to and from Beaverton from Los

Angeles. I was subsequently told by Bhupesh that I was eating his budget up faster than he expected. Going forward, Nike would only authorize 40 hours per week of hourly compensation for only the 4 ten hour days per week on premises – Monday through Thursday. These hours were supervised project work in house at IHM & then Mia Hamm on the knit shoe efforts as per strict directive of Bhupesh Dua for accounting for project progress weekly. I invoiced accordingly on the P.O. directives from Bhupesh to work on only what he agreed to, and received payment for 40 hours only. Given this was short-term; I felt my company and I could endure the reduced income temporarily.

- My actual work week for Nike during this contract averaged 60 to 75 hours or more to achieve the initial shoe– so I could deliver what they needed and go back to my apparel business. Per our agreement of March 2008, and Bhupesh's directive, Nike would not pay beyond the 40 hours. This was because of the extensive travel to different time zones and Bhupesh's concerns that test swatches out of his supervision could not be anticipated in terms of limiting the time and budget. He wanted one bill and Nike paid by check on invoice.
- Several weeks later towards the end of my six months, I'd been working on ways to reinforce knitted apparel fabrics in my studio. The first thing I thought of was using fusible thread. I pulled a cone off my shelf to take it with me on Monday. I had a secondary idea of creating a thicker yarn structure, and as the machine was running I was noting the timing and spacing of the feeders. I modified my own equipment and cut a feeder block and used the Stoll standard feeder to create a cable layout that inlayed cable into a ripple. I planned this to wrap around the instep medial and lateral regions to provide support. This feeder did not dip, but made the initial swatches.
- When I returned to Beaverton on the following Monday, I showed the swatch to Bhupesh and Ben, explaining my idea for structural support while knitting the upper to shape. I also gave him the fusible thread with a swatch and explained what it did and why it could be useful for our footwear purposes and that he needed to order a thicker version for us to use on the Nike machinery. He contacted my fusible vendor, who in turn sent him several sizes of thread. **(I was never compensated for my time, parts, machine parts, yarns, materials, or work outside the 40 hrs at IHM & Mia Hamm. Everything I brought in from my studio, and created in my own time was never reimbursed.)**

- My six months machinery evaluation ended – as did the above contract. Nike had made its' decision on the machinery; my work on providing Nike with a proof of concept shoe, proving the viability and potential of the machine was satisfied. We ALL considered the evaluation contract completed – Nike, Stoll America and Fabdesigns, Inc.
- At the end of the machinery evaluation period, Bhupesh told me that Nike still didn't have the knitting platform position ready yet to offer me the position we'd discussed, and I packed up and prepared to go back to my business in Los Angeles as planned.
- Several days later in the week, I was told by Bhupesh that Nike Management was still working on budgeting the flat knit program and concerned that they would not have the know-how in house to continue running the machine they'd leased. The in-house Nike people also needed further training. **(See example email below from around the same time, of a frustrated Nike engineer. Per the e-mail's reference - mid August 2008 there were already a minimum of 14 shoe variations to prove the machine worked for the purpose scoped.)**

-----Original Message-----
From: White, Vince <Vince.White@nike.com>
To: fabdesigns@aol.com; Huffa, Bruce (ETW) <Bruce.Huffa@nike.com>
Cc: Dua, Bhupesh <Bhupesh.Dua@nike.com>; Bangert, Don <Don.Bangert@nike.com>; Casillas, Tina (ETW) <Tina.Casillas@nike.com>; Shaffer, Ben <Ben.Shaffer@nike.com>; Hawkinson, Karen (ETW) <Karen.Hawkinson@nike.com>; Hensley, Shaun <Shaun.Hensley@nike.com>
Sent: Thu, 21 Aug 2008 4:33 pm
Subject: RE: Shoe 14-B OK to Knit?

Connie,

Thanks for the keen insight and experienced perspective, not to mention the great pep talk!

It's a little overwhelming to dive in so deep without some good grounding in the basics of what you're talking about below. In tackling an entire shoe upper, I'm definitely in over my head!

Bruce makes flat knitting look so easy, but the learning curve is surprisingly long and startlingly steep! *The more I learn, the more I realize how much more there is to learn. Most of all, I'm learning just how much of a wizard Bruce is!*

Hopefully Nike will be as patient with me as you suggest. I still wonder if more formal hands-on knitting classes taught by Stoll might be a good way for me to get more basic knitting experience, in a way that won't hinder Bruce's fantastic cutting-edge work.

Again, thanks for all the words of wisdom. When I'm back from time off I'll certainly take it to heart.

Vince

From: fabdesigns@aol.com [mailto:fabdesigns@aol.com]
Sent: Thursday, August 21, 2008 2:57 PM
To: White, Vince; Huffa, Bruce (ETW)
Cc: Dua, Bhupesh; Bangert, Don; Casillas, Tina (ETW); Shaffer, Ben; Hawkinson, Karen (ETW); Hensley, Shaun
Subject: RE: Shoe 14-B OK to Knit?

Vince,
This is Connie Huffa. Bruce is unavailable today. I see you are having some difficulty. Most of what you are describing are issues that can be resolved with a bit of practice and patience. Several of the issues you've noted I see here are things that are usually a balan ce of weight (take down), tensions on the yarn being stabilized better and a few issues of perhaps more conducive feeder placements, a possible small racking correctious and absolutely a few NP adjustments on your tucks and knits so that you have a compatible fabric arrangement where the yarn is not fighting the bending into the loop configuration. Monofil has a tendency to want to be straight - so, when you knit it into a loop it becomes a spring. Working with all these things at one time is very challenging and nearly impossible to take on all at once and get it right in one shot. My suggestion would be to isolate one issue at a time and then trouble shoot them - one issue at a time. For instance; Almost all yarn issues are down to how one strings up the machine.

You must realize that what you are trying to do is more difficult than what just about anyone else is doing at this moment in 3-D knitting. I have been knitting and engineering fabrics for more than 20 years, on all kinds of equipment from warp knits to circulars and just about everything in between. I still have some of the same issues you're describing he re. You need to work on the nuances of going from one take down to the next; loosening and tightening stitches, stringing up yarns and working with different tensions, as well as figuring out what NP's are appropriate for fabric compatibilities - plus a few=2 0other items of adjustment. A

hundred differenet variations of the same fabric can be made with just fine adjustments on take down, NP's, and knit and tuck variations of the same lay out. It takes practice, focus and patience with yourself, to figure out which set of variations is the one that sells the product :)

You wouldn't run a a marathon with out going through the necessary steps of working up to the distance, knowing your route and getting into shape. Nor would you fly a plane with out spending considerable time getting accustomed to your gauges and controls, maybe even taking some short hop flights before you circumnavigate the globe, right? :) Same here with getting used to all the fabric controls you have at your figer tips. There are 3 computers on that machine, each doing completely different things to regulate the quality of your fabric, the memory of your jacquard, and the timing of all those parts. Your needle bed alone has almost 5200 parts all working at the same time.

I understand that you have had considerable training already. My advice would be to go over your notes on the particular fabric that you're having the most difficulty with and start there.&n bsp; Check you yarn set up and the tensions on your monofil. Make sure that your take down is not to heavy or your will rip the needles right out of the bed. But do things one at20a time - rather than all at once. Good luck and just take your time and make lots of notes as to the things you've tried. This is unfortunately how we all learn. :) Connie

-----Original Message-----
From: White, Vince <Vince.White@nike.com>
To: fabdesigns@aol.com; Huffa, Bruce (ETW) <Bruce.Huffa@nike.com>
Cc: Dua, Bhupesh <Bhupesh.Dua@nike.com>; Baugert, Don <Don.Baugert@nike.com>; Casillas, Tina (ETW) <Tina.Casillas@nike.com>; Shaffer, Ben <Ben.Shaffer@nike.com>; Hawkinson, Karen (ETW) <Karen.Hawkinson@nike.com>; Hensley, Shawn <Shawn.Hensley@nike.com>
Sent: Thu, 21 Aug 2008 1:46 pm
Subject: F.E: Shoe 14-B OK to Knit?

=0 D
Bruce (and Team),

High hopes for knitting a Shoe 14 with the requested improvements in color were dashed this morning. Fight after fight with the machine. I just couldn't get the program to start correctly and keep going:

Area or Issue	Possible Cause	Proposed Fix
Various "start" difficulties – very odd	Incorrect "start" program?	Check for correct start, Shoe's vs. Nike's
6 ends of gray dyed yarn lacked tension	Not enough Primo's!	Go back to 75 dtex 2-ply blue yarn
Flywire in feeder #4 kept breaking &n bsp;	Poor manual clamping?	Learn a better technique?
	Inertia of spool?	Use friction feed wheels?
Monofil would get tangled in carriage	No tucks across to start?	Add tucks to keep monofil down
Cast-offs did not cast off orange yarn	Incorrect NP's in start?	Again, start with the correct start
Comic elastic didn't clear needles &n bsp;	Wrong clamp/release?	Fix all release/clamp cut settings

Bottom line, when I come back, I'd like to pick up on Shoe 14-B* right where I left off.
Seeing some fruits of my labor would go a long way in helping me gain some programming confidence!
A few observations and p ointers from a seasoned professional will also help me avoid more delays!

OK, it's off to the M&M lab for a tour. May you have a great productive week while I'm gone!

Vince

* Shoe 14-A was a feeble first attempt with misunderstood requests for a thicker monofil collar

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- Bhupesh requested me to at least continue a P.O. billing relationship with Nike for another 3 to 4 months to the end of 2008. The arrangement he created, proposed continuing the 40 hours work on Nike premises, with the spelled out weekly goals. I performed the hours he requested on the items he and the team requested and billed accordingly. We were told by Bhupesh that a new contract was not necessary for only an additional 90 days. But he had his assistant, Frances Hall, change our billing and payment terms. Fabdesigns, Inc. was then set up with electronic transfer.

From: Hall, Frances A. <Frances.Hall@nike.com>
To: Huffa, Bruce (ETW) (ETW) <Bruce.Huffa@nike.com>; fabdesigns <fabdesigns@aol.com>
Cc: Dua, Bhupesh <Bhupesh.Dua@nike.com>
Subject: Invoicing Procedure
Date: Wed, Aug 6, 2008 3:59 pm

Dear Bruce,

Below is the recommended Nike accounts payable procedure to use for submitting invoices.

1) Contact me by e-mail (cc: Bhupesh Dua) with the total number of hours you have worked and the time frame (i.e. 8/4-8/8/08).

2) I will create a purchase order and you will receive a copy.
3) Reference the purchase order number on your invoice
4) Send the invoice electronically to apaid@nike.com the Nike accounts payable e-mail address.

Kim Olson is the accounts payable representative that processes your invoice -- she has assured me that she will take care of your invoices immediately and they will be paid according to the N30 terms. As she indicated to you, she will gladly answer any payment questions you may have and you can call her directly at 503-532-2038. Going forward, I will give Kim a heads-up when I create a new purchase order so she will know to expect your invoice.

Your EFT request form and supporting documentation for electronic payments to your bank have been sent to the Nike treasury department today. It generally takes a couple of days to set that up. After the set-up is complete, you will receive confirmation as well as information about Global Advice (Bank of America's portal of payment information). The next invoice you submit to accounts payable will be paid electronically so make sure to reference the "submit payment to" (your banking information) on the invoice.

Please do contact me if you have any questions or concerns about the above.

Best regards,

Frances Hall
Advanced Materials Research
e-mail: frances.hall@nike.com
PH: 503-671-4499 FX: 503-532-4664

"Please consider the environment and don't print this email unless you really need to.

The information in this e-mail and any attachments is privileged and confidential, and is intended for addressee(s) only. Reading, copying, disclosure or use by anybody else is unauthorized. If you are not the intended recipient, please delete this message and any attachments, and advise the sender by return e-mail.

- At the end of 2008, the P.O. billing arrangement and his budget were supposed to end and I'd return to Los Angeles. I was also told that Nike was supposed to formally extend an offer of employment, at the position they repeatedly discussed ($150K on E band).
- Yet, at end of 2008, the knit platform still was not budgeted, I was told by Bhupesh. He asked if I'd do another 3 months. I continued into 2009, billing 40 hours on P.O.'s from Bhupesh, though my work week still averaged 60 to 75 hours or more - much of it going to work on this non dipping feeder idea. This feeder prototype that I'd pieced together in my studio, worked 80% of the time, and I continued trying to perfect it, minimizing the damages to the fabric and the machine.
- This P.O. working arrangement was verbally extended multiple times every three months into 2009 with the same promises of a platform lead position. Again and again, at the end of each subsequent 3 month interval, Bhupesh still contended that Nike still wanted to hire me at the position they planned for me ($150K on E band) but there was a hiring freeze.

- In the spring of 2009 I could not get the Stoll inlay feeder to work for a production worthy shoe. Nor could I get the standard feeder modification, (non-dipping feeder I'd Frankensteined with my own machine parts), to work consistently.
- With my machine in Los Angeles apart for my own business on a weekend, I drew a sketch of an idea of how to create an inlay feeder to get a structure fiber into a small area and respond to the timing of the machine.
- When I returned to Beaverton on the following Monday, I showed the 2D design of a feeder to Bhupesh. He could not understand why I needed a different type of feeder. He would not authorize any project money or hours from the weekly 40 he'd committed to in order to develop a feeder, and was not at all interested in it or knowing anything about it. He felt it was the machine builder's job to create such things and that Nike was not in the machine parts business.
- I knew this special feeder I had in mind was the key needed to create the structure in a fabric in a short area, as other inlay feeders from the machine builders that I had and tried, were designed for wider apparel and medical and could not work for what I needed the machine to do in such a small knitting space, at high speed, and with multiple colors. Therefore, with no support from Nike, I had **no choice** but to create my feeder design on speculation that it would work, and engineer it on my own time and at my own expense.
- The following month, I showed my dipping feeder design to Jason Badden who just happened to be visiting on a curiosity trip to the knit studio in Mia Hamm. Jason was from the Nike Pantry and I expressed how stupid this short sightedness was on the [Flyknit] technology and budget side, that I could not even get this tool prototyped, and that I was going to pay for it myself. He gave $2000 from the Pantry Budget, which he paid not to me, but to an outside third party to have it CNCd in Portland.
- I ran the resulting feeder in multiple sample to make sure it worked on Nike's machine and after couple dozen tests, I showed both the feeder and the swatches to Bhupesh. The first thing he asked was where I got the money from. I told him – don't ask, don't tell. He had no idea for several days and was very upset that the Pantry funded anything, and said it made him look bad. Bruce Kilgore also wanted Nike to have nothing to do with manufacturing feeders or machine parts.
- Throughout 2009, I continued to bill 40 hours on P.O.'s from Bhupesh, though my work week continued to average 60 to 75 hours or more. By the end of 2009, for every dollar that Nike paid me I was spending $1.35 to continue the two city relationship in support of this project. My feeder design worked exactly as I'd intended.
- I continued this 3 month interval verbal extension arrangement on monthly P.O. invoicing with Nike until April 2010, at which time my company could no longer support my absence from day to day business, and the apparel manufacturing entity needed to be closed out. Neither could my family survive the substantial reduction in income due to this Nike knit project holding me in Beaverton, limiting my time in Los Angeles to work on our own business, while absorbing all the extra time dedicated to meeting the Nike deadlines. The over extension of the relationship with Nike required my family to borrow to the limit on our home to continue financing the company overhead and living expenses with me gone. I had also missed birthdays, holidays, anniversaries, and life events for more than 2 years. I told Bhupesh and the Nike management that I either needed to leave to return to Los Angeles or they needed to step up to their continued promises.
- In June 2010, Nike finally put the contract, lease, mutual NDA into writing for me with the end strategy of Nike hiring me at the position they continually discussed ($150K on E band as head of their flat knitting program). My company business was suspended except for invoicing Nike; equipment was sold or put in storage, my machinery leased to Nike, and my family moved to Portland, cutting off all other income except this new contract.

This contract was specific in its' deliverables and scope to include Footwear only. **(See entire Schedule A prepared by Bruce Kilgore and Nike legal)**

SCHEDULE A

Description of Services, Deliverables and Compensation

This Schedule is hereby incorporated into, forms a part of, and is in all respects subject to the terms of, the Agreement. All capitalized terms not defined in this Schedule will have the meanings assigned to those terms in the Agreement.

1. Description of Services & Deliverables.

Throughout the term of this Agreement, Contractor will provide the following Services and Deliverables to NIKE:

- Execute the commercialization and successful launch of the Lunar Racer III for the SP/SU 12 season.
- Demonstrate flat knitting as an effective method of making basketball, running, and soccer products. Products must meet or exceed current performance standards. It is expected that this will drive a new (unique) visual presentation of NIKE products.
- Engineer the above products to be economically viable via commercially available equipment.
- Effectively manage and maintain the equipment required to achieve the program goal.
- Guide NIKE and its manufacturing partners in the evaluation, selection, and procurement of knit machinery to support development and production.
- Effectively manage and train staff associated with the knit program.
- Design/engineer patterns, structures, to create form fitting footwear products.
- Develop effective techniques for grading, nesting, and finishing footwear products.
- Work with internal product and materials teams.
- Work with key external resources (yarn suppliers, machine suppliers, etc.)
- Run pre-production trials to validate operation.
- Transfer products from development to production.
- Provide, operate and maintain at NIKE's Mia Hamm facility all of Contractor's business equipment (collectively the "Contractor Equipment"), including but not limited to the following.

- **From fall 2008 through May 2010 there was no written or signed contract for service agreement to develop a knit shoe or product line between Fabdesigns, Inc. and Nike. This was a verbal 3 month, budgeted P.O. and billing cycled for 40 hours per week – Monday through Thursday, plus travel expenses and accommodation. I was NOT reimbursed travel time, meals, or any other hours, resources, materials, out of pocket expenses, or for any knitting, parts, materials or machine ideas done on my own time, beyond the meticulously documented 40 hours per week that Bhupesh would agree to budget toward the knit shoe project.**

- 6 to 8 months after signing this June 1, 2010 contract with Nike, (Nov-Dec of 2010), both my wife and I were approached by third party recruiters using the exact job description written into my contract/offer.
- In about the same week I was trying to settle this platform position with Bruce Kilgore, Bhupesh, and Nike's management (Mike Donohue), I was also signing the patent on the feeder I'd created in my own time, with Byron in Nike legal.
- A short time later after signing the feeder patent, I was told that the written employment offer from Nike that was part of my June 2010 contract ($150K on E band as head of their flat knitting program) was subsequently withdrawn.
- When I approached Bhupesh Dua and other Nike management, I was subsequently told Nike was hiring someone else for this lead position as knit platform lead as well as several others in a flat knitting department as programmers, and that if I wanted to work for Nike, I would need to apply for a job at Nike on line with the rest of the world's

applicants, for positions that were less than half the salary, less experience, and no managerial scope other than a simple knit programmer. I was told it was a formality. So I applied. I got a response back that I wasn't qualified for even a programming position in the platform. Yet, Nike went on to hire lesser qualified non-US citizens for all of these positions except the director of knitting position, which I was told went to an internal person who was up for a promotion – Steve Wright. Great person but has no idea about knitting. Many of these other lesser qualified 'world applicants' that were hired did not even have green cards.

From: Human Resources <human_resources@invalidemail.com>
To: brucchuffa <brucchuffa@aol.com>
Subject: Knit Innovation Director-054463 at Nike, Inc. including its affiliates
Date: Mon, Apr 4, 2011 5:09 pm
Attachments: cc_message_cn_html.htm (2K)

Dear Bruce,

Thank you for your interest in the Knit Innovation Director opening. The information provided in your application will be compared with the requirements of the position. Please understand that due to the large volume of applications we receive, we are only able to respond to internal candidates and those external candidates who best match the qualifications of our openings.

Nike values the global diversity of our employees, athletes and customers. We are committed to equal treatment of all qualified individuals. It's our policy to remove barriers to employment opportunities and ensure that access to jobs is strictly based on job-related factors.

We elevate our performance through our constant search for diversity. Not by looking for things that make us different, but by looking for things that make us better.

Thanks for taking the time to apply. We do appreciate your interest.

Sincerely,

Talent Acquisition
Nike, Inc.

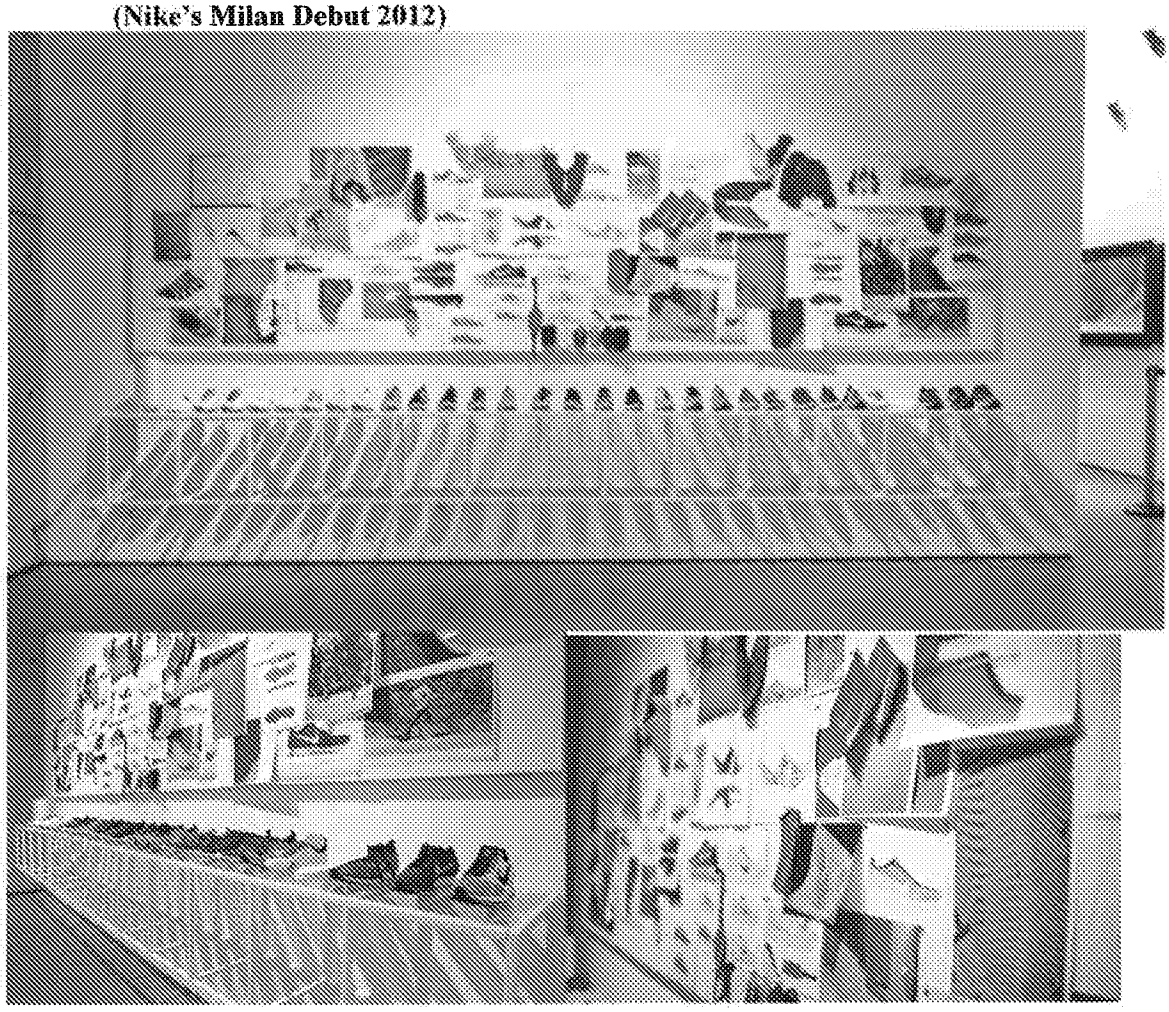
Replies to this message are undeliverable and will not reach Nike Talent Acquisition. Please do not reply.

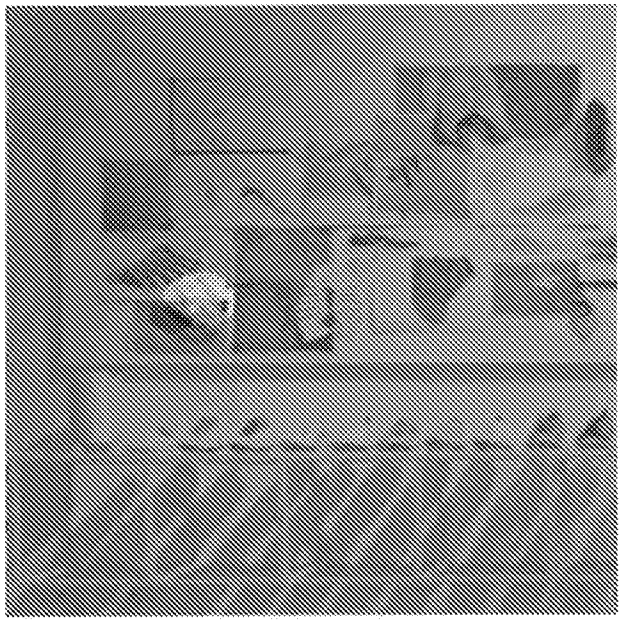
- I finished out the contract for Nike to the end of its' planned one year term – May 2011, did not extend it further, and moved back to Los Angeles to avoid bankruptcy for both my personal and business finances.

Example: As we previously discussed on your visit, I also created the inlay combination feeder design and engineering on my own time because like this stroble, the soccer ball liner and other structural 3 D knit items I created, Bhupesh could not envision what I was talking about technically. (It's probably not his fault, this is highly technical and likely not his expertise.) And when I showed the 2D design of a feeder to Bhupesh, he still could not understand, would not authorized any project money or hours from the weekly 40 he'd committed to in order to develop a feeder, and was not at all interested in it or knowing anything about it. He felt it was the machine builder's job to create such things.

It was clear at that point Nike had limited knowledge of flat knitting at that particular time, no real idea of technical flat textile modifications for machinery or materials, and desperately needed enlightening on the subject for others at Nike, beyond Bhupesh, to understand the potential of a flat knitted shoe with structure, not just a knitted shoe that would last one or two selling seasons as the original understanding of the March 2008 Nike 'knit shoe' design brief.

(Nike's Milan Debut 2012)





http://insidethesneakerbox.com/wp-content/uploads/2012/04/DSC_8562-e1334614458856.jpg

This is the EXACT same swatch to which Byron had to correct the patent, as Bhupesh had placed his own name on it as sole inventor. This filing was amazing and disturbing to me considering that Bhupesh wanted nothing to do with adapting the machine for any reason (worrying about warranties), didn't want to see it, contributed nothing to it, knew nothing about it until it was completed, and it was designed, created, and completed entirely off site, adapting my own machine, on my own time, at my own risk, with my own resources.

Nike's entire investment in the inlay concept and the development of this (above) highlighted swatch from Nike', which was the birth of the Flyknit, was **$0**. Bhupesh's response to Byron why he put himself solely on this patent, was that, 'he always wanted a knit shoe.' It also took Byron a considerable amount of time to get Bhupesh to admit that I was the actual inventor of this patent. Byron explained to him that the patent would be invalid without my name on it, as would every other future patent that references it. It also took until June 2010 to get my name added to this patent, many months after Bhupesh finally admitted to Byron that I had been the one who invented this concept in our December 2009 meeting with Byron.

Nike's entire investment in the combination feeder was Jason's $2K from the Pantry to the outside CNC company to help make the dipping feeder more than a year later (March 2010. Nike had been using the feeder I created with parts from my own machine and brought in to make the inlay feasible on that make and model machine series.

Bruce Huffa

From: Badden, Jason
Sent: Thursday, February 18, 2010 1:33 PM
To: Huffa, Bruce (ETW)
Subject: Re: send info

Bruce , great to meet you today ! I will jump all over this part and hopefully have something for you late next week ..

Thanks > Jason Badden < 503-532-7143
Designer Kitchen

On 2/18/10 1:11 PM, "Huffa, Bruce (ETW)" <Bruce.Huffa@nike.com> wrote:

Bruce Huffa
Nike, Inc.
One Bowerman Drive
Beaverton, OR 97005
Tel: 503-532-4384
bruce.huffa@nike.com

Without this (above) prototype and Jason's $2K dollars from his budget in March 2010 that was paid to the CNC, the entire Flyknit project would not have used any cables what so ever, because it was not financially or productively efficient, and it would not be the functional success and building block that it is. It would just be a "knit shoe" as the

original Nike project design brief called for in 2008 **(51-3764 Figure 14A)** and the 40 hours per week on premises would have produced.

ONLY after seeing my physical 'frankensteined' feeder configuration work and the original swatch on his desk in fall 2008, would Bhupesh authorize P.O. money to go forward refine the inlay concept aesthetics for Nike. Bhupesh would not reimburse me for my obvious extended amount of time and effort in creating the feeder and proof of concept swatches. And even after the combination feed was actually built without his knowledge and running, he would not accept my feeder until he took my IP to Stoll to ask their opinion.

The second white and black swatch, just to right of the highlighted swatch, in the above photo, I had completed within a day or so of showing Bhupesh the original inlay proof of concept from my studio and it is in the exact format of what was given to Ben Schaefer to help build the aesthetics to kick off the Flyknit design. The white yarn, and black thick yarn came from my studio, because Nike had no materials in Beaverton to work with. I even had to supply the vendor contact and yarn specification. **This** is the origin of Flyknit.

I contributed the monstrous quantity of hours, all these extra innovative development items, including the feeder design to Nike's project, in good faith because a well-spelled out career opportunity, in terms of a set salary and scope of heading up the entire 3D knit platform of innovation with Nike, was promised to me consistently for 3 years by Nike management from March 2008 onward and subsequently put into writing in 2010.

I was not looking for royalties and understood that my ideas might be incorporated or not, and that if so it would be royalty free. I used every bit of energy and know how that I could, on and off the clock, in building what I anticipated was an exciting and mutually beneficial future to revolutionize knitting and take Nike to the forefront of a technology it hadn't tapped yet. It was extremely exciting, highly creative time for me as a cutting edge knitting engineer to know that my innovations would actually be made into some 'cool' products. I did not expect the wording in these patents to contradict the 2010 mutual NDA agreement as much as they do.

So, in all truth and sincerity, I have not received ANY valuable consideration or any benefit for these and several other items That I brought in that preexisted the Nike relationship, work I completed in my own time, at my own expense and without resources for Nike, other than my name on a patent, and in some cases, not even that much. And in all cases having to share functional inventor ship with people, who's only contribution was finding the finished swatches, shoes and other items in my hand on Monday morning. They should have been on separate design patents if at all. To say I was disappointed in not leading the knit platform as promised for 3.5 years, was an understatement at the time in 2011.

What's done, is in the past and we do not wish Nike any ill will what so ever. Nor, do I still desire to be a full time employee of any company. Today, my family is financially stable once again; we prevented bankruptcies, though the apparel business is gone at a huge financial loss that we are still paying on debt.

I am thrilled to see how well the Flyknit is received globally. As we told you and Eric upon your visit, we put a tremendous amount of effort, endured hardships, and extreme

personal sacrifice for the project, far beyond the hours for which we were compensated. To any true inventor, seeing the product grow and be so well received by athletes, wannabe athletes, the design world, and our own knitting industry as revolutionary is tremendous in our opinion. We are just now more prepared to quote projects better, should Nike require my help in the future, and not subsidize a billion dollar+ company.

We have been respectful to our agreements with Nike, support Nike whole-heartedly in their efforts to defend Flyknit, have remained loyal, and will continue to do what we can to protect Nike's interests. I have no issue with Nike using my invention(s) in shoes as intended, since it is already out there, and what was originally intended when I agreed to help Nike in 2008.

I can't sign these agreement documents that says I created this as an employee, for hire, received any valuable consideration or enjoyed any benefits, – as this is not the case. Nor, will I agree to sell, assign or transfer anything that is subject to my IP pre-ownership in the mutual NDA – royalty free use is suggested. This includes all the off the clock work, materials, and resources that I was never paid for, and for which Bhupesh would not agree to pay even after shown my viable prototypes, yet he still incorporated them freely into Nike products, prior to the effective date of that Mutual NDA- June 1, 2010.

It must also be noted that the combination feeder that I designed is make, model and series specific. It is not applicable to other machine brands; is captive to operate ONLY on Stoll models TC and HP. It is specifically programmable only on Stoll CAD system M1+ and not retrofitable to previous generations of machinery and CAD. Nor is it applicable to the new Stoll ADF machine which was launched two years ago by Stoll. Nor does any Nike product use the special 'combination' features I built into this feeder beyond inlay and close parking, which effected optimal production efficiency.

As for 51-3279 other wise known as 'monofilament, intarsia with inlay'

I have no issues supporting Nike in defending this article of footwear.
My concerns are:

- pre-existing IP that is Fabdesigns, Inc.'s, and which is incorporated into the shoe royalty free.
- The agreement page does not pertain to me as noted previously
- patenting in to other markets where these techniques are already in existence and we can not support that effort.
- pre-existing IP that is Fabdesigns, Inc.'s, and which would be incorporated into other than footwear. We can not support that effort, in direct contradiction to our Mutual NDA of 2010.
- Anatomical mapping and knitting to zones already exists in other markets. Suggest footwear only wording.

The monofilament applications described in this document are stitch techniques that I have used for many years prior to my relationship with Nike. These are techniques that I taught Daniel Podhajny, who had never used monofilament before he came to the Nike project. It was brought to Nike prior to Dan joining the Nike knit team the first time.

[0003] ". . . By decreasing the number of material elements utilized in the upper, therefore, waste may be decreased while increasing recycleability of the upper."

Cradle to cradle technology was suggested to Nike for this knit shoe project on the initial consultation with Fabdesigns, Inc. as we had recycled yarns and fabrics in house and showed the swatches to Bhupesh in January of 2008. These were/are commercially available materials, off the shelf from Unifi, which we were using for an initiative for a different apparel project. The concept was to use as little material as possible, having that materials already being recycled, and able to be recycled yet again. This is a 'green' concept we've also brought to automotive consumer products and several other industries. It is a marketing point in our opinion, not a patentable claim. I can't see reasoning to support recycleability as a patentable claim. But I absolutely support the concept if you can help clarify.

We brought this integrated knitting concept of a unitary knit to shape component to Nike and taught Nike how I proposed to adapt it to a shoe format and create an integrated structure, knit in one piece, with as little material as possible, and as efficiently as I could possibly get the machinery to function. Nike did not invent this manufacturing process.

The fact is, I created a complete 3D knit manufacturing platform for developing and mass producing structural and anatomically correct knit shoes and train the staff at Nike to program, QA & QC production best practices on an exponential scale suitable for the anticipated size of this entire project. Plus create lean and sustainable best practices in development and production to minimize materials and waste and optimize efficiency throughout the process.

Again, I have no issue with front page of the patent. The agreement document that says I created this **as an employee**, received valuable consideration and enjoyed benefits – as previously noted, this is not the case. Nor would it be reasonable that I'm selling, assigning or transferring the technique, other than royalty free. The monofilament and original knit downs were from my apparel studio, on my time. I've seen this already in the medical industry and used it many times in medical and aerospace applications. The origins of this inlay intarsia monofilament predate the Nike relationship by several years.

[0005-0007, 0044, 0045] This specific technique was in our line of clothing, and used frequently in projects predating our relationship with Nike, in very much the exact same state as is stated in this patent. The monofilament and the fusible used at Nike were materials that I brought in from my studio shelf and taught Nike how to use them in combination with a tensile element. This monofilament is something we've used, as others have on many other types of flat knitting machinery, in aerospace applications, apparel, trim, medical applications, home furnishings, and several other fabrication that need flexibility and strength. We've used it as reinforcement and 'see through' intarsia regions in many fabrics (mixed in combination with other stitches such as 'stain glass', which we showed you when you were here) before our relationship with Nike existed and since. We, as well as many others before us, have also used the same principle in medical products for the foot where the monofilament is an elastic, which exerts compression, stretch in one direction, but not the other which has a rigid yarn. This is a common technical stitch in many markets, specifically medical.

This stitch, like many others we discussed on your last visit, may be new to Nike, but it is not new to the knitting world – and should not be new to anyone on your knitting team if they were being completely honest. This public domain stitch technique is why we say this should be a copyright or a design patent.

Common example of [0057, 0059, 0060]: I brought monofilament padded zoning (mock quilting) and this monofilament intarsia stitch in swatch, cones of yarn, and finished article form with my label to Nike along with many which Bhupesh Dua then borrowed from our studio and kept at Nike for several years. This particular monofilament, intarsia, with inlay technique along with other type of combination techniques using monofilament spanning color changes, including transfer jacquard, and multi-jacquard joins was developed on my own time and independent of Nike resources and has been used on my own products as well as for many other clients in medical, aerospace, architectural, and other related over nearly two decades. It's a common practice in providing structure, counter stretch, and aesthetics.

(Below – popular 2003 to 2005)

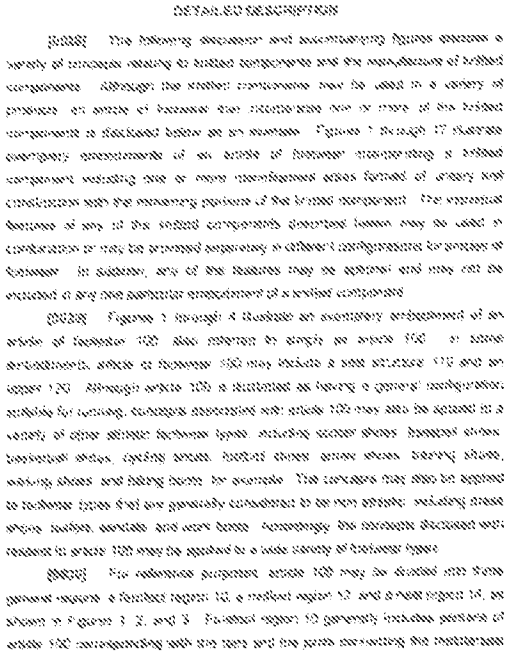


We brought 25 plus years of knitting technology in machine builder swatches, yarns, our own work, and new materials like this monofilament to show Nike's team the possibilities and capabilities of the machinery. I shared this library of inspiration materials for demonstration purposes, as did the machine builders who we visited together. This technique was also part of the CAD stitch library I left at Nike.

[0008] I am very concerned about Nike patenting this technique beyond footwear. In our opinion it would put Nike at risk in other industries.

We've seen it at Steiger flat machinery, which has its' own special inlay feeders and is well known in the medical industry for inlay intarsia with monofilament elastics for use in orthopedics which need to immobilize joints and flex in other directions. In my professional opinion: claiming this use of monofilament inserted in the way this document does is almost akin to claiming a Fairisle, mesh, argyle, or Aran stitch or other generic off the shelf technique that the machine builders already show in their libraries, and just applying it to a shoe.

[0028, 0036, 0041, 0042] 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 used in a variety of products. . . article of footwear . . . as an example."

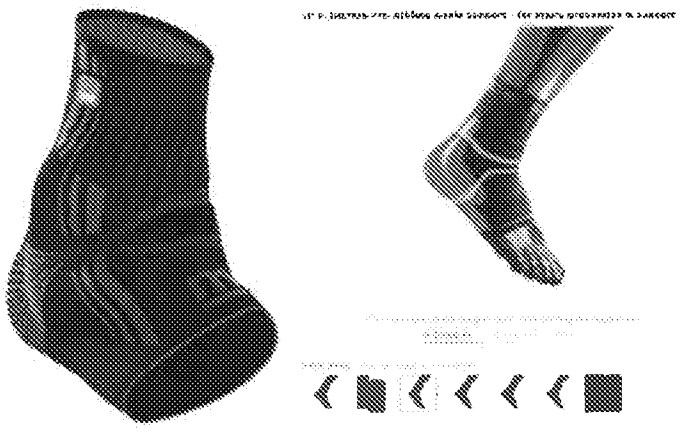


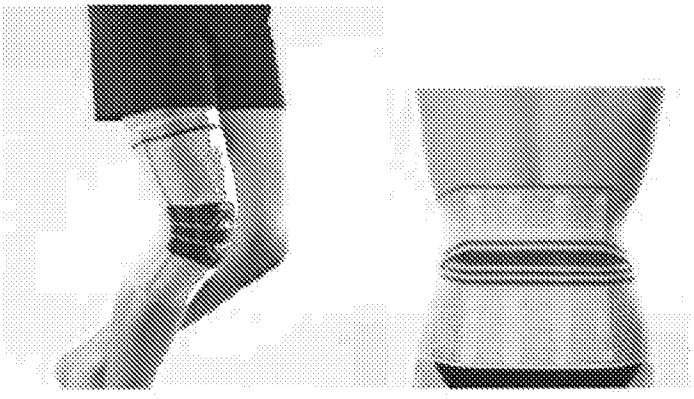
This technique we brought to Nike. Also per our 2010 mutual NDA, Nike has a duty to protect our IP 'as it would its' own.' It might appear that extending the scope of this patent by reaching into other markets beyond footwear as this document does, and into other industries where we currently do business, would harm Fabdesigns, Inc. rather than protect. Further, we also advise that the reaching into other markets where 'inlay of monofilament' processes already have existed for decades, may put Nike at risk. We can not support Nike into areas beyond the scope of footwear.

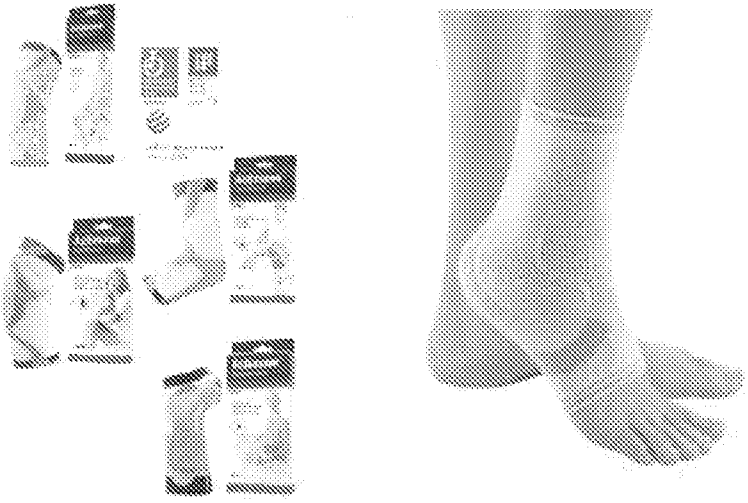
Therefore I can't sign a document that sells or assigns this technique, prevents me from using inlay in other technical projects, or requests that I assign public domain techniques that already exist in other industries, but are just now new to Nike.

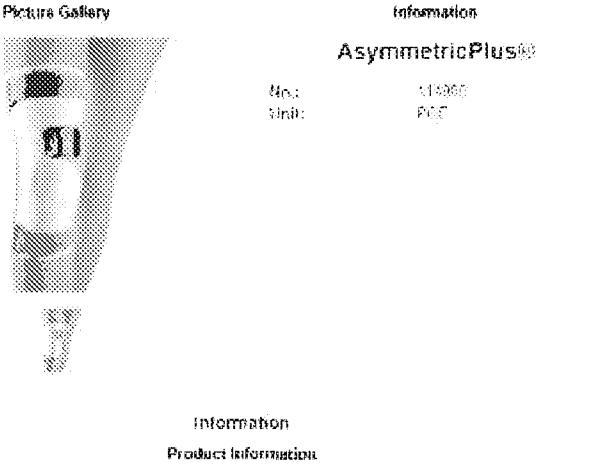
Examples: We suggest that the focus of this patent be footwear only as this technique is very common for example in flat knitted medical bracing.

[0038] Others in the industry, using this monofilament inlay intarsia technique, (that I did not develop), and which have been common practice and commercially available for feet for quite some time: Bort, Bauerfiend, BSN (Jobst) among others. Intarsia inlay on flat machinery and the monofilament that they are talking about is an elastic monofilament that wraps around the foot just as described in this patent. Some used in ankle, joint and other orthopedic products as well as lymphedema flat knitted hosiery, where a tensile yarn is used for the heel as reinforcement.





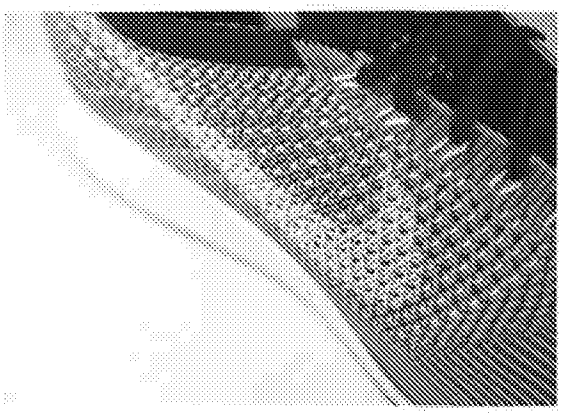




This product from Bort uses 'integrated filaments (like the Nike cables), but sculpted around the knee area. They are inserted into the knitted fabric at the time of manufacture with an inlay feeder on the Steiger flat machine and adjusted with those external straps. Likewise the BSN product above has lateral and medial inlay intarsia arrangements that are size and left or right specific. Many have body mapped anatomical monofilament inlay patterns that are proprietary.

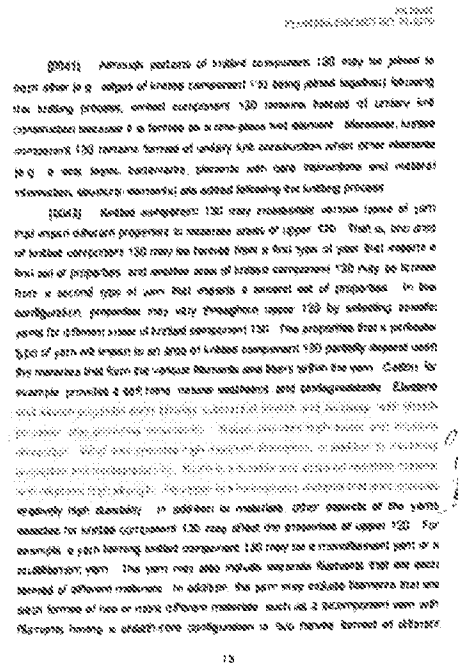
[0038] In medical flat knit braces and compression hosiery the exact size of the monofilament is specified in the UK, French, and German RAL standards to deliver a specific performance to zones of the product.

[0038, 0039, 0040] Incorporating this monofilament technique was created in this specific manner prior to Daniel Podhajny joining the Nike knit team.

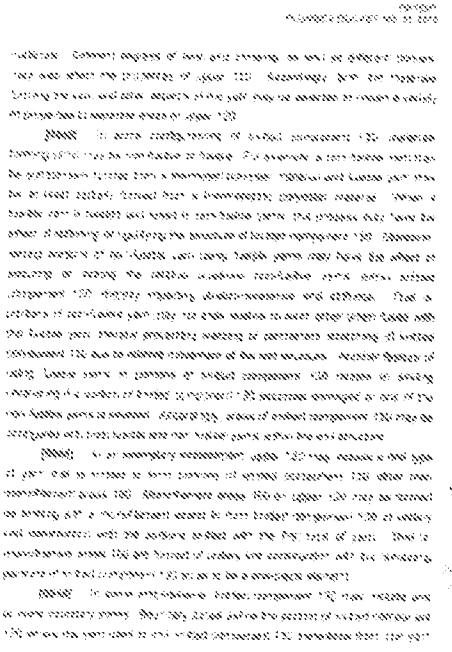


Shoe on display at Milan 2012

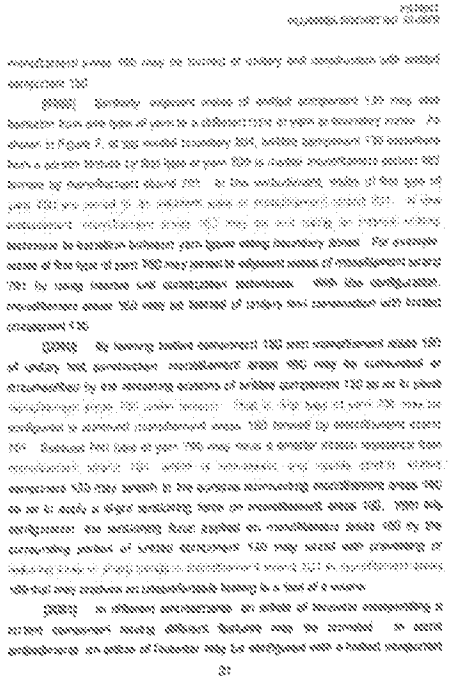
[0042 through 0057] This document needs to focus on footwear only. See highlighted areas.



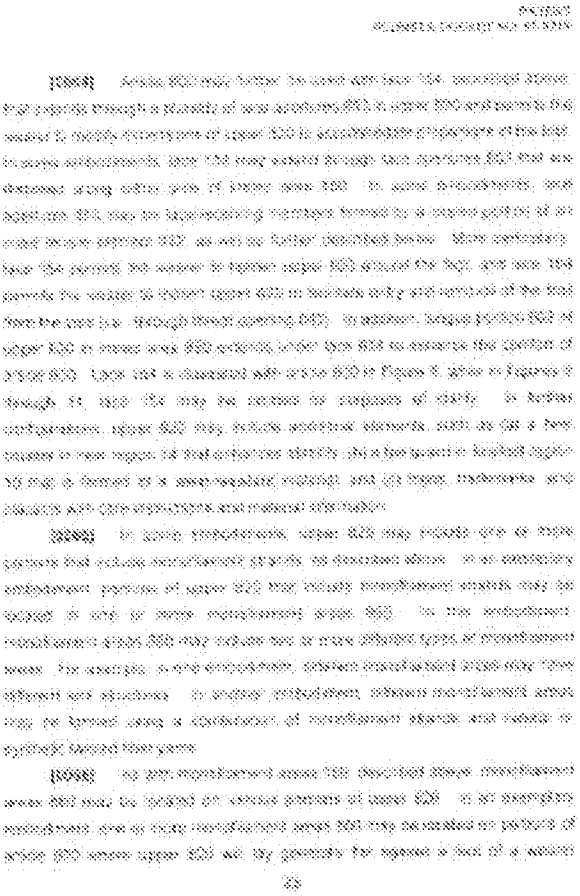
Engineered yarns and knitting them into zones already exists in many categories of knitted products. This is generic knitting 101 information. This would be embarrassing to defend this as an innovation or claim for Nike beyond footwear. Engineered yarns may be new to Nike, but aerospace, medical, military and fashion as well as automotive have been utilizing these techniques in 'zones', layers, by yarn blocking (just like color blocking in jacquards). There are too many examples and samples of these yarn mapped products from the machine builder and other industries to list here.



[0060] This is what I taught Nike's team in how to properly knit monofilament into a shoe fabric – specifically how I taught Daniel Podhajny to knit monofilament. This is not innovation and was not invented or perfected at Nike. Much of this is also common sense and a waste of a paragraph – like knitting 101. I would protest that Dan invented this claim as would the entire technical knitting industry. The machine builder sells tensioning devices to make all these adjustments automatically in the knit CAD program specifically for monofilaments and technical yarns.



[0065, 0069, 0070] This technique was not invented at Nike, but was brought to Nike and predates Daniel Podhajny joining the Nike knit team, including the directionals in 0070.

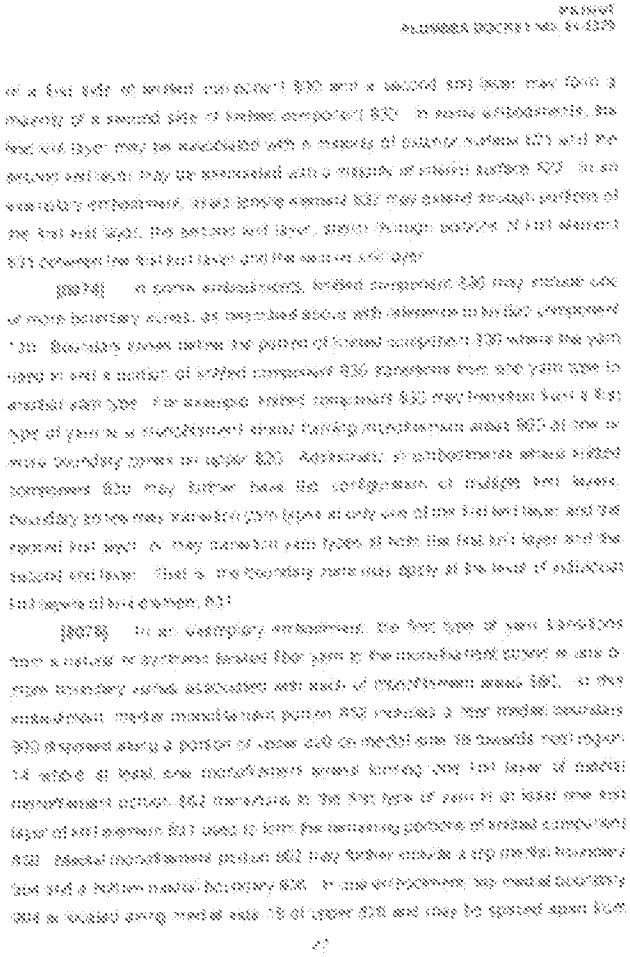


[0071 through 0079] Heel filaments that radiate from the lace area for tensile strength with a series of directional wedges which is also spanned with monofilaments and fusible. The filament technology that spans the instep to the meta-tarsal predates Daniel Podhjany joining the Nike Knit team and was in many of the original shoes that used my inlay techniques. However, what is also not new is the arrangement that wraps **around** the heel and is left/right specific to orientation. I explored seam placements on all parts of the foot and built many shoes in 2008-2009 with this seam orientation prior to Daniel Podhajny joining the Nike team (the first time), including this exact inlay tensile strategy. This arrangement and many of the other seam placements were suspended and placed in storage box and on the Mia Hamm sample wall we discussed on your visit. This seam arrangement and cable orientation were tabled due to the orientation being inefficient on the machine; the seam being not as aesthetically pleasing to marketing, and consumer safety concerns of rolling the ankle if the seam were to fail. I would protest that Dan invented anything on this shoe functionally. This should be a Design patent where he arranged existing stitch technology, using my IP in a 'paint by numbers' zone mapping (in my original template that included the cables) as I showed you was possible on the CAD software. Specifically **[0074]** should be shoe/footwear specific. This monofilament application existed prior to our relationship with Nike.

- I would not support Nike taking this cable mapping technique that I created on my own time, prior to my relationship with Nike, into other industries beyond footwear – per our mutual NDA of 2010.
- I would not support Nike taking this cable mapping technique, combined with more of my IP in the stitch techniques, into other industries beyond footwear - – per our mutual

NDA of 2010. I already have used this in many other industries from medical to aerospace pre – Nike relationship. Variations also exist at machine builder libraries.

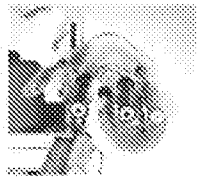
- I would not support Nike taking this cable mapping into industries where it already exists, placing Nike at risk, as well as my industry integrity.



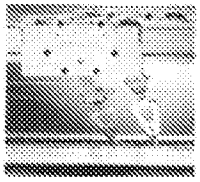
[0080 through 0087] This two layer description is actually technically described as 'plaiting' in **[0087].** This is a very common stitch technique that creates a surface, and an anterior face with a totally different yarn. This is one of the original techniques I brought to Nike, by bringing in the special order 'plaiting feeders' from my own machinery in Los Angeles. Nike borrowed them for 3 years as well as my tension devices. The wording in this area of the patent needs updating to proper terminology. 'Layers' in cut and sew footwear already exist. **(Brochure 1999 below)**

Equipment *for your personal requirements*

A range of special attachments are available for the Stoll CMS range to help you improve knitting economy even further and solve special production requirements.



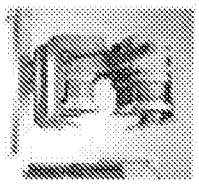
Stoll feeder feed wheel



Intarsia yarn feeders



Plating yarn feeders



Storage feed wheel 180 holes

Plating feeder

Special order equipment, showing plaiting feeder, third from left.

[0088 through 0094, 0099, 00100 through and including 00110] is also intarsia yarn mapped in Zones. This was done in many previous shoe designs and machine tests. The 'ventilation'

benefits of this fabric are already existing in flat knit medical products, using inlay monofilament and venting the patella, popliteal, under arms, and other regions of high heat, wound care, and sweat but need structure; military – helmet liners are one example. In some products fusible is also use simultaneously. The particular stitch used and described is IP I brought to Nike.

[0095] US Patent Application Publication 2012/0233882 And article of footwear with and integrated knit tongue - CROSS-REFERENCE TO RELATED APPLICATIONS

> **[0001]** This application is a continuation-in-part of co-pending U.S. patent application Ser. No. 13/474,531, entitled "Article Of Footwear Incorporating A Knitted Component With A Tongue", filed on May 17, 2012, which application is a continuation of U.S. patent application Ser. No. 13/400,511, entitled "Article Of Footwear Incorporating A Knitted Component With A Tongue", filed on Feb. 20, 2012, which applications are hereby incorporated by reference in their entirety.
>
> I don't believe I have these copies, and have not reviewed any of these claims.

[00109] The stitches identified are not proper knitting terminology. There is no such thing as a mock mesh. The wording in this area of the patent needs updating to proper terminology.

16. **[00111]** The concerns we have with this patent are the reaches into other market and products beyond footwear where our own IP will be incorporated without our knowledge and permission. This may also preclude us and any of our respective clients in these other industries for using our own know-how. Per our mutual NDA of 2010 we request that our IP continue to be respected and incorporated into footwear only as agreed. This patent incorporates both a new 'silhouette' for the techniques we brought to Nike to be arranged and combined in any manner desired for any market or category. Though much of the stitches that were combined – specifically the monofilament, plaiting and collar padding were IP we brought to Nike from our own library, swatches and work done on our own time, with our own resources, with no compensation from Nike. This is IP I brought to Nike. I would not support Nike beyond footwear and would lodge protest based on mutual NDA agreement.

Fig 16B is already existing in the medical industry.
Fig 17 already exists in other industries. This is common, generic and inherent in knit technology.

Claims – Page 43

1. Suggest this be focused on an article of footwear. Claims in #1, sentences 2, 3,4 already exist. These are generic statements and describe the general knitting of a yarn with ANY monofilament. If this is incorporating the technique I brought to Nike from my own technical library then I object to it, beyond footwear.

17. Claims in #16, sentences 2, already exist. This describes plaiting. This is a general stitch already existing in knitwear for many decades. I would not support Nike beyond footwear. Claims in #16, sentences 3, already exist. This is IP I brought to Nike. I would not support Nike beyond footwear and would lodge protest based on mutual NDA agreement. Claims in #16, sentences 4, already exist. This is IP I brought to Nike. I would not support Nike beyond footwear and would lodge protest based on mutual NDA agreement.

37. Claims in #37. Claims in #37, sentences 2, already exist. This is IP I brought to Nike. I would not support Nike beyond footwear and would lodge protest based on mutual NDA

agreement. Claims in #37, sentences 3, already exist. This is IP I brought to Nike. I would not support Nike beyond footwear and would lodge protest based on mutual NDA agreement.

Here are a few other industries where monofilament fibers are already used.

Textile material made of woven knitted fabrics
EP 0655095 B1
Used in car seat covers since 1996 – with mono filaments

http://architype.org/product/lama-concept-holoknit-textile/
architectural – holoknit – (Intarsia monofilament inlay knit – photo looks like a warp knit but could be made on flat bed equipment)

I could spend more time than I already have finding more examples, but I don't want to waste any more of my time than I already have. This list is not exhaustive and requires much more due diligence to research properly for Nike's protection.

As for 51-3214 otherwise known as 'adjustable Knitted Portion'

I have no issues supporting Nike in defending this as an article of footwear only.
My concerns are:

- Agreement page does not pertain to me as noted previously. pre-existing IP that is Fabdesigns, Inc.'s, work performed on our own time, with our own resources and machinery, which incorporated into the shoe royalty free. This was unpaid work, done in my own time, - no valuable consideration received. Suggest royalty free or such wording for footwear only.
- pre-existing IP that is Fabdesigns, Inc.'s, which would be incorporated into other than footwear. Using this technique beyond footwear This is considered our IP under 2010 mutual NDA agreement. We have used this stitching technique of inlaying single or multiple threads between to as a closure and securing technique many times in a **[0032]** ". . . variety of shapes, sizes, and characteristics . . ." prior to our relationship with Nike.
- patenting in to other markets where these techniques are already in existence and we can not support that effort. This is IP I brought to Nike. I would not support Nike beyond footwear and would lodge protest based on mutual NDA agreement.
- [0056] US Patent8490299 B2 - 2008/ 0110048 I respectfully decline to acknowledge that Bhupesh Dua had anything to do with this patent and refuse to perjure ourselves in continuing to reinforce what has felt to us, intellectual fraud. This is the same patent that arose from MY original inlay swatch to which Byron had to correct the patent, as Bhupesh had placed his own name on it as sole inventor. I immediately protested it **(11/2/2009)** and insisted on speaking further with Nike legal to discuss (again with Byron). I further will not support efforts to take this is IP I brought to Nike to other markets. I would not support Nike beyond footwear and would lodge protest based on mutual NDA agreement.
- US Patent application 13/781,336 does not exist. Vertical inlay tensile element. I would not sign this as I already have done two strands of vertical inlay this for medical foot applications prior to this non-existent patent application. I may have shown you the swatch on your visit. One vertical inlay will not provide any structure to a shoe – purely decorative purposes. The **figure 7G of 51-3345 is inaccurate. It is NOT a vertical inlay. It would be a horizontal inlay because of how the knit shape is formed. The**

Nike shoe is comprised of knit to shape wedges, zones and complex knit dimensions that would make this absolutely impossible as a vertical inlay. Direction is completely 90 degrees wrong. Secondly, the technology is not there yet to create a vertical inlay in a knit to shape shoe. I am working on perfecting it with a machine builder. Even though I can and have created vertical inlay in a knit to a shape very similar to a shoe format, (I HAVE ALREADY CREATED MULTIPLE VERTICAL INLAYS IN A SHOE-LIKE FORM) the software is not reliable yet to produce it consistently. Specific machinery and complex adapted machine accessories are also required. Nike doesn't have them yet, as the machine builder doesn't have them yet. Without jeopardizing my project's current IP further, **I assure you that vertical inlays do not and can not look like figure 7G in a shoe.**

- Front page is fine.

Inlay has been possible on many makes and models of machinery for decades. This particular technique we have used with an elastic inlay yarn and created smocking to gather in the bodice of a garment, sleeve closures, waist bands, aerospace applications, medical, military applications, and has been incorporated into many other technical knit products before, during, and since our relationship with Nike commenced.

[0079-0083] Per our 2010 mutual NDA, this adapted adjustable inlay cable technique for a closure system is for use in footwear only, because we developed the system entirely on our own, with no Nike resources, is for royalty free use by Nike in footwear only. Any other use by Nike requires permission of Fabdesigns, Inc. This was unpaid work, done in my own time, with our own resources and at risk to our machinery - no valuable consideration received. Also per our 2010 mutual NDA, Nike has a duty to protect our IP 'as it would its' own.' It might appear that extending the scope of this patent by reaching into other markets beyond footwear as this document does, and into other industries where we currently do business, would harm Fabdesigns, Inc. rather than protect. Further, we also advise that the reaching into other markets where 'inlay' processes already have existed for decades, may put Nike at risk. We can not support Nike into areas beyond the scope of footwear.

Therefore I can't sign a document that sells or assigns this technique, prevents me from using inlay in other technical projects, or requests that I assign public domain techniques that already exist in other industries, but are just now new to Nike.

[0086-0096] US patent 13/048,527 - 2012-0234051 "Combination feeder for a Knitting Machine". This feeder does not use the combination knit and inlay in this knitted component. It uses the inlay feature only. Inlay has been possible on many makes and models of machinery for decades.
Also this feeder is specific to a Make and Model of Stoll knitting machinery. It is applicable only to 330 TC, 530, and 530 HP machinery, and programmable with M1+ software only. It is not retrofitable to older machinery, not programmable with older CAD, and is not compatible with newer technology – 530 ADF, or other brands of flat knitting machinery. It was also designed on my own time. This was unpaid work, done in my own time, with our own resources and at risk to our machinery - no valuable consideration received. Also per our 2010 mutual NDA, Nike has a duty to protect our IP 'as it would its' own.' It might appear that extending the scope of this patent by reaching into other markets beyond footwear as this document does, and into other industries where we currently do business, would harm Fabdesigns, Inc. rather than protect. Further, we also advise that the reaching into other markets where 'inlay' processes already have existed for decades, may put Nike at risk. We can not practically support Nike in patenting inlay into areas beyond the scope of footwear.

Claims: I support these claims for footwear applications only.

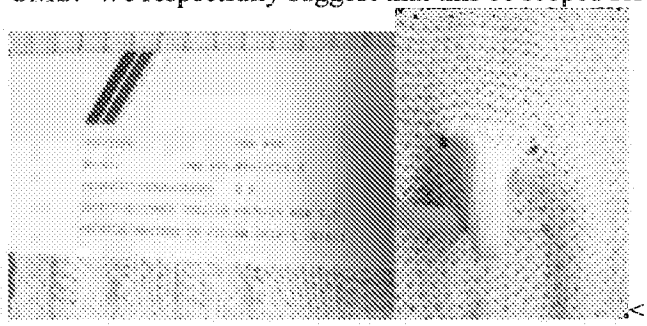
As for 51-3209 otherwise known as 'knit component'

Front page is fine. This was paid work, done for hire. Adapting a knit and wear appendage to be used as an integrated tongue. Also integrated our knitting techniques for padding.

- Main concerns: Agreement page objections as previously noted.
- Claims cover 3 D knitting / whole garment (unitary integrated knit component) technology in many markets as previous noted and objected
- I respectfully suggest that these claims be focused and specifically scoped to reflect the types of footwear agreed to in our mutual NDA of June 1, 2013 Schedule A, deliverables, as previously noted. Any other use requires our permission. We can not support Nike reaching into these other product markets.
- I can not comment on cross referenced patents to review application or relevance if I have not reviewed the patent claims referenced.
- Who claimed inventorship of this? Is this an Add on?

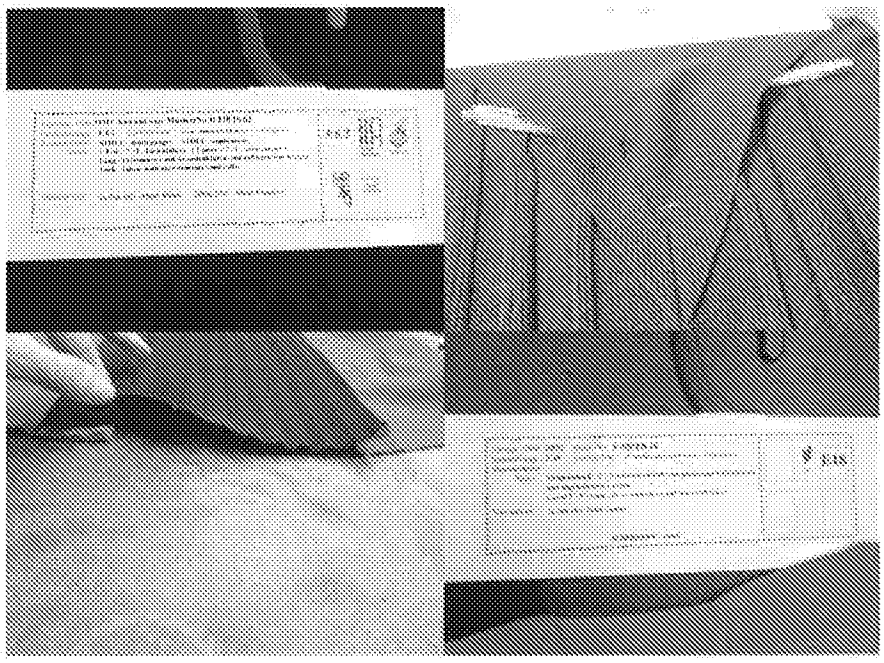
Cross reference to related applications
[0001] US Patent Application 13/474,531. I do not believe I have seen this patent, nor review the claims.
US Patent Application 13/400,511. I do not believe I have seen this patent, nor review the claims.
[0005] Recycleability: Claims as previously noted are marketing advertising points that need substantiation, quantification and responsible federal (FTC) accountability for 'green' and pre-consumer recycled content / post consumer recycleability technologies. This is a general claim. This technology in flat knit format was brought to Nike as previously noted.
[0011] We respectfully suggest that this technology be applied solely to the specific footwear products agreed to in our June 1, 2010 Mutual NDA agreement schedule A – Deliverables. This 3 D technology for knitting appendages and attaching them in the knitting process already exists in other markets. This would be impractical to defend otherwise.
[0043] We respectfully suggest that this technology be applied solely to the specific footwear products agreed to in our June 1, 2010 Mutual NDA agreement schedule A – Deliverables. This 3 D technology for knitting appendages and attaching them in the knitting process already exists in other markets. We have used these techniques prior to our relationship with Nike, currently and intend to continue using these techniques constantly as do many others in these exact listed product categories. This would be impractical to defend otherwise.
[0044-0046] We respectfully suggest that this technology be applied solely to the specific footwear products agreed to in our June 1, 2010 Mutual NDA agreement schedule A – Deliverables.
[0047- 0051]Some Embodiments: We respectfully suggest that this technology be applied solely to the specific footwear products agreed to in our June 1, 2010 Mutual NDA agreement schedule A – Deliverables. I object to this being unconfined and reaching into other markets.
[0052-0053] increased manufacturing efficiency: As previously noted, this is not the case. Sewing the tongue in is far more efficient way of attaching it. 12 minutes to knit in versus 10 seconds to sew in. The damage risk is also escalated in knitting the tongue into the shoe. All that is guaranteed is the same dye lot of yarn is used (all previously noted).
[0054] We respectfully suggest that this technology be applied solely to the specific footwear products agreed to in our June 1, 2010 Mutual NDA agreement schedule A – Deliverables. I

object to this being unconfined to the specific footwear previously noted, and reaching into other product markets. This is impractical to defend.
[0054] Figure 5 We respectfully suggest that this technology be applied solely to the specific footwear products agreed to.
[0055-0066] We respectfully suggest that this 3 D technology be scoped and applied solely to the specific footwear products agreed to as previously noted.
[0067] elements with a lace aperture: This is existing technology from 1987 introduction to the CMS. We respectfully suggest that this be scoped for footwear only.



.< 1987 belt loop technique from Machine builder's original CMS capability swatches. This is the technique used in creating the loop on the tongue. It is common technique for cinching, belting and lacing applications in many industries.

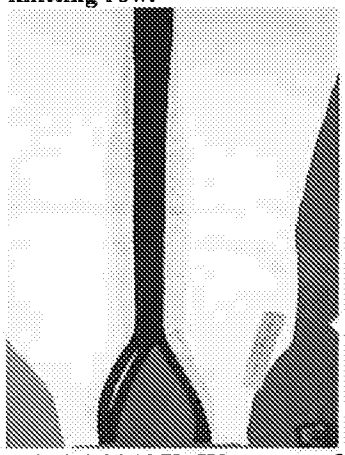
[0068-74] Figure 6, 7, 9, 12, 14,15. This is a common view of knitting 3 D components with overlapping portions, with flaps, plackets and button holes. This is existing technology from 1987 introduction to the CMS. We respectfully suggest that this be scoped for footwear only. We have made these flapped closure systems for many years prior to our Nike relationship as have other tech experts and machine builders in other markets. This is impractical to defend other than in footwear. Here are a few examples I found in 5 minutes. I suggest more due diligence be spent.



[0078] US patent AP 12/338,726 – 2010/0154256 – comments as previously noted.
US Patent AP 2012/0233882 – comments as previously noted.

[0079-0096] This is impractical to defend other than in footwear. We respectfully suggest that this be scoped to footwear only to avoid inviting easy challenge.
[0097-00104] General flat knitting knowledge. Unremarkable.
[00105-00107] These describe general properties of inlay – ALL of which already exist in other industries. This is not practical to defend beyond footwear. We respectfully suggest that these claims be focused and scoped on the specific footwear described in our Mutual NDA of June 1, 2010 – Schedule A Deliverables only.
Also note that in no cases have Nike products used the combination feeder for anything else than an INLAY feature. The inlay feature possible without the combination feeder and was employed in my original swatches from my studio. It was just not as efficient. It is also machine make, and model specific as previously noted. General inlay descriptions are not practical to defend beyond footwear as they already exist. (Multiple objections as noted previously)
[00108] US Patent AP 13/474,531, US Patent AP 13/400,511 – comments as previously noted.
[00109-0013] Figures 22 and 23 represent 3 D knitting techniques already in existence.
[0014] Spool package is common practice in direct feeders for Steiger and Stoll machines, especially for fashion, medical, technical and industrial textiles.
[00117] Figure 24 is absolutely defendable and is already specific to footwear.
Fig 27 could be any 3 D Knit. This is how V necks are formed, but in the context of footwear, this is fine. This is technology and knitting techniques I brought to Nike. It was not invented at Nike.

Below is a V neck made on a Stoll machine in 2002 in the exact same knitting technique and sold commercially in the US and Europe. Notice the knit and inlay technique on the same row, plus intarsia, plus full cables down each side. Cables knit, tuck, float, and transfer on the same row. So example this has knit, tuck, transfer, float, float inlay, intarsia with multiple feeders all in the same knitting row.



[00126-00127] We respectfully suggest that these claims be focused and scoped on the specific footwear described in our Mutual NDA of June 1, 2010 – Schedule A Deliverables only. I could not support Nike and would object to the patent office if this were extended to other product markets. Other market product manufacturers, machine builders and technical experts would likely also object. This is not defendable beyond footwear.

Claims 1 through 27: We respectfully suggest that these claims be focused and scoped on the specific footwear described in our Mutual NDA of June 1, 2010 – Schedule A Deliverables only. I could not support Nike and would object to the patent office if this were extended to other product markets. Other market product manufacturers, machine builders and technical experts would likely also object. This is not defendable beyond footwear.

As for 51-3345 otherwise known as 'knit component'

- Front page is fine. This was paid work, done for hire.
- Main concerns:
- Who claimed inventorship of this? Is this an Add on?
- Patent 8490299 B2 – 2008/0110048 – protested

Page 7: Patent 6,931,762 – August 25, 2005 – Dua: It references circular knitting with a seamless technology. It is a tubular sock. **"An article of footwear with a knit upper and a method of manufacturing the footwear are disclosed. The upper is formed through a knitting process to include a plurality of sections formed of different yarns and knits to provide the sections with different physical properties. In portions of the upper where sections formed of different yarns are in adjacent wales, a tuck stitch is utilized to join the sections. The method utilizes a circular knitting machine having multiple feeds that work together to knit the upper into a unitary, seamless structure. The multiple feeds, each of which provide multiple types of yarns, produce the sections to have varying physical properties."** Our technical concerns for Nike are that there are many medical products on the market that use and have used this technology for many decades; Gibaud in France, who we know, have used it for almost 100 years. Bauerfiend have use it more than 50 years, BSN and others have also.

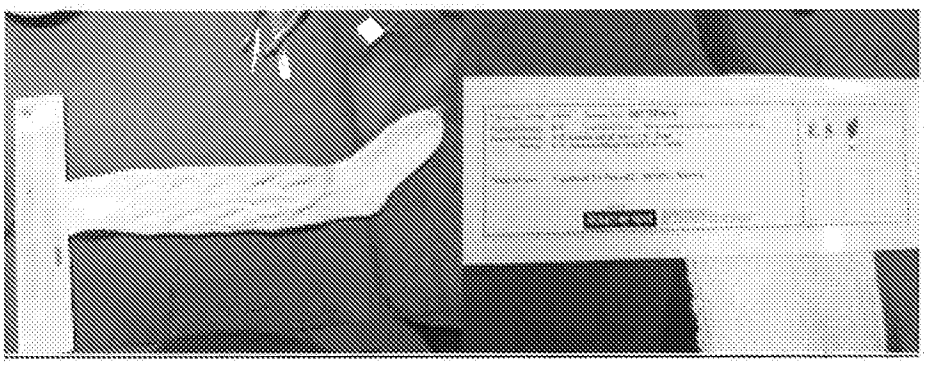




The machine builders, Santoni, Merz, Lonati, and others have created machinery based on achieving these principals in sock and foot products for several decades (Lonati since 1946) and advertise these claims as part of their marketing. **(Picture above Left from Lonati trade booth; Picture above left: Knit hosiery machine "Komet" of the English company Bentley, circa 1934)** We suggest the scope be limited to footwear; concurrent design patent and copyrights should be filed.

Patent 7,347,011- March 25, 2008 – Dua:
"An article of footwear comprising: an upper incorporating a weft-knitted textile element having edges that are joined together to define at least a portion of a void for receiving a foot, wherein the weft-knitted textile element incorporates a single type of textile having a plurality of knit constructions; and a sole structure secured to the upper." This claims a weft knit shoe with a single type of textile with multiple stitches that utilizes multiple seams, multiple layers, multiple types of knitting machinery (flat, circular and warp, and multiple components. This single textile technique and technology was and is common in machine and hand knitted slippers in the industry for many years prior to this patent. The multiple component has also been in use. The multiple knitting machinery fabrications assembled, has also been in use. None of these general claims for a knitted article of footwear have anything to do with,

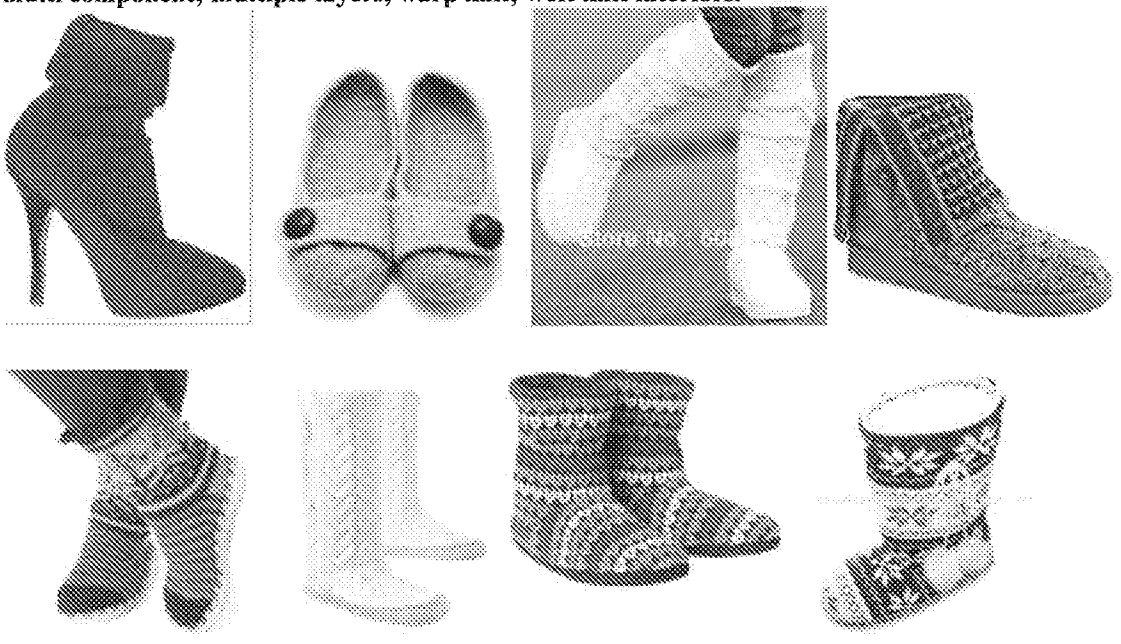
nor incorporate fully integrated flat knitting techniques, typically seen in 'whole garment', industrial, or technical textiles. 'Rib' is the only stitch identified in the claims, but no discussion of where it applies in the configuration, what it does, or how incorporated or why.

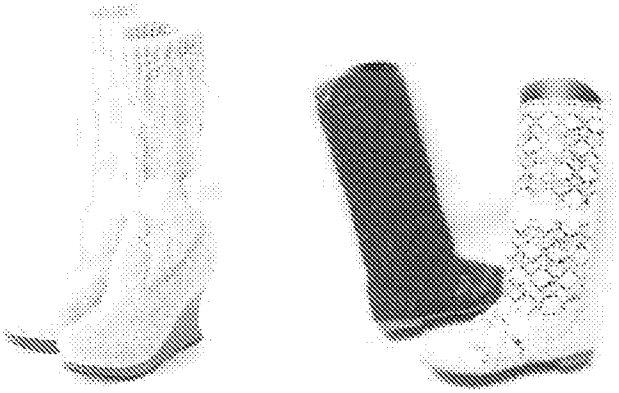


(Above is a finished article of weft knitted footwear as a machine builder swatch Circa 2002. It incorporates a single type of textile having a plurality of knit constructions and is completely finished by the machine, finished edges that define a void for receiving a foot, and ready to be sewn to a sole as the commercial products shown below.)

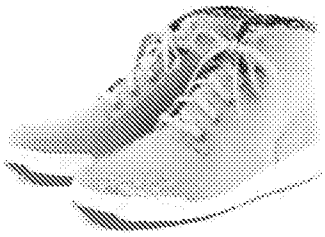
Both these patents relate to socks and cut and sew goods respectively; flat knit components are used in this sense in the later as a 'fabric component', which is supported by some other layer of material. Flat knitting is not shown in these patents as the base for the entire shoe structure and configuration. These are general patents – public domain knitting techniques that have been in the market decades, possibly a century or more, prior to these patents. The technology that we **built** for Nike is integrated knitting with dimensional structure and stability incorporated into the fabric at the time the fabric is constructed. We feel that type of claim is much stronger for Nike than a generic sock and generic cut and sew.

Below – circular sock with uppers of unitary seamless structure; cut and sew; flat knit multi stitch; multi component; multiple layers; warp knit; weft knit interiors.





<-warp knit



<-Weft knit interior

[0024] This list of materials covers every possible and potential material known to the industry and many already in use. **(See products above)** Please reconsider as a concurrent Design patent and copyright.

[0025] Article of footwear having an upper incorporating a knitted component
US 8490299 B2 ; "2008/0110048 – Dua". I respectfully decline to acknowledge that Bhupesh Dua had anything to do with this patent and refuse to perjure ourselves in continuing to reinforce what has felt to us, intellectual fraud. This is the same patent that arose from MY original inlay swatch to which Byron had to correct the patent, as Bhupesh had placed his own name on it as sole inventor. I only learned of the filing accidentally after it was already done, nearly a year later, Bryan Ferris and Gina Cheng helped me find Byron Kuzara to discuss it. I immediately protested it **(11/2/2009)** and insisted on speaking further with Nike legal to discuss (again with Byron).

Bruce Huffa

From: byron.kuzara <byron.kuzara@plumsea.com>
Sent: Monday, November 2, 2009 4:24 PM
To: Huffa, Bruce (ETW)
Cc: Cheng, Gina
Subject: Knit Application

To: Huffa, Bruce (ETW)

Cc: Cheng, Gina

Bruce,

Gina mentioned that you may be an inventor of one of the knit applications we recently filed. In order to get the paperwork started to add you as an inventor, I will need a little information from you:

1) Full legal name
2) Country of citizenship
3) City and state of residence

Thanks,
Byron

From: Huffa, Bruce (ETW) [mailto:Bruce.Huffa@nike.com]
Sent: Wednesday, October 28, 2009 10:09 AM
To: byron.kuzara@plumsea.com
Subject: Nike Knit Patents

Hi Byron,
I had a few questions on the patents.

1). What is the normal flow of patents ? example research / application / approval.

2). On the three patents we talked about. At this stage how protected are we ?
mainly the patent for the knit shoe ref #51-1677

Thanks
Bruce

Bruce Huffa
Nike, Inc.
One Bowerman Drive
Beaverton, OR 97005
Tel: 503-532-4384
bruce.huffa@nike.com

*** This message has been archived. *** Links are for MAC use only!!!

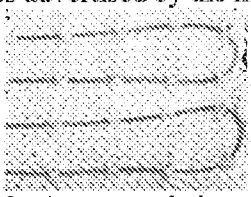
This filing was amazing and disturbing to me considering that Bhupesh wanted nothing to do with any machine adaptations (worrying about warranties), contributed nothing to it, knew nothing about it until it was completed, and it was designed, created, and swatch proofed entirely off site, adapting my own machine, on my own time, at my own risk, with my own resources.

Neither did Ben Schaefer contribute anything to this original functional idea using inlaid cables, nor did they know anything about it until this original technical and functional textile concept was in a complete proof of concept swatch form – a rectangle with an opening with two sets of opposing cable inlays to form a closure system ready to accept a lace, cord, bungee, or hardware clasps. It was at that point anatomically suitable for an adjustable closure system for adapting to sleeve openings, pants fly, pants cuff, neck/yoke, bags, shoes as well as other consumer products in smaller and larger formats.



And only after seeing to original swatch, aesthetics work began – where they DID contribute, by incorporating the technique, making it market worthy.
We respectfully decline to reinforce and perpetuate an inaccuracy, and will not sign documents that reference this patent in the form that it stands now, without proper acknowledgement. Nor will we agree that this was created for hire. This inventorship of this patent was immediately protested by me, when I learned of it's existence, and again later protested in a letter sent directly to Mark Parker, Nike CEO, on July 29, 2012. As we related to you on your visit with Eric Gibson, we have never received a response to that letter or acknowledgement.

Inlay is also a common practice in complex technical textiles, medical, and other industries, where we are world class experts and utilize the technique for many technical markets including aerospace, apparel, and military projects to name a few. Below is one application example in public domain from a machine builder. There are many ways to inlay fiber, wire, etc. already in public domain and are common features advertised by the machine builders for technical textiles.



What should have happened in 2008/2009: A separate design patent and a copyright should have been filed by Nike, where Bhupesh Dua and Ben Schaefer could have been added to address the aesthetics IP. The aesthetics IP are what they contributed ONLY AFTER the function swatch was brought in to Nike by me, Bruce Huffa.
The original patent should have been corrected to properly reflect the **truth** once Nike legal was made aware of the situation in November 2009, and Bhupesh was made aware that incorrect filing of the inventors and contributions to this functional patent could/would invalidate the patent itself, putting Nike at risk. It is not our intention to put Nike in any risk. We've agreed to cooperate with Nike to help defend this

technology to the best of our abilities. However, I will not sign a document that sells or assigns this technique, prevents me from using inlay in other technical projects, or requests that I assign public domain techniques that already exist in other industries, but are just now new to Nike. This is IP I brought to Nike. I would not support Nike beyond footwear and would lodge protest based on mutual NDA agreement. I have waited since November of 2009 to have this resolved with Nike's legal team to fix the filing properly. Instead if properly attributing, Ben Shaefer's name was then added too – even after Bhupesh admitted to Byron in December of 2009 that I was the inventor.

Per our 2010 mutual NDA, this adapted 'adjustable inlay cable technique for a closure system' which was 'incorrectly attributed', and to which we have continuously protested the inventorship as it is currently recorded, because we developed the system entirely on our own, with no Nike resources, is for royalty free use by Nike in footwear only. Any other use by Nike requires permission of Fabdesigns, Inc. This was unpaid work, done in my own time, with our own resources and at risk to our machinery - no valuable consideration received. Also per our 2010 mutual NDA, Nike has a duty to protect our IP 'as it would its' own.' It might appear that extending the scope of this patent by reaching into other markets beyond footwear as this document does, and into other industries where we currently do business, would harm Fabdesigns, Inc. rather than protect. Further, we also advise that the reaching into other markets where 'inlay' processes already have existed for decades, may put Nike at risk. We can not support Nike into areas beyond the scope of footwear. I am already unhappy with how the patent is currently recorded. I have not officially protested with the patent office. That would be a last resort and one we would hope to not have to entertain beyond this conversation.

[0029, 0031] references Figure 6: **". . . strands 43 may be formed from any generally one-dimensional material that may be utilized in a knitting machine or other device that forms knitted component 40. . . . Accordingly, suitable materials for strands include various filaments . . . liquid crystal polymer."** This technique is for royalty free use by Nike in footwear only. Any other use by Nike requires permission of Fabdesigns, Inc. This was unpaid work, done in my own time, with our own resources, materials, yarns, filaments, and at risk to our machinery - no valuable consideration received.

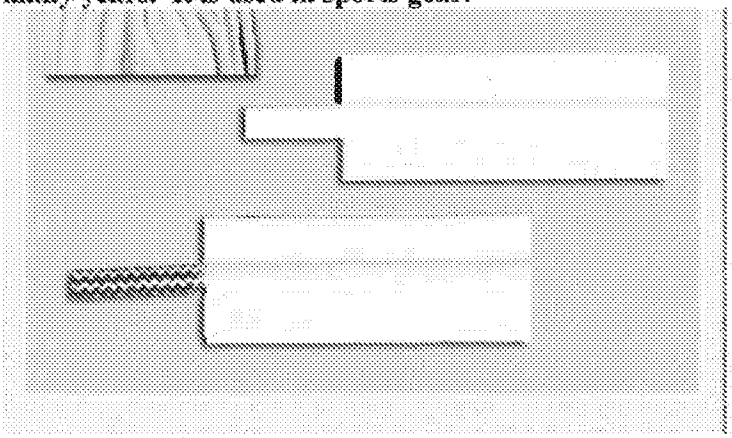
The stitch technique for creating tubular constructions and textured tubular constructions was also brought as part of our CAD library.
Strands within tubes was not invented at Nike. This is a common technique we use for closure systems in many industry projects as do other technical knit developers. (see Bort knee products) Configurations of rope, thread, webbing cable, yarn filament, and chain are already common practice in many technical textiles that have tubes. This inlaying of strands inside tube constructions is something already in use in fashion for draw string (shirred) garments, knit and wear, aerospace, military, medical and many other types of 3D knit applications.



The above Machine builder's swatch on face left with knit tub construction, having strands internally and externally over the tube (channel, tunnel) constructions, predates the entire Nike shoe program by several years. Circa 2002. Center and Right is a garment purchased at retail in 2003, manufactured commercially in China with a knit and wear component sleeve. Webbing is inserted into the channels and adjusts the sleeve.

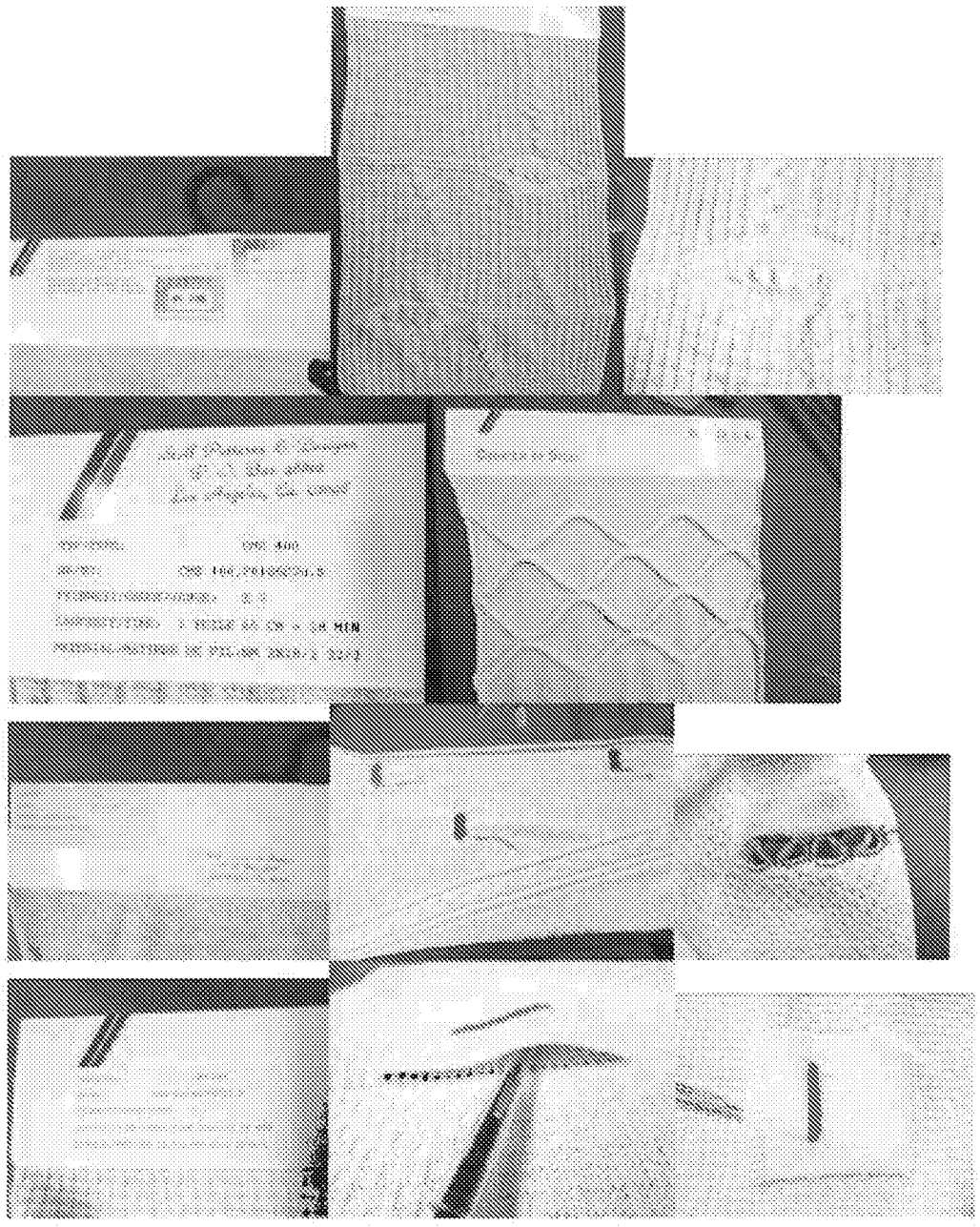
Likewise there are already knitted component waste bands already commercially available that have tube channels or voids created during the knitting process and cables, webbing, cords or other 'strands' inserted while the fabric is being produced.

Below is a product from North East Knitting, which has been commercially available for many years. It is used in sports gear.

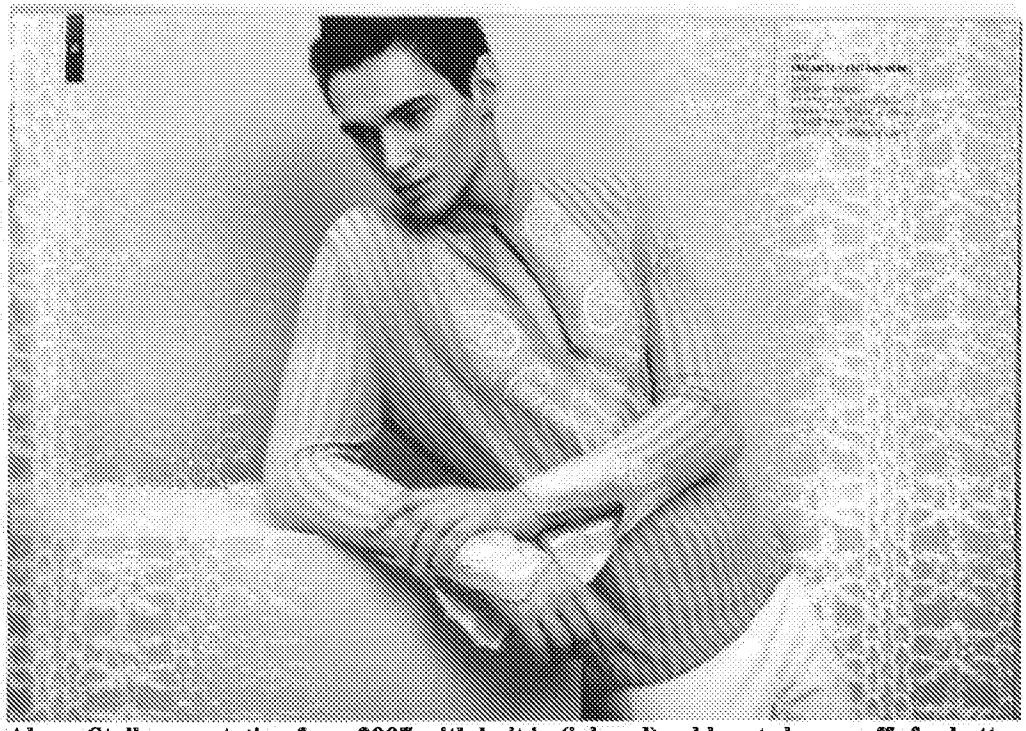


Likewise many aerospace, military and medical products use direct feed systems to insert (inlay) 'strands' into weft knitted components at the time the product or component is manufactured.

Below are swatches of just such applications in machine builder's swatches from 1987. These three dimensional techniques are what the CMS generation of Stoll machinery, SET & SES from Shima and other models from Steiger were built to do and demonstrated as such commercially since ITMA in Paris 1987.

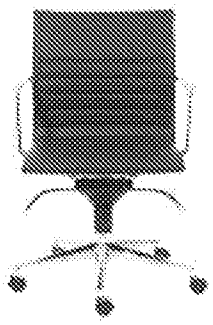


We respectfully suggest that these claims be focused on the specific footwear described in our Mutual NDA of June 1, 2010 – Schedule A Deliverables only.



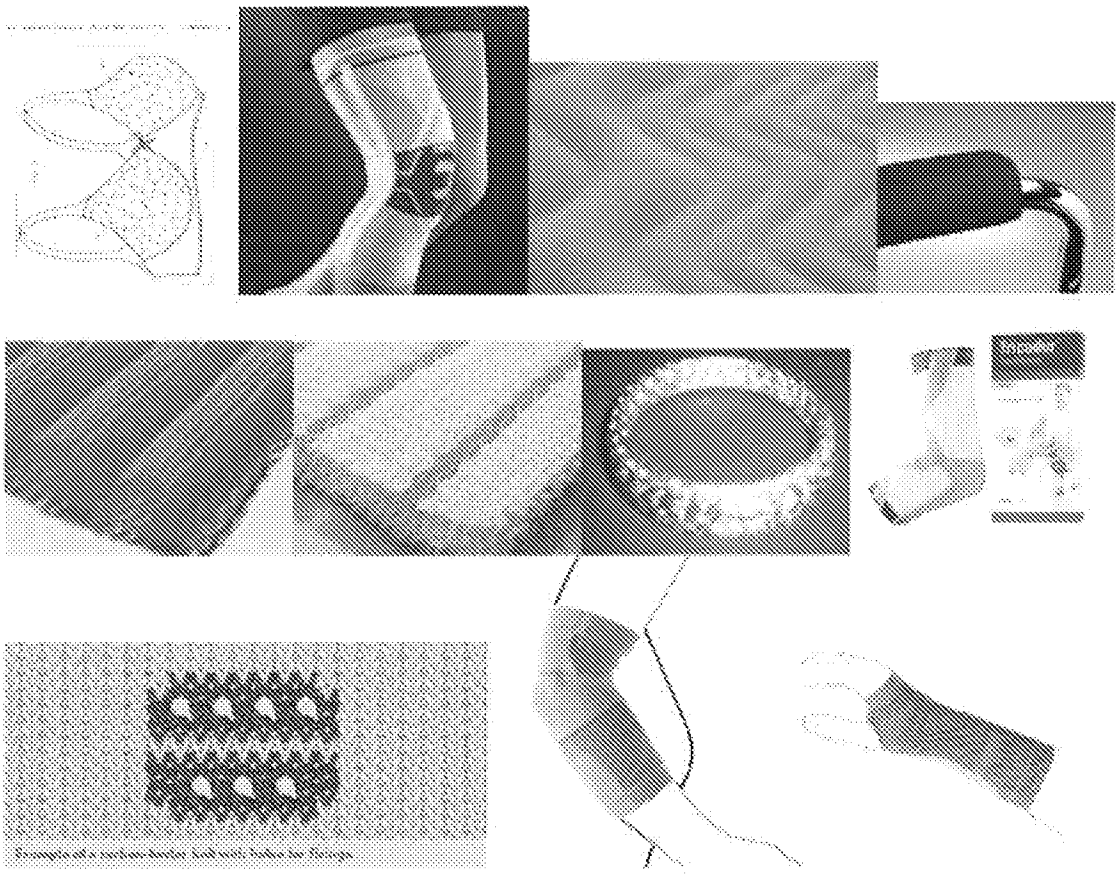
Above Stoll presentation from 2007 with knit in (inlayed) cables at sleeve cuffs for button holes.

[0032] This technique of a floating yarns to provide a compressible structure in a knitted collar [created in a 'zoned shape'] was NOT invented at Nike, but was borrowed from the medical textile industry, lingerie, upholstery, and aerospace constructions. The stitch technique was also brought as part of our CAD library. There are many examples in machine builders' libraries.



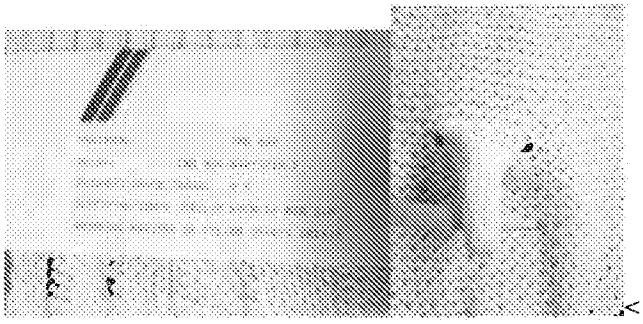
< Commercial float spacer seat cover made on a Stoll Flat machine

This padding technique was brought in from our own library of swatches, commercial medical products, machine builders, and finished apparel products in various forms some from our machinery, some in our materials, and brought in to Nike as a concept for integrating padding in the ankle zone and tongue. Spacers are commonly used and already part of 3D knitting industry for comfort regions. This is an industry building block that has been incorporated into the Nike product. It was not invented at Nike.



http://www.stoll.com/technical-textiles/upholstery-fabrics/4_2 - **knit to shape padded upholstery and technical textiles from the machine builder**

- We respectfully suggest that these claims be focused and scoped on the specific footwear described in our Mutual NDA of June 1, 2010 – Schedule A Deliverables only.
- We can not support Nike into areas beyond the scope of footwear as we know this technique was not invented at Nike and is already used in many markets past present and future.
- It was my idea to pad the tongue, not Nike's designers, knowing what techniques to use from my previous experience in 3d technical knit textile development. The adaptation was done for hire on Nike premises.
- We further suggest that the adaptation be filed as a design patent and a copyright.



< 1987 belt loop technique from Machine builder's original CMS capability swatches. This is the technique used in creating the loop on the tongue. It is common technique for cinching, belting and lacing applications in many industries.

[0044] **U.S patent Number 6,910,288 – Dua. Footwear incorporating a textile with fusible filaments and fibers** –respectfully commented: **The fusible system used in the Nike shoe is completely different than what is described in this patent.** Nike would not have STEAMABLE fusible in this knit shoe project if we did not supply it and show Bhupesh Dua and the team how it worked and why it was needed to secure an integrated knit system in strategic areas, with specific yarns.
I personally had to first steam swatches, then steam uppers at a flat knitting textile factory in Los Angeles (Trimknits, Inc.) with a vacuum steam table to create the demonstration components to show how I intended the fusible to help provide additional stiffness to portions of the whole shoe upper, which I did not want to flex, but to provide structure to the foot. I also showed Bhupesh and the Nike team how the steam fusible could be used to customize the fit for each wearer. I was never compensated for my R&D time or expenses in Los Angeles. We have many photos of the steam fusible process we calculated and recorded at the time at Trimknits, Inc. in Los Angeles.

We had been using this system of plaiting and floating fusible threads into flat knitted fabrications for various reasons for products in several markets since 1985. It is our opinion, that it is one thing to speculate and theorize how something might be done in a hypothetical textile application, and quite another to have actually employed, hands-on practiced and technically mastered a technique for many years, to contemplate stitch densities, load mapping, the nuances of yarn thickness, temperature, moisture finishing and tension to properly place a fusible adhesive yarn exactly where it's needed anatomically and not elsewhere in a whole garment integrated flat knit component. This is very different and specific; so specific it is engineered down to individual fibers and stitch levels, manipulated digitally in the CAD, like 'painting' an anatomical picture of the foot with steam glue. This special knowledge and technique was brought to Nike, not invented at Nike, nor known to anyone on the Nike team including Bhupesh Dua. This steam fusible is a completely different technique and process than the general thermoplastic fusible described in the above patent. Nike borrowed my machine's plaiting feeders for 3 years, used my original spec, used my swatches, and used fusible yarns from my studio.

Patenting this process to prevent us, the teachers, from using this technique and our native materials and processes that we brought to Nike and which had existed prior to our relationship in both our own practices as well as the knitting industry in general, is not acceptable. We can not support this patent over reaching into other markets and categories beyond footwear.

Patenting this technique beyond footwear, is also not acceptable as this was our technical know how and work we did on our own time and expense to perfect it. We respectfully suggest that these claims be focused and scoped on the specific footwear described in our Mutual NDA of June 1, 2010 – Schedule A Deliverables only.
We also suggest that Nike review the applicability of this patent (**6,910,288**) at all, since the actual fusible IP that I brought to Nike for this shoe process would seem far more protectible as it is different and much more specific to the function and performance of the shoe.

[0053] ". . . In comparison with conventional manufacturing processes, the use of knitted component 40 may reduce the overall number of manufacturing steps. Additionally, waste may be decreased while increasing recycleability."

We brought this integrated knitting concept to Nike and taught Nike how I proposed to adapt it to a shoe format and create an integrated structure, knit in one piece, with as little material as possible, and as efficiently as I could possibly get the machinery to function. Nike did not invent this manufacturing process.

Art to Wear Proves 'Green' Fashion is Good business!

Source: Cosmetic Buffs
Dated: Aug 07, 2008

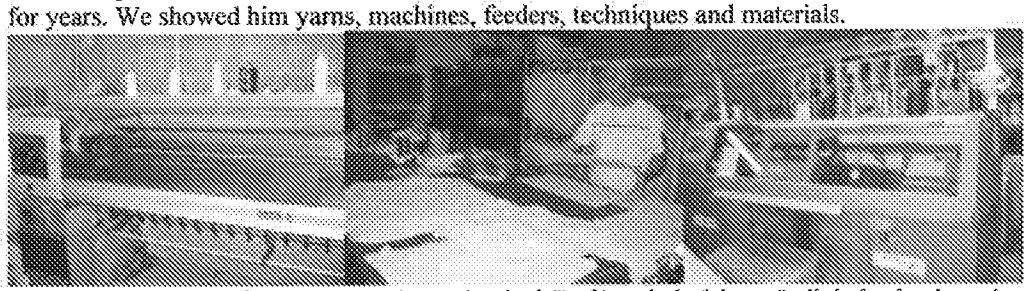
U.S Knit Designer tracks rule of stocking imports – produces mostly and makes in USA!

NORTH HOLLYWOOD, Calif. – North Hollywood, CA – Fabdesigns, Inc. today announced its' contemporary knitwear brand, Concetta Bosco, has a unique program focused on developing contemporary lifestyle apparel exclusively for the specialty market. The company which uses yarns from renewable sources such as Rayon – made from wood pulp – bamboo, and other natural fibers stocks only raw materials and makes customized knitwear here in the USA for retailers of better and designer goods. The company already sells to some of the top specialty stores in the USA who are keen on differentiating their stores and maintaining a unique identity in an overly competitive industry.

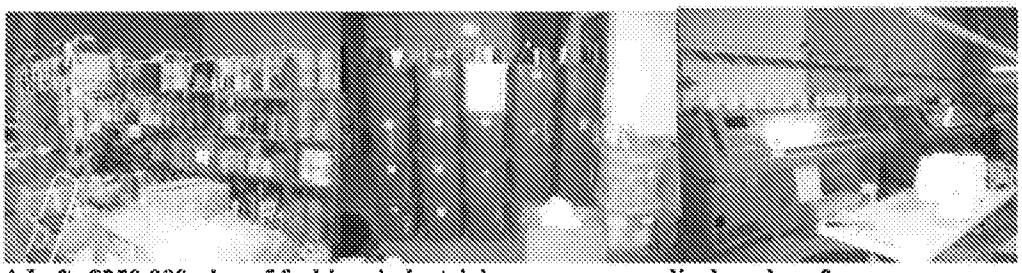
"We already fill a distinctive niche in the specialty store market, supplying exquisite art-to-wear which is high quality, on trend and reasonably priced," says Concetta Bosco, Director of Design who has more than 15 years of experience as a knitwear designer. "We are completely vertical which means we create everything in house, designs, fabrics, silhouettes and even our trims. We don't stock any finished garments, only premium quality yarns from the USA and Europe. This saves on energy, materials and space among many other things. The one thing that any designer worries about these days is cheap, imported knock-offs. We don't have that issue. Every piece is made to order by in house expert craftsmen and artists. We sell to fine shops across the USA, Canada and the Caribbean who want items 'sculpted by hand' without the worry of seeing a similar, but less impressive illusion of the same style down the block. So, these specialty boutique customers get the 'real' fashion they want without the frustration of seeing the styles saturating the market in department stores and discounters. If a larger chain wants to buy from us, we make them their own exclusive styles that suit their customers and climate. We're small enough and agile enough to develop individuality for these stores without the outrageous costs."

Nike and others had tried for 9 years with nothing but a circular knit sock to show for it; a few slipper like prototypes that Nike did not like.

This was one-sided training, with Fabdesigns, Inc. doing the teaching of this manufacturing process. Fabdesigns, Inc. was approached by Nike and met with Nike's representative Bhupesh Dua, early 2008, and we explained to him the technology of what we were using on our own products and Stoll machinery for years. We showed him yarns, machines, feeders, techniques and materials.



^ generations of machines we owned. Mechanical (Left) vs belt driven & digital selection . ^

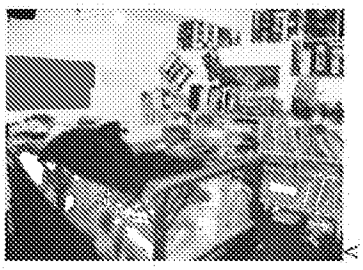


^ Left: $250,000 plus of fashion, industrial, aerospace, medical, and performance yarns.
Center: yarns requiring light, air, and humidity sensitivity storage handling.
Far right: medical products – prototyping and production on multiple generations of Stolls



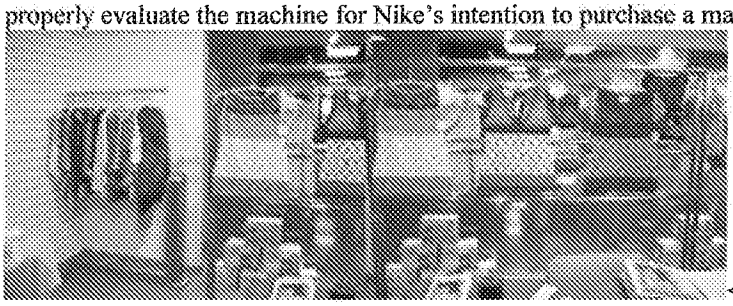
< swatches

For many years prior to our relationship with Nike, and the entire knit shoe program we engineered other companies' complex technical projects and we sold our own label apparel and accessories to high end luxury boutiques that had extremely high standards for quality, materials and finishing. We made everything in our couple thousand square foot, 2 story, vertically integrated factory in North Hollywood, California. Yarn came in, finished goods were shipped. All this and several hundred of our fabrication concepts were shown to Bhupesh in January of 2008.



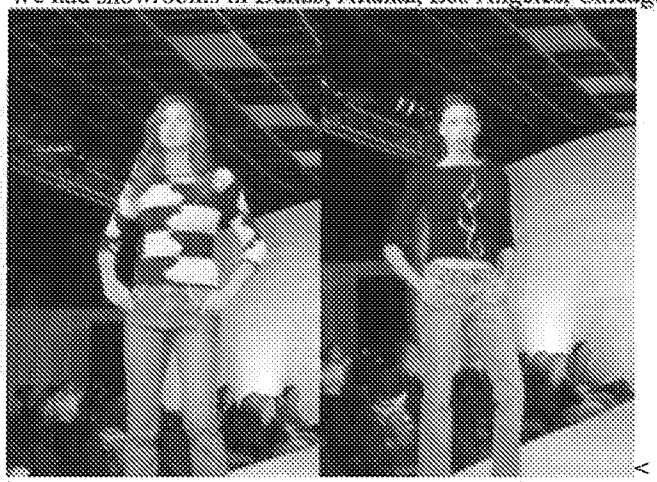
< Bhupesh, my wife Connie, also a textile engineer, and I sat in our design room for several hours, sifting through hundreds swatches, performance yarns, and garments.
Side note: Connie graduated with the same PCT&S BSc degree as Nike's Ed Thomas and Darien Hopkins-Reese; 1 year behind and knows them well. They had the same knitting teacher, Helen Estakrian. Ed joined Nike immediately after graduation. Connie joined Stoll in 1987, after already being at the forefront of flat knitting on Shimas and many other types of knitting equipment already for 4 years with Van Heusen's factories. Connie also taught textiles on a master's level at the same prominent college they all graduated from in '96 through '98. Connie met with Ed in June of 2008 at Nike, to catch up, showing him the same swatches – minus the ones Bhupesh still had on loan.

Bhupesh 'borrowed' half a dozen of our most cutting edge pieces in January 2008, to bring back to Nike after several hours of conversations of how these could be applied to running shoes and would be interesting to Nike. He spent the whole day at our studio, except for lunch at the British Pub. He said that he wanted to borrow our swatches to prove to his manager that I had the advanced technical skills to properly evaluate the machine for Nike's intention to purchase a machine to create a knit shoe.



< Our showroom in the Dallas Mart

We had showrooms in Dallas, Atlanta, Los Angeles, Chicago and a road rep in New York tri-state area.



< Our designs at Atlanta Mart Fashion show

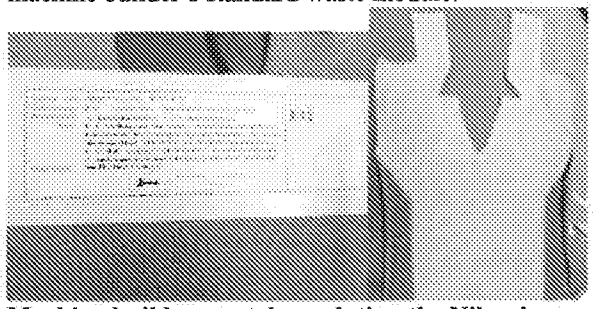
Our signature products had strategically placed monofilament (opaque and transparent) yarns for stretch, transparency, performance yarn areas, strength, rigidity, fused and everything you and everyone else are now reading about and filing for Flyknit. You saw these garments here in our studio

Fabdesigns, Inc. is just one of several technical knit developers in the world that have also created and engineered these same 3D knit to shape techniques for military, aerospace, medical, automotive, outdoor sports, and many other companies sent to all of us by the machine builders when the technical project is not a sweater, is too complex or they don't have staff experienced enough to tackle building the samples, training staff, and setting up the manufacturing plants. We could not practically support Nike in defending this patent beyond footwear.

However, the fact is for footwear, there was and is no one else in the world that knows how to do what I did for Nike to create a complete 3D knit manufacturing platform for developing and mass producing structural and anatomically correct knit shoes and train the staff at Nike to program, QA & QC production best practices on an exponential scale suitable for the anticipated size of this entire project. Plus create lean and sustainable best practices in development and production to minimize materials and waste and optimize efficiency throughout the process

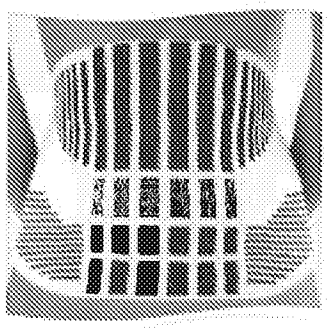
For over 30 years, I have taught people this material saving 3D knit manufacturing system as a master instructor for the machine builder, for FIDM college, Cal State Los Angeles, knitting students at several large apparel companies, clients in several countries, and interns at Fabdesigns. The system I created is not unique to Nike. The waste transition fabric that I built into the Nike shoe process, I created on my own and have been using since 1981. This is unique to my style of cost savings. The knitting principle of this technique goes back to the original CNCA-3F – a fully fashioned Stoll machine of which I was globally

known in the industry for mastery – the go-to technical expert. This is almost as old as Nike itself. My transition technique uses even less material and is far more productive than what is supplied and used by the machine builder. If it saves Nike 2 minutes per shoe, which is an immense savings in itself over the machine builder's standard waste module.

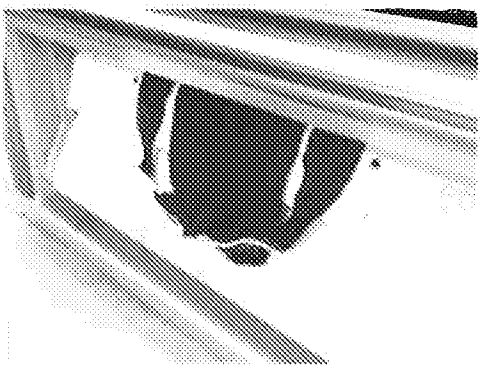


Machine builder swatch predating the Nike shoe project. Note the construction of an integrated one piece panel with a void is the same machine knitting path in this example of a V neck with knit in lapel collar as the very first knit shoe prototype I produced for Nike in June 2008, two weeks after Nike received its' machine. This is a basic shape block starting point to build pieces that wrap around body limbs. I chose this type of structure to test the machine for Nike's interest in producing shoes. This is also the similar stitch structure to the first knit shoe prototype that was used for proof of concept that the Stoll 530 machine was viable for Nike's purposes.

This unconventional manufacturing process that integrally knits just what is needed where it is needed, and to shape is what Fabdesigns, Inc. specializes in. It is the whole basis for three dimensional knitting, whole garment technology, knit and wear and technical flat knit textiles. This concept and hundred of examples have been advertised by knitting machine builders, Shima (1995) and Stoll, for nearly 20 years.







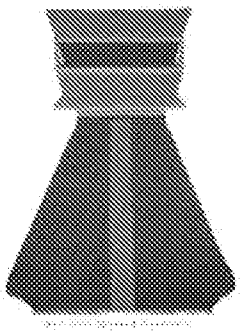
http://www.shimaseiki.com/wholegarment/ **"In sharp contrast, SHIMA SEIKI's revolutionary WHOLEGARMENT knitwear is produced in one entire piece, three-dimensionally, directly on the knitting machine. Consequently it requires no expensive, time-consuming post-production labor"**

http://www.indiantextilejournal.com/articles/FAdetails.asp?id=1457 – **Shima Whole Garment 1995**

http://www.stoll.com/stoll-produkte/knit-wear-class/2_7 **Stoll Knit and Wear technology; stitch density progression**

It is a technically complex manufacturing system that takes ONLY the most skilled technical people at the machine builders to program, due to cost and complicated variables in materials, CAD, and machine types. Nike has only ONE type of machine for production, and only ONE gauge.

From the CMS technology **entry level model**





^ September 1995

This 'knit in one piece concept' to reduce components, eliminate cutting and minimize sewing, is new to Nike, but not the world and is possible on MANY machine makes and models. Fabdesigns, Inc., specifically Bruce Huffa, has an long well documented career of excelling in bringing this complex manufacturing system to life in many companies, transforming knit production to reduce waste and create 'mass customization' production processes individually created for specific companies to reduce costs and carbon foot print. This is the ability to create lean manufacturing for flat knitting over the entire line of Stoll machinery circa 1978 through the 2013 ADF HP in every gauge, plus other makes and models – not just the one machine specification Nike uses – 530 HP 7.2/14.

One example of how this system I brought to a company created enormous savings and production agility and one which is documented in many text books is French Rags. Brenda French had many types of machines, numerous gauges, and hundreds of product styles. She custom made one of a kind garments with their names knitted inside the garment. http://frenchragshappenings.wordpress.com/the-principals/

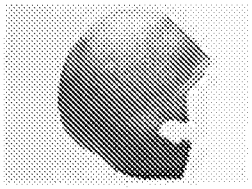
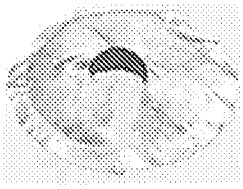
- We respectfully suggest that these manufacturing process claims be focused and scoped on the specific footwear described in our Mutual NDA of June 1, 2010 – Schedule A Deliverables only.
- The manufacturing process is actually inherent in the machine builder's software and engineering and in Nike's case is specific to a Make and Model of machinery. We believe this claim puts Nike at risk as 3D integrated all in one piece technology was brought to Nike, not invented at Nike. And it predates everything Nike has patented for footwear by more than a decade.
- We can not support Nike patenting knit to shape, 3D integrated technical knitting as a manufacturing process, or into areas beyond the scope of footwear as we know this

technique was not invented at Nike and is already used in many markets past present and future.

- Supporting this claim beyond footwear would undermine our past present a future work in our industry as well as the entire industry. We believe this general catch all puts Nike at risk.
- We further suggest that the adaptation be filed as a design patent and a copyright.
- Recycleability. Cradle to cradle technology for knits was suggested to Nike for this knit shoe project on the initial consultation with Fabdesigns, Inc. as we had recycled yarns and fabrics in house and showed the swatches to Bhupesh in January of 2008. These were/are commercially available materials, off the shelf from Unifi, which we were using for an initiative for a different apparel project. The concept was to use as little material as possible, having that materials already being recycled, and able to be recycled yet again. This is a 'green' concept we've also brought to automotive consumer products and several other industries. This is a marketing point in our opinion, not a patentable claim. We can't see reasoning to support recycleability as a patentable claim. Perhaps this should be reviewed.
- Sustainability and reduced carbon footprint are industry wide goals for several years, and has been our mission in all Fabdesigns, Inc. projects. The technology is not really a brand new technology, but one based on our own studio techniques and best practices that I, Bruce Huffa, created on my own for years prior to bringing them to Nike. When we met Bhupesh in 2008, we were a small highly technical apparel company with limited resources so we created as little waste as possible and cut out as much sewing and finishing as we could to keep costs down and fashion expectations high for many years. Our factory's scrap was so small that we had no industrial trash service. We had almost zero waste because of our techniques. This materials savings may not be a claim exclusive to Nike as the materials for knitted recycled and recyclable products have been on the market for many years. Some are in use already by Nike's competitors. http://www.repreve.com/business/ProgramsAndProducts/RecyclingCenter.aspx
- Material savings for knitting components to shape have been a benefit of the fully fashion industry since the invention of the machinery. Specific to flat bed machinery: (US2680363 A circa 1954, US2783631 A circa 1957)

[0054] **"the invention is disclosed above and in the accompanying figures with reference to a variety of configurations. The purpose served by the discloser, however, is to provide and 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."**

We absolutely object to patents for this technology reaching beyond footwear. This technology of integrated knitting to shape and combining components was brought to Nike, by Fabdesigns, Inc.'s Bruce Huffa. This integrated knit to shape technology is widely known and employed in the knitting world, specifically the technical textile knitting world, using multiple stitch techniques and multiple yarn types – even multiple gauges. Signing this document would prevent us from using the technology invented by the machine builders to continue making a living creating complex 3 dimensional integrated flat knit textile fabrications.

http://www.stoll.com/technical-textiles/composite-materials-and-industrial-textiles/4_3

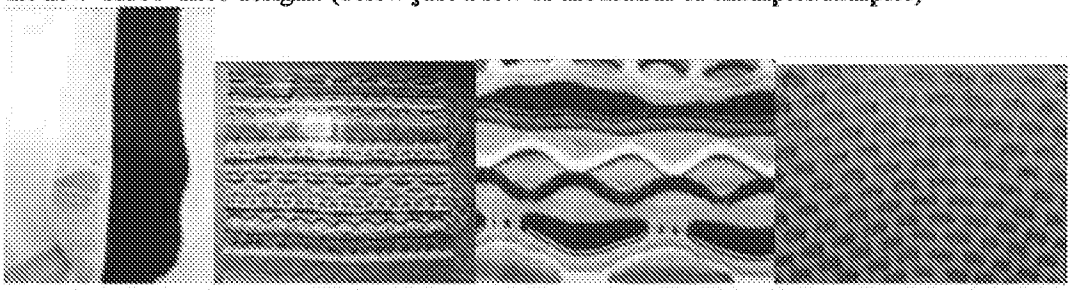
The scope the spacer that we adapted for Nike is specifically for agreed specific types footwear. Shaped spacers already exist in other industries. They are building blocks for other products as noted above. This adaptation was created on our own time and incorporated into Nike products. Signing this document would prevent us from using spacers in any other industry. We respectfully suggest that this be a design patent or a copyright as both shaped spacers and 3D knitting are not exclusive to Nike, though new to Nike. http://www.stoll.com/technical-textiles/upholstery-fabrics/4_2

Further Notes: The real origins of these strategic knitting techniques and multi stitch combination fabrications started in the 80's with those loud 3D Coogi / Cosby type sweaters which came about due to technological advancements of CAD and computerized flat knitting machinery that was driven by flat belts rather than chains, gears and digital needle selection rather than mechanical. The advance in multiple technologies allowed inlay, tubes, tunnels, channels, textures, intarsia, and jacquards all in the same line of knitting.



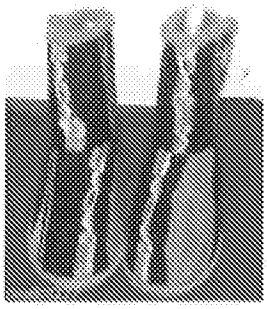
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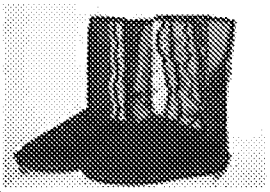
We created and engineered hundreds of these multi textured garments, accessories, socks, hats, gloves, bags, leggings, and more - for knitting factories all over the globe. Almost every factory that has flat machinery makes, or has made these fabrics at some time. We have kept these 1980's techniques in our computer library palette for several decades as they are now public domain for many makes, models and gauges of flat knitting machines. Incidentally, these are the same knit techniques you are seeing pasted into the new 'Kobe' shoe designs. **(below just a few of thousands of examples/samples)**





<1992





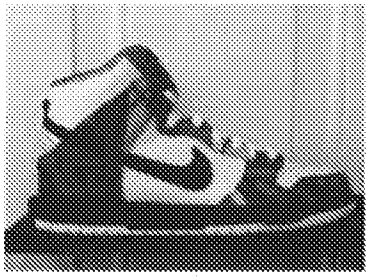
Coogi did have these stitches in shoes.

UNITE

PRODUCTS MEN WOMEN BLOG TOP BRANDS ABOUT CONTACT

UNITE FEBRUARY 25, 2010

Nike Dunk High Premium SB "Coogi" "Cosby" "Huxtable" In-store now



Nike SB has delivered the much hyped Dunk High Premium "Coogi." UNITE has a limited supply of February's quickest hit in-store now. Come in to get your size or call to reserve a pair.

(613) 565 5770

^(Not sure if this was an actual Nike Coogi partnership?) 2010. Possibly weft knit cut & sew.

Claims: [1 through and including 13]We object to this claim as it extends beyond footwear to incorporate our IP. This is for royalty free use in footwear only. Any other use by Nike requires permission of Fabdesigns, Inc.
I respectfully decline to acknowledge the current registered inventorship of US Patent Application 2008/0110048 to Bhupesh Dua which is incorporated into this patent as it has been protested by me since I learned of its' existence as noted previously. I will not sign this as it is not true.

- **[0047]** The **figure 7G of 51-3345 is inaccurate. It is NOT a vertical inlay. It would be a horizontal inlay because of how the knit shape is formed. The Nike shoe is comprised of knit to shape wedges, zones and complex knit dimensions that would make this absolutely impossible as a vertical inlay. Direction is completely 90 degrees wrong. Secondly, the technology is not there yet to create a vertical inlay in a knit to shape shoe. I am working on perfecting it with a machine builder. Even though I can and have created vertical inlay in a knit to shape shoe format, (I HAVE ALREADY CREATED MULTIPLE VERTICAL INLAYS IN A SHOE FORM) the software is not reliable yet to produce it consistently. Specific**

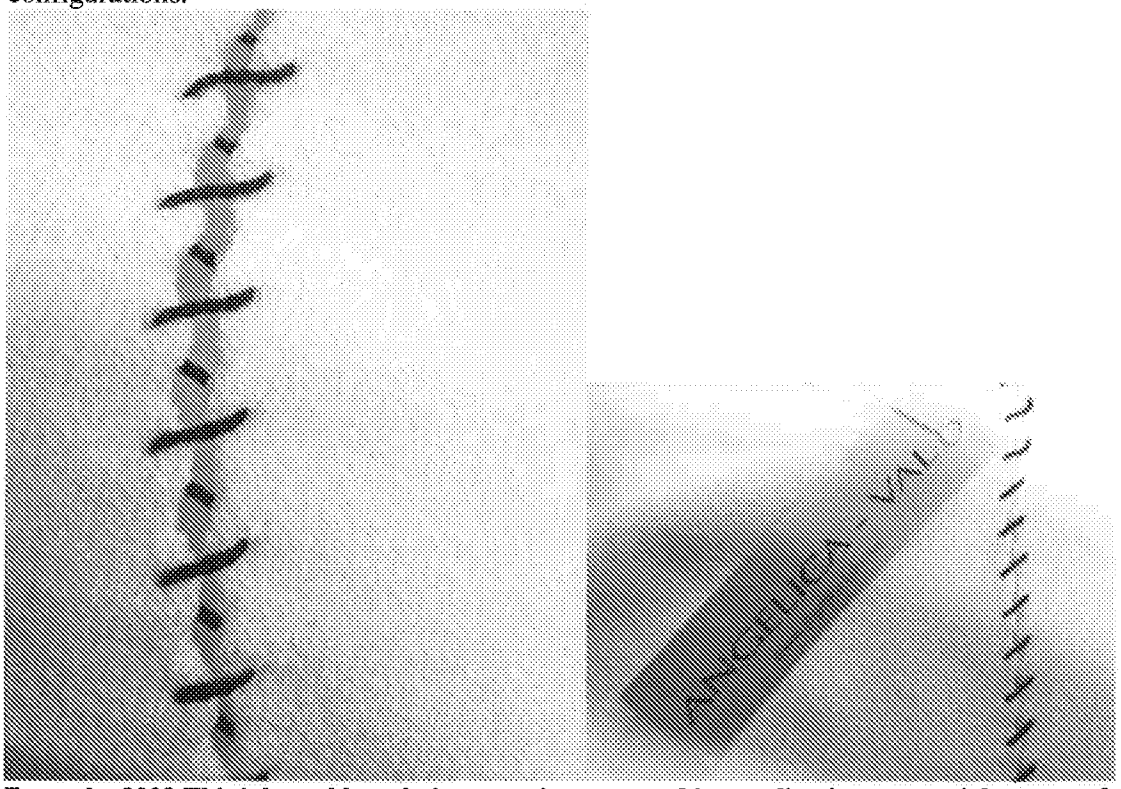
machinery and complex adapted machine accessories are also required. Without jeopardizing my current IP further, **I assure you that vertical inlays do not and can not look like figure 7G in a shoe.**

As for 51-3723 otherwise known as 'method of lasting an article of footwear" (Strobel)

Front page is fine. Agreement page is as previously noted above – royalty free use for footwear only. This was unpaid work, done in my own time, - no valuable consideration received. Suggest royalty free or such wording.

Page 3: [0008] We object to this claim as it extends beyond footwear. This is for royalty free use in footwear only. Any other use by Nike requires permission of Fabdesigns, Inc.
Page8: [0034] "As an alternative to flat knitting, lasting element 40 maybe formed through weaving or warp-knitting with a weft insertion." Please check these other industries as we believe these structural configurations may already exist. Without searching prior art, we can not be sure that they are not used for lasting shoes.
Page 15: [0056] We object to this claim as it extends beyond footwear. This is for royalty free use in footwear only. Any other use by Nike requires permission of Fabdesigns, Inc.
Page 20: Abstract: This is for royalty free use in footwear only. Any other use by Nike requires permission of Fabdesigns, Inc.

This is a stitch technique that we have used for many years in various sizes, shapes and configurations.



Example: 2002 This inlay cable technique was incorporated into a client's commercial garment for an adjustable closure to adjust the amount of 'skin' the wearer wanted to show.

We also showed you several examples on your visit of this technique that predated our relationship with Nike. These are the same swatches that were shown and lent to Bhupesh in January of 2008.



<- our own sweater line 2006

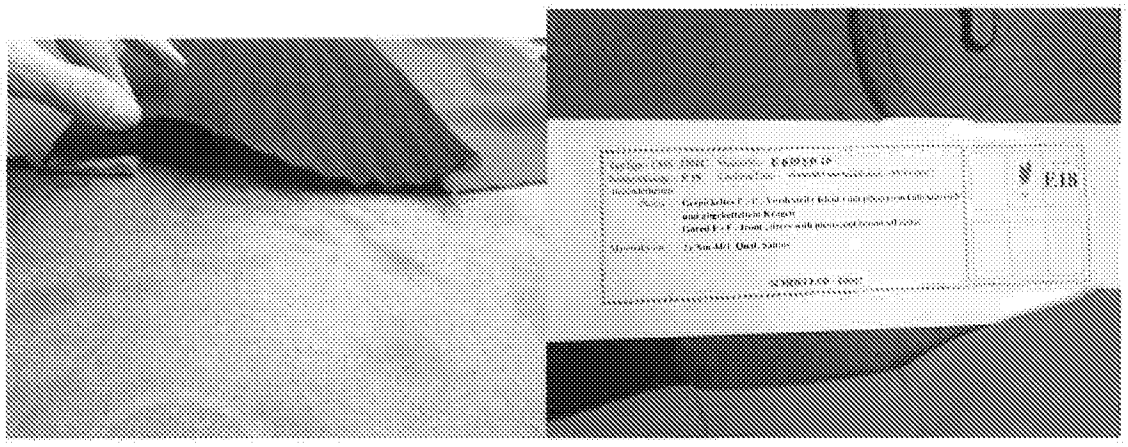
Per our 2010 mutual NDA, this adapted adjustable inlay cable technique for a closure system between to fixed length panels (straps, strips), where the cable is inserted automatically by the knitting machinery, and flows freely through holes knit in the panels (straps, strips) to provide tensioning adjustment, drawing the opposing sides closer together along substantially all of the length of the panel (strap, strip) components, was developed entirely on our own time, with our materials, our machinery, with no Nike resources, is for royalty free use by Nike in footwear only. Any other use by Nike requires permission of Fabdesigns, Inc. This was unpaid work, done in my own time, with our own resources and at risk to our machinery - no valuable consideration received. Also per our 2010 mutual NDA, Nike has a duty to protect our IP 'as it would its' own.' It might appear that extending the scope of this patent by reaching into other markets beyond footwear as this document does, and into other industries where we currently do business, would harm Fabdesigns, Inc. rather than protect. Further, we also advise that the reaching into other markets where 'inlay' processes already have existed for decades, may put Nike at risk. We can not support Nike into areas beyond the scope of footwear.

Therefore I can't sign a document that sells or assigns this technique, prevents me from using inlay in other technical projects, or requests that I assign public domain techniques that already exist in other industries, but are just now new to Nike.

As for 51-3764 otherwise known as 'knit tongue'

Front page is fine. This was paid work, done for hire. EXCEPT
[0004] Recycleabilty – as noted previously
[0006] Needs to be footwear specific as noted previously. This knitting of a flap in a 3 dimensional shape is in public domain for other industries, predating the entire shoe project. See machine builder swatches below. (These were found in less than 10 minutes research and is by no means exhaustive)

Trend Collect



[0045] This paragraph is ridiculous. It would mean that neither we nor any of the existing people and machine builders could make 3 dimensional knit components. It would mean that the entire manufacturing process that we built for Nike with our own IP, we could not use in ever knitting for any other entity on earth or in our government projects. Totally unacceptable and impractical to defend. We could never agree to sign that this is a valid claim as it would create a situation where the entire knitting industry to cease to exist. You've covered every single category of knit componentry that we discussed in our conversation with you and Eric Gibson here in August 2013. Much of this is already in use in these other industries for many years; some of this uses information we disclosed to Nike as part of the LAUNCH 2013 project that we participated in; and other parts would use our own IP subject to the June 1, 2010 mutual NDA, section 4.1.

Incidentally, we learned from several people (industry colleagues) on the LAUNCH 2013 committee that Nike requested to specifically have Fabdesigns, Inc. advanced knit project removed at Nike's discretion from the finalists in the competition, even though we had reached 5th place in on-line voting. This doesn't matter to us as several of the concepts are currently projects is in development with DOD contractors. We have no intention of disappointing any of our past, present or future clients that rely on our IP. What does matter to us is that Ed Thomas was on the committee and had access to the confidential IP we released. What also matters to us is that the IP for this LAUNCH SYSTEMS 2013 is promised to remain with the respective inventors as per the entry rules and regulations.
We respectfully suggest that this patent be refocused for the specific footwear we agreed to in our mutual NDA June 1, 2013 – schedule A – Deliverables, as we would need to protest this with the patent office, because in the manner that it is currently written seems to reflect a far broader scope than we originally agreed. This list of applications is especially disturbing to us since this is being filed after the LAUNCH SYSTEMS 2013 project, which is sponsored by Nike, and this patent appears to contain elements that were not released to the general public, and only to the LAUNCH SYSTEMS committee and respective sponsors.

[0053] This describes the 3 D knitting process – 'unitary construction' Objections as noted above in previous patents. We respectfully suggest that this be refocused for the specific types of footwear previously noted, as we would need to protest this with the patent office in the manner that it is currently written.

[0054 – 0060] Inlay already exists. Objections as previously noted for both existing in the market and using our IP in other industries (June 1, 2010). We respectfully suggest that this be refocused for footwear.

[0061] Figure 7 is from our IP. Objections as previously noted for both existing in the market and using our IP in other industries (June 1, 2010). We respectfully suggest that these claims be focused and scoped on the specific footwear described in our Mutual NDA of June 1, 2010 – Schedule A Deliverables only.

[0062-0063] These describe general properties of inlay – ALL of which already exist in other industries. This includes figures 8a & 8b. This is not practical to defend. We respectfully suggest that these claims be focused and scoped on the specific footwear described in our Mutual NDA of June 1, 2010 – Schedule A Deliverables only.

Also note that in no cases have Nike products used the combination feeder for anything else than an INLAY feature. The inlay feature as shown in Figure 9 WAS possible without the combination feeder. It was just not as efficient. It is also machine make, and model specific as previously noted. General inlay descriptions are not practical to defend beyond footwear as they already exist. (Multiple objections as noted previously)

[0065-0066] Plaiting: Generic plaiting already exists as previously noted. The plaiting of steam fusible to digitally place it where it needs to be, is our IP brought to Nike and subject to our June 1, 2010 mutual NDA, section 4.1. We respectfully suggest that these claims be focused and scoped on the specific footwear described in our Mutual NDA of June 1, 2010 – Schedule A Deliverables only.

[0067] **Figure 7E** is our IP brought to Nike and subject to our June 1, 2010 mutual NDA, section 4.1. We respectfully suggest that this be refocused for specific footwear. See photos.

[0068] Padding with floats: Generic float padding already exists as previously noted. The sculptured padding to digitally place it where it needs to be, is our IP brought to Nike and subject to our June 1, 2010 mutual NDA, section 4.1. We respectfully suggest that this be refocused for specific footwear.

[0070-0079] Structured Inlay closure system and base structure reinforcement with tensile members. Generic inlay structures already exist in many industries form medical to aerospace as previously noted. The sculptured inlay to digitally place it where it needs to be, is our IP brought to Nike and subject to our June 1, 2010 mutual NDA, section 4.1. We also further protest the December 2008 patent application that was wrongly attributed. Much of these paragraphs already exist in knit and wear and whole garment technology since 1995 as previously noted. We further respectfully suggest that these claims be focused and scoped on the specific footwear described in our Mutual NDA of June 1, 2010 – Schedule A Deliverables only.

[0080] tubular and interlock tuck knits are generic and have been used in 'zones' for medical among many other industries. We further respectfully suggest that these claims be focused and scoped on the specific footwear described in our Mutual NDA of June 1, 2010 – Schedule A Deliverables only.

[0081-0083] 1x1 mesh knit, 2x2 mesh knit, 3x2 mesh knit are not technical terms. The loop diagram figures 13A through and including 13H as shown also and have been used in 'zones' for medical among many other industries. We further respectfully suggest that these claims be focused and scoped on the specific footwear described in our Mutual NDA of June 1, 2010 – Schedule A Deliverables only.

[0084-0086] There is no such technical knitting term as 'mock mesh'. This appears to be transfer jacquard, but without seeing the fabric, I am guessing the proper terminology from your description of 'indentations'. Incidentally these are all stitches in the CAD library, which I left properly named in 2011.

[0087] Padded Zones. Generic float padding already exists as previously noted. The sculptured padding to digitally place it where it needs to be, is our IP brought to Nike and subject to our June 1, 2010 mutual NDA, section 4.1. We respectfully suggest that these claims be focused and scoped on the specific footwear described in our Mutual NDA of June 1, 2010 – Schedule A Deliverables only.

[0088] This paragraph stating surface texture/interest is exactly why we state this should be part of a design patent. The stitch types described here have little to do with the structure and function of the shoe.

[0089] 14 A is the first test shoe complete in June 2008 – I support this though it is generic in shape just as the first knit in one piece shoe was. This is absolutely defendable. However **14C I absolutely object to** as it is a represents my IP of the closure system I brought to Nike and which is subject. This is the EXACT same swatch to which Byron had to correct the patent, as Bhupesh had placed his own name on it as sole inventor. Nike's entire investment in the inlay concept and the development of this (as noted in great detail above) swatch from Nike's Milan presentation, which was the birth of the Flyknit, was **$0**. Bhupesh's response to Byron why he put himself solely on this patent, was that, 'he always wanted a knit shoe.' It also took until June 2010 to get my name added to this patent, after Bhupesh finally admitted to Byron that I had been the one who invented this concept in our December 2009 meeting with Byron. I will not sign this Figure, and officially lodge protest. This inlay structure is my IP, created on my own time, with my own resources, at my expense, with no valuable consideration ever from Nike, brought to Nike, and subject to our June 1, 2010 mutual NDA, section 4.1. We respectfully suggest that this be refocused for the specific types of footwear previously noted, and that the original patent be revised and attributed to reflect the truth.

[0090] We respectfully suggest that this be refocused for footwear. These statements represent our IP brought to Nike and subject to our June 1, 2010 mutual NDA, section 4.1. We respectfully suggest that this be refocused for specific footwear as previously noted.

[0096-97] Description of an Inlay feeder. This is dated, no longer true from two years before this filing date; this information is specific to machine make and model generation, specific to M1+ CAD programmability, specific as previously noted above. Steiger have provided a Tremeur' inlay feeder with direct yarn feed that also knits for several years; Stoll provide a multi- feeder with direct yarn feed that also knit, inlay, and fit 32 per machine on new generations of machines since ITMA 2011. Also note that NIKE products do not currently use the combination benefit that I built into my feeder design. <u>They utilize the inlay and close parking on the same rail features only.</u> This inlay technique was already possible and done without the combination feature using an inlay feeder I created from my own machine parts, tested and swatched on my own time and expense, and later lent to Nike until Spring 2010 when Jason Badden gave a CNC company budget money. The combination feeder optimized the production times. Furthermore this combination inlay structure is my IP, invented on my own time, with my own resources, at my expense, with no valuable consideration ever from Nike, brought to Nike, and subject to our June 1, 2010 mutual NDA, section 4.1. We respectfully suggest that this be refocused for specific types of footwear only as previously noted.

[0098-0099] describe inlay practices already in use in many other industries. We respectfully suggest that this be refocused for the specific types of footwear only as previously noted.

[00100-00109] full description of my feeder and a lot of general inlay practices already in use in many other industries. We further respectfully suggest that this be refocused for the specific types of footwear only as previously noted.

[00110- 00116] describes general knitting on a flat be machine. The pop up and lowering techniques are already features on the Steiger machinery yarn feeds predating this feeder design.

[00117-00119] this is a common inlay description. Figures 21E through 2H. in [00119 the yarn feeder moving ahead of the regular feeder is specific to make, model and generation. Both Steiger and Stoll have inlay / knit feeders that move independently of the carriage and perform inlay, intarsia, knit and in addition perform other weave type actions associated with warp knitting.

[00122-00124] is a correct depiction of what the combination feeder does, but this is not currently used in ANY Nike product in this manner.

[00125-00127] - is a correct depiction of what the combination feeder does, but this is not currently used in ANY Nike product in this manner. It is also not true that 'various conventional knitting machines' can accept this feeder. This feeder is VERY SPECIFIC to make, model and generation of Stoll machinery ONLY.
[00128] Figure 8B is generic inlay NOT PLAITING. Fusible is already used in this inlay manner and inlaid into fabrics on other machine types and generations in many other industries. Plaiting is a different process as described previously and uses a very different knitting technique, and specific fusible technology IP we brought to Nike, subject to our NDA of 2010. The wording in this paragraph needs to be clarified and we respectfully suggest that this be refocused for the specific types of footwear only as previously noted.

[00129] Mock mesh is not a proper knitting term – it does not exist. As noted previously, this may be referring to transfer jacquard. The racking is how the loops get transferred from one bed to the other. Transfer jacquard is not depicted in these figures. Typically the transfer is in one direction only front to back (face of fabric to rear). This is a very common and very basic sweater industry stitch not a patentable technique. We respectfully suggest that this be refocused for the specific types of footwear only, as previously noted, and in only knit to shape, all in one piece integrated knitted upper and related shoe components. This and many other sweater/apparel stitches have already been used in Coogi footwear as noted above.

[00130] Darting is not what is going on in the Nike shoes. This is wedge knitting, flasage, goring. Darts are cut and sew terms. Darts in 3D knitting are open folded fabric constructions that stick out - a different construction technique and look. These would resemble 'closed darts'. But the knitted fabric is flat rather than seamed and clipped as in cut and sew. We respectfully suggest that this be refocused for the types of footwear as previously noted only, as it already exists in many industries and is an integral technique to 3 D knitting that would be impractical to defend otherwise.



These are only a few examples but there are literally thousands of examples in our own library, and the three top machine builder's archives dating back to at least 1987 with the debut of the for digitally operated and belt driven machines. We suggest significant due diligence be employed for further examples.

[00132] through [00135] : Concerns that these, specifically **[00135]** are far overreaching the scope of this patent into fabrics. We're hoping that this is background explanation to the patent office? Please clarify. Concerns below.

[00132] 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

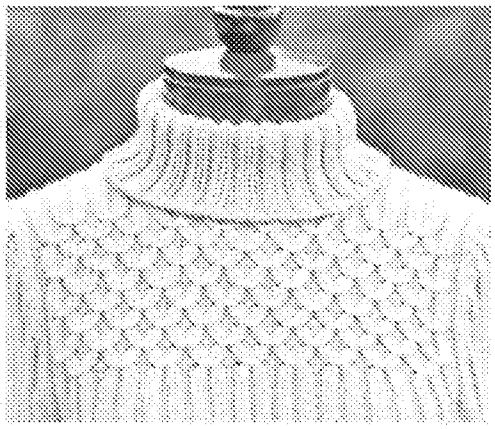
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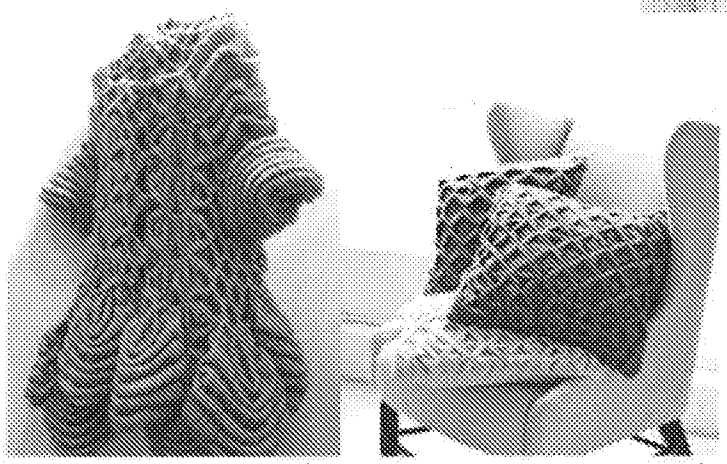
[00132] Tucking an inlay is common practice and generic. It is the basis of smocking in flat knitting.

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 a thermoplastic polymer material 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 tied 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.

[00133] 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 oil and induce fusing of the yarns. As discussed above with respect to Figure 8D, 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 152 to each other, or (c) another element (e.g., logos, trademarks, and materials 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.

[00134] Although processes associated with the steaming process may vary greatly, one method involves pinning one or more 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





These are only a few quick examples that are commercially available.

Fusible has already been discussed in detail previously. What is used in the Nike shoe knitting process is a specific fusible technology – our for tucking, plaiting and inlaying steam fusible digitally mapping it and in varying the densities, depending on the flexion and stiffening needed is IP we brought to Nike, subject to our NDA of 2010. The wording in this paragraph needs to be clarified and we respectfully suggest that this be refocused for the specific types of footwear only as previously noted.

[00133] The knit process with fusible yarns is used in many industries since the 1970's. it is always fed into the knit system with another yarn or as an inlay or else there will be an undesired separation inside a fabric. The yarns are not joined, but the fusible yarn becomes liquid glue, no longer in yarn format, and fuses the fabric. In the trim industry is it's known as 'steam away' because a desired hole or separation of pieces is wanted. Steaming is the generic way to set the

yarn. Nike would not have fusible in this knit shoe project if we did not supply it and show Bhupesh Dua and the team how it worked and why it was needed to secure an integrated knit system. **(See concerns and alternative advice on fusible in above notes and also in notes for other patent)**

Patenting this process to prevent us, the teachers, from using this technique and our native materials that we brought to Nike and which had existed prior to our relationship in both our own practices as well as the knitting industry in general, is not acceptable.

[00134] Steaming process do not vary greatly. The temperatures are set by the manufacturer of the respective fusible yarns and twisted yarns. The process we taught Nike is specific to the needs of this shoe project to digitally place the right amount of steam fusible, exactly where it is needed. Pinning processes are generic in the steaming and finishing processes for many industries, especially fully fashioned or knit to shape products. These are best practices from the knitting industry that we also taught Nike. These are not NEW to the industry. What is used in the Nike shoe knitting process is a specific fusible technology – our for tucking, plaiting and inlaying steam fusible digitally mapping it and in varying the densities, depending on the flexion and stiffening needed is IP we brought to Nike, subject to our NDA of 2010. The wording in this paragraph needs to be clarified and we respectfully suggest that this be refocused for the specific types of footwear only as previously noted.

[00135] I cannot agree to defend this paragraph. It combines public domain 3 dimensional knitting techniques employed in the industry for decades. It would mean that neither we nor any of the existing people and machine builders could make 3 dimensional knit components. It would mean that the entire manufacturing process that we built for Nike with our own IP and subject to our mutual NDA of 2010, we could not use in ever knitting for any other entity on earth or in our government projects. Totally unacceptable, impractical, and naïve to the existing industry - impossible to defend. We could never agree to sign that this is a valid claim as it would create a situation where the entire knitting industry to cease to exist. Much of this is already in use in these other industries for many years. We respectfully suggest that this be refocused for footwear as we would need to protest this with the patent office in the manner that it is currently written.

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 132, 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.

[00135] 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.

The manufacturing process described here using knitting to shape, combination or reciprocating feeders is already in practice in the apparel, equipment, containers, medical, upholstery, technical textiles, aerospace, and all the applications notes. This type of manufacturing is not new to the world and is common best practices.

We use these manufacturing techniques in all these industries, and have done so for many years. As you saw and was explained to you on your visit – 3 D knitting, technical textiles, and these manufacturing processes we taught Nike, are not new to the world though it appears it is news to Nike.

We TAUGHT Nike this manufacturing process in the same way we have taught <u>many</u> other companies in these other industries to use these very same materials and techniques. This is entire the principal of 3D knitting, technical knitted textiles in general, and the basis for our own technical IP, know how and 'tool chest' of flat knitting technology. We and many others have made a living in engineering 3 D flat knitted technical textiles for more than thirty years. We can't agree that this belongs in this patent. Our agreement with Nike is for footwear only, and our existing IP and everything we've created on our own time at our own expense, with out own resources is ours. Whatever is incorporated, is used royalty free by Nike. Signing that this manufacturing process is exclusive to Nike, was developed at Nike or belongs exclusively to Nike is not true, can never be true, and is naïve to even put on paper.

To claim these non-footwear industry applications for Nike in these terms, is something that we will resist, and could not support, as would every other professional and machine builder, in our

textile industry. There are other feeders and machinery adaptations that already do all of [00135] 3D knit claims, yarn, fusible, stitch – except for how my feeder design works in being able to knit, and inlay in products. The wording in this document, specifically these paragraphs, is asking for a firestorm from the knitting industry and we would strongly recommend that you revise them for Nike's own benefit.
Machinery that has been commercially on the market for two years also makes most of the feeder applications of knitting, intarsia, and inlay in tight spaces in these fabrics obsolete. This is now germane.

To our own business this paragraph [00135] is troubling to read.

Per our 2010 mutual NDA, much of this was unpaid R&D work, done in my own time, with our own resources and no valuable consideration received. Also per our 2010 mutual NDA, Nike has a duty to protect our IP 'as it would its' own.' It might appear that extending the scope of this patent by reaching into other markets beyond footwear as this document does, and into other industries where we currently do business, would harm Fabdesigns, Inc. rather than protect. Further, we also advise that the reaching into other markets where 'inlay' processes already have existed for decades, may put Nike at risk. We can not support Nike into areas beyond the scope of footwear.

Therefore I can't sign a document that sells or assigns this technique, prevents me from using my own IP and public domain items in other technical projects, or requests that I assign public domain techniques that already exist in other industries, but are just now new to Nike.

[00136-00139] Tongue: Much of this is already in use in these other industries for many years as previously noted. It is integral for knitting flaps and other dimensional appendages into a bas material. This is a common building block of 3 dimensional knitting. We respectfully suggest that this claim be refocused for the specific types of footwear only, as previously noted.

Padding was our IP incorporated into a Nike product royalty free.
As I noted to you on your visit, I created multiple shoes with integrated tongues – all prior to Daniel Podhajny joining Nike. They were tabled and put to the box / wall in Mia Hamm. The reason was that the tongue took 12 minutes to knit in and ten seconds to sew in.

[00140] I have no idea where this patent 2010/0154256 to Dua came from. I don't believe I have ever seen it except for the front signature page. Given my past experiences, I'd perhaps should like to review what Nike states I invented, please.

[00141-00142] We respectfully suggest that this be refocused for the specific types of footwear only, as previously noted. We've seen this in medical applications, apparel, quilted knitted bags, and other industries.

[00143] – 'more efficient manufacture.' This is not true as noted above. It is less efficient. The only benefit is the same dye lot of yarn is guaranteed to be used.

[00144] Sculptured compressible padding was brought to Nike. Not invented at Nike. We respectfully suggest that these claims be focused and scoped on the specific footwear described in our Mutual NDA of June 1, 2010 – Schedule A Deliverables only.

[00145] We TAUGHT Nike this 3 D appendage manufacturing process in the same way we have taught many other companies in these other industries to use these very same materials and

techniques. This is entire the principal of 3D knitting, technical knitted textiles in general, and the basis for some of our own technical IP, know-how, and 'tool chest' of flat knitting technology. We and many others have made a living in engineering 3 D flat knitted technical textiles for more than thirty years. We can't agree that this belongs in this patent. Signing that this manufacturing process is exclusive to Nike, was developed at Nike or belongs exclusively to Nike is not true, can never be true, and is naïve to even put on paper. We respectfully suggest that these claims be focused and scoped on the specific footwear described in our Mutual NDA of June 1, 2010 – Schedule A Deliverables only.

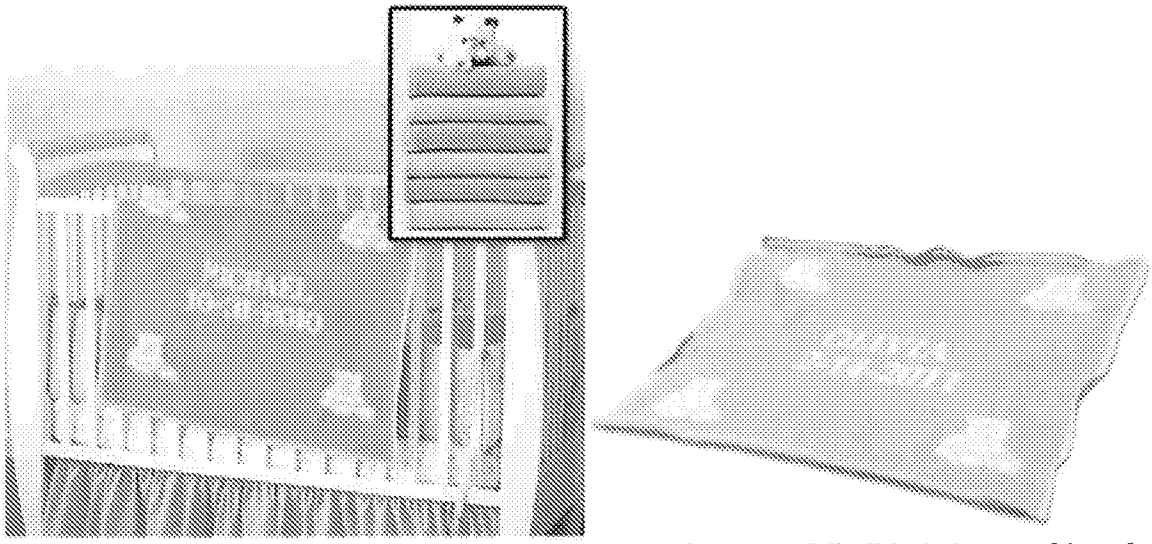
[00146-00157] As shown in numerous photos above, this 3 D appendage manufacturing process in the same way we have taught many other companies in these other industries to use these very same materials and techniques. This is entire the principal of 3D knitting since 1987, technical knitted textiles in general, and the basis for some of our own technical IP, know-how, and 'tool chest' of flat knitting technology as well as other experts and machine builders in the technical flat knitting industry. We and many others have made a living in engineering 3 D flat knitted technical textiles for more than thirty years. We can't agree that this belongs in this patent. Signing that this manufacturing process is exclusive to Nike, was developed at Nike or belongs exclusively to Nike is not true, can never be true, and is naïve to even put on paper. We respectfully suggest that this be refocused for the agree specific types of footwear, as it would be far easier to defend.

[00158 - 00163] This is a common feature of the machine builder's software. It is used frequently in medical products which REQUIRE serial numbers and sequential numbering for production liability, quality control, customization for distribution purposes and other reasons.



Above is a BSN product from Stoll production. Notice the FOOT shape.

Sequential numbering is also used in aerospace and military knit applications for exactly the same reasons and others that are macabre to describe here. This is a feature inherent in the machine builder's software, not invented at Nike. This entire segment belongs in a design patent. We have used this technology since flat knitting machines used computers and have programs on the Apple IIgs from 1987 that create this exact same sequential alterations.



The above company www.personalbabyproducts.com **has owned Stoll knitting machines for nearly 50 years. They, like many companies in the same business, use sequential alteration programs to change the alpha-numerics in each individual unit of production.**

This feature has been available to program into Stoll software in the earliest generations of CAD. The program can be set at night and left to run automatically. On the Apple IIgs the limit of memory was 100 units (hats, mittens, blankets, etc). On the subsequent CAD generations Sirix, and later CAD systems there is not a limitation. Stoll has a program that it sells to medical companies to do many adjustments on an individual basis. Sequential numbering is just one of the features. The cost of that program is $25,000 and has been commercially available for several years.

Daniel Podhajny knows this information and owned/owns a company (with his brother-in-law / relative) that is in this very blanket business in Uruguay. My wife recruited Daniel for Bhupesh, when Bhupesh expressed that the project was growing, and more help was needed, but he didn't know where to look. My wife worked as a knit engineer previously at the same company as Daniel (Tricot St Raphael / Perry Ellis) and was able to obtain references for Bhupesh from the owners at a time when Daniel was out of work. We know his technical background very well.

Signing this document, to state that this sequential numbering was invented at Nike is purely wrong information that you've been given. We have also already seen this used in footwear ads from a Nike's competitor. We suggest that this sequential alteration be dropped entirely.

Claims: As previously noted there are numerous objections to this patent. We respectfully suggest that these claims be focused and scoped on the specific footwear described in our Mutual NDA of June 1, 2010 – Schedule A Deliverables only.

Electronic Acknowledgement Receipt

EFS ID:	19825212
Application Number:	14087169
International Application Number:	
Confirmation Number:	5123
Title of Invention:	Article Of Footwear Having A Flat Knit Upper Construction Or Other Upper Construction
First Named Inventor/Applicant Name:	Bhupesh Dua
Customer Number:	57618
Filer:	Eric M. Gibson/Jose Espejo
Filer Authorized By:	Eric M. Gibson
Attorney Docket Number:	51-3770
Receipt Date:	11-AUG-2014
Filing Date:	22-NOV-2013
Time Stamp:	11:05:18
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	2014-08-11_51-3770_IDS_Cover_letter.pdf	55349 a26992bd264d9cfa7dbfb7c2502a837091b43112	no	1

Warnings:	
Information:	

2	Information Disclosure Statement (IDS) Form (SB08)	2014-08-11_51-3770_IDS.pdf	28446 fd63f858172cfcbf7117084f808ef71ca93c1524	no	3
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	Non Patent Literature	2014-08-11_51-3770_IDS_Bruce_Huffa_Letter.pdf	5045650 e1f5ee583cd35bb1d8a3222aa266883f026b0079	no	71
Warnings:					
Information:					
		Total Files Size (in bytes):	5129445		

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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.

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

Appln. No.	:	14/087,169	Confirmation No. 5123
Applicant	:	Bhupesh Dua	
Filed	:	November 22, 2013	
Title	:	Article of Footwear Having a Flat Knit Upper Construction or Other Upper Construction	
TC/A.U.	:	3765	
Examiner	:	Larry D. Worrell Jr.	
Attorney Docket No.:		51-3770	
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 11, 2014

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

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
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 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.		

This collection of information is required by 37 CFR 1.31, 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.

Electronic Acknowledgement Receipt

EFS ID:	23438250
Application Number:	14087169
International Application Number:	
Confirmation Number:	5123
Title of Invention:	Article Of Footwear Having A Flat Knit Upper Construction Or Other Upper Construction
First Named Inventor/Applicant Name:	Bhupesh Dua
Customer Number:	57618
Filer:	Eric D. Babych/Kristin Hooper
Filer Authorized By:	Eric D. Babych
Attorney Docket Number:	51-3770
Receipt Date:	09-SEP-2015
Filing Date:	22-NOV-2013
Time Stamp:	12:32:17
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	15571-26_Transmittal_09-09-2015.pdf	107990 5054ae61c1644fd5cfc920a70361f6c813d611fb	no	1

Warnings:	
Information:	

2	Assignee showing of ownership per 37 CFR 3.73	15571-26_3-73c_Statement_09-09-2015.pdf	49316 62c9df5b6865501b72246e62add6a7e616b29010	no	3
Warnings:					
Information:					
3	Power of Attorney	NIKE_General_POA_133691-signed.pdf	640948 e50ba9d82737b55b49c60f0ffaf1e6fc4ff6c8c9	no	1
Warnings:					
Information:					
			Total Files Size (in bytes):	798254	

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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.

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 9, 2015 Name: Eric D. Babych, Reg. #57,542 Signature: /Eric D. Babych/

BRINKS GILSON & LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Dua et al.		
Appln. No.:	14/087,169	Examiner:	Worrell, Jr., Larry D.
Filed:	November 22, 2013	Art Unit:	3765
For:	Article Of Footwear Having A Flat Knit Upper Construction Or Other Upper Construction	Conf. No.:	5123
Attorney Docket No.:	15571/26		

TRANSMITTAL

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

Sir:

Attached is/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 9, 2015
Date

/Eric D. Babych/
Eric D. Babych (Reg. No. 57,542)

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 of 1995, no persons are required 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. 15571/26 (06-0517US100)

Application No./Patent No.: 14/087,169 Filed/Issue Date: November 22, 2013

Titled: ARTICLE OF FOOTWEAR HAVING A FLAT KNIT UPPER CONSTRUCTION OR OTHER UPPER CONSTRUCTION

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 18993, Frame 0211, 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.

This collection of information is required by 37 CFR 3.73(b). 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 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, 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.

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 of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

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.

/Eric D. Babych/	September 9, 2015
Signature	Date
Eric D. Babych	57,542
Printed or Typed Name	Title or Registration 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.

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
14/087,169	11/22/2013	Bhupesh Dua	51-3770

CONFIRMATION NO. 5123

POWER OF ATTORNEY NOTICE

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

OC00000077470510

Date Mailed: 09/16/2015

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

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

- 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**.

/ytdemisse/

Skechers EX1013-p. 1205
Skechers v Nike

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
14/087,169	11/22/2013	Bhupesh Dua	15571/26

CONFIRMATION NO. 5123

POA ACCEPTANCE LETTER

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

OC00000077470568

Date Mailed: 09/16/2015

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

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

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**.

/ytdemisse/

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 on the below date:

Date: December 7, 2015 Name: Eric D. Babych Signature: /Eric D. Babych/

BRINKS GILSON & LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Bhupesh Dua et al.		
Appln. No.:	14/087,169	Examiner:	Larry D. Worrell, Jr.
Filed:	November 22, 2013	Art Unit:	3765
For:	ARTICLE OF FOOTWEAR HAVING A FLAT KNIT UPPER CONSTRUCTION OR OTHER UPPER CONSTRUCTION	Conf. No.:	5123
Attorney Docket No.:	15571-26		

SECOND SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

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

In accordance with the duty of disclosure, Applicant(s) hereby cites the following references:

US PATENT REFERENCES

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	NAME
	C1	2,770,055	11/13/1956	Hayden

OTHER ART – NON PATENT LITERATURE DOCUMENTS

EXAMINER INITIAL	Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	
	C2	European Search Report from corresponding European Application No. 15168417.2, dated September 7, 2015 (7 pages).

1. PRIORITY INFORMATION:

☐ This application claims priority under 35 USC §120 to the following United States patent application(s): _____. In accordance with 37 CFR §1.98(d), copies of the references cited herein which were submitted to, or cited by, the office, in compliance with 37 CFR §1.98(a)-(c) in the earlier application are not provided herewith. The Examiner is directed to those references cited in all Information Disclosure Statements filed in the priority United States patent application(s) cited above in addition to the references cited herein.

Examiner Signature		Date Considered	

Skechers EX1013-p. 1207
Skechers v Nike

2. CERTIFICATIONS: (CHECK ALL THAT APPLY)

☐ For purposes of 37 CFR §1.704(d)(i), Applicant hereby certifies that each item of information contained in this Information Disclosure Statement was first cited in any communication from a patent office in a counterpart foreign or international application or from the Office, and that this communication was not received by any individual designated in 37 CFR §1.56(c) more than thirty days prior to the filing of this Information Disclosure Statement.

☐ For purposes of 37 CFR §1.704(d)(ii), Applicant hereby certifies that each item of information contained in this Information Disclosure Statement is a communication that was issued by a patent office in a counterpart foreign or international application or by the Office, and that this communication was not received by any individual designated in 37 CFR §1.56(c) more than thirty days prior to the filing of this Information Disclosure Statement.

☐ Applicant hereby certifies pursuant to 37 CFR §1.97(e)(1) that each item of information in this 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 this Information Disclosure Statement.

☐ Applicant hereby certifies pursuant to 37 CFR §1.97(e)(2) that no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this Statement was known to any individual designated in 37 CFR §1.56(c), more than three months prior to the filing of this Information Disclosure Statement.

3. FEE INFORMATION: (CHECK IF FEE REQUIRED)

☐ Applicant has calculated a processing fee in the amount of _____ to be due under 37 CFR §1.17(p) in connection with the filing of this Information Disclosure Statement. Applicant authorizes charging the fee to Deposit Account _____.

☒ The Director is hereby authorized to charge any fee deficiency associated with the filing of this Information Disclosure Statement to Deposit Account 23-1925.

Pursuant to the undersigned attorney's obligation and duties under 37 CFR §§ 1.56 and 1.98(a)(3) and (c), either English language abstracts, partial translations, or full translations are included for patent documents which are not in English for the express purpose of providing a concise explanation of the references to the Patent and Trademark Office with the opportunity to evaluate the same. Applicant respectfully requests the Examiner's consideration of the above reference(s) and entry thereof into the record of this application.

By submitting this Statement, Applicant is attempting to fully comply with the duty of candor and good faith mandated by 37 CFR §1.56. As such, this Statement is not intended to constitute an admission that any of the enclosed references, or other information referred to therein, constitutes "prior art" or is otherwise "material to patentability," as that phrase is defined in 37 CFR §1.56(a).

Respectfully submitted,

December 7, 2015
Date

/Eric D. Babych/
Eric D. Babych (Reg. No. 57,542)

BRINKS GILSON & LIONE
405 S. Main Street, Suite 1000
Salt Lake City, Utah 84111-3411
(801) 355-7900

Europäisches Patentamt
European Patent Office
Office européen des brevets

Europe . Patent Office
80298 MUNICH
GERMANY

Questions about this communication ?
Contact Customer Services at www.epo.org/contact

Tombling, Adrian George
Withers & Rogers LLP
4 More London Riverside
London SE1 2AU
ROYAUME UNI

Records	08/09.	WW.
Forwards		
Pre Exmr	AGT	—

Date: 07.09.15

AGT

Reference	Application No./Patent No.
P523101DIV1D1AT	15168417.2 - 1658
Applicant/Proprietor: NIKE Innovate C.V.	

Communication

The extended European search report is enclosed.

The extended European search report includes, pursuant to Rule 62 EPC, the European search report (R. 61 EPC) or the partial European search report/ declaration of no search (R. 63 EPC) and the European search opinion.

Copies of documents cited in the European search report are attached.

☑ 0 additional set(s) of copies of such documents is (are) enclosed as well.

The following have been approved:

☐ Abstract ☑ Title

☑ The Abstract was modified and the definitive text is attached to this communication.

The following figure(s) will be published together with the abstract: 1B

Refund of search fee
If applicable under Article 9 Rules relating to fees, a separate communication from the Receiving Section on the refund of the search fee will be sent later.

Should you wish to further prosecute this application in the examination phase, your attention is drawn to the provisions of Rule 70a EPC. An invitation to respond to the extended European search report will be issued once the date of publication of the European search report has been mentioned in the European Patent Bulletin (R. 69(1), R. 70(2) EPC).

Europäisches Patentamt • European Patent Office • Office européen des brevets

EPO Form 1507N 06.12

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 15 16 8417

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2 147 197 A (GLIDDEN ALFRED A) 14 February 1939 (1939-02-14) * page 1, column 2; figures *	1-10	INV. A43B23/02 B32B27/12 A43B1/04
A	US 6 029 376 A (CASS WILLIAM J [US]) 29 February 2000 (2000-02-29) * columns 4-9; figures *	1-10	
A	US 2005/115284 A1 (DUA BHUPESH [US]) 2 June 2005 (2005-06-02) * paragraph [0019] - paragraph [0040]; figures *	1-10	
A	US 2 770 055 A (HAYDEN HELEN M) 13 November 1956 (1956-11-13) * column 3, lines 37-41; figures *	1-10	

TECHNICAL FIELDS SEARCHED (IPC)

A43B
B32B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	26 August 2015	Herry, Manuel

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 15 16 8417

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

26-08-2015

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2147197 A	14-02-1939	NONE	
US 6029376 A	29-02-2000	NONE	
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 2770055 A	13-11-1956	NONE	

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

ABSTRACT / ZUSAMMENFASSUNG / ABRÉGÉ

15168417.2

Articles of footwear (100) include a textile upper member (102) with an exterior (102a) constructed from knitted textile material, the exterior including a region (106, 108) with stability ribs and a second unribbed region (110). The region(s) having stability ribs may be located, for example: along a lateral midfoot side of the upper member; along a forefoot portion of the upper member; and/or along a medial midfoot side of the upper member. Other articles of footwear include an upper member having exterior and interior textile elements joined together in a stitchless manner at the foot-receiving opening of the upper member. The exterior surface of this upper member also may include one or more regions with stability structures.; The stitchless textile engagement techniques can provide a smooth, non-bulky, and breathable joint that does not require thick layers of textile material in contact with or adjacent the wearer's foot.

The examination is being carried out on the **following application documents**

Description, Pages

1-39 as originally filed

Claims, Numbers

1-10 as originally filed

Drawings, Sheets

1/10-10/10 as originally filed

1 The features of the present claims introduce subject-matter which extends beyond the content of the earlier application as filed, contrary to Article 76(1) EPC. The features concerned are the following.

According to present claim 1, "a first area of the textile element has a ribbed structure", without further specifying the nature of the ribs. With this wording, for instance, the ribs could be external elements glued to the upper, or the ribs could be designed to ensure elasticity (as in US 2 147 197 A, see p.1, col.2, l. 41-44).

On the contrary the earlier applications EP 06 787 564 and EP 12 170 581 as originally constantly referred to ribs being "stability ribs integrally formed in the textile material" (see in particular claims 1, 26-27, 45 and the whole description of the earlier application as originally filed).

There is therefore no basis for a generalisation of the nature of the ribs.

This objection could be overcome, in claim 1 specifies that the ribs are ""stability ribs integrally formed in the textile material".

Otherwise, the divisional application must be refused under Article 97(2) due to non-compliance with Article 76(1) EPC (Examination Guidelines, C-IX, 1.4).

2 It seems that an amended claim 1 overcoming the previous objection, i.e. specifying that the ribs are "stability ribs integrally formed in the textile material", could be considered as being new and inventive for the following reasons.

The closest prior art is represented by US 2 147 197 A, which discloses a knitted upper with reinforced zones at the forefoot and heel parts (fig.1).

Claim 1 specifies that the first area of the textile element has a ribbed structure and that the second area of the textile element has a non-ribbed smooth structure, wherein a first portion of the first area of the textile element extends along the the forefoot region of the exterior surface of the upper and a second portion of the first area of the textile element extends along a lateral midfoot side of the exterior surface of the upper, and a portion of the second area of the textile element extends between the first and second portions of the first area on a lateral midfoot side of the upper. These features provide a knitted upper structure capable of ensuring stability in the forefoot area and in th elateral midfoot area, while still allowing flexibility between these areas in order to facilitate the natural deformation of the feet during activities such as yoga, pilates, stretching or dance (par.5).

The skilled person would find no indication in the cited prior art, that would lead him to these features. In particular:

• in US 2 147 197 A the midfoot portion of the knitted upper is explicitly designed to be soft and elastic.

• US 6 029 376 A discloses support elements 50-60 on a textile upper, and ribs 116 on a heel cap. However, different stitch configurations in the first and second areas are not foreseen.

• the whole outer surface of US 2005/115284 A1 is covered with ribs.

• component 30 of US 2 770 055 A is an ornamental piece covering inelastic body 16.

The earlier applications EP 06 787 564 and EP 12 170 581 did not claim the present subject-matter.

3 The applicant is invited to file amendments overcoming the above-mentioned objections. An independent claim should be filed taking account of Rule 43(1) EPC. The applicant should also indicate in the letter of reply the difference of the subject-matter of the new claim vis-à-vis the state of the art and the

significance thereof.

The features of the claims should be provided with reference signs placed in parentheses to increase the intelligibility of the claims (Rule 43(7) EPC).

The description and the dependent claims should be adapted to the newly filed independent claim.

To meet the requirements of Rule 42(1)(b) EPC, the most relevant cited document(s) should be identified in the description and the relevant background art disclosed therein should be briefly discussed.

In order to render the examination of the conformity of the amended application with the requirements of Article 123(2) EPC possible, the applicant should clearly identify the amendments carried out, irrespective of whether they concern amendments by addition, replacement or deletion, and indicate the passages of the application as filed on which these amendments are based (see Examination Guidelines, H-III, 2.2).

Reference is made to the Official Journal of the EPO, OJ EPO 2013, 603, according to which with effect from 1 January 2014, the EPO will discontinue its existing practice and, in strict compliance with Rule 50(1) EPC in conjunction with Rule 49(8) EPC, will no longer accept handwritten amendments in documents replacing parts of the European patent application. The same applies mutatis mutandis to opposition proceedings (Rule 86 EPC).

Electronic Acknowledgement Receipt

EFS ID:	24285831
Application Number:	14087169
International Application Number:	
Confirmation Number:	5123
Title of Invention:	Article Of Footwear Having A Flat Knit Upper Construction Or Other Upper Construction
First Named Inventor/Applicant Name:	Bhupesh Dua
Customer Number:	133691
Filer:	Eric D. Babych/Jayna Lofgran
Filer Authorized By:	Eric D. Babych
Attorney Docket Number:	15571/26
Receipt Date:	07-DEC-2015
Filing Date:	22-NOV-2013
Time Stamp:	17:43:14
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)	15571-26_2d-Supp-IDS_151207.pdf	93527 f326cdf74d006aa19e1591521971c47393f3e7b5	no	2

Warnings:	
Information:	

This is not an USPTO supplied IDS fillable form					
2	Other Reference-Patent/App/Search documents	European-Search-Report_EP15168417-2_2015-09-07.pdf	301928 db38c5d0a404212ca186bd46edf5efe382abf7cd	no	7
Warnings:					
Information:					
			Total Files Size (in bytes):	395455	

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.
14/087,169	11/22/2013	Bhupesh Dua	06-0517US100/15571-26	5123

133691 7590 08/02/2016

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

EXAMINER
WORRELL JR, LARRY D

ART UNIT	PAPER NUMBER
3765	

MAIL DATE	DELIVERY MODE
08/02/2016	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. 14/087,169	Applicant(s) DUA 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) *1-20* 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) *1-20* 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 *3/13/14, 8/11/14, 12/7/15*.

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

4) ☐ Other: _____.

Skechers EX1013-p. 1219
Skechers v Nike

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

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.

Claim(s) 1, 5-9 and 12-18 is/are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Dua et al. (US 2005/0193592), henceforth known as Dua.

Dua teaches the invention as claimed including an article of footwear (10) comprising an upper (30) including a flat-knitted element (40") formed from at least one yarn mechanically manipulated in a flat-knitting process ([0044]), the flat-knitted element including a first layer having: a central portion (See annotated Figure 11) having a domed, three-dimensional structure (the domed area includes a length, a width and a thickness) configured for extending over the top of a foot (See annotated Figure 11); a first side portion (See annotated Figure 11) being formed of unitary construction with the central portion and extending from a first side of the central portion; and a second side (See annotated Figure 11) portion being formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion.

Regarding claim 5, the knitted element defines a void for receiving a foot of a wearer ([0033]).

Regarding 6, wherein the knitted element defines at least a portion of an exterior surface of the upper, and the knitted element defines at least a portion of a void for receiving a foot of a wearer ([0033]).

Regarding 7, the knitted element includes a first area and a second area, the first area including a first type of knit structure (46''), and the second area including a second type of knit structure (48''), the first type being different than the second type.

Regarding 8, the at least one mechanically manipulated yarn includes a first yarn and a different second yarn, the first yarn being located in a first area of the upper, and the second yarn being located in a second area of the upper ([0056]).

Regarding 9, wherein the knitted element forms a defined shape having finished edges during the flat knitting process (See annotated Figure 11).

Regarding claim 12, Dua also teaches the method of manufacturing an article of footwear including forming during a flat-knitting process ([0044]) an upper (30) including a flat-knitted element (40'') including a first layer having: a central portion (See annotated Figure 11) having a domed, three-dimensional structure (the domed area includes a length, a width and a thickness) configured for extending over the top of a foot; a first side portion (See annotated Figure 11) being formed of unitary construction with the central portion and extending from a first side of the central portion; and a second side portion (See annotated Figure 11); being formed of unitary

construction with the central portion and extending from a second side opposite the first side of the central portion.

Regarding claim 13, the flat knitting process includes forming a first area (46") and a second area (48''), a stitch type of the first area being different that a stitch type of the second area.

Regarding claim 14, the flat knitting process includes forming a first area and a second area, a yarn type of the first area being different than a yarn type of the second area ([0056]).

Regarding claim 15, wherein the flat knitting process includes forming a first area and a second area, a stitch type and a yarn type of the first area being different than a stitch type and a yarn type of the second area ([0056]).

Regarding 16, assembling the flat- knitted element into an article of footwear (figures 3-5).

Regarding 17, the assembling includes joining side edges of the first side portion and the second side portion to form a seam (51, figure 5) extending under a foot and along a longitudinal length of the foot.

Regarding 18, the assembling includes joining rear edges of the first side portion and the second side portion to form a seam (52, figure 4) that extends upward along a heel.

Claim Rejections - 35 USC § 103

The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made

> to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2-4, 10, 11, 19 and 20 is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Dua in view of Hatfield et al. (US 6,367,168), henceforth known as Hatfield.

Dua teaches the invention substantially as claimed as indicated above in the rejection to claim 1. However, Dua does not set forth a first loop being formed as a second layer of unitary construction with the first layer. Hatfield discloses a central portion of a knitted upper which includes loops (36) formed as a second layer of unitary construction with the first layer (38). It would have been obvious at the time the invention was made to provide the upper structure of Dua with loops formed as a second layer of unitary construction with the first layer as shown by Hartfield in order to provide a means for attaching frame members (22) for structurally stiffening the shoe upper. Regarding claim 3, note that the first loop (36) extends outward from the central portion of the upper. 4. Regarding claim 4, note eight loops (36, figures 1, 2) being formed as a second layer of unitary construction with the first layer. Regarding claim 10, Dua teaches the article of footwear (10) substantially as claimed including an upper (30) having a flat-knitted element (40'') formed from at least one yarn mechanically manipulated in a flat-knitting process, the flat-knitted element including a first layer, the first layer including a central portion (See annotated figure 11); a first side portion (See annotated figure 11) being formed of unitary construction with the central portion and extending from a first side of the central portion; and a second side portion (See annotated figure 11) being formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion. Dua does not second layer of unitary construction with the first layer forming an overlapped loop. Hatfield discloses a central portion of a knitted upper which includes loops (36) formed as

a second layer of unitary construction with the first layer (38). It would have been obvious at the time the invention was made to provide the upper structure of Dua with loops formed as a second layer of unitary construction with the first layer as shown by Hartfield in order to provide a means for attaching frame members (22) for structurally stiffening the shoe upper. Regarding claim 11, the central portion (annotated figure 11) has a domed, three-dimensional structure (length, width, thickness) configured for extending over the top of a foot. Regarding claim 19, the flat knitting process of the combined teachings of Dua and Hartfield includes forming a first loop of unitary construction in the textile element. Regarding claim 20, the combined teachings of Dua and Hartfield include extending a lace (22) element through the first loop.

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. 14/087,169	Applicant(s)/Patent Under Reexamination DUA ET AL.	
	Examiner DANNY WORRELL	Art Unit 3765	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-8,225,530 B2	07-2012	Sokolowski; Susan L.	A43B3/0031	12/142G
*	B	US-6,367,168 B1	04-2002	Hatfield; Tinker L.	A43B7/06	36/101
	C	US-				
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC 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.

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 on the below date:

Date: December 7, 2015 Name: Eric D. Babych Signature: /Eric D. Babych/

BRINKS GILSON & LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Bhupesh Dua et al.		
Appln. No.:	14/087,169	Examiner:	Larry D. Worrell, Jr.
Filed:	November 22, 2013	Art Unit:	3765
For:	ARTICLE OF FOOTWEAR HAVING A FLAT KNIT UPPER CONSTRUCTION OR OTHER UPPER CONSTRUCTION	Conf. No.:	5123
Attorney Docket No.:	15571-26		

SECOND SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

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

In accordance with the duty of disclosure, Applicant(s) hereby cites the following references:

US PATENT REFERENCES

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	NAME
	C1	2,770,055	11/13/1956	Hayden

OTHER ART – NON PATENT LITERATURE DOCUMENTS

EXAMINER INITIAL	Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	
	C2	European Search Report from corresponding European Application No. 15168417.2, dated September 7, 2015 (7 pages).

1. PRIORITY INFORMATION:

☐ This application claims priority under 35 USC §120 to the following United States patent application(s): _____. In accordance with 37 CFR §1.98(d), copies of the references cited herein which were submitted to, or cited by, the office, in compliance with 37 CFR §1.98(a)-(c) in the earlier application are not provided herewith. The Examiner is directed to those references cited in all Information Disclosure Statements filed in the priority United States patent application(s) cited above in addition to the references cited herein.

Examiner Signature	/DANNY WORRELL/ (08/01/2016)	Date Considered	

Skechers EX1013-p. 1228
Skechers v Nike

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /DW/

Second Supplemental Information Disclosure Statement

Application No. 14/087,169 Attorney Docket No. 15571-26

2. CERTIFICATIONS: (CHECK ALL THAT APPLY)

☐ For purposes of 37 CFR §1.704(d)(i), Applicant hereby certifies that each item of information contained in this Information Disclosure Statement was first cited in any communication from a patent office in a counterpart foreign or international application or from the Office, and that this communication was not received by any individual designated in 37 CFR §1.56(c) more than thirty days prior to the filing of this Information Disclosure Statement.

☐ For purposes of 37 CFR §1.704(d)(ii), Applicant hereby certifies that each item of information contained in this Information Disclosure Statement is a communication that was issued by a patent office in a counterpart foreign or international application or by the Office, and that this communication was not received by any individual designated in 37 CFR §1.56(c) more than thirty days prior to the filing of this Information Disclosure Statement.

☐ Applicant hereby certifies pursuant to 37 CFR §1.97(e)(1) that each item of information in this 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 this Information Disclosure Statement.

☐ Applicant hereby certifies pursuant to 37 CFR §1.97(e)(2) that no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this Statement was known to any individual designated in 37 CFR §1.56(c), more than three months prior to the filing of this Information Disclosure Statement.

3. FEE INFORMATION: (CHECK IF FEE REQUIRED)

☐ Applicant has calculated a processing fee in the amount of _____ to be due under 37 CFR §1.17(p) in connection with the filing of this Information Disclosure Statement. Applicant authorizes charging the fee to Deposit Account _____.

☒ The Director is hereby authorized to charge any fee deficiency associated with the filing of this Information Disclosure Statement to Deposit Account 23-1925.

Pursuant to the undersigned attorney's obligation and duties under 37 CFR §§ 1.56 and 1.98(a)(3) and (c), either English language abstracts, partial translations, or full translations are included for patent documents which are not in English for the express purpose of providing a concise explanation of the references to the Patent and Trademark Office with the opportunity to evaluate the same. Applicant respectfully requests the Examiner's consideration of the above reference(s) and entry thereof into the record of this application.

By submitting this Statement, Applicant is attempting to fully comply with the duty of candor and good faith mandated by 37 CFR §1.56. As such, this Statement is not intended to constitute an admission that any of the enclosed references, or other information referred to therein, constitutes "prior art" or is otherwise "material to patentability," as that phrase is defined in 37 CFR §1.56(a).

Respectfully submitted,

December 7, 2015 /Eric D. Babych/

Date Eric D. Babych (Reg. No. 57,542)

BRINKS GILSON & LIONE
405 S. Main Street, Suite 1000
Salt Lake City, Utah 84111-3411
(801) 355-7900

Skechers EX1013-p. 1229
Skechers v Nike

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /DW/

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14087169	DUA ET AL.
	Examiner	**Art Unit**
	LARRY WORRELL JR	3765

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

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

CLAIM		DATE								
Final	Original	08/01/2016								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	✓								
	9	✓								
	10	✓								
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	12	✓								
	13	✓								
	14	✓								
	15	✓								
	16	✓								
	17	✓								
	18	✓								
	19	✓								
	20	✓								

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
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14087169
Filing Date	2013-11-22
First Named Inventor	Bhupesh Dua
Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3770

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					

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]

/DANNY WORRELL/ (08/01/2016)

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /DW/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3770

	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	/DANNY WORRELL/ (08/01/2016)	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. /DW/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Application Number	14087169
Filing Date	2013-11-22
First Named Inventor	Bhupesh Dua
Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3770

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)	2014-08-11
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.**

/DANNY WORRELL/ (08/01/2016)

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /DW/

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

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

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Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3770

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	2343390		1944-03-07	Ushakoff	
	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	

/DANNY WORRELL/ (08/01/2016)

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /DW/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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

Application Number	14087169
Filing Date	2013-11-22
First Named Inventor	Bhupesh Dua
Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3770

	9	6333105		2001-12-25	Tanaka et al.	
	10	3583081		1974-06-08	Hayashi	
	11	4447967		1984-05-15	Zaino	
	12	4813158		1989-03-21	Brown	
	13	4756098		1988-07-12	Boggia	
	14	5345638		1994-09-13	Nishida	
	15	4785558		1988-11-22	Shiomura	
	16	0601192		1898-03-22	Woodside	
	17	1215198	A	1917-02-06	Rothstein	
	18	1597934	A	1926-08-31	Stimpson	
	19	1888172	A	1932-11-15	Joha	

/DANNY WORRELL/ (08/01/2016)

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /DW/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(**Not for submission under 37 CFR 1.99)**

Application Number	14087169
Filing Date	2013-11-22
First Named Inventor	Bhupesh Dua
Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3770

	20	1902780	A	1933-03-21	Holden et al.	
	21	1910251	A	1933-05-23	Joha	
	22	2001293	A	1935-05-14	Wilson	
	23	2047724	A	1936-07-14	Zuckerman	
	24	2330199	A	1943-09-28	Basch	
	25	2400692	A	1946-05-21	Herbert	
	26	2586045	A	1952-02-19	Hoza	
	27	2675631	A	1954-04-20	Doughty	
	28	2994322	A	1961-08-01	Cullen et al.	
	29	3694940	A	1972-10-03	Stohr	
	30	3704474	A	1972-12-05	Winkler	

/DANNY WORRELL/ (08/01/2016)
ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /DW/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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

Application Number	14087169
Filing Date	2013-11-22
First Named Inventor	Bhupesh Dua
Art Unit	3765
Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3770

	31	3766566	A	1973-10-23	Tadakoro	
	32	3778856	A	1973-12-18	Christie et al.	
	33	3952427	A	1976-04-27	Von den Benken et al.	
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Examiner Name	Larry D. Worrell Jr.
Attorney Docket Number	51-3770

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

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

EXAMINER SIGNATURE

Examiner Signature	/DANNY WORRELL/ (08/01/2016)	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.

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Attorney Docket Number	51-3770

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)	2014-03-13
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.**

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14087169	DUA ET AL.
	Examiner	Art Unit
	LARRY WORRELL JR	3765

CPC- SEARCHED		
Symbol	Date	Examiner
D04B 7/30, 7/24, 7/28, 1/24, 1/26, 7/32	8/1/2016	/dw/
A43B 23/0205, 23/0235, 23/024, 23/0245, 23/042, 1/04	8/1/2016	/dw/

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
36	48, 49	7/31/2016	/dw/

SEARCH NOTES		
Search Notes	Date	Examiner
Review related applications	7/31/2016	/dw/
CPC and US Class search limited by term "Knit$5"	8/1/2016	/dw/

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

Skechers Exhibit p. 1252

Skechers v Nike

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: January 30, 2017 Signature: /Andrew A. Hufford/

Name: Andrew A. Hufford

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Bhupesh Dua, et al.

Serial No.: 14/087,169

Filed: Nov. 22, 2013

For: ARTICLE OF FOOTWEAR HAVING A FLAT KNIT UPPER CONSTRUCTION OR OTHER UPPER CONSTRUCTION

Attorney Docket No.: 15571-26 (06-0517US100)

Examiner: Worrell, Larry D.

Group Art Unit: 3765

Confirmation No.: 5123

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

AMENDMENT

Dear Madam:

Responsive to the Non-Final Office Action of August 2, 2016 ("Office Action"), please amend the above-referenced patent application as follows:

Amendments to the Claims are set forth in the Listing of the Claims, which begins on page 2 of this paper; and

Remarks begin on page 6 of this paper.

Amendments to the Claims:

Claim 11 is cancelled herein. Claims 1, 10, and 12 are amended herein. All pending claims are shown below. Please enter these claims as amended. This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently amended) An article of footwear comprising an upper including a flat-knitted element formed from at least one yarn mechanically manipulated in a flat-knitting process, the flat-knitted element including a first layer having:

a central portion having a domed, three-dimensional structure configured for extending over the top of a foot;

a first side portion being formed of unitary construction with the central portion and extending from a first side of the central portion; and

a second side portion being formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion, the domed, three-dimensional structure shaped to extend above the plane of the first side portion and the second side portion when the flat-knitted element is in a flattened configuration.

2. (Original) The article of footwear of claim 1, further comprising a first loop being formed as a second layer of unitary construction with the first layer.

3. (Original) The article of footwear of claim 2, wherein the first loop extends outward from the central portion.

4. (Original) The article of footwear of claim 2, further comprising eight loops being formed as a second layer of unitary construction with the first layer.

5. (Original) The article of footwear of claim 1, wherein the knitted element defines a void for receiving a foot of a wearer.

6. (Original) The article of footwear of claim 1, wherein the knitted element defines at least a portion of an exterior surface of the upper, and the knitted element defines at least a portion of a void for receiving a foot of a wearer.

7. (Original) The article of footwear of claim 1, wherein the knitted element includes a first area and a second area, the first area including a first type of knit structure, and the second area including a second type of knit structure, the first type being different than the second type.

8. (Original) The article of footwear of claim 1, wherein the at least one mechanically manipulated yarn includes a first yarn and a different second yarn, the first yarn being located in a first area of the upper, and the second yarn being located in a second area of the upper.

9. (Original) The article of footwear of claim 1, wherein the knitted element forms a defined shape having finished edges during the flat knitting process.

10. (Currently amended) An article of footwear comprising an upper including a flat-knitted element formed from at least one yarn mechanically manipulated in a flat-knitting process, the flat-knitted element including a first layer and a second layer, the first layer including:

a central portion having a domed, three-dimensional structure configured for extending over the top of a foot;

a first side portion being formed of unitary construction with the central portion and extending from a first side of the central portion; and

a second side portion being formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion; and

the second layer being flat-knitted with the first layer at opposite ends of the second layer to form an overlapped loop.

11. (Cancelled).

12. (Currently amended) A method of manufacturing an article of footwear, the method comprising

forming during a flat-knitting process an upper including a flat-knitted element including a first layer having:

a central portion having a domed, three-dimensional structure configured for extending over the top of a foot;

a first side portion being formed of unitary construction with the central portion and extending from a first side of the central portion; and

a second side portion being formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion, wherein the domed, three-dimensional structure is shaped to extend above the plane of the first side portion and the second side portion when the flat-knitted element is in a flattened configuration.

13. (Original) The method recited in claim 12, wherein the flat knitting process includes forming a first area and a second area, a stitch type of the first area being different that a stitch type of the second area.

14. (Original) The method recited in claim 12, wherein the flat knitting process includes forming a first area and a second area, a yarn type of the first area being different than a yarn type of the second area.

15. (Original) The method recited in claim 12, wherein the flat knitting process includes forming a first area and a second area, a stitch type and a yarn type of the first area being different than a stitch type and a yarn type of the second area.

16. (Original) The method recited in claim 12, further comprising assembling the flat- knitted element into an article of footwear.

17. (Original) The method recited in claim 16, wherein the assembling includes joining side edges of the first side portion and the second side portion to form a seam extending under a foot and along a longitudinal length of the foot.

18. (Original) The method recited in claim 16, wherein the assembling includes joining rear edges of the first side portion and the second side portion to form a seam that extends upward along a heel.

19. (Original) The method recited in claim 12, wherein the flat knitting process includes forming a first loop of unitary construction in the textile element.

20. (Original) The method recited in claim 19, further comprising extending a lace element through the first loop.

REMARKS

The Office Action has been received and reviewed. All claim amendments and cancellations are made without prejudice or disclaimer. No new matter has been added. Reconsideration is respectfully requested.

Claim Amendments

Claims 1 and 12 are amended to recite "...the domed, three-dimensional structure shaped to extend above the plane of the first side portion and the second side portion when the flat-knitted element is in a flattened configuration." Claim 10 is amended to recite "...a central portion having a domed, three-dimensional structure configured for extending over the top of a foot." Support can be found in existing claims 1, 10, and 12, before amendment, and throughout the Specification, for example, at [0058], [0060], [0061] ("Whereas side portions 72 are relatively flat in configuration, central portion 71 has a domed shape formed through the flat knitting process. That is, the flat knitting process forms central portion 71 to have a three-dimensional structure that is shaped to extend over the foot"); and FIGS. 10A-10C. For example, FIGS. 10A and 10C illustrate two embodiments of a flat-knit element including a central portion 71 having a three-dimensional structure shaped to extend above the plane of the first side portion 72 and the second side portion 72 when the flat-knitted element is in a flattened configuration.

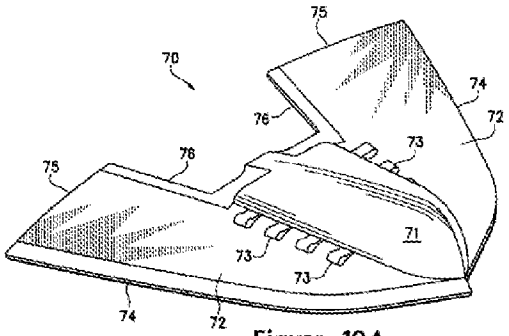


Figure 10A

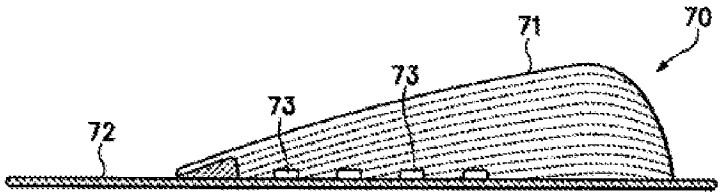


Figure 10C

35 U.S.C. § 102(b)

Claims 1, 5-9, and 12-18 stand rejected under pre-AIA 35 U.S.C. § 102(b) as assertedly anticipated by Dua et al. (US 2005/0193592) ("Dua").

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently, in a single prior art reference. MPEP § 2143. All words in a claim must be considered in judging the patentability of that claim against the prior art." Id.

Dua does not teach:

> An article of footwear comprising an upper including a flat-knitted element formed from at least one yarn mechanically manipulated in a flat-knitting process, the flat-knitted element including a first layer having:
> a central portion having a domed, three-dimensional structure configured for extending over the top of a foot;
> a first side portion being formed of unitary construction with the central portion and extending from a first side of the central portion; and
> a second side portion being formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion, the domed, three-dimensional structure shaped to extend above the plane of the first side portion and the second side portion when the flat-knitted element is in a flattened configuration,

as recited in claim 1, as amended.

Dua does not teach:

> A method of manufacturing an article of footwear, the method comprising forming during a flat-knitting process an upper including a flat-knitted element including a first layer having:
> a central portion having a domed, three-dimensional structure configured for extending over the top of a foot;
> a first side portion being formed of unitary construction with the central portion and extending from a first side of the central portion; and
> a second side portion being formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion, wherein the domed, three-dimensional structure is shaped to extend above the plane of the first side portion and the second side portion when the flat-knitted element is in a flattened configuration.

as recited in claim 12, as amended.

Claims 5-9, and 13-18 depend from claims 1 or 12 and are not anticipated for at least the same reasons. Thus, the rejections should be withdrawn.

35 U.S.C. § 103(a)

Claims 2-4, 10, 11, 19 and 20 stand rejected under pre-AIA 35 U.S.C. § 103(a) as assertedly being unpatentable over Dua in view of Hatfield et al. (US 6,367,168) ("Hatfield").

Claim 11 is cancelled, rendering the rejection moot.

As to the remaining claims, the applicants respectfully disagree.

To establish a *prima facie* case of obviousness, the prior art reference itself (or references when combined) or "the inferences and creative steps that a person of ordinary skill in the art would [have] employ[ed]" at the time of the invention must teach or suggest all of the claim elements. MPEP § 2143.03.

Claims 1, 10, and 12 are amended as described herein.

The cited references do not teach or suggest:

> An article of footwear comprising an upper including a flat-knitted element formed from at least one yarn mechanically manipulated in a flat-knitting process, the flat-knitted element including a first layer having:
> a central portion having a domed, three-dimensional structure configured for extending over the top of a foot;
> a first side portion being formed of unitary construction with the central portion and extending from a first side of the central portion; and
> a second side portion being formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion, the domed, three-dimensional structure shaped to extend above the plane of the first side portion and the second side portion when the flat-knitted element is in a flattened configuration,

as recited in claim 1, as amended.

The cited references do not teach or suggest:

> An article of footwear comprising an upper including a flat-knitted element formed from at least one yarn mechanically manipulated in a flat-knitting process, the flat-knitted element including a first layer and a second layer, the first layer including:
> a central portion having a domed, three-dimensional structure configured for extending over the top of a foot;
> a first side portion being formed of unitary construction with the central portion and extending from a first side of the central portion; and
> a second side portion being formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion; and
> the second layer being flat-knitted with the first layer at opposite ends of the second layer to form an overlapped loop.

as recited in claim 10, as amended.

In addition, the cited references do not teach or suggest:

> A method of manufacturing an article of footwear, the method comprising forming during a flat-knitting process an upper including a flat-knitted element including a first layer having:
> a central portion having a domed, three-dimensional structure configured for extending over the top of a foot;
> a first side portion being formed of unitary construction with the central portion and extending from a first side of the central portion; and
> a second side portion being formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion, wherein the domed, three-dimensional structure is shaped to extend above the plane of the first side portion and the second side portion when the flat-knitted element is in a flattened configuration.

as recited in claim 12, as amended.

Claims 2-4 and 19-20 are dependent from claims 1 or 12 and are not obvious for the same reasons. Thus, the rejections should be withdrawn.

CONCLUSION

In view of the foregoing remarks and amendments, the application should be in condition for allowance, and an early notice thereof is respectfully solicited. However, should the Office determine that additional issues remain which might be resolved by a telephone conference, the Examiner is requested to contact Applicants' undersigned attorney.

Respectfully submitted,

/Andrew A. Hufford/
Andrew A. Hufford
Registration No. 69,425
Attorney for Applicants

BRINKS GILSON & LIONE
405 South Main Street, Suite 1000
Salt Lake City, UT 84111-3411
Tel: (801) 333-7910

Encl: Petition for Extension of Time (3 months)

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: January 30, 2017 Name: Andrew A. Hufford (Reg. No. 69,425) Signature: /Andrew A. Hufford/

BRINKS GILSON & LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Bhupesh Dua et al.		
Appln. No.:	14/087,169	Examiner:	Worrell, Larry D.
Filed:	November 22, 2013	Art Unit:	3765
For:	ARTICLE OF FOOTWEAR HAVING A FLAT KNIT UPPER CONSTRUCTION OR OTHER UPPER CONSTRUCTION	Conf. No.:	5123
Attorney Docket No.:	15571-26/06-0517US100		

PETITION AND FEE FOR EXTENSION OF TIME (37 CFR § 1.136(a))

Mail Stop Amendment
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir/Madam:

This is a petition for an extension of the time to respond to a Non-Final Office Action dated August 2, 2016 for a period of three (3) month(s).

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

	Extension Months	Fee	Small Entity Fee	Micro Entity Fee
☐	One Month	$ 200	$ 100	$ 50
☐	Two Months	$ 600	$ 300	$150
☒	Three Months	$1,400	$ 700	$350
☐	Four Months	$2,200	$1,100	$550
☐	Five Months	$3,000	$1,500	$750

Payment Method:

☒ The Commissioner is hereby authorized to charge $1,400.00 to cover the fees listed above to Deposit Account No. 23-1925.

☐ Payment by credit card in the amount of $_____ to cover the fees listed above. Form PTO-2038 is enclosed for this purpose.

☒ The Commissioner is hereby authorized to charge any deficiencies in fees or credit overpayment to Deposit Account No. 23-1925.

Respectfully submitted,

January 30, 2017
Date

/Andrew A. Hufford/
Andrew A. Hufford Reg. No. 69,425
Attorney for Applicant(s)

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405 S. Main Street, Suite 1000
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(801) 355-7900

Electronic Patent Application Fee Transmittal

Application Number:	14087169
Filing Date:	22-Nov-2013
Title of Invention:	Article Of Footwear Having A Flat Knit Upper Construction Or Other Upper Construction
First Named Inventor/Applicant Name:	Bhupesh Dua
Filer:	Andrew A. Hufford/Jayna Lofgran
Attorney Docket Number:	06-0517US100/15571-26

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:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 3 months with $0 paid	1253	1	1400	1400
Miscellaneous:				
			Total in USD ($)	**1400**

Electronic Acknowledgement Receipt

EFS ID:	28208573
Application Number:	14087169
International Application Number:	
Confirmation Number:	5123
Title of Invention:	Article Of Footwear Having A Flat Knit Upper Construction Or Other Upper Construction
First Named Inventor/Applicant Name:	Bhupesh Dua
Customer Number:	133691
Filer:	Andrew A. Hufford/Jayna Lofgran
Filer Authorized By:	Andrew A. Hufford
Attorney Docket Number:	06-0517US100/15571-26
Receipt Date:	30-JAN-2017
Filing Date:	22-NOV-2013
Time Stamp:	16:58:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$1400
RAM confirmation Number	013117INTEFSW00004516231925
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		2017-01-30_Response_NFOA_15571-26_06-0517US100.pdf	141308 3ea60b8f4ba8bd31b72bb6e76e967b256799b7fe	yes	9
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	5	
	Applicant Arguments/Remarks Made in an Amendment		6	9	
Warnings:					
Information:					
2	Extension of Time	2017-01-30_Petition-Extension-Time_15571-26_06-0517US100.pdf	77995 6abefffb19f119ae527280b4a5da7376b10e2cca	no	1
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30685 dc4ab94fd76ec35e510f25c262de7333caabc628	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	249988		

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
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/087,169	Filing Date 11/22/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) 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

AMENDMENT	01/30/2017	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 19	Minus	** 20	= 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

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) 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
BRENDA MURPHY

This collection of information is required by 37 CFR 1.16. 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, 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.

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: April 4, 2017 Name: Andrew A. Hufford (Reg. No. 69,425) Signature: /Andrew A. Hufford/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	14/087,169
	Filing Date	November 22, 2013
	First Named Inventor	Bhupesh Dua
	Art Unit	3765
	Confirmation Number	5123
	Examiner Name	Larry D. Worrell, Jr.
	Attorney Docket No.	15571-26/06-0517US100

In accordance with the duty of disclosure, Applicant(s) hereby cites the following references:

US PATENT REFERENCES

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	NAME
	D1	4,967,494 A	11/6/1990	Johnson
	D2	6,227,010 B1	5/8/2001	Roell
	D3	6,986,269 B2	1/17/2006	Dua
	D4	8,448,474 B1	5/28/2013	Tatler et al.
	D5	2006/0010931 A1	1/19/2016	Lynch et al.
	D6	2006/0130359 A1	6/22/2006	Dua et al.
	D7	2007/0294920 A1	12/27/2007	Baychar
	D8	2012/0240429 A1	9/27/2012	Sokolowski et al.
	D9	2013/0160323 A1	6/27/2013	Hsiao
	D10	2013/0269209 A1	10/17/2013	Lang et al.
	D11	2013/0269212 A1	10/17/2013	Little
	D12	2014/0137433 A1	5/22/2014	Craig
	D13	2014/0150292 A1	6/5/2014	Podhajny et al.
	D14	2015/0075031 A1	3/19/2015	Podhajny et al.

FOREIGN PATENT REFERENCES

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	COUNTRY	TRANSLATION YES OR NO
	D15	CN 1925763 A	3/7/2007	China	Yes
	D16	CN 201536681 U	8/4/2010	China	Yes - Abstract
	D17	CN 103556384 A	2/5/2014	China	Yes
	D18	DE 475363 C	4/24/1929	Germany	No
	D19	EP 2805638	11/26/2014	Europe	
	D20	GB 12787	6/6/1904	Great Britain	
	D21	TW 1228158 B	2/21/2005	Taiwan	Yes - Abstract
	D22	TW 201402030 A	1/16/2014	Taiwan	Yes - Abstract
	D23	TW M498500 U	4/11/2015	Taiwan	Yes - Abstract
	D24	WO 2013/108506 A1	7/25/2013	WIPO	Yes - Abstract
	D25	WO 2013/126313 A2	8/29/2013	WIPO	

Examiner Signature		Date Considered	

Skechers EX1013 p. 1269
Skechers v Nike

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	COUNTRY	TRANSLATION YES OR NO
	D26	WO 2014/050289 A1	4/3/2014	WIPO	Yes - Abstract

OTHER ART – NON PATENT LITERATURE DOCUMENTS

EXAMINER INITIAL		Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	D27	First Office Action with English translation for Chinese Patent Application No. 201410768401.1, dated January 26, 2016, (21 pages).
	D28	International Preliminary Report on Patentability for International Application No. PCT/US2013/070651, mailed June 4, 2015.
	D29	International Search Report and Written Opinion for International Application No. PCT/US2013/070651, dated March 27, 2014 (14 pages).
	D30	International Search Report and Written Opinion for International Application No. PCT/US2015/015340, dated April 28, 2015 (10 pages).
	D31	International Search Report and Written Opinion for International Application No. PCT/US2015/015343, dated June 16, 2015 (11 pages).
	D32	International Search Report and Written Opinion for International Application No. PCT/US2015/015346, dated April 22, 2015 (10 pages).
	D33	International Search Report and Written Opinion for International Application No. PCT/US2016/026345, dated October 4, 2016 (20 pages).
	D34	Office Action for Chinese Application No. 2013800364497, dated September 25, 2015 (6 pages).
	D35	Office Action for European Application No. 13814673.3, dated June 30, 2015 (2 pages).
	D36	Office Action for Korean Application No. 10-2014-7036252, dated January 21, 2016 (11 pages).
	D37	Office Action for Taiwanese Application No. 102142337, dated May 27, 2015 (36 pages).
	D38	Office Action for Taiwanese Application No. 102142337, dated September 21, 2015 (33 pages).
	D39	Office Action for Taiwanese Application No. 105111914, dated December 26, 2016 (19 pages).

1. PRIORITY INFORMATION:

☐ This application claims priority under 35 USC §120 to the following United States patent application(s): _____. In accordance with 37 CFR §1.98(d), copies of the references cited herein which were submitted to, or cited by, the office, in compliance with 37 CFR §1.98(a)-(c) in the earlier application are not provided herewith. The Examiner is directed to those references cited in all Information Disclosure Statements filed in the priority United States patent application(s) cited above in addition to the references cited herein.

2. CERTIFICATIONS: (CHECK ALL THAT APPLY)

A. Certifications For 37 CFR §1.97(c) or 37 CFR §1.97(d):

☐ Applicant hereby certifies pursuant to 37 CFR §1.97(e)(1) that each item of information in this 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 this Information Disclosure Statement.

☐ Applicant hereby certifies pursuant to 37 CFR §1.97(e)(2) that no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart

Examiner Signature		Date Considered	

foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this Statement was known to any individual designated in 37 CFR §1.56(c), more than three months prior to the filing of this Information Disclosure Statement.

B. For Patent Term Adjustment Purposes:

☐ For purposes of 37 CFR §1.704(d)(i) or 37 CFR §1.704(d)(ii), Applicant hereby certifies that each item of information contained in this Information Disclosure Statement was first cited in any communication from a patent office in a counterpart foreign or international application or from the Office or is a communication that was issued by a patent office in a counterpart foreign or international application or by the Office, and that this communication was not received by any individual designated in 37 CFR §1.56(c) more than thirty days prior to the filing of this Information Disclosure Statement.

3. FEE INFORMATION: (CHECK IF FEE REQUIRED)

☒ Applicant has calculated a processing fee in the amount of $180 (large entity) to be due under 37 CFR §1.17(p) in connection with the filing of this Information Disclosure Statement. Applicant authorizes charging the fee to Deposit Account 23-1925.

☒ The Director is hereby authorized to charge any fee deficiency associated with the filing of this Information Disclosure Statement to Deposit Account 23-1925.

Pursuant to the undersigned attorney's obligation and duties under 37 CFR §§ 1.56 and 1.98(a)(3) and (c), either English language abstracts, partial translations, or full translations are included for patent documents which are not in English for the express purpose of providing a concise explanation of the references to the Patent and Trademark Office with the opportunity to evaluate the same. Applicant respectfully requests the Examiner's consideration of the above reference(s) and entry thereof into the record of this application.

By submitting this Statement, Applicant is attempting to fully comply with the duty of candor and good faith mandated by 37 CFR §1.56. As such, this Statement is not intended to constitute an admission that any of the enclosed references, or other information referred to therein, constitutes "prior art" or is otherwise "material to patentability," as that phrase is defined in 37 CFR §1.56(a).

Respectfully submitted,

April 4, 2017 /Andrew A. Hufford/
Date Andrew A. Hufford (Reg. No. 69,425)

Examiner Signature		Date Considered	

Skechers EX1013 p. 1271
Skechers v Nike

Espacenet

Bibliographic data: CN1925763 (A) — 2007-03-07

Article of footwear having a textile upper

Inventor(s): NATHANIEL DUA BHUPESH THOMAS E [US] ± (DUA BHUPESH,THOMAS EDWARD NATHANIEL)

Applicant(s): NIKE INC [US] ± (NIKE INC)

Classification: - international: *A43B1/04; A43B23/04; A43B9/02*
- cooperative: A43B1/04; A43B23/0205; A43B23/021; A43B23/0215; A43B23/0235; A43B23/0275; A43B23/028; A43B23/042; A43B7/085; A43B9/02; A43D111/00; D04B1/102; D04B1/24; D04B21/20; D04B21/207; D10B2501/043

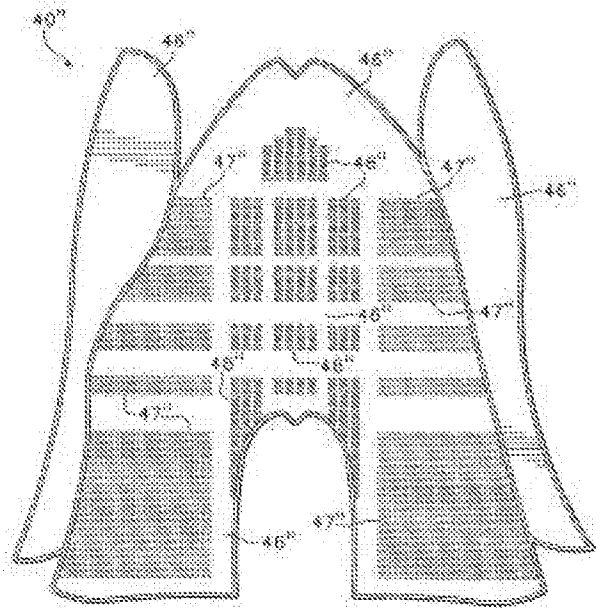
Application number: CN2005806670 20050216

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An article of footwear and a method of manufacturing the article of footwear are disclosed. The footwear may include an upper and a sole structure. The upper incorporates a textile element with edges that are joined together to define at least a portion of a void for receiving a foot. The textile element may also have a first area and a second area with a unitary construction. The first area is formed of a first stitch configuration, and the second area is formed of a second stitch configuration that is different from the first stitch configuration to impart varying textures to a surface of the textile element. Various warp knitting or weft



knitting processes may be utilized to form the textile element.

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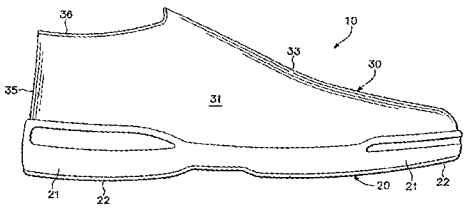
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[54] 发明名称

具有织物鞋面的鞋类产品

[57] 摘要

本发明公开一种鞋类产品和制造所述鞋类产品的方法。所述鞋类产品可以包括鞋面和鞋底结构。所述鞋面结合带有边缘的织物部件，所述边缘结合到一起以界定用于容纳足部的至少部分空间。所述织物部件还可以具有带有整体结构的第一区域和第二区域。所述第一区域由第一缝合结构形成，所述第二区域由不同于第一缝合结构的第二缝合结构形成以对织物部件的表面赋予可变的纹理。不同的经线编织法或是纬线编织法可以用于形成所述织物部件。



1. 一种鞋类产品，其包括:

一鞋面，其包括通过纬线编织法制成的一织物部件，所述织物部件具有连接在一起以界定用于容纳足部的至少一部分空间的边缘；以及

一鞋底结构，其固定到所述鞋面。

2. 如权利要求 1 所述的鞋类产品，其中所述织物部件形成所述鞋面的外侧面、内侧面、和脚背区域的至少一部分。

3. 如权利要求 1 所述的鞋类产品，其中所述诸边缘包括一对第一边缘，其被连接以形成沿着所述鞋面的下部区域纵向延伸的第一接缝。

4. 如权利要求 3 所述的鞋类产品，其中所述诸边缘包括一对第二边缘，其被连接以形成沿着所述鞋面的足跟区域延伸的第二接缝。

5. 如权利要求 4 所述的鞋类产品，其中所述第二接缝垂直延伸。

6. 如权利要求 4 所述的鞋类产品，其中所述诸边缘包括至少一对第三边缘，其被连接以形成沿着所述鞋面的足前区域延伸的第三接缝。

7. 如权利要求 1 所述的鞋类产品，其中所述织物部件具有带有整体结构的第一区域和第二区域，所述第一区域由第一缝合类型形成，以及所述第二区域由不同于所述第一缝合类型的第二缝合类型形成，以对所述织物部件表面赋予变化的纹理。

8. 如权利要求 7 所述的鞋类产品，其中所述第一缝合类型对所述第一区域提供基本光滑的纹理。

9. 如权利要求 8 所述的鞋类产品，其中所述第二缝合类型对所述第二区域提供基本粗糙的纹理。

10. 如权利要求 7 所述的鞋类产品，其中所述第一缝合类型和所述第二缝合类型的至少之一在所述织物部件中形成孔。

11. 如权利要求 1 所述的鞋类产品，其中所述织物部件是所述鞋面的一外层、一中间层、和一内层之一。

12. 如权利要求 1 所述的鞋类产品，其中所述鞋面包括一外层、一中间层、和一内层，并且所述织物部件形成所述内层的至少一部分。

13. 如权利要求 1 所述的鞋类产品，其中所述织物层形成所述鞋面的

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外表面和内表面两者的至少一部分。

14. 如权利要求 13 所述的鞋类产品，其中至少一个附加部件被固定到所述外表面并形成所述外表面的一部分。

15. 如权利要求 14 所述的鞋类产品，其中所述附加部件被固定到所述鞋面的足前区域。

16. 如权利要求 14 所述的鞋类产品，其中所述附加部件被固定到所述鞋面的足跟区域。

17. 如权利要求 1 所述的鞋类产品，其中所述织物部件形成所述鞋面的内表面。

18. 如权利要求 1 所述的鞋类产品，其中所述纬线编织法是圆筒形编织。

19. 如权利要求 1 所述的鞋类产品，其中所述纬线编织法是平面编织。

20. 一种鞋类产品，其包括:

一鞋面，其包含一通过纬线编织法制造的织物部件，所述织物部件具有带有整体结构的第一区域和第二区域，所述第一区域由第一缝合结构形成，以及所述第二区域由不同于所述第一缝合结构的第二缝合结构形成，以对所述织物部件赋予不同的特性；以及

一鞋底结构，其固定到所述鞋面。

21. 如权利要求 20 所述的鞋类产品，其中所述第一缝合结构对所述第一区域提供基本平滑的纹理，以及所述第二缝合结构对所述第二区域提供比所述平滑纹理较为粗糙的纹理。

22. 如权利要求 21 所述的鞋类产品，其中所述第二缝合结构在所述第二区域中形成凸纹结构。

23. 如权利要求 20 所述的鞋类产品，其中所述第一缝合结构和所述第二缝合结构中的至少一个在所述织物部件中形成一个孔。

24. 如权利要求 20 所述的鞋类产品，其中所述织物部件是所述鞋面的外层、中间层、和内层之一。

25. 如权利要求 20 所述的鞋类产品，其中所述鞋面包括一外层、一中间层、和一内层，并且所述织物部件形成所述内层的至少一部分。

26. 如权利要求 20 所述的鞋类产品，其中所述织物层形成所述鞋面

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的内表面和外表面两者的至少一部分。

27. 如权利要求 20 所述的鞋类产品，其中所述织物部件形成所述鞋面的内表面。

28. 一种鞋类产品，包括:

一鞋面，其包含一具有边缘的织物部件，所述边缘被连接到一起以形成接缝并界定用于容纳足部的空间的至少一部分，所述接缝包括第一接缝和第二接缝，所述第一接缝沿着所述鞋面的下表面从所述鞋的足跟区域延伸到足前区域，并且所述第二接缝在所述足跟区域垂直延伸；以及

一鞋底结构，其固定到所述鞋面。

29. 如权利要求 28 所述的鞋类产品，其中所述鞋类包括通过所述鞋面的所述足前区域延伸的第三接缝。

30. 如权利要求 28 所述的鞋类产品，其中所述织物部件具有带有整体结构的第一区域和第二区域，所述第一区域由第一缝合类型形成，以及所述第二区域由不同于所述第一缝合类型的第二缝合类型形成，以对所述织物部件赋予不同的特性。

31. 如权利要求 30 所述的鞋类产品，其中所述第一缝合类型和所述第二缝合类型中的至少一个在所述织物部件中形成孔。

32. 如权利要求 30 所述的鞋类产品，其中所述不同特性包括所述织物部件的不同的弹性。

33. 如权利要求 30 所述的鞋类产品，其中所述不同的特性包括所述织物部件的不同的透气性。

34. 如权利要求 28 所述的鞋类产品，其中所述织物部件是所述鞋面的外层、中间层、和内层之一。

35. 如权利要求 28 所述的鞋类产品，其中所述织物层形成所述鞋面的内表面和外表面两者的至少一部分。

36. 如权利要求 28 所述的鞋类产品，其中所述织物层形成所述鞋类的内表面，以及至少一个附加层形成所述鞋类的外表面。

37. 如权利要求 28 所述的鞋类产品，其中所述织物部件通过纬线编织工序制成。

38. 如权利要求 37 所述的鞋类产品，其中所述的纬线编织法是圆筒

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形编织法和平面编织法之一。

39. 如权利要求 28 所述的鞋类产品，其中所述织物部件通过经线编织工序制成。

40. 如权利要求 39 所述的鞋类产品，其中所述经线编织法是双针床提花拉歇尔经线编织法。

41. 一种鞋类产品，其包括:

一鞋面，其包括有由编织机制成的织物部件，所述织物部件从包括所述织物部件轮廓的织物结构移去，以及所述织物部件具有连接到一起以界定用于容纳足部的空间的至少一部分的边缘；以及

一鞋底结构，其连接到所述鞋面。

42. 如权利要求 41 所述的鞋类产品，其中所述编织机是宽筒圆筒形编织机。

43. 如权利要求 41 所述的鞋类产品，其中所述编织机是双针床提花拉歇尔经线编织机。

44. 如权利要求 41 所述的鞋类产品，其中所述诸边缘包括一对第一边缘，其被连接以形成沿着所述鞋面下部区域纵向延伸的第一接缝。

45. 如权利要求 44 所述的鞋类产品，其中所述诸边缘包括一对第二边缘，其被连接以形成沿着所述鞋面的足跟区域延伸的第二接缝。

46. 如权利要求 45 所述的鞋类产品，其中所述边缘包括至少一对第三边缘，其被连接以形成沿着所述鞋面的足前区域延伸的第二接缝。

47. 如权利要求 41 所述的鞋类产品，其中所述织物部件具有带有整体结构的第一区域和第二区域，所述第一区域由第一缝合类型形成，以及所述第二区域由不同于所述第一缝合类型的第二缝合类型形成，以对所述织物部件表面赋予变化的纹理。

48. 如权利要求 41 所述的鞋类产品，其中所述织物部件是所述鞋面的外层、中间层、和内层之一。

49. 如权利要求 41 所述的鞋类产品，其中所述织物部件形成所述鞋面的内表面。

50. 一种制造鞋类产品的方法，所述方法包括以下步骤:

以圆筒形编织机机械地操作纱线以形成圆柱形织物结构;

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从所述织物结构移去至少一织物部件;

合并所述织物部件到所述鞋类产品的鞋面中。

51. 如权利要求 50 所述的方法，其中所述机械操作步骤包括使用宽筒圆筒形编织机。

52. 如权利要求 50 所述的方法，其中所述机械操作步骤包括在所述圆柱形织物结构中形成带有所述织物部件形状的纹理。

53. 如权利要求 50 所述的方法，其中所述机械操作步骤包括形成所述织物部件，以包括带有整体结构的第一区域和第二区域，所述第一区域由第一缝合结构形成，以及所述第二区域由不同于所述第一缝合结构的第二缝合结构形成，以赋予所述织物部件表面变化的纹理。

54. 如权利要求 50 所述的方法，其中所述机械操作的步骤包括在所述圆柱形织物结构中形成至少两个织物部件。

55. 如权利要求 50 所述的方法，其中所述机械操作的步骤包括在所述织物部件中形成孔。

56. 如权利要求 50 所述的方法，其中所述结合步骤包括将所述织物部件的第一对边缘彼此固定在一起以形成沿着所述鞋面的下部区域延伸的第一接缝。

57. 如权利要求 56 所述的方法，其中所述结合步骤还包括将所述织物部件的第二对边缘彼此固定在一起以形成沿着所述鞋面足跟区域延伸的第二接缝。

58. 一种制造鞋类产品的方法，所述方法包括以下步骤:

以编织机机械地操作纱线以形成具有至少一个织物部件的轮廓的织物结构;

从所述织物结构移去所述织物部件;

结合所述织物部件到所述鞋类产品的鞋面中。

59. 如权利要求 58 所述的方法，其中所述机械操作步骤包括使用宽筒圆筒形编织机。

60. 如权利要求 59 所述的方法，其中所述机械操作的步骤包括在所述圆柱形织物结构中形成带有所述织物部件形状的纹理。

61. 如权利要求 58 所述的方法，其中所述机械操作的步骤包括使用

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双针床提花拉歇尔经线编织机。

62. 如权利要求 58 所述的方法，其中所述机械操作的步骤包括形成所述织物部件以包括带有整体结构的第一区域和第二区域，所述第一区域由第一缝合结构形成，以及所述第二区域由不同于所述第一缝合结构的第二缝合结构形成，以对所述织物部件表面赋予变化的纹理。

63. 如权利要求 58 所述的方法，其中所述结合的步骤包括将所述织物部件的第一对边缘彼此固定在一起以形成沿着所述鞋面的下部区域延伸的第一接缝。

64. 如权利要求 58 所述的方法，其中所述结合步骤还包括将所述织物部件的第二对边缘彼此固定在一起以形成沿着所述鞋面的足跟区域延伸的第二接缝。

65. 一种鞋类产品，其包括：

一鞋面，其包含有通过平面编织法形成的一织物部件，所述织物部件具有带有整体结构的第一区域和第二区域，所述第一区域具有第一套特性，以及所述第二区域具有不同于所述第一套特性的第二套特性，以对所述织物部件赋予变化的特征；以及

一鞋底结构，其固定到所述鞋面。

66. 如权利要求 65 所述的鞋类产品，其中所述第一套特性和所述第二套特定是缝合结构和纱线类型的至少之一。

67. 如权利要求 65 所述的鞋类产品，其中所述织物部件是所述鞋面的外层、中间层、和内层之一。

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具有织物鞋面的鞋类产品

发明背景

发明领域

本发明涉及鞋类。此发明尤其涉及结合了至少部分由织物材料形成的鞋面的鞋类产品。

背景技术描述

常规的运动鞋类产品包括鞋面和鞋底结构两个主要部件。鞋面提供对足部的包覆层，其相对于鞋底结构安全地容纳并定位足部。此外，鞋面可以具有保护足部并提供通气的结构，从而使足部冷却并排除汗液。鞋底结构被固定到鞋面的下表面并通常位于足部和地面之间。除了缓冲地面反作用力以及吸收能量（即，给予缓冲），鞋底结构可以提供附着摩擦力并控制潜在地有害的足部运动，诸如过内旋。因此，鞋面和鞋底结构协同操作以提供适用于广泛的诸如走路和跑步等步行运动的舒适结构。常规鞋面的通常特征和结构在下文更加详细的讨论。

鞋面形成用于容纳足部的在鞋类内部的空间。所述空间具有足部的通常形状，并通过脚踝开口提供对此空间的进入。因此，鞋面遍布足部的脚背和足尖区域，沿着足部的外侧面和内侧面，并围绕足部的足跟区延伸。鞋带系统通常结合到鞋面中以选择性地增加脚踝开口的大小并允许穿着者改变鞋面的某些尺寸，尤其是周长，以给双脚提供可变的尺寸。此外，鞋面可以包括在鞋带系统下延伸的鞋舌以增强穿着者的舒适，并且鞋面可以包括足跟后帮以限制足跟的运动。

在制造鞋面中可以使用不同的材料。例如，运动鞋类产品的鞋面可以由包括外层、中间层、和内层的多材料层制成。形成鞋面外层的材料可以

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根据，例如耐磨性、可弯曲性、和透气性的特性而选择。至于外层，足尖区和足跟区可以由皮革、合成皮革、或橡胶材料制成以赋予相对高程度的耐磨性。皮革、合成皮革、和橡胶材料可能不呈现所需程度的可弯曲性和透气性。因此，鞋面外层的不同其它区域可以由合成或天然织物制成。因此，鞋面外层可以由许多材料部件制成，所述每一部件赋予鞋面的特定部分以不同特性。

鞋面的中间层可以由轻质聚合物泡沫材料制成，其提供缓冲并保护足部不受可接触鞋面的物体的损伤。类似的，鞋面内层可以由从紧密围绕足部的区域排汗的吸湿灯芯（moisture-wicking）织物制成。在一些运动鞋类产品中，不同层可以由粘合剂连接，缝合可以用于在单独层内连接部件，或用于强化鞋面的特定区域。

即使为鞋面选择的材料显著不同，织物材料经常形成至少部分外层和内层。织物可以定义为任何来自以可弯曲性、细度、和长度对厚度的高比率来描述特征的纤维、纤丝、或纱线的产品。织物通常分为两个种类。第一种类包括由纤丝或纤维的织品通过任意连结以构成非编织的纤维物和毡而直接制造的织物。第二种类包括通过例如机械操作纱线，从而产生编织的纤维物而形成的织物。

纱线是用于形成第二种织物的原材料。通常，纱线定义为具有基本长度和相对小的横截面积的组件，其由至少一个纤丝或多个纤维制成。纤维具有相对短的长度并需要纺纱或编织步骤以产生用于织物使用的适合长度的纱线。纤维的通常例子是棉线和羊毛。但是，纤丝具有不确定的长度，并可以仅结合其它纤丝以产生适用于织物使用的纱线。现代的纤丝包括主要带有丝的多种合成材料，诸如人造纤维、尼龙、聚酯、聚丙烯酸，天然的除外。纱线可以由单纤丝制成，其通常被称之为单纤丝纱线，或由组合在一起的多个单独的纤丝制成。纱线还可以包括由不同材料制成的分离的纤丝，或纱线可以包括各由两种或更多材料制成的多种纤丝。相似的概念还应用到由纤维形成的纱线。因此纱线可以具有通常符合以上提供的定义的多种结构。

用于将纱线机械操作成织物的不同技术包括交织（interweaving）、

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缠结（intertwining）和编织（twisting）、以及互相圈结（interlooping）。交织是两条纱线的交叉，其以直角度彼此横穿和交织。被用于交织中的纱线通常称为经线和纬线。缠结和编织包括诸如编织和打结等的步骤，此处纱线彼此缠结以形成织物。互相圈结包括多个互相啮合的线圈列的形成，互相圈结的最普通方法是编织（knitting）。

用于鞋类的鞋面中的织物通常提供可弯曲的并舒适地容纳足部的轻质、透气结构。为了对鞋类赋予其它特性，包括持久性和抗伸展性，额外的材料通常与织物结合，例如包括皮革、合成皮革、或橡胶。至于持久性，Zaino 的美国专利号 US4,447,967 公开了由织物材料形成的鞋面，所述织物材料具有被注射到特定区域中的聚合物材料以强化抵抗磨损或其它形式磨损的区域。至于抗伸展性，Brown 的美国专利号 US4,813,158 和 Boggia 的 4,756,098 二者公开了固定到鞋面的基本不可伸展的材料，从而限制鞋面特定部分的伸展程度。

从制造的角度，使用多种材料以对鞋类产品赋予不同特性可能是无效率的实践。例如，用于常规鞋面的不同材料通常不来自单独的供应商。因此，生产条件必须协调多个供应商的材料的特定数量的收据，所述供商可能具有不同的商业习惯或可以位于不同区域或国家。不同材料还可以需要额外的机械和不同的组装线技术以剪切或以其它方式制备用于结合到鞋类中的材料。此外，将分开的材料结合到鞋面中可能包括需要多个工人的多个不同生产步骤。除了织物，使用多种材料还可以减损鞋类的呼吸能力。例如皮革、合成皮革、或橡胶通常是不透气的。因此，将皮革、合成皮革、或橡胶置于鞋面外部上可以阻止穿过鞋面的空气流，从而增加在鞋面内并围绕足部截留的汗液、水蒸汽和热量的数量。

发明概述

本发明是鞋类产品的鞋面，所述鞋面结合例如以编织机形成的织物部件。在此发明的一个方面，所述织物部件具有边缘，所述边缘连接在一起以界定用于容纳足部的至少部分空间。所述发明的另一方面，所述织物部件具有整体结构的第一区域和第二区域。所述第一区域由第一缝合结构形

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成，所述第二区域由不同于第一缝合结构的第二缝合结构形成以对织物部件的表面赋予变化的纹理。编织机可以具有一种结构，其通过或经线编织或是纬线编织形成织物部件。

发明的另一方面包括制造鞋类产品的方法。所述方法包括例如以圆形编织机机械地操作纱线以形成圆柱形织物结构的步骤。此外，所述方法包括从织物结构移除至少一个织物部件，以及将织物部件结合到鞋类产品的鞋面中。

在所述发明的另一方面，鞋类产品具有鞋面和固定到所述鞋面的鞋底结构。所述鞋面结合由编织机形成的织物部件。所述织物部件从包括织物部件轮廓的织物结构移除，织物部件具有边缘，其结合在一起以定义用于容纳足部的至少部分空间。

描述本发明特性的新颖性的优点和特征被所附权利要求特性指出。但是，为了获得对于新颖性的特征和优点的更好的理解，可以参考以下说明内容和附图，其描述和图示了涉及所述发明的不同实施方式和概念。

附图说明

前述发明概述，以及如下的发明详细说明，当结合附图阅读的时候将更好的被理解。

图 1 是具有根据本发明鞋面的鞋类产品的侧视图。

图 2 是鞋面的侧视图。

图 3 是鞋面的顶部平面视图。

图 4 是鞋面的后视图。

图 5 是鞋面的底部平面视图。

图 6 是鞋面的第一横截面视图，如由图 2 中剖面线 6-6 定义的。

图 7 是鞋面的第二横截面视图，如由图 2 中剖面线 7-7 定义的。

图 8 是形成至少部分鞋面的织物部件的平面视图。

图 9 是结合两个织物部件的织物结构的透视图。

图 10 是另一织物部件的平面视图。

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图 11 是又另一织物部件的平面视图。

图 12 是具有根据本发明鞋面的另一鞋类产品的侧视图。

图 13 是具有根据本发明鞋面的又另一鞋类产品的侧视图。

图 14 是图 13 中描述的鞋类的横截面视图，如由剖面线 14-14 定义的。

发明的详细描述

以下讨论和附图公开了根据本发明的鞋类产品 10 和制造鞋类 10 的方法，或其部件。鞋类 10 在附图中被描述并在以下讨论为具有适于尤其是跑步的体育运动的结构。但是，涉及鞋类 10 的所公开的概念可以应用到专门为各种其它体育运动而设计的鞋类的类型，所述运动包括例如篮球、棒球、足球、橄榄球、走路、和徒步旅行，并还可以用于各种非运动鞋类类型。因此，相关领域技术人员将认识到本文所公开的概念可以用于宽范围的鞋类的类型，并不限于下文讨论的和附图描述的特定实施方式。

鞋类 10 的主要部件在图 1 中被描述为鞋底结构 20 和鞋面 30。鞋底结构 20 被固定到鞋面 30 的下部分并提供持久、耐磨的部件，当鞋 10 冲击地面的时候，所述部件提供缓冲。鞋面 30 至少部分地由织物部件 40 形成，其界定了用于舒适容纳足部并将足部相对于鞋底结构 20 固定于一位置的内部空间。而织物部件 40 的不同边缘被固定在一起以形成鞋面 30 的形状。在一些实施方式中，织物部件 40 可以基本形成所有鞋面 30，或织物部件 40 可以只形成部分鞋面。

鞋底结构 20 通常具有包括鞋底夹层 21 和鞋外底 22 的常规结构。鞋底夹层 21 被固定到鞋面 30 的下部分并由聚合物泡沫材料制成，诸如乙基乙烯基醋酸酯和聚亚安酯。因此，当鞋底结构 20 冲击地面的时候，鞋底夹层 21 削减地面反作用力并吸收能量（即提供缓冲）。为了增强鞋底结构 20 的力的削减和能量吸收特性，鞋底夹层 21 可以结合流体充注囊，如 Rudy 的美国专利号 US 4,183,156 和 4,219,945 公开的。可选地或组合，鞋底夹层 21 可以结合多个离散的柱形的支撑部件，如 Kilgore 等人的美国专利号 US5,343,639 和 5,353,523 公开的。鞋外底 22 被固定到鞋底夹层 21

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的下表面并可以由碳黑橡胶化合物制成，以提供用于啮合地面的持久的、耐磨的表面。鞋外底22还可以结合有纹理的下表面以增强鞋类10的附着摩擦力特性。此外，鞋类10可以包括鞋内底（未描述），其是用于增强鞋10的舒适，相对薄的、位于鞋面30内并靠近足部的足底表面的缓冲部件。

上文将鞋底结构20描述为具有用于运动鞋类的常规鞋底结构的部件。其它鞋类类型，例如包括时装鞋和靴子，可以具有专门剪裁的，用于与各自鞋类的类型一起使用的其它类型的常规鞋底结构。但是，除了常规结构，鞋底结构20还可以呈现为独特的、非常规的结构。因此，鞋底结构20的详细结构在本发明范围内可以显著变化，以包括常规的或非常规的广泛的结构。

鞋面30在图2-7中被描述为具有外侧区域31、相对的内侧区域32、脚背区域33、下区域34、和足跟区域35。外侧区域31通过鞋类10的纵向长度延伸并通常设计为接触并覆盖足部的外侧面。内侧区域32具有通常对应于足部内侧面的类似结构。脚背区域33置于外侧区域31和内侧区域32之间的位置，以及脚背区域33遍布足部的脚背区域延伸。下区域34形成鞋面30的底部表面并也通过鞋类10的纵向长度延伸。足跟区域35形成鞋面30的后部分并通常设计为接触并覆盖足部的足跟区。此外，外侧区域31、内侧区域32、脚背区域33、和足跟区域35协同界定了踝开口36，用于对足部提供进入鞋面30内的空间的入口。

鞋面30至少部分地由织物部件40形成，其形成区域31-35，并还可以包括鞋带或与用于鞋类的常规鞋面关联的其它部件。织物部件40是单独的材料部件，其被成型以呈现整体（即，单体）结构，并且织物部件40被成型或以其它方式成型为围绕足部延伸。如在图2-7中所描述的，织物部件40既形成鞋面30的内表面也形成其外表面。织物部件40可以形成为较大织物部件的一部分。然后织物部件40从较大织物部件移出，织物部件40的不同边缘被固定在一起以形成鞋面30的形状。因此，当织物部件的边缘连接时，形成多个接缝51-54。接缝51沿着下区域34的纵向长度延伸并相对于外侧区域31和内侧区域32居中放置。接缝52也居中

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放置并沿着足跟区域 35 向上延伸。接缝 53 位于鞋面 30 的足前区并将下区域 34 的部分与外侧区域 31 和内侧区域 32 二者相连。此外，接缝 54 位于鞋面 30 的后部区域并将下区域 34 与足跟区域 35 相连。

织物部件 40 在形成接缝 51-54 之前呈现为图 8 中描述的大体形状。但是，形成接缝 51-54 之后，织物部件 40 呈现为图 2-7 中描述的鞋面 30 的形状。接缝 51-54 通过将织物部件 40 的不同边缘固定在一起而形成。更加详细的，（1）接缝 51 通过将边缘 41a 与边缘 41b 固定而形成；（2）接缝 52 通过将边缘 42a 与边缘 42b 固定而形成；（3）接缝 53 的第一部分通过将边缘 43a 与边缘 43b 固定而形成；（4）接缝 53 的第二部分通过将边缘 43c 与边缘 43d 固定而形成；（5）接缝 54 的第一部分通过将边缘 44a 与边缘 44b 固定而形成；（6）接缝 54 的第二部分通过将边缘 44c 与边缘 44d 固定而形成。参考图 8，区域 31-35 和脚踝开口 36 的位置被标识以提供关于织物部件 40 的不同部分的参考系。

为了连接边缘 41a 和 41b 以形成接缝 51，织物部件 40 被折叠或以其它方式重叠，使得边缘 41a 被置于靠近边缘 41b 的位置。例如，缝合、粘合剂、加热粘合然后就被用于固定边缘 41a 和边缘 41b。如图 8 中所描述的织物部件 40 具有通常的平面结构。但是，一旦形成接缝 51，织物部件 40 的一部分就重叠于织物部件 40 的另一部分。重叠部分之间的体积有效地形成用于容纳足部的鞋面 30 内的空间的一部分。

折叠或重叠织物部件 40 以形成接缝 51，将边缘 42a 置于靠近边缘 42b 的位置，其有利于接缝 52 的形成。参照图 8，在织物部件 40 中边缘 45 形成大体 U 型的区域。一旦连接边缘 42a 和 42b 形成接缝 52，U 型区域成为织物部件 40 中的孔并有效地形成脚踝开口 36。各个边缘 43a-43d 和边缘 44a-44d 是由织物部件 40 的大体 V 型的区域形成。因此，接缝 53 和 54 可以通过闭合 V 型的区域并将不同边缘固定在一起而形成。

随着每个接缝 51-54 的形成，鞋面 30 的制造基本完成。可以进行不同的修整（finishing）步骤，例如，诸如强化脚踝开口 36。然后鞋面 30（即，织物部件 40）用例如粘合剂被固定到鞋底结构 20。然后鞋内底被置于鞋面 30 内的空间中并靠近下区域 34。在一些实施方式中，不同的强

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化部件可以被添加到鞋面20的外或内表面以便限制鞋面20的伸展程度或提供增强的耐磨性。此外，鞋带系统可以被添加以提供可调节性。

织物部件40是带有整体结构的单独材料部件，如上所讨论的。如为用于本发明的目的所定义的，整体结构被用于表达一种结构，其中织物部件的部分没有通过接缝或其它连接而连接在一起，如图8中所描述的织物部件40。即使不同的边缘41a-44d被连接在一起以形成接缝51-54，但如下文论述的，织物部件40的不同部分被成型为不带有接缝的整体部件。

织物部件40主要由一种或更多纱线制成，所述纱线例如通过或交织、缠结和编织，或互相圈结方法被机械操作。如以上发明背景部分讨论的，交织是两条纱线的交叉，其以直角角度彼此横穿和交织。被用于交织中的纱线通常称之为经线和纬线。缠结和编织包括诸如编织和打结等步骤，此处纱线彼此缠结以形成织物。互相圈结包括多个互相啮合的线圈列的形成，互相圈结的最普通方法是编织。因此，织物部件40由用于制造织物的这些方法之一制成。

各种机械的方法已经被开发以制造织物。通常，机械方法可以被分类为或是经线编织或纬线编织。关于经线编织，可以用于制造织物的不同的特定亚类包括经编织物、拉歇尔经编织物（raschel）、双针床拉歇尔经编织物（double needle-bar raschel）（其还包括拉双针床提花拉歇尔经编织物）。关于纬线编织，可以用于制造织物的不同的特定亚类包括圆筒形编织和平面编织。圆筒形编织的不同类型包括短袜编织（小直径筒（narrow tube）），身体衣服（无接缝或宽筒），以及提花编织。

织物部件40可以通过以上讨论的任一种机械方法制成。因此，织物部件40可以在经线编织机或纬线编织机上形成。用于形成织物部件40的一种适合的编织机是宽筒（wide tube）圆筒形编织提花机。另一种适合用于形成织物部件40的编织机是宽筒圆筒形编织机，其在Lonati Group由意大利的Santoni S.p.A制造，型号为SM8 TOP1。这种Santoni S.p.A宽筒圆筒形编织机可以形成的织物结构具有的直径范围从10英寸到20英寸，每个直径8次喂纱（feed）。所述机械呈现为对于10英寸直径每分钟最大140转，和对于13英寸直径每分钟最大120转。此外，机械规格在每英寸

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16、22、24、26、28 和 32 针之间变化，以及其适用于各种范围从 48 到 75 的针规格。

如 Santoni S.p.A 制造的宽筒圆筒形编织机通常形成圆柱形织物结构并能够在单独织物结构内形成不同类型的缝合。通常，宽筒圆筒形编织机可以编程为通过针的选择改变织物结构上的设计。也就是说，在织物结构的各位置上形成的缝合类型可以通过编程宽筒圆筒形编织机而选择，如此特定的针或接受或不接受各个缝合位置的纱线。以这种方法，可以选择性地和目的性地赋予织物结构不同的图案、纹理或设计。

图 9 中描述了可以用宽筒圆筒形编织机制造的织物结构 60 的一个实施例。织物结构 60 具有大体圆柱形的结构，并且缝合类型遍布织物结构 60 而变化，使得以织物部件 40 的轮廓形成图案。也就是说，织物结构 60 内的缝合的差别形成带有织物部件 40 的形状和比率的轮廓。

Santoni S.p.A 的宽筒圆筒形编织机可以形成的织物结构具有范围从 10 英寸到 16 英寸的直径，如以上讨论的。假设织物结构 60 呈现 10 英寸的直径，织物结构 60 的圆周就近似为 31 英寸。在许多情况下，织物部件 40 的总宽度将近似为 12 英寸，根据鞋类 10 的尺寸。因此，至少两个织物部件 40 的轮廓可在织物结构 60 上形成。参考图 9，织物部件 40 的轮廓被描述在织物结构 60 的前部分上，并且另一织物结构 40 的轮廓被描述在织物结构 60 的后部分上。因此，第一织物部件 40 和第二织物部件 40 可以同时在单一的织物结构 60 中形成。但是，当织物部件 60 的直径增加或织物部件 40 的宽度减少时，甚至是更大量的织物部件 40 可以在织物结构 60 上被勾勒出轮廓。

织物结构 60 可以用宽筒圆筒形编织机制造，如以上讨论的。形成织物结构 60 的缝合类型可以是变化的以在织物结构 60 上形成一个或更多织物部件 40 的轮廓。也就是说，宽筒圆筒形编织机可以编程以形成织物结构 60 中不同类型的缝合以便描绘一个或更多织物部件 40 的轮廓。然后各个织物部件 40 用冲切、激光切割、或其它常规切割操作从织物结构 60 移去。一旦织物部件 40 从织物结构 60 移去，接缝 51-54 可以形成并且织物部件 40 可以结合到鞋 10 中。

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形成织物部件 40 的纱线通常可以定义为具有基本长度和相对小的横截面的组件，其由至少一纤丝或多个纤维制成。纤维具有相对短的长度并需要纺纱或编织步骤以产生使用于互相圈结法中的适合长度的纱线。纤维的通常例子是棉线和羊毛。但是，纤丝具有不确定的长度，并可以仅结合其它纤丝以产生使用于互相圈结法中的适合的纱线。现代的纤丝包括主要带有丝的多种合成材料，诸如人造纤维、尼龙、聚酯、聚丙烯酸，天然的除外。纱线可以由单纤丝（通常被称为单纤丝纱线）或多个单独的纤丝制成。纱线还可以由不同材料制成的分离的纤丝而形成，或纱线可以由多种纤丝形成，所述纤丝的每一种由两种或更多不同材料制成。相似的概念还应用到由纤维形成的纱线。因此纱线可以具有在本发明范围内的各种结构，其通常符合以上提供的定义。

为了对鞋面 30，尤其是织物部件 40 提供伸展和恢复特性，可以使用结合弹性纤维的纱线。弹性纤维从 E.I. duPont de Nemours Company 的商标为 LYCRA 的产品购得。这样的纤维可以具有包含 LYCRA 的结构，其中所述纤维包括由尼龙外壳包围的 LYCRA 核。一种适合的纱线，例如包括 70 但尼尔的弹性核，其被具有 2 层、80 但尼尔、92 纤丝结构的尼龙覆盖。其它呈现弹性特性得纤维或纤丝也可以使用。

如上所讨论的，结合弹性纤维的纱线适用于织物部件 40。多种其它纱线，无论是弹性的或无弹性的，也适用于织物结构 40。选择用于织物部件 40 的纱线的特性主要根据形成不同纤丝和纤维的材料。例如，棉线提供柔软手感、自然美学的、和生物可降解性。如上所述的弹性纤维提供基本的伸展和可恢复性。尼龙提供高光泽和湿气吸收。羊毛除了绝缘特性也提供高度的湿气吸收。聚四氟乙烯覆盖层可以提供在织物和皮肤之间的低摩擦接触。尼龙是高强度的持久性和抗磨损的材料。最后，聚酯是也提供相对高耐久性的疏水材料。因此，包括纱线的材料可以被选择以赋予织物部件 40 各种物理特性，并且所述物理特性可以包括，例如强度、伸展性、支撑性、舒适性、复原性、舒适以及形式。

织物部件 40 被描述为具有通常的平滑、无变化的缝合结构。也就是说，相似的缝合被遍布织物部件 40 使用以对织物部件 40 的不同部分赋予

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共同的纹理。但是，如上所述，宽筒圆筒形编织机通常能够在单织物结构内形成不同类型的缝合。因此，宽筒圆筒形编织机可以改变织物部件 40 内的缝合以产生不同的，例如图案、设计、或纹理。不同类型的缝合也可以用其它类型的编织机制造。参照图 10，带有织物部件 40 的通常形状的织物部件 40'被描述为具有带有不同纹理的不同区域。例如，对应于脚背区域 33 的中心区具有通常是平滑的第一纹理 46'。此外，织物部件 40'包括第二纹理 47'，其是多个纵向的凸纹。结合到鞋类 10 中的时候，所述凸纹将沿着外侧区域 31 和内侧区域 32 纵向延伸，以及所述凸纹可以延伸到足跟区域 35 中。凸纹例如可以呈现为用于美学的目的，或可以影响鞋面 20 的伸展特性。因此，织物部件 40'呈现单独织物材料部件中的带有不同纹理的区域。

许多传统的鞋类产品结合带有各自呈现不同特性的不同材料部件的鞋面。例如，第一材料部件可以是平滑的、以及第二材料部件可以是有纹理的。然后第一和第二材料部件可以缝合在一起以形成常规鞋面的部分。织物部件 40'也呈现平滑的和有纹理的区域。但是，与常规鞋面相比，第一纹理 46'和第二纹理 47'结合到单独的整体织物部件中，而不是被缝合的或以其它方式连接在一起的两个分开的部件。

织物结构 40"在图 11 中被描述并具有织物部件 40 和织物部件 40'二者的通常形状。织物部件 40"包括带有三种不同纹理的区域。第一纹理 46"通常是平滑的并具有不同的带结构，所述带穿过对应于外侧区域 31、内侧区域 32、和脚背区域 33 的区域横向延伸。织物部件 40"的不同部分还包括第二纹理 47"，其与第一纹理 46"相比通常是粗糙的。此外，织物部件 40" 对应于脚背区域 33 的区域包括第三纹理 48"。不同的纹理 46"-48" 仅由变化的缝合类型形成，所述缝合类型由宽筒圆筒形编织机在织物部件 40"的各位置制造。纹理 46"-48" 可以呈现美学的差别性，或所述差别是结构的。例如，带有纹理 46"-48"的区域中的伸展程度可以是不同的，或者所述区域的耐磨性根据使用的缝合可以改变。织物部件 40"的透气性在不同的区域也可以变化。第三纹理 48"被成型以包括穿过织物部件 40"延伸的多个孔。在宽筒圆筒形编织法过程中，通过在特定位置省略缝合可以形

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成所述孔，此孔便于鞋面20内的空间和鞋面20的外区域之间的空气传递。因此，在织物部件40”，或织物部件40或40’之一中形成的不同的缝合可用于改变鞋类10在单独、整体部件材料内的纹理、物理特性，或美学特性。

除了改变缝合类型以形成纹理46’-47’和46”-48”，在织物部件40’和40”的不同区域中使用的纱线类型可以被改变以赋予不同特性。如上所述，纱线可以由例如棉线、羊毛、弹性纤维、人造纤维、尼龙和聚酯形成。这些纱线的每一类型可以对相应于纹理46’-47’和46”-48”的区域赋予不同特性。例如，弹性纤维可以用于赋予伸展性，羊毛可以用于绝缘，以及尼龙可以用于持久性。因此，不同的纱线类型可以用于赋予不同特性。可以用于形成带有不同特性（例如，纱线的特性、纹理等）的不同区域的编织类型可以显著变化以包括之前讨论的不同的经线编织和纬线编织法，例如，诸如经编织物、拉歇尔经编织物、双针床拉歇尔经编织物，圆筒形编织法，和平面编制法。

图12中描述鞋类产品110，且其包括鞋底结构120和鞋面130。鞋面130包括具有织物部件40的普通结构的织物部件140。如同织物部件40，织物部件140既形成鞋面130的外表面也形成鞋面130的内表面。此外，鞋面130包括鞋带131和多个部件132-135，其也形成外表面部分。鞋带131通过形成于织物部分140中的多个孔延伸。通过在特定位置省略缝合，所述孔可以被形成。部件132位于鞋110的前脚区的位置并可以由例如皮革或橡胶制成，以提供额外的耐磨性。部件133围绕脚踝开口延伸以增强并限制脚踝开口区域中的伸展。部件134围绕足跟区域延伸以阻遏足跟的移动并将足跟定位在鞋底结构120之上。此外，部件135基本上是不可伸展的诸如皮革或合成皮革等的材料带，其限制了鞋类110外侧面上的伸展。尽管鞋面30几乎排他性地由织物部件40构成，鞋面130还包括鞋带131和部件132-135。因此，根据本发明的鞋面可以结合多个附加部件。

另一鞋类产品210在图13-14中被描述并包括鞋底结构220和鞋面230。鞋面230包括形成外层的织物部件240。此外，鞋面230包括中间层250和外层260。如在以上发明背景部分所述的，常规鞋类产品的鞋面可

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以由包括外层、中间层、和内层的多材料层制成。形成鞋面外层的材料可以根据例如耐磨性、可弯曲性、和透气性等特性而选择。鞋面的中间层可以由轻质聚合物泡沫材料制成，其提供缓冲并保护足部不受可以接触鞋面的物体的损害。类似的，鞋面外层可以由吸湿灯芯织物制成，其从紧密围绕足部的区域排汗。

鞋面 230 具有类似于使用了不同材料层的常规鞋面结构的结构。但是，与常规鞋面比较，内层由织物部件 240 构成，其通过上述方法被生产。也就是说，织物部件 240 是形成鞋面 230 内层的单独织物部件。使用织物部件 240 用于内层的优点在于织物部件 240 包括少数几个可以接触足部的接缝。此外，用于织物部件 240 不同位置的缝合可以改变鞋面 230 的内表面的纹理，从而限制足部和鞋面 230 之间发生的滑动的程度，或增强鞋面 230 在特定位置的透气性。

不同的经线编织或纬线编织法可被用于形成织物部件 40，或以上所述的不同的其它织物部件。这种方法的优点在于不同的缝合可以结合到织物部件 40 的特定位置中以改变织物部件 40 的物理特性或美学。尽管常规鞋面包括缝合或粘合地连接的不同部件，织物部件 40 是单独的、整体的部件材料。从制造的观点，使用多种材料以赋予鞋类产品不同的特性可能是无效率的实践。但是，通过将织物部件 40 成型为单独的整体的部件材料，由于鞋面 20 可以包括单独的织物部件，而不是许多连接部件，效率被增加。

各种编织方法可以用于形成织物部件 40，如上所述。作为特定的实施例，双针床提花拉歇尔经编织机可以用于形成平面织物结构，并也可以用于形成织物结构以具有间隔网状织物的结构。不同于织物结构 60，其通常呈现为的圆柱形的结构，以双针床提花拉歇尔经编织机形成的织物结构将具有平坦结构。但是，类似于织物结构 60，织物部件的轮廓可以被赋予以双针床提花拉歇尔经编织机形成的织物结构。也就是说，织物结构内缝合的差别可以形成带有所需织物部件的形状和比例的轮廓。因此，织物部件可以从织物结构中移去并结合到鞋类 10 中。此外，双针床提花拉歇尔经编织机可以用于对织物部件赋予不同纹理、不同特性、或不同纱线

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类型。类似的，其它类型的编织，诸如平面编织可以在本发明范围内被使用以对织物部件赋予不同纹理、不同特性、或不同纱线。

参考不同实施方式，本发明在上文和附图中被公开。但是，所述公开的目的是提供涉及所述发明的不同特征和概念的实施例，而不是限制发明的范围。相关领域技术人员将认识到可以对以上描述的实施方式做许多变化和修改而不偏离如所附权利要求所定义的本发明的范围。

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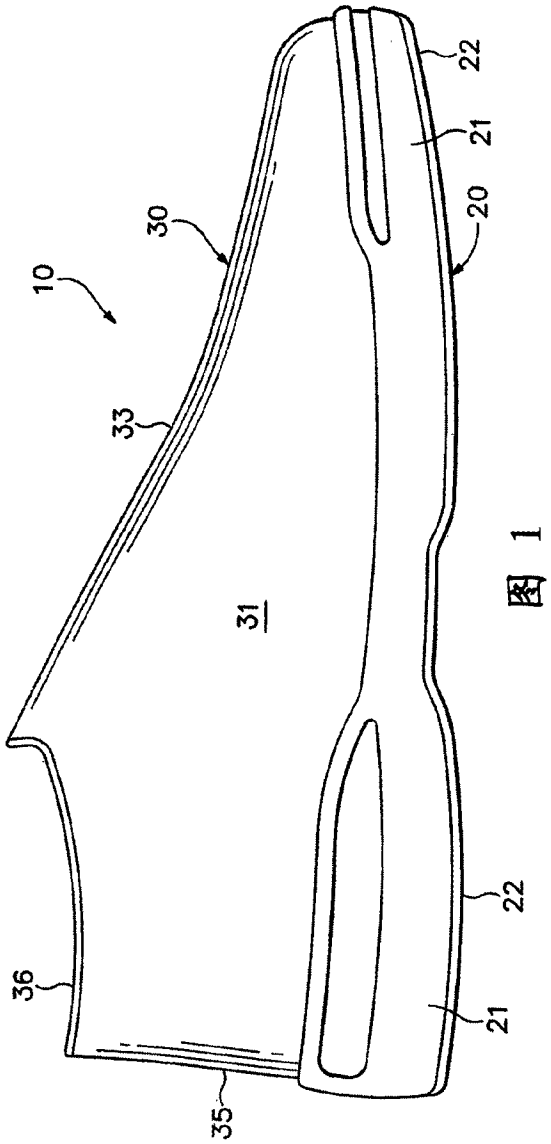


图 1

Skechers EX1013-p. 1295
Skechers v Nike

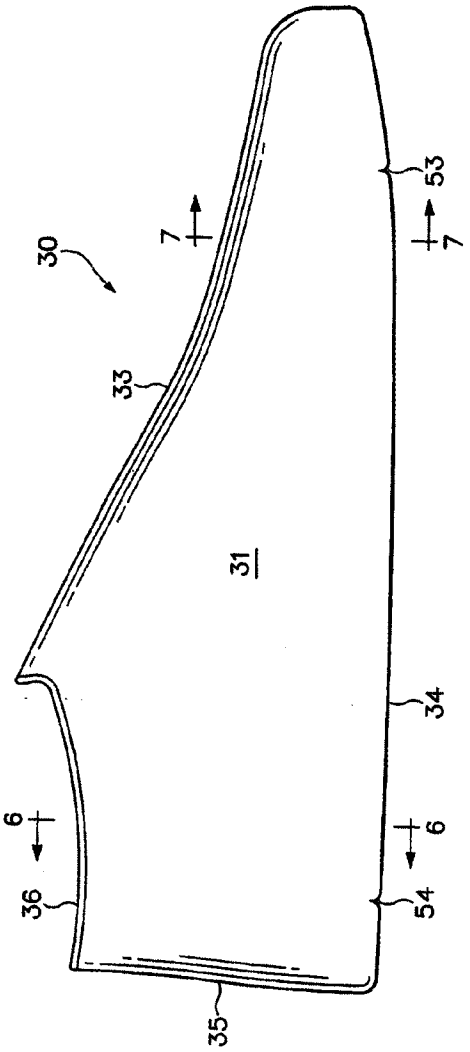


图 2

Skechers EX1013-p. 1296
Skechers v Nike

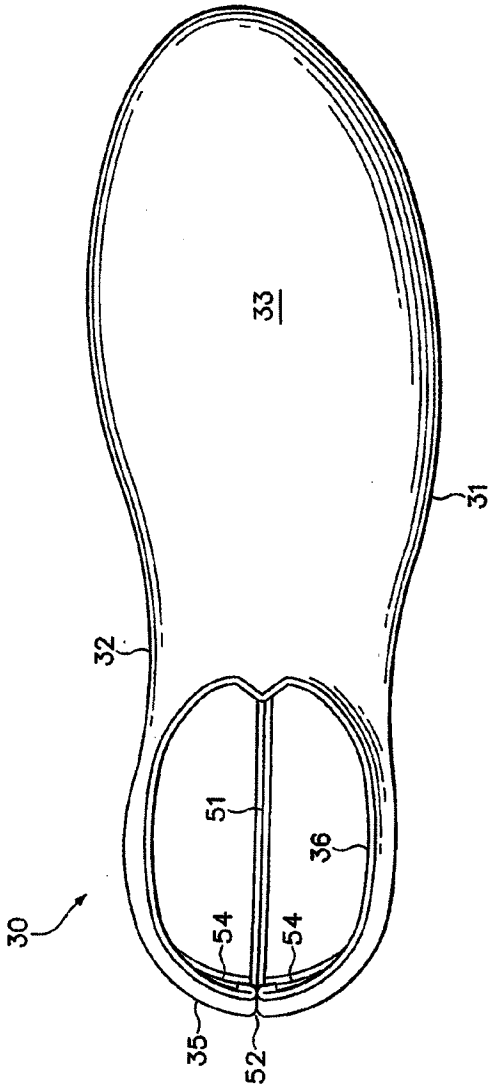


图 3

Skechers EX1013-p. 1297
Skechers v Nike

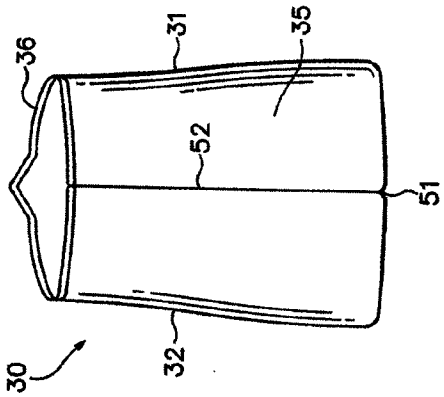


图 4

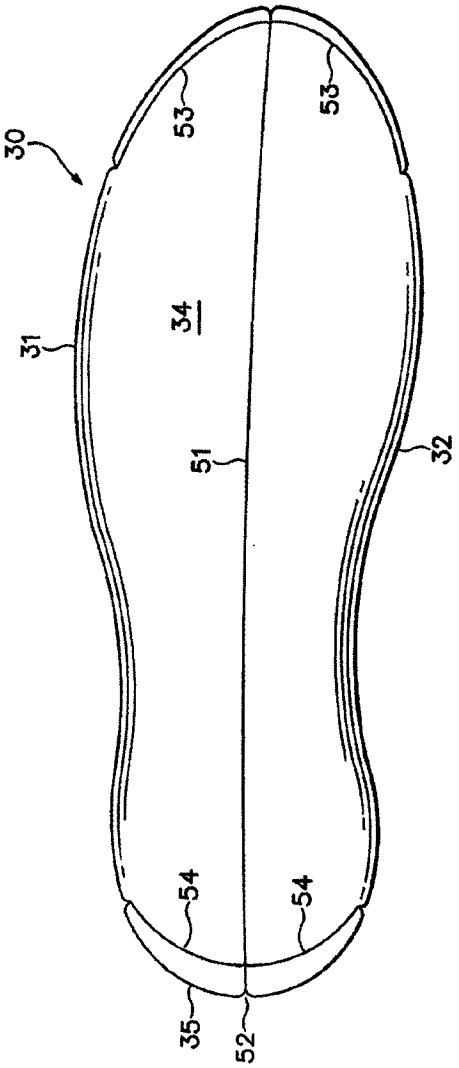


图 5

Skechers EX1013-p. 1298
Skechers v Nike

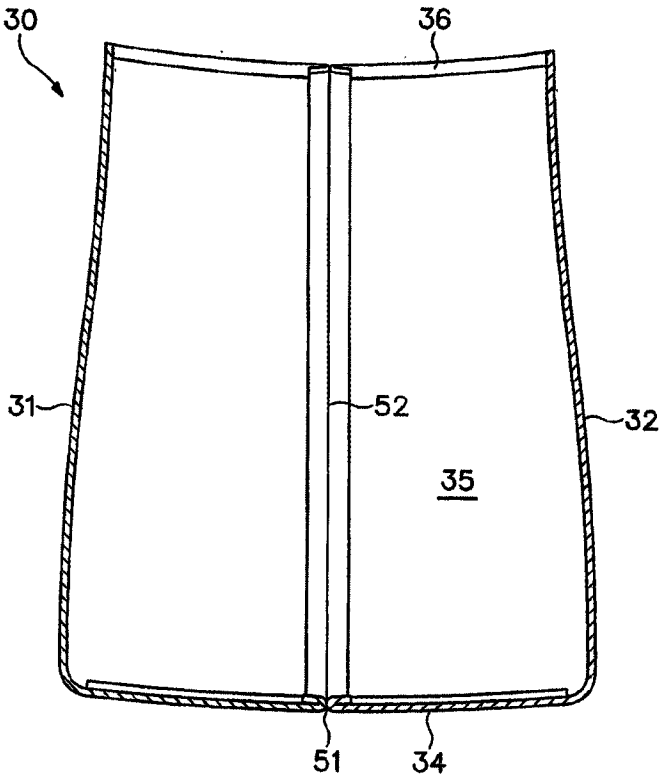


图 6

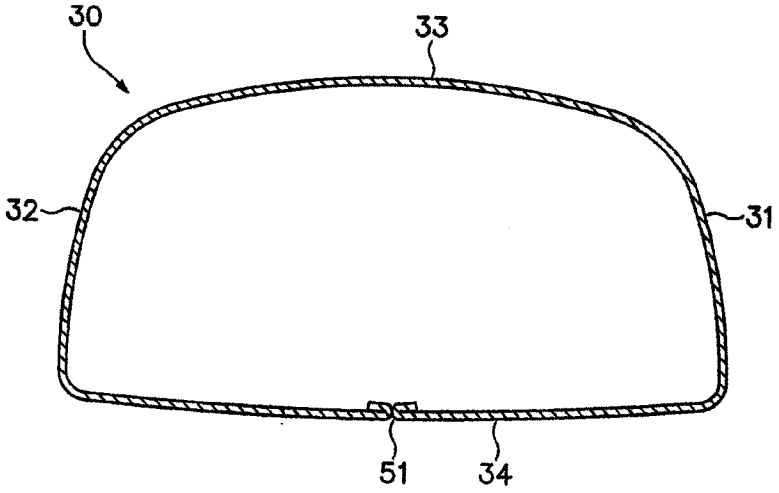


图 7

Skechers EX1013-p. 1299
Skechers v Nike

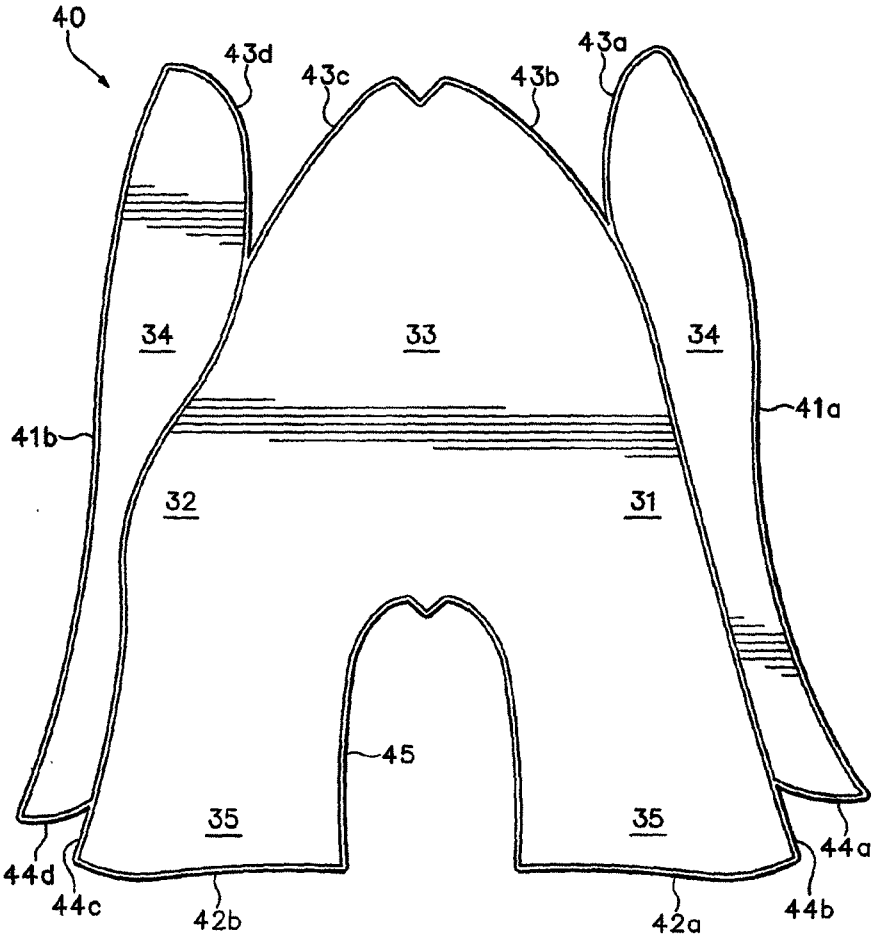


图 8

Skechers EX1013-p. 1300
Skechers v Nike

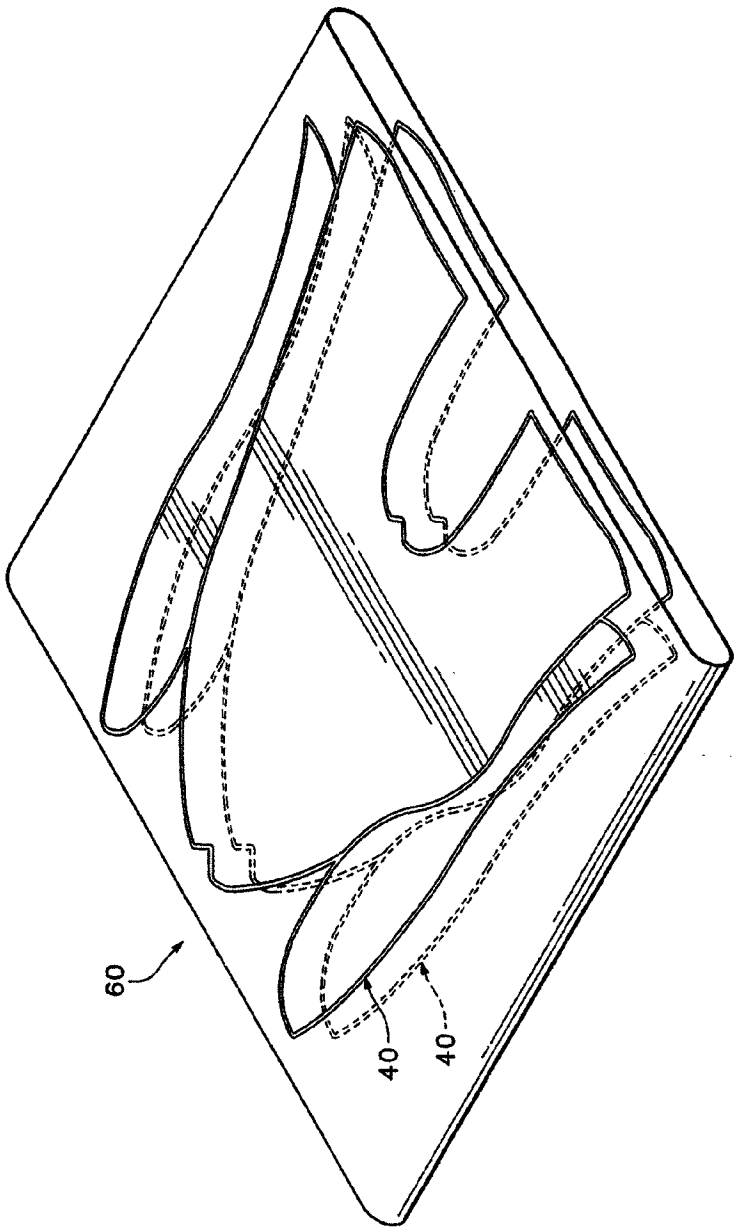


图 9

Skechers EX1013-p. 1301
Skechers v Nike

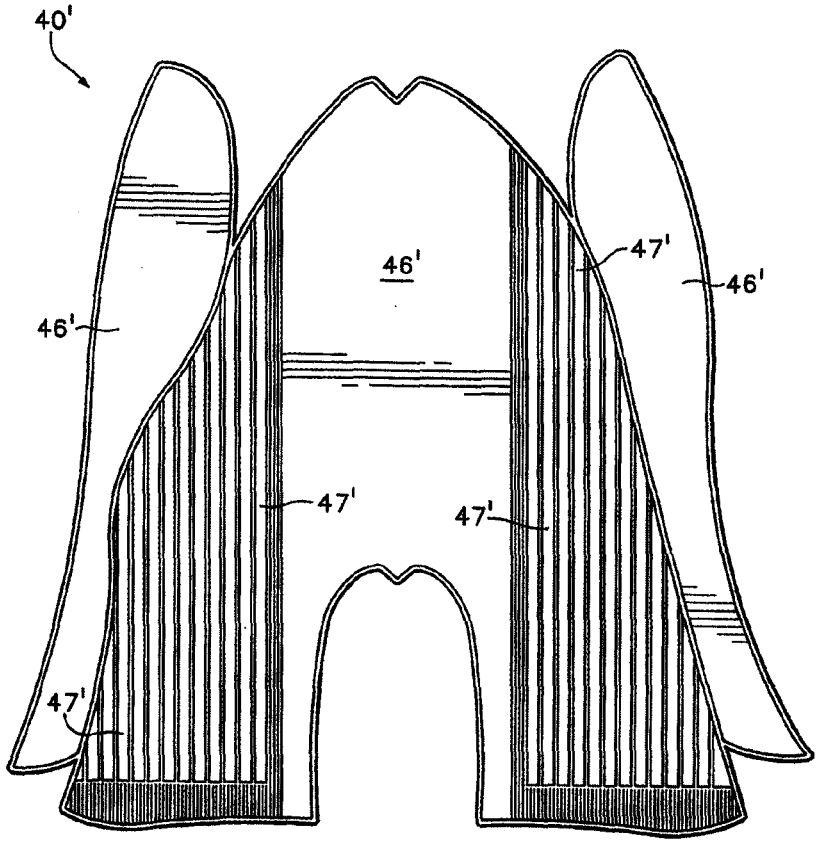


图 10

Skechers EX1013-p. 1302
Skechers v Nike

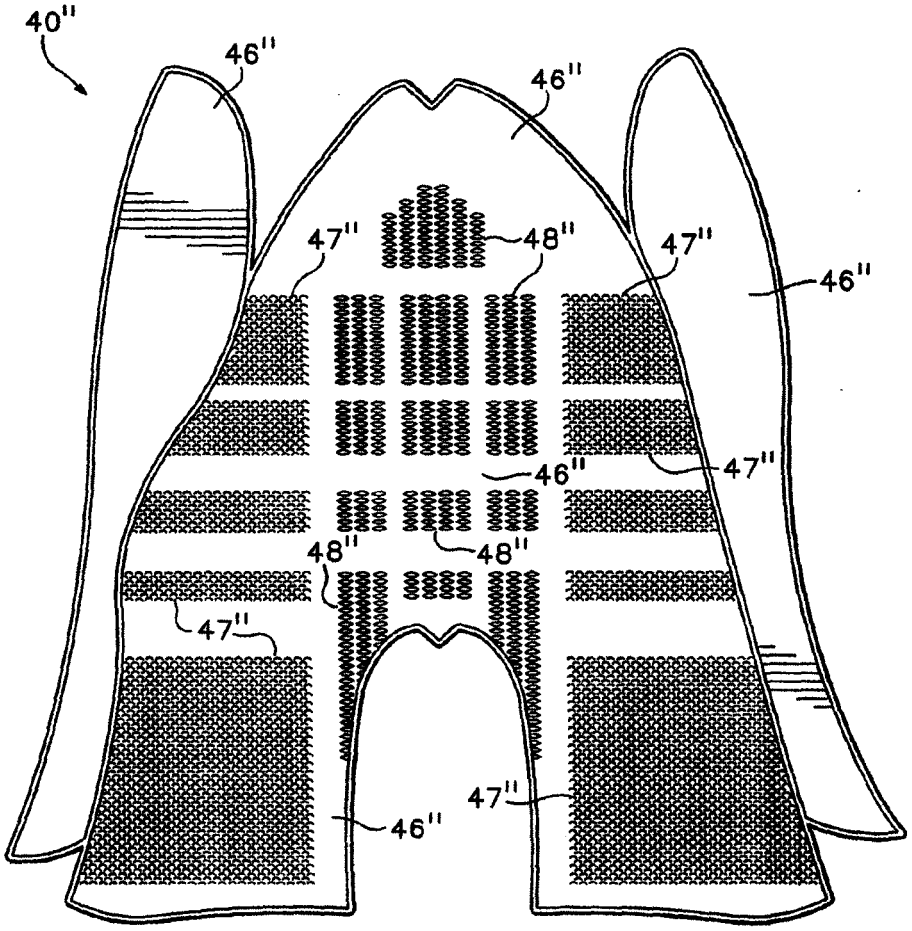


图 11

Skechers EX1013-p. 1303
Skechers v Nike

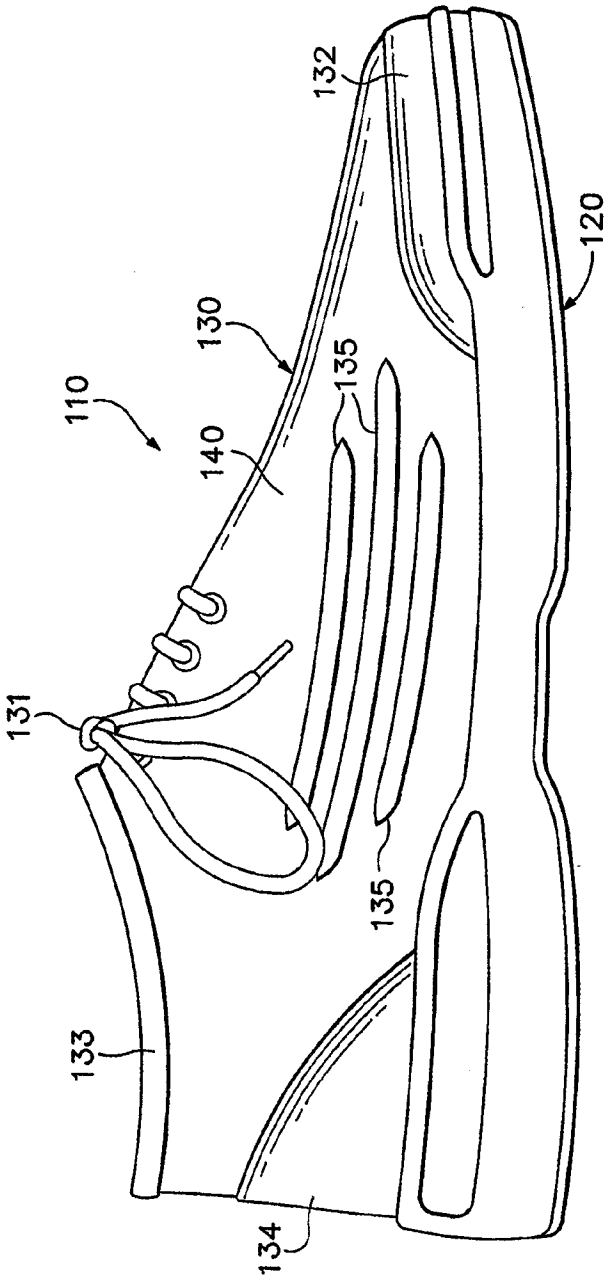


图 12

Skechers EX1013-p. 1304
Skechers v Nike

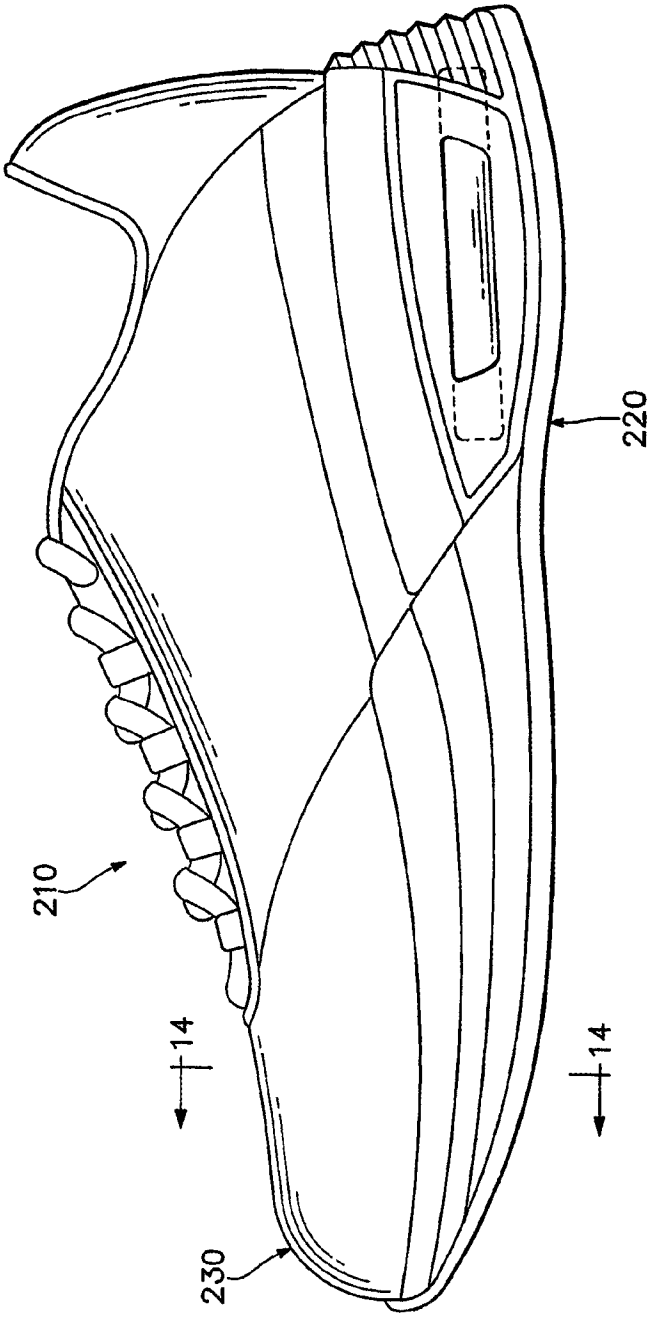


图 13

Skechers EX1013-p. 1305
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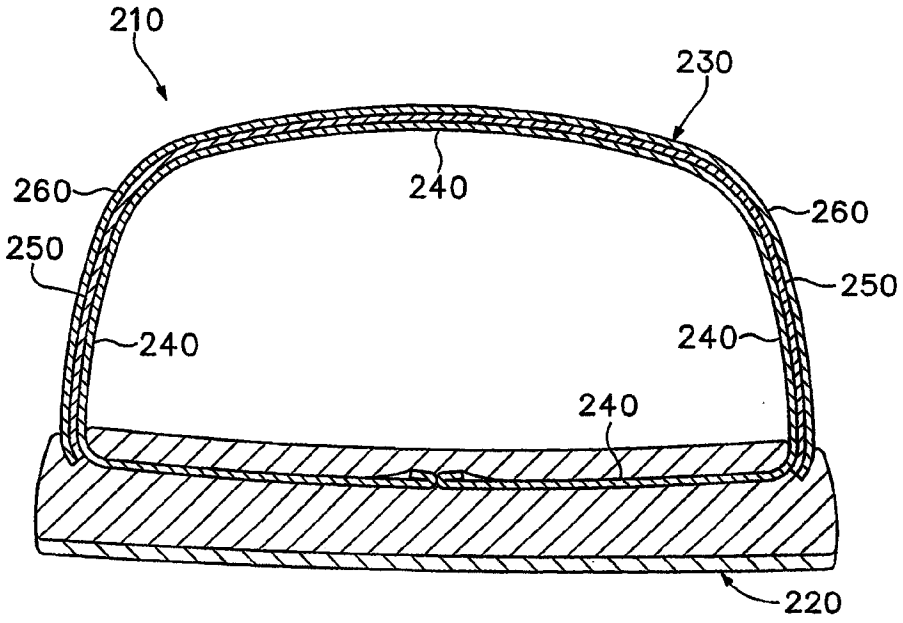


图 14

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Espacenet

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Combined shoes comprising cage-shaped structures

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Abstract of CN201536681 (U)

The utility model provides combined shoes. Each combined shoe comprises a cage-shaped structure, a detachable shoe sole and a shoe cover. The cage-shaped structure is formed by interlaced straps and includes a vamp portion, a shoe upper portion, a heelpiece portion and a lower sole portion, the vamp portion of the cage-shaped structure is provided with an opening, the bottom portion of the detachable shoe sole is provided with an embedded groove structure matching with the lower sole portion of the cage-shaped structure, and the shoe cover is provided with a shoe upper, a vamp, a heelpiece and an inner sole. The detachable shoe sole is placed inside via the opening of the cage-shaped structure to lead the embedded groove structure of the detachable shoe sole to be completely engaged with the lower sole portion of the cage-shaped structure so as to form a sandal, and then the shoe cover is placed inside the cage-shaped structure on the detachable shoe sole to form a shoe with warm keeping function. Accordingly, the shoes can flexibly meet wearing requirements of different seasons and climates. Therefore, the shoes have the advantages that the shoes are dual-purpose, have changeable modeling and are flexible and practicable and the like.

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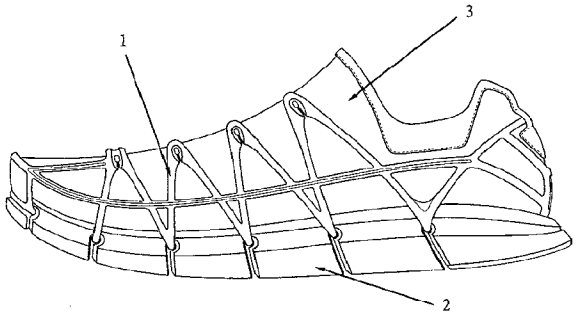
权利要求书 1 页 说明书 3 页 附图 4 页

(54)实用新型名称

一种包括笼状结构的组合鞋

(57)摘要

本实用新型提供了一种组合鞋，包括笼状结构、可拆卸鞋底和鞋套三部分。笼状结构由交织的条带组成，具有鞋面部分、鞋帮部分、后跟部分和下底部分，并且笼状结构的鞋面部分具有开口。可拆卸鞋底的底部设置有与笼状结构的下底部分相配合的嵌入沟槽结构。鞋套具有鞋帮、鞋面、后跟和内底。通过笼状结构的开口放入可拆卸鞋底，使得可拆卸鞋底的嵌入沟槽结构与笼状结构的下底部分配合在一起，即可组成凉鞋；再将鞋套放入到可拆卸鞋底上的笼状结构中，即可组成具有保暖功能的鞋。这样，该鞋可通过搭配不同的鞋套或者不搭配鞋套，灵活地适应不同季节和气候的穿着需要，因此本实用新型的鞋具有一鞋两穿、造型多变和灵活实用等优点。



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1. 一种鞋，其特征在于包括：

由交织的条带组成的弹性的笼状结构，其具有鞋面部分、鞋帮部分、后跟部分和下底部分，该笼状结构的鞋面部分具有开口，所述开口设置有扣合装置；和

可拆卸鞋底，该可拆卸鞋底的底部设置有与所述笼状结构的下底部分相配合的嵌入沟槽结构，

其中，通过所述笼状结构的开口放入所述可拆卸鞋底，并且所述可拆卸鞋底的嵌入沟槽结构与所述笼状结构的下底部分配合在一起。

2. 如权利要求 1 所述的鞋，其特征在于，还包括鞋套，所述鞋套具有鞋帮、鞋面、后跟和内底，所述鞋套通过所述笼状结构的开口被放入到所述可拆卸鞋底上的笼状结构中。

3. 如权利要求 1 所述的鞋，其特征在于，所述笼状结构的鞋帮部分具有加强筋。

4. 如权利要求 2 所述的鞋，其特征在于，所述笼状结构的后跟部分和所述鞋套的后跟具有相互配合的相对固定装置。

5. 如权利要求 1 所述的鞋，其特征在于，所述笼状结构是一次成型的。

6. 如权利要求 1 所述的鞋，其特征在于，所述扣合装置是鞋带和所述笼状结构的开口两侧的鞋带孔。

7. 如权利要求 1 所述的鞋，其特征在于，所述笼状结构由弹性材料整体组成。

8. 如权利要求 1 所述的鞋，其特征在于，所述可拆卸鞋底由耐磨材料整体组成。

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一种包括笼状结构的组合鞋

技术领域

[0001] 本实用新型涉及一种鞋类制品，具体地，涉及一种包括笼状结构的鞋。

背景技术

[0002] 鞋是人们重要的生活用品。传统的鞋是由鞋面、大底、中底和鞋跟等部分组成的，这些结构往往被牢固地固定在一起，不可拆卸。传统鞋类只能应对一种气候环境，因此人们需要在换季时买鞋，例如，在炎热时需要穿凉鞋，比较凉爽时需要穿有一定保暖功能又具透气性的鞋，而在严寒时节需要保暖性好的鞋。实际上，一鞋专用的状况会造成某种程度上的浪费，人们为此多支出了不必要的费用。如果鞋的不同部位可以更换，那么只需更换鞋子包裹住脚的那一部分就足以轻松应对不同季节，而鞋底等部位是可以继续使用的。

[0003] 另外，鞋的某些部位（如，鞋底和鞋面外部）由于与外界接触等原因，往往容易磨损，而鞋的维修需要求助于专业人员，这对如今的快节奏生活来说显得非常麻烦。如何设计出一种鞋，使人们可自主更换鞋的不同部位，成为业界正在研究的课题。

[0004] 目前已有一些可更换鞋子部件的灵活性设计，例如，实用新型 CN2044430U 和 CN2277204Y 提供了容易更换鞋跟的结构，其中，鞋跟与鞋底之间是通过单个装置连接的，例如楔槽或金属弹片，这样鞋子的稳定性不是太好，而且可操作性不强，还会增加制造的复杂度和成本。

[0005] CN2416770 提出利用楔形凹槽和楔形凸槽的配合来连接各层鞋底；CN2291810 提出通过凸头凹槽或楔头楔槽来连接外底和中底；CN201223028 提出利用滑轨、滑块、螺杆和转动销；CN201178717 则是通过在外底、中底和内底上布置压片、胶柱和对应的孔洞来实现鞋底更换功能。容易理解，上述设计也是比较机械化的，需要连接件的形状和位置准确配合，因此，对鞋子的加工精度要求较高，成本高，不是很容易操作，并且可能会存在稳定性和安全性问题。

[0006] CN2112295、CN101209140、CN201019057、CN2315806、CN2815038、CN2559234 等提出通过尼龙扣粘接、拉链连接的方式来实现外底和中底之间的活动连接。这种设计的优点是加工简单，对精度的要求不高，成本低，但是其缺点也显而易见——尼龙扣的使用寿命非常有限，一般几次拆接之后粘合力就大打折扣甚至消失，因此无法频繁拆装鞋底；拉链的形状结构决定了它非常容易损坏，在行走过程中无法避免的灰尘、泥土和硬物碰撞都可能使拉链无法正常工作。因此，这种连接结构容易损坏，结果未损坏的部分也无法再继续使用，反而造成浪费。

[0007] 为了解决现有技术中存在的问题，本实用新型的发明人从草鞋得到灵感，设计出一种形似草鞋的笼状结构，以及与之相搭配的可拆卸鞋底和鞋套。在现代工艺与传统文化的完美结合下，这种鞋不仅造型具有仿古元素而倍显时尚，而且在更换时操作简便，结构简单适合批量生产。

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实用新型内容

[0008] 根据本实用新型的一个方面的鞋包括：由交织的条带组成的笼状结构，其具有鞋面部分、鞋帮部分、后跟部分和下底部分，该笼状结构的鞋面部分具有开口，开口处设置有扣合装置；和鞋底，该鞋底的底部设置有与笼状结构的下底部分相配合的嵌入沟槽结构，其中，通过笼状结构的开口放入鞋底，并且鞋底的嵌入沟槽结构与笼状结构的下底部分配合在一起。优选地，笼状结构的鞋帮部分具有加强筋。笼状结构的开口处的扣合装置是鞋带孔，可使用鞋带等将笼状结构固定在穿用者的脚上。笼状结构是一次成型的，并且由弹性材料整体组成。鞋底由耐磨材料整体组成。

[0009] 根据本实用新型的另一方面，这种鞋还包括鞋套，鞋套具有鞋帮、鞋面、后跟和内底，鞋套通过笼状结构的开口被放入到鞋底上的笼状结构中。优选的是，笼状结构的后跟部分和鞋套的后跟具有相互配合的固定装置。

[0010] 在使用方面，本实用新型的鞋具有安全性好、使用方便的优点，还可以一鞋多穿 -- 通过笼状结构的开口放入可拆卸鞋底，使得可拆卸鞋底的嵌入沟槽结构与笼状结构的下底部分配合在一起，即可组成凉鞋；再将鞋套放入到可拆卸鞋底上的笼状结构中，即可组成具有保暖功能的鞋。这样，该鞋可通过选择搭配不同的鞋套或者不搭配鞋套，灵活地适应不同季节和气候的穿着需要。在鞋子的笼状结构、鞋底和鞋套中的某个部分出现破损时，只需更换相应的部分即可，而不必为此支付整双鞋的费用。

[0011] 在制造方面，本实用新型的鞋的三个部分——笼状结构、可拆卸鞋底和鞋套——可以分开单独制作，省去了将它们合成整鞋的粘合或缝合步骤，这降低了加工难度，节约生产成本。例如，笼状结构可使用弹性材料一次成型制造，可拆卸鞋底可使用耐磨材料一次成型制成，鞋套根据材质和用途可以一次成型也可以用现有材料通过缝制或粘合等工艺制成。

附图说明

[0012] 图 1 示出了根据本实用新型的鞋的整体结构示意图，该鞋包括笼状结构、可拆卸鞋跟和鞋套三部分；

[0013] 图 2 示出了图 1 的实施例的笼状结构的分解图；

[0014] 图 3 示出了图 1 的实施例的可拆卸鞋底的分解图；以及

[0015] 图 4 示出了图 1 的实施例的鞋套的分解图。

具体实施方式

[0016] 下面通过本实用新型的一个优选实施例来举例说明。

[0017] 图 1 示出了根据本实用新型的鞋的整体结构示意图，图 2-4 分别示出了该鞋的各组成部分的分解图。现参考图 2，笼状结构 1 具有鞋状的轮廓，并且由交织的条带组成。与传统的鞋类似地，笼状结构 1 可以分成鞋面部分、鞋帮部分、后跟部分和下底部分。笼状结构 1 的鞋面部分具有开口，用于放入可拆卸鞋底和鞋套，开口处设置有扣合装置 4。在该实施例中，扣合装置 4 是设置在开口两侧的鞋带孔，可配合鞋带等来使用。笼状结构 1 是由弹性材料（如，TPU 等）一次成型制成的，例如，通过使用模具。由于笼状结构 1 是由弹性的条带交织组成的，为了使其形状相对稳定，可以在笼状结构 1 的鞋帮部分设置加强筋 5，加

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强筋 5 的方向可以是从脚尖到脚跟，可以仅在一侧鞋帮设置也可以两侧均设置。根据需要，可以在脚尖和脚跟部分也设置加强筋或者闭合的面片结构来增加强度，使其更加稳固。

[0018] 现参考图 3，该图示出了可拆卸鞋底 2。与笼状结构 1 的下底部分的结构相适应地，可拆卸鞋底 2 的底部设置有嵌入沟槽结构 7。当通过笼状结构 1 的开口将可拆卸鞋底 2 放入笼状结构 1 中时，笼状结构 1 下底部分的条带嵌入到可拆卸鞋底 2 的嵌入沟槽结构 7 内，从而二者互相匹配地组合在一起。此时，组合而成的鞋可以作为凉鞋穿用。穿着者可通过笼状结构 1 的开口放入脚，用鞋带穿过开口两侧的鞋带孔 4 系在一起，即成为系带式凉鞋。或者，在笼状结构 1 的开口较大时，或者开口处的弹性非常好时，不必解开鞋带就可以方便地穿、脱凉鞋。

[0019] 图 4 示出了该实施例的鞋套 3。鞋套 3 具有鞋帮、鞋面、后跟和内底。应理解，鞋套 3 可以是不包括大底的鞋，因此适于用现有工艺加工，而无须专门的设备。鞋套 3 通过笼状结构 1 的开口被放入到可拆卸鞋底 2 上的笼状结构 1 中。优选的是，笼状结构 1 的后跟部分和鞋套 3 的后跟具有相互配合的固定装置，见图 2 中的附图标记 6 和图 3 中的 8。在该实施例中，鞋套 3 具有上部固定在鞋套上，下部可通过粘接方式活动固定的固定装置 8，与笼状结构 1 的条带 6 配合，用于将鞋套 3 从笼状结构 1 的开口放入后固定二者的相对位置。组合后的鞋如图 1 所示。

[0020] 本实用新型的笼状结构采用一次成型工艺制成，不需使用胶水或车线，因此其牢固性更好，而且制作工艺简单，适于批量生产。鞋套和鞋底均可采用现有工艺和设备来制作，因此不会造成成本的额外增加。另外，本实用新型的鞋可实现对脚的全方位的包围保护，能够确保穿着者的安全。

[0021] 此外，可以设计具有不同功能、不同鞋型、不同颜色的鞋套或鞋底。消费者可以在专卖店中自由购买各种鞋套、鞋底或笼状结构，不仅经济节约，更可享受自由搭配的乐趣。

[0022] 本领域的技术人员容易理解，本实用新型的鞋可以有多种变形和实施方式，这些变形都应涵盖在本实用新型的保护范围之内。笼状结构 1 开口处的鞋带孔 4 的数目可以改变，也可以采用其它形式，例如，挂钩和孔、按扣、粘接结构等，或者本领域人员所能想到的任何制鞋领域中常用的具有固定功能的设计。笼状结构 1 与鞋套 3 之间的固定装置也可以设置在其它部位，并且该固定装置可以采用多种形式。鞋套 3 可以是透气面料制成的，也可以是厚实保暖面料制成的，其形状既可以是休闲鞋、运动鞋、皮鞋，也可以是靴子。笼状结构 1 既可以完全包裹鞋套，也可以部分包裹，还可以超出鞋套包裹在穿着者的脚踝甚至小腿上，增加设计感、时尚感，满足不同需求，同时实现更好的固定功能。

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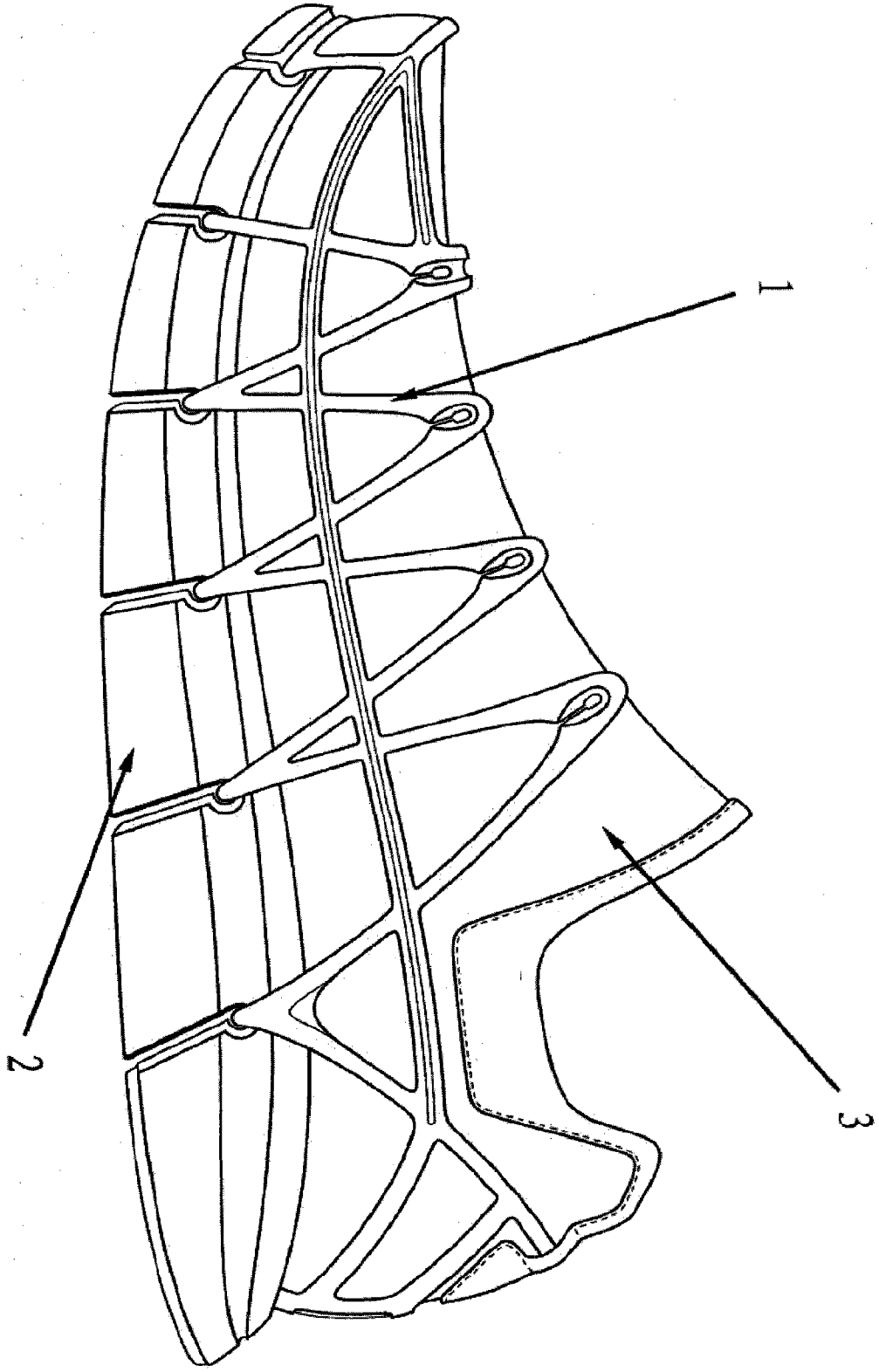


图 1

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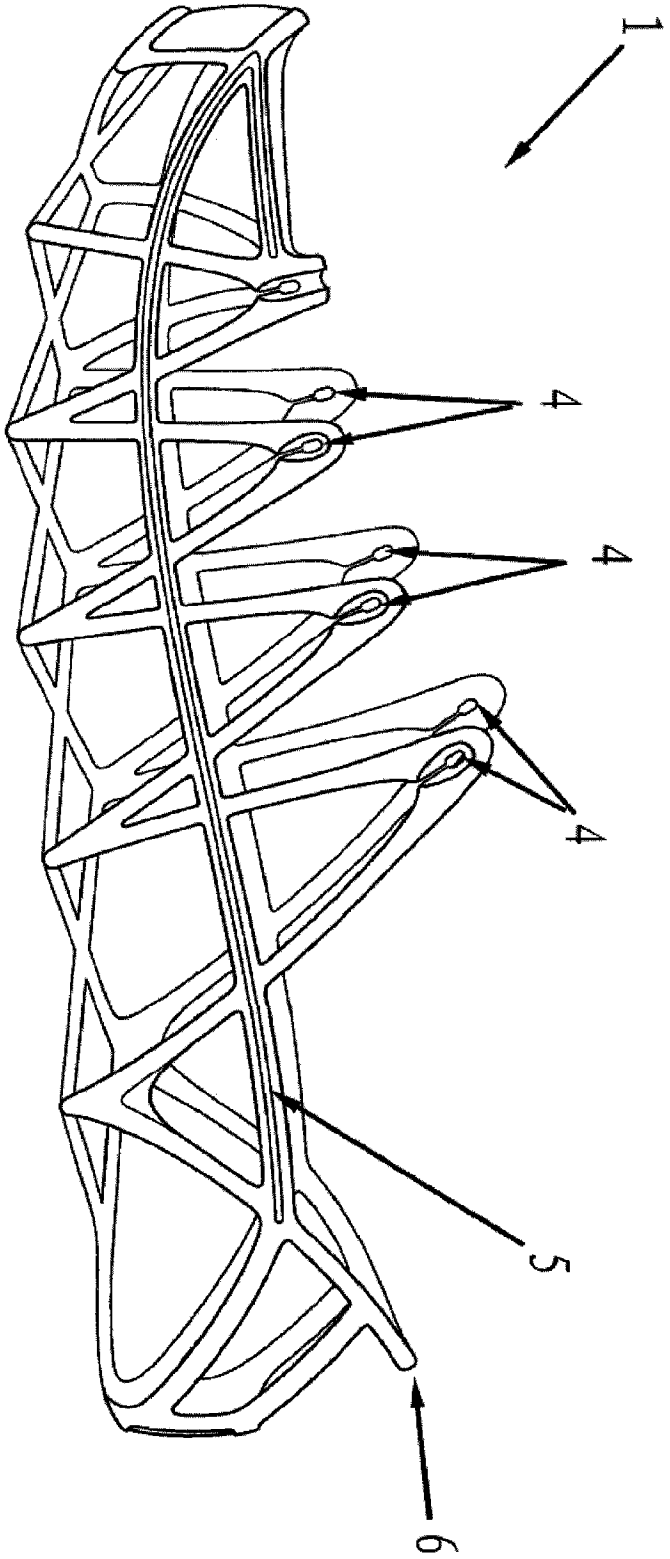


图 2

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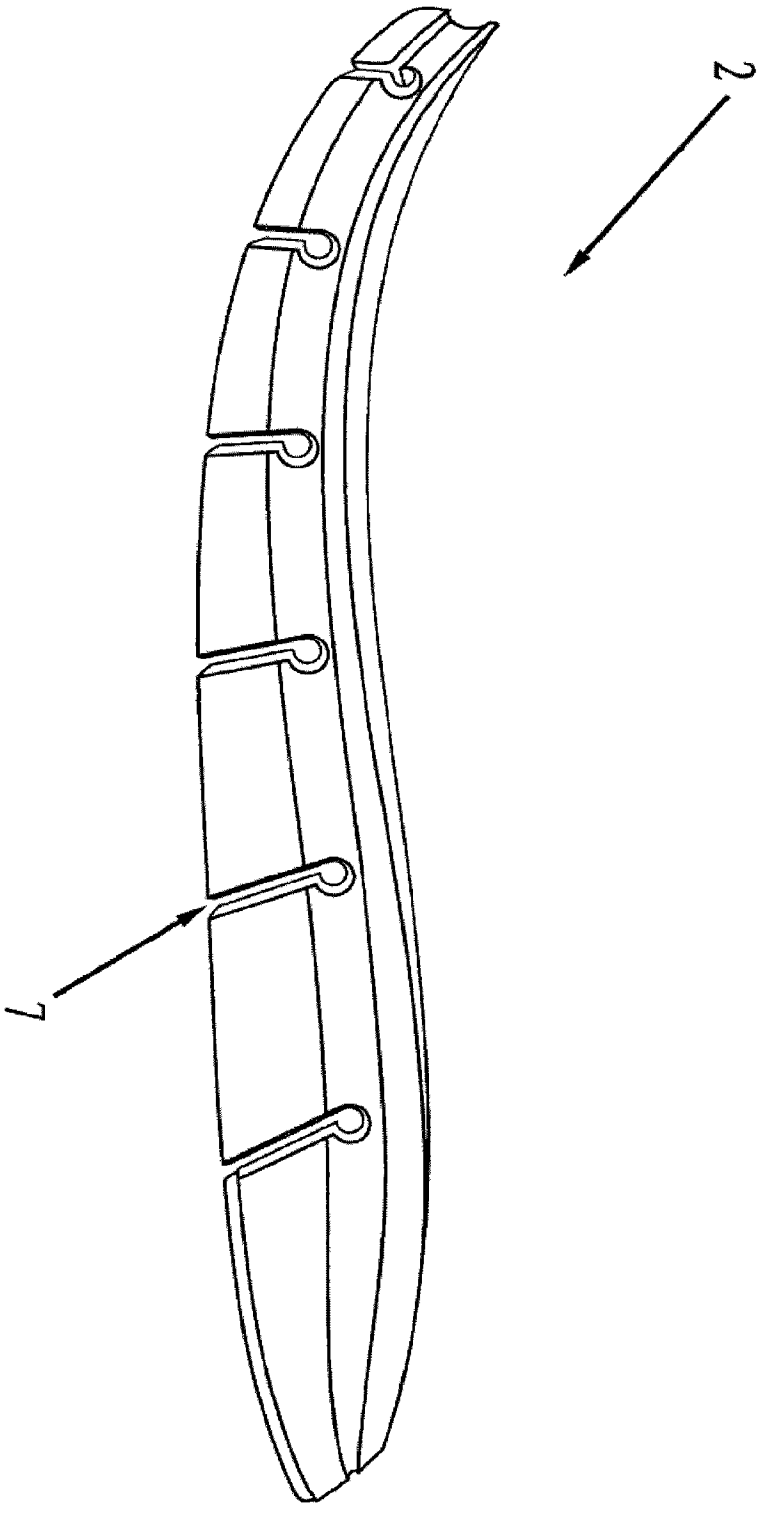


图 3

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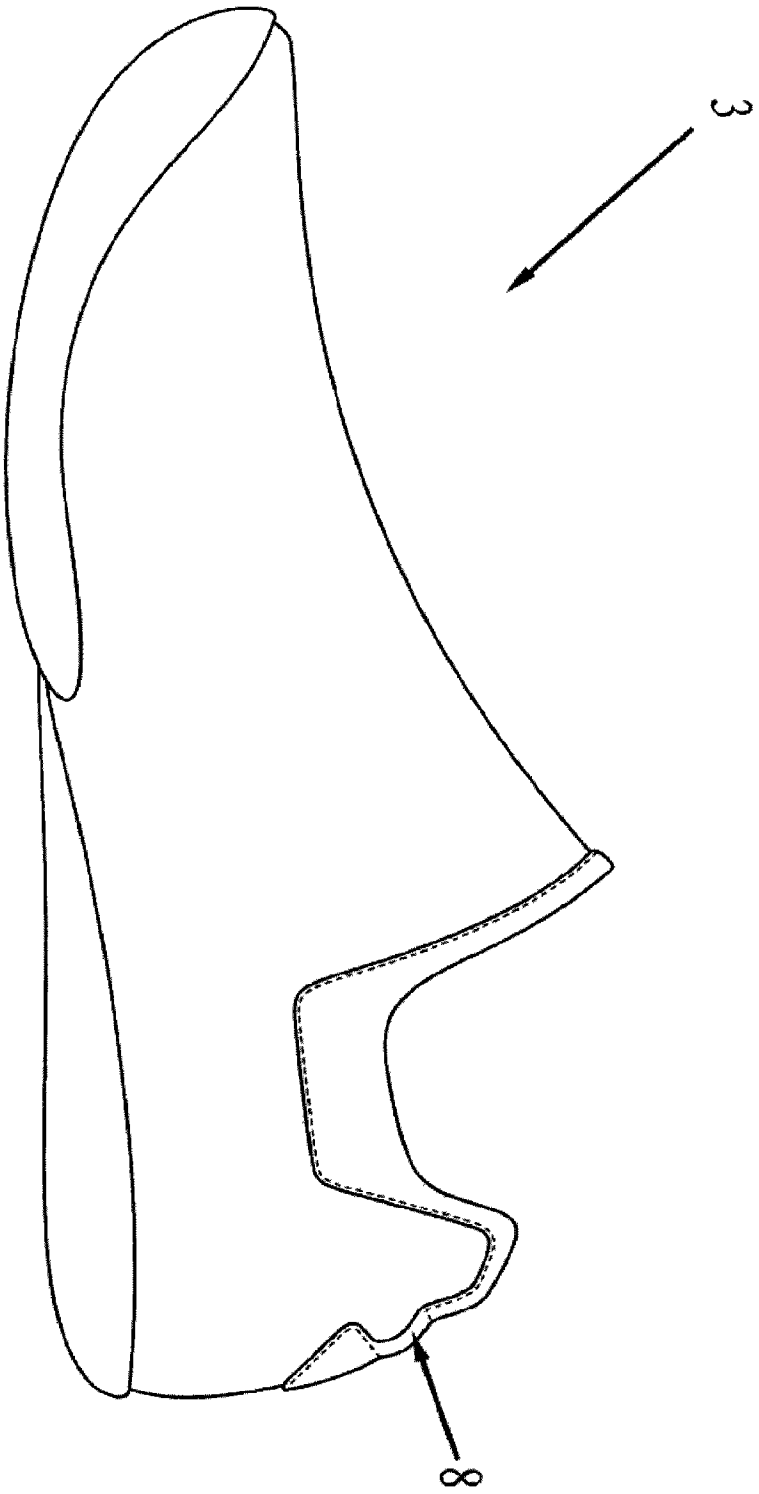


图 4

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Abstract

The invention discloses a method for knitting a single-color or multicolor double-layer-spaced jacquard warp-knitted fabric. The knitting method comprises the following steps: (1) designing jacquard patterns of the warp-knitted fabric by using a computer; (2) preparing for knitting; (3) inputting parameters on a Jacquard warp knitting machine, and knitting through the warp knitting machine, so as to obtain a double-layer-spaced jacquard warp-knitted fabric with preset patterns. The knitting method adopted in the invention is unique, the amount of warp run-in of each yarn is controlled reasonably, the obtained single-color or multicolor double-layer-spaced jacquard warp-knitted fabric comprises a surface layer and a bottom layer, an irregular knitting method is adopted between the surface layer and the bottom layer, the surface layer and the bottom layer are connected through yarns, or the surface layer and the bottom layer are and are not connected through yarns alternately, and a gap layer is formed at the position without connection through the yarns; the gap can be filled with elastic materials such as cotton wool, plush or sponge, so that the gap part is bulged. Therefore, the knitted fabric integrally has different layered effects.

Claims

1. A method for knitting a single-color or multicolor double-layer-spaced jacquard warp-knitted fabric, characterized in: the warp-knitted fabric is knitted through a double-needle-bed Jacquard warp knitting machine, the knitting method comprises the following steps:

(1) designing jacquard patterns of the warp-knitted fabric by using a computer;

(2) preparing for knitting: the warp knitting machine is provided with six yarn guide bars arranged from front to rear of the machine as bar GBl, Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4, Jacquard bar JB5 and bar GB6, wherein:

A) the bar GBl and the bar GB6 use all-gauge yarn guide needle block; the Jacquard bar JB2, the Jacquard bar JB3, the Jacquard bar JB4 and the Jacquard bar JB5 use semi-gauge yarn guide needle block;

B) the needles on the bar GBl and the bar GB6 are fully passed through by the yarns;

the needles on the Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 are all passed through by 238 yarns, half of the needles are passed through by the yarns, and the other half are not passed through by the yarns, the needles passed through by the yarns and the needles not passed through by the yarns are arranged alternately; the let-off amount of yarns is 1000-2800 mm/lacquer;

C) the bar GBl uses chain stitch;

the Jacquard bar JB2 and the Jacquard bar JB3 use the same needle shifting method and the yarns in the same color, the needle shifting method used is chain stitch, tricot stitch or cord stitch;

the Jacquard bar JB4 and the Jacquard bar JB5 use the same needle shifting method and the yarns in the same color, the needle shifting method used is chain stitch, tricot stitch or cord stitch;

the bar GB6 uses chain stitch;

D) the bar GBl knits to form a surface layer of the warp-knitted fabric;

the bar GB6 knits to form a bottom layer of the warp-knitted fabric;

the Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5

knit together to connect the surface layer and the bottom layer; the surface layer and the bottom layer are connected through yarns, or the surface layer and the bottom layer are and are not connected through yarns alternately; and a spacer layer is formed at the position without connection through the yarns;

(3) inputting parameters on a the Jacquard warp knitting machine, and knitting through the machine, so as to obtain a double-layer-spaced jacquard warp-knitted fabric with preset patterns.

2. The method for knitting a single-color or multicolor double-layer-spaced jacquard warp-knitted fabric according to claim 1, characterized in: the warp knitting machine is further provided with a seventh yarn guide bar, bar GB7, which uses all-gauge yarn guide needle block; the needles of the bar GB7 are passed through by 476 yarns; the bar GB7 uses weft insertion stitch or cord stitch.

3. The method for knitting a single-color or multicolor double-layer-spaced jacquard warp-knitted fabric according to claim 1, characterized in: after the step (3), further comprising the step of dyeing: putting the knitted fabric obtained from step (3) into a vat into which dyes in corresponding pattern and color and a white antifouling agent are also input, raising the temperature in the vat to 98-102℃ and holding at this temperature for 1 hour, and continuing to raise the temperature in the vat to 118-122℃ and holding at this temperature for 1 hour, and again raising the temperature in the vat to 128-132℃and holding at this temperature for 1 hour, thereby completing dyeing gauze.

4. The method for knitting a single-color or multicolor double-layer-spaced jacquard warp-knitted fabric according to claim 1, characterized in: the Jacquard bar JB2 and the Jacquard bar JB3 are jacquard on a first needle bed of the double needle bed Jacquard warp knitting machine and have the same let-off amount; the Jacquard bar JB4 and the Jacquard bar JB5 are jacquard on a second needle bed of the double needle bed Jacquard warp knitting machine, and simultaneously participate into knitting on the first needle bed; the tension of the yarns passing through the Jacquard bar JB4 and the Jacquard bar JB5 is tension compensated by a double-layer spring compensation device.

5. The method for knitting a single-color or multicolor double-layer-spaced jacquard warp-knitted fabric according to claim 2, characterized in: the bar GBl knits a surface layer of the warp-knitted fabric through chain stitch; the bar GB6 knits a bottom layer of the warp-knitted fabric through chain stitch; the bar GB7 uses weft insertion stitch or cord stitch; the Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 all use tricot stitch to knit to connect the surface layer and the bottom layer.

6. The method for knitting a single-color or multicolor double-layer-spaced

jacquard warp-knitted fabric according to claim 2, characterized in: the bar GBl knits a surface layer of the warp-knitted fabric through chain stitch; the bar GB6 knits a bottom layer of the warp-knitted fabric through chain stitch; the bar GB7 uses weft insertion stitch or cord stitch; the Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 all use chain stitch to knit to connect the surface layer and the bottom layer.

7. The method for knitting a single-color or multicolor double-layer-spaced jacquard warp-knitted fabric according to claim 2, characterized in: the yarns passing through the bar GBl, Jacquard bar JB2 and Jacquard bar JB3 are polyester fiber, nylon fiber, colored fiber, cationic fiber, polyester and nylon composite wire or machinery covered yarn;

the yarns passing through the Jacquard bar JB4, Jacquard bar JB5 and bar GB6 are polyester fibers, nylon fibers, colored fibers, cationic fiber, polyester and nylon composite wire or machinery covered yarn;

the yarns passing through the bar GB7 are polyester fibers, nylon fibers, cationic fiber, colored fibers, polyester and nylon composite wire or machinery covered yarn;

the machinery covered yarn is spandex core yarn wounded evenly with fiber filaments at its outside.

8. A single-color or multicolor double-layer-spaced jacquard warp-knitted fabric knitted by the knitting method of one of claims 1-7.

9. The single-color or multicolor double-layer-spaced jacquard warp-knitted fabric according to claim 8, characterized in: the warp-knitted fabric comprises a surface layer and a bottom layer, the surface layer and the bottom layer being connected through yarns, or the surface layer and the bottom layer being and being not connected through yarns alternately, a gap layer being formed at the position without connection through the yarns.

10. The single-color or multicolor double-layer-spaced jacquard warp-knitted fabric according to claim 9, characterized in: the gap layer is filled with elastic materials that are cotton wool, plush or sponge.

Single-color or multicolor double-layer-spaced jacquard warp-knitted fabric and knitting method thereof

Technical field

The present invention relates to a method for knitting warp-knitted fabric through a Jacquard warp knitting machine, especially relates to a single-color or multicolor double-layer-spaced jacquard warp-knitted fabric and knitting method thereof.

Background Art

Double-needle bed single jacquard machine in the market can only knit single-side jacquard uppers formed integrally, but can not knit jacquard knitted uppers with double-side jacquard and ultra thin effect. At present, there are integrally formed three-layer warp-knitted fabric in the market, comprising a surface layer, an intermediate layer and a bottom layer, wherein the intermediate layer is a support layer of the surface layer and the bottom layer, the connection between the surface layer cannot be irregular, so it has relatively poor permeability.

Summary of the Invention

In order to overcome the deficiencies of the prior art, the object of the present invention is to provide a single-color or multicolor double-layer-spaced jacquard warp-knitted fabric, which can achieve single-color or multicolor, lightweight, breathable, comfort, health, environmental protecting and energy saving, and does not need an intermediate support layer between the surface layer and the bottom layer. The present invention also provides a knitting method to achieve irregular knitting between the surface layer and the bottom layer.

The technical scheme of the present invention is: a knitting method for a single-color or multicolor double-layer-spaced jacquard warp-knitted fabric, said warp-knitted fabric is knitted through a double-needle-bed Jacquard warp knitting machine, the knitting method comprises the following steps:

(1) designing jacquard patterns of the warp-knitted fabric by using a computer;

(2) preparing for knitting: the warp knitting machine is provided with six yarn guide bars arranged from front to rear of the machine as bar GBl, Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4, Jacquard bar JB5 and bar GB6, wherein:

A) the bar GBl and bar GB6 use all-gauge yarn guide needle block; Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 use semi-gauge yarn

guide needle block;

B) the needles on the bar GBl and bar GB6 are fully passed through by the yarns; the needles on the Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 are all passed through by 238 yarns, half of the needles are passed through by the yarns, and the other half are not passed through by the yarns, the needles passed through by the yarns and the needles not passed through by the yarns are arranged alternately; the let-off amount of yarns is 1000-2800 mm/lacquer;

C) the bar GBl uses chain stitch; the Jacquard bar JB2 and Jacquard bar JB3 use the same needle shifting method and the yarns in the same color, the needle shifting method used is chain stitch, tricot stitch or cord stitch; the Jacquard bar JB4 and Jacquard bar JB5 use the same needle shifting method and the yarns in the same color, the needle shifting method used is chain stitch, tricot stitch or cord stitch; the bar GB6 uses chain stitch;

D) the bar GBl knits to form a surface layer of the warp-knitted fabric; the bar GB6 knits to form a bottom layer of the warp-knitted fabric; the Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 knit together to connect the surface layer and the bottom layer; the surface layer and the bottom layer are connected through yarns, or the surface layer and the bottom layer are and are not connected through yarns alternately; and a spacer layer is formed at the position without connection through the yarns;

(3) inputting parameters on the Jacquard warp knitting machine, and knitting through the machine, so as to obtain a double-layer-spaced jacquard warp-knitted fabric with preset patterns. By means of the above knitting method, the present invention is provided with six yarn guide bars, wherein both bar GBl and bar GB6 are comb, and Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 are all Jacquard bars.

By means of the above knitting method of the present invention, the warp-knitted fabric has a surface layer and a bottom layer, and both surfaces of the surface layer and the bottom layer are jacquard and have different patterns, the surface layer and the bottom layer are connected through yarns, or the surface layer and the bottom layer are and are not connected through yarns alternately with a balance amount of yarns so as to form irregularly connected intervals between the surface layer and the bottom layer, thus, the double-layer jacquard warp-knitted fabric obtained has function of being lightweight, breathable, comfortable, health, environmental protection. The knitting method of the invention not only makes the knitted fabric have a beautiful surface pattern, but also gives unique properties to the surface layer and the bottom layer of the spaced warp-knitted fabric, which greatly increases the demand of the market.

After said step (3), the method further comprises the step of dyeing: putting the knitted fabric obtained from step (3) into a vat into which dyes in corresponding pattern and color and a white antifouling agent are also input, raising the temperature in the vat to 98-102℃ and keeping this temperature for 1 hour, and continuing to raise the temperature in the vat to 118-122℃ and keep this temperature for 1 hour, again raising the temperature in the vat to 128-132℃ and keeping this temperature for 1 hour, thereby completing dyeing gauze.

Further, the warp knitting machine of the present invention is further equipped with a seventh yarn guide bar, bar GB7, which uses all-gauge yarn guide needle block. The needles of the bar GB7 are passed through by 476 yarns. Bar GB7 uses weft insertion stitch or cord stitch.

The Jacquard bar JB2 and Jacquard bar JB3 are jacquard on a first needle bed of the double needle bed Jacquard warp knitting machine. These two bars do not participate into knitting of other bars, so they have the same let-off amount. The Jacquard bar JB4 and Jacquard bar JB5 are jacquard on a second needle bed of the double needle bed Jacquard warp knitting machine, and simultaneously participate into knitting on the first needle bed, so as to form local connection and non-connection, thereby forming connection intervals and non-connection intervals on the fabric surface. In this way, the overall tension is changed, that is, the tension is strong at the connection point but weak at the non-connection point. Therefore, the tension of the yarns passing through the Jacquard bar JB4 and Jacquard bar JB5 is tension compensated by a double-layer spring compensation device. Meanwhile, the tension can also be adjusted regularly in a large area by warping segment by segment, and the tension adjusted irregularly in a local small area can only be compensated depending on an art flower pattern and spring sheet.

The present invention achieves effect of balancing the overall let-off amount by connecting the surface layer and the bottom layer of the knitted fabric using yarns or connecting them with yarns and without yarns alternately. In the existing common jacquard knitted fabric, an intermediate layer (support layer) is used for the connection, so no irregular connection can be achieved between the surface layer and the bottom layer of the knitted fabric.

Further, in the present invention, the bar GBl uses chain stitch to knit the surface layer of the warp-knitted fabric; the bar GB6 uses chain stitch to knit the bottom layer of the warp-knitted fabric; the bar GB7 uses weft insertion stitch or cord stitch; the Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 all use tricot stitch to knit to connect the surface layer and the bottom layer.

Further, in the present invention, the bar GBl uses chain stitch to knit the surface layer of the warp-knitted fabric; the bar GB6 uses chain stitch to knit the bottom layer of the warp-knitted fabric; bar GB7 uses weft insertion stitch or cord stitch; the

Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 all use chain stitch to knit to connect the surface layer and the bottom layer.

In the present invention, the needles on the bars can be passed through by yarns in a variety of materials such that the knitted fabric knitted has or has no elasticity. In specific: the yarns passing through the bar GBl, Jacquard bar JB2 and Jacquard bar JB3 are polyester fiber, nylon fiber, colored fiber, cationic fiber, polyester and nylon composite wire or machinery covered yarn; the yarns passing through the Jacquard bar JB4, Jacquard bar JB5 and bar GB6 are polyester fibers, nylon fibers, colored fibers, cationic fiber, polyester and nylon composite wire or machinery covered yarn; the yarns passing through the bar GB7 are polyester fibers, nylon fibers, colored fibers, cationic fiber, polyester and nylon composite wire or machinery covered yarn; the machinery covered yarn is spandex core yarn wounded evenly with fiber filaments at its outside.

The present invention also provides a single-color or multicolor double-layer-spaced jacquard warp-knitted fabric knitted by the knitting method.

Further, the warp-knitted fabric of the present invention comprises a surface layer and a bottom layer, the surface layer and the bottom layer being connected through yarns, or being and being not connected through yarns alternately, a gap layer being formed at the position without connection through the yarns.

Further, the gap layer is filled with elastic materials that may be cotton wool, plush or sponge and so on.

The knitting method of the present invention is unique and reasonably controls the let-off amount and tension of yarns. The single-color or multicolor double-layer-spaced jacquard warp-knitted fabric obtained comprises a surface layer and a bottom layer. An irregular knitting method is used between the surface layer and the bottom layer. The surface layer and the bottom layer are connected through yarns, or are and are not connected through yarns alternately, a gap layer is formed at the position without connection through the yarns, and the gap is filled with elastic materials such as cotton wool, plush or sponge so that the gap part is bulged. Therefore, the knitted fabric integrally has different layered effects.

Brief description of drawings

The present invention will be further described in detail in combination with the drawings and embodiments in below:

Fig. 1 is a schematic view of the structure of the warp-knitted fabric obtained from Embodiment 1 of the present invention;

Fig. 2 is a schematic view of the structure of the warp-knitted fabric obtained from Embodiment 2 of the present invention;

Fig. 3 is a schematic view of the structure of the warp-knitted fabric obtained from Embodiment 3 of the present invention.

Detailed description of the embodiments

The present invention will be further described in detail in combination with the specific embodiments in below.

The present invention provides a method for knitting a single-color or multicolor double-layer-spaced jacquard warp-knitted fabric, the warp-knitted fabric is knitted on a double needle bed Jacquard warp knitting machine, the knitting method comprises:

(1) designing jacquard patterns of the warp-knitted fabric by using a computer;

(2) preparing for knitting: the warp knitting machine is provided with six yarn guide bars arranged from front to rear of the machine as bar GBl, Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4, Jacquard bar JB5 and bar GB6, wherein:

A) the bar GBl and bar GB6 use all-gauge yarn guide needle block; the Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 use semi-gauge yarn guide needle block;

B) the needles on the bar GBl and bar GB6 are fully passed through by the yarns; the needles on the Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 are all passed through by 238 yarns, half of the needles are passed through by the yarns, and the other half are not passed through by the yarns, the needles passed through by the yarns and the needles not passed through by the yarns are arranged alternately; the let-off amount of yarns is 1000-2800mm/lacquer;

C) the bar GBl uses chain stitch; the Jacquard bar JB2 and Jacquard bar JB3 use the same needle shifting method and the yarns in the same color, the needle shifting method used is chain stitch, tricot stitch or cord stitch; the bar GB6 uses chain stitch; the Jacquard bar JB4 and Jacquard bar JB5 use the same needle shifting method and the yarns in the same color, the needle shifting method used is chain stitch, tricot stitch or cord stitch;

D) the bar GBl knits to form a surface layer of the warp-knitted fabric; the bar GB6 knits to form a bottom layer of the warp-knitted fabric; the Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 knit together to connect the surface layer and the bottom layer; the surface layer and the bottom layer are connected through yarns, or the surface layer and the bottom layer are and are not

connected through yarns alternately; and a spacer layer is formed at the position without connection through the yarns;

(3) inputting parameters on a Jacquard warp knitting machine, and knitting through the machine, so as to obtain a double-layer-spaced jacquard warp-knitted fabric with preset patterns.

After said step (3), the method further comprises the step of dyeing: putting the knitted fabric obtained from step (3) into a vat into which dyes in corresponding pattern and color and a white antifouling agent are also input, raising the temperature in the vat to 98-102℃and keeping this temperature for 1 hour, and continuing to raise the temperature in the vat to 118-122℃and keeping this temperature for 1 hour, and continuing to raise the temperature in the vat to 128-132℃and keeping this temperature for 1 hour, thereby completing dyeing gauze.

Further, the warp knitting machine of the present invention is further equipped with a seventh yarn guide bar, bar GB7, which uses all-gauge yarn guide needle block. The needles of bar GB7 are passed through by 476 yarns. Bar GB7 uses weft insertion stitch or cord stitch.

The Jacquard bar JB2 and Jacquard bar JB3 are jacquard on the first needle bed of the double needle bed Jacquard warp knitting machine. These two bars do not participate into knitting of other bars, so they have the same let-off amount. Jacquard bar JB4 and Jacquard bar JB5 are jacquard on the second needle bed of the double needle bed Jacquard warp knitting machine, and simultaneously participate into knitting on the first needle bed, so as to form local connection and non-connection, thereby forming connection intervals and non-connection intervals on the fabric surface. In this way, the overall tension is changed, that is, the tension is strong at the connection point but weak at the non-connection point. Therefore, the tension of the yarns passing through the Jacquard bar JB4 and Jacquard bar JB5 is tension compensated by a double-layer spring compensation device. Meanwhile, the tension can also be adjusted regularly in a large area by warping segment by segment, and the tension adjusted irregularly in a local small area can only be compensated depending on an art flower pattern and spring sheet.

The present invention achieves effect of balancing the overall let-off amount by connecting the surface layer and the bottom layer of the knitted fabric using yarns or connecting them with yarns and without yarns alternately. In the existing common jacquard knitted fabric, an intermediate layer (support layer) is used for the connection, so no irregular connection can be achieved between the surface layer and the bottom layer of the knitted fabric.

Further, in the present invention, the bar GBl uses chain stitch to knit the surface layer of the warp-knitted fabric; bar GB6 uses chain stitch to knit the bottom layer of

the warp-knitted fabric; bar GB7 uses weft insertion stitch or cord stitch; the Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 all use tricot stitch to knit to connect the surface layer and the bottom layer.

Further, in the present invention, the bar GBl uses chain stitch to knit the surface layer of the warp-knitted fabric; bar GB6 uses chain stitch to knit the bottom layer of the warp-knitted fabric; bar GB7 uses weft insertion stitch or cord stitch; the Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 all use chain stitch to knit to connect the surface layer and the bottom layer.

In the present invention, the needles on the bars can be passed through by yarns in a variety of materials such that the knitted fabric knitted has or has no elasticity. In specific: the yarns passing through the bar GBl, Jacquard bar JB2 and Jacquard bar JB3 are polyester fiber, nylon fiber, cationic fiber, polyester and nylon composite wire or machinery covered yarn; the yarns passing through the Jacquard bar JB4, Jacquard bar JB5 and bar GB6 are polyester fibers, nylon fibers, colored fibers, cationic fiber, polyester and nylon composite wire or machinery covered yarn; the yarns passing through the bar GB7 are polyester fibers, nylon fibers, colored fibers, cationic fiber, polyester and nylon composite wire or machinery covered yarn; the machinery covered yarn is spandex core yarn wounded evenly with fiber filaments at its outside.

The present invention also provides a single-color or multicolor double-layer-spaced jacquard warp-knitted fabric knitted by the knitting method.

Further, the warp-knitted fabric of the present invention comprises a surface layer and a bottom layer, the surface layer and the bottom layer being connected through yarns, or the surface layer and the bottom layer being and being not connected through yarns alternately, a gap layer being formed at the position without connection through the yarns.

Further, the gap layer is filled with elastic materials that may be cotton wool, plush or sponge and so on.

Detailed description is provided in below in combination with specific embodiments.

Embodiment 1

A warp-knitted fabric is knitted on a double needle bed Jacquard warp knitting machine, the knitting method comprises the following steps:

(1) designing jacquard patterns of the warp-knitted fabric by using a computer, as shown in Fig. 1;

(2) preparing for knitting: the warp knitting machine is provided with six yarn guide bars arranged from front to rear of the machine as bar GBl, Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4, Jacquard bar JB5 and bar GB6, wherein:

A) bar GBl and bar GB6 use all-gauge yarn guide needle block; Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 use semi-gauge yarn guide needle block;

B) the needles on the bar GBl and bar GB6 are fully passed through by the yarns; the needles on the Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 are all passed through by 238 yarns, half of the needles are passed through by the yarns, and the other half are not passed through by the yarns, the needles passed through by the yarns and the needles not passed through by the yarns are arranged alternately; the let-off amount of yarns is 2000-2350 mm/lacquer; the tension of the yarns on Jacquard bar JB4 and Jacquard bar JB5 is tension compensated by a double-layer spring compensation device;

C) the bar GBl uses chain stitch; the yarns passing through the needles of bar GBl are polyester fiber; the Jacquard bar JB2 and Jacquard bar JB3 use the same needle shifting method and the yarns in the same color, the needle shifting method used is chain stitch, and the yarns used are polyester fiber; the Jacquard bar JB4 and Jacquard bar JB5 use the same needle shifting method and the yarns in the same color, the needle shifting method used is tricot stitch, and the yarns used are colored fiber (blue polyester fiber); the bar GB6 uses chain stitch; the yarns passing through the needles of bar GB6 are nylon fiber;

D) the bar GBl knits to form a surface layer of the warp-knitted fabric; the bar GB6 knits to form a bottom layer of the warp-knitted fabric; the Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 knit together to connect the surface layer and the bottom layer; the surface layer and the bottom layer are connected through yarns to form the surface layer and the bottom layer into an integrity.

(3) inputting parameters on a Jacquard warp knitting machine, and knitting through the machine, so as to obtain a double-layer-spaced jacquard warp-knitted fabric with preset patterns.

The warp-knitted fabric knitted in this embodiment comprises a surface layer and a bottom layer, the surface layer and the bottom layer are connected through yarns to achieve different jacquard patterns on the two surfaces and through-holes on both surfaces and so on.

Embodiment 2

A warp-knitted fabric is knitted on a double needle bed Jacquard warp knitting machine, the knitting method comprises the following steps:

(1) designing jacquard patterns of the warp-knitted fabric by using a computer, as shown in Fig. 2;

(2) preparing for knitting: the warp knitting machine is provided with six yarn guide bars arranged from front to rear of the machine as bar GBl, Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4, Jacquard bar JB5 and bar GB6, wherein:

A) the bar GBl and bar GB6 use all-gauge yarn guide needle block; Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 use semi-gauge yarn guide needle block;

B) the needles on the bar GBl and bar GB6 are fully passed through by the yarns; the needles on the Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 are all passed through by 238 yarns, half of the needles are passed through by the yarns, and the other half are not passed through by the yarns, the needles passed through by the yarns and the needles not passing through by the yarns are arranged alternately; the let-off amount of yarns is 2000-2800 mm/lacquer;

C) the bar GBl uses chain stitch; the yarns passing through the needles of bar GBl are polyester fiber; the Jacquard bar JB2 and Jacquard bar JB3 use the same needle shifting method and the yarns in the same color, the needle shifting method used is tricot stitch, and the yarns used are polyester fiber; the Jacquard bar JB4 and Jacquard bar JB5 use the same needle shifting method and the yarns in the same color, the needle shifting method used is cord stitch, and the yarns used are nylon fiber; the bar GB6 uses chain stitch; the yarns passing through the needles of bar GB6 are nylon fiber;

D) the bar GBl knits to form a surface layer of the warp-knitted fabric; the bar GB6 knits to form a bottom layer of the warp-knitted fabric; the Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 knit together to connect the surface layer and the bottom layer; Jacquard bar JB4 and Jacquard bar JB5 knit by local irregular connection with or without yarns, the connection with yarns and the connection without yarns are disposed alternately, and a gap layer is formed at the connection part without the yarns. Since the tension of the yarns between the surface layer and the bottom layer is greatly different due to connection with yarns or the connection without yarns, the tension of the yarns is tension compensated by selecting a knitting process and by means of a double-layer spring compensation device; when the connection is regular in a large area in an overall piece, and the overall piece is connected with yarns or without yarns, the tension can be adjusted by (EBC) warping segment by segment;

(3) inputting parameters on a Jacquard warp knitting machine, and knitting through the machine, so as to obtain a double-layer-spaced jacquard warp-knitted fabric with preset patterns.

(4) The knitted fabric obtained from step (3) is put into a vat, into which dyes in corresponding pattern and color and a white antifouling agent are also input; the temperature in the vat is raised to 100℃ and held at this temperature for 1 hour, the temperature in the vat continues to be raised to 118℃ and held at this temperature for 1 hour, and again the temperature in the vat is raised to 132℃ and held at this temperature for 1 hour, thereby completing dyeing gauze. At different temperatures, different yarns will be dyed with corresponding dyes, and an anti-pollution agent is used to prevent mixed dyeing with adjacent other yarns, thus, a process of dye bath can complete dyeing with two colors.

The warp-knitted fabric knitted in this embodiment comprises a surface layer and a bottom layer, the surface layer and the bottom layer are connected with yarns or without yarns, the two structures are disposed alternately, and a gap layer is formed at position without connection through the yarns. The gap layer is filled with elastic materials that may be cotton wool, plush or sponge and so on.

Embodiment 3

A warp-knitted fabric is knitted on a double needle bed Jacquard warp knitting machine, the knitting method comprises the following steps:

(1) designing jacquard patterns of the warp-knitted fabric by using a computer, as shown in Fig. 3;

(2) preparing for knitting: the warp knitting machine is provided with seven yarn guide bars arranged from front to rear of the machine as bar GBl, Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4, Jacquard bar JB5, bar GB6 and bar GB7, wherein:

A) the bar GBl, bar GB6 and bar GB7 use all-gauge yarn guide needle block; Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 use semi-gauge yarn guide needle block;

B) the needles on the bar GBl, bar GB6 and bar GB7 are fully passed through by the yarns; the needles on the Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 are all passed through by 238 yarns, half of the needles are passed through by the yarns, and the other half are not passed through by the yarns, the needles passed through by the yarns and the needles not passed through by the yarns are arranged alternately; the let-off amount of yarns is 2000-2350 mm/lacquer;

C) the bar GBl uses chain stitch; the yarns passing through the needles of the bar GBl are polyester fiber; the Jacquard bar JB2 and Jacquard bar JB3 use the same needle shifting method and the yarns in the same color, the needle shifting method used is tricot stitch, and the yarns used are polyester fiber; the Jacquard bar JB4 and Jacquard bar JB5 use the same needle shifting method and the yarns in the same color, the needle shifting method used is tricot stitch, and the yarns used are nylon fiber; the bar GB6 uses chain stitch, and the yarns passing through the needles of bar GB6 are nylon fiber; bar GB7 uses cord stitch, and the yarns passing through the needles of bar GB7 are cation fiber;

D) the bar GBl knits to form a surface layer of the warp-knitted fabric; the bar GB6 knits to form a bottom layer of the warp-knitted fabric; the Jacquard bar JB2, Jacquard bar JB3, Jacquard bar JB4 and Jacquard bar JB5 knit together to connect the surface layer and the bottom layer; the surface layer and the bottom layer are connected through yarns such that the surface layer and the bottom layer form into an integrity;

(3) inputting parameters on a Jacquard warp knitting machine, and knitting through the machine, so as to obtain a double-layer-spaced jacquard warp-knitted fabric with preset patterns.

(4) The knitted fabric obtained from step (3) is put into a vat, into which dyes in corresponding pattern and color and a white antifouling agent are also input; the temperature in the vat is raised to 100℃ and held at this temperature for 1 hour, the temperature in the vat is continued to be raised to 118℃and held at this temperature for 1 hour, and again the temperature in the vat is raised to 130℃ and held at this temperature for 1 hour, thereby completing dyeing gauze. At different temperatures, different yarns will be dyed with corresponding dyes, and an antifouling agent is used to prevent mixed dyeing with adjacent other yarns, thus, a process of dye bath can complete dyeing with three colors.

The warp-knitted fabric knitted in this embodiment comprises a surface layer and a bottom layer, the surface layer and the bottom layer are connected with yarns, thereby achieving multicolor effect, different jacquard patterns on two surfaces, and through-holes on both surfaces, etc.

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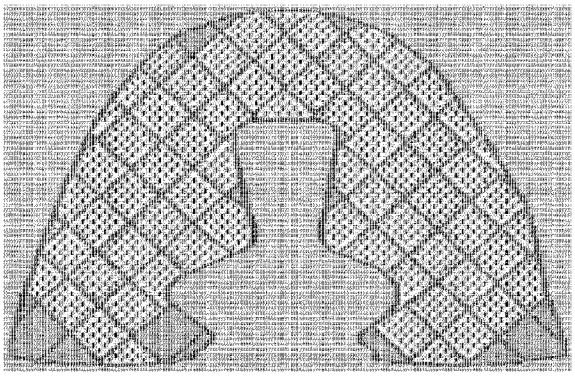
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(54)发明名称

一种单色或多色双层间隔提花经编布及其编织方法

(57)摘要

本发明公开一种单色或多色双层间隔提花经编布的编织方法，其包括以下步骤：(1)采用电脑设计经编布的提花图案；(2)编织准备；(3)在贾卡经编机上输入参数，上机编织，得到预设图案的双层间隔提花经编布。本发明采用的编织方法独特，合理控制各纱线的送经量及张力，得到的单色或多色双层间隔提花经编布包括表层和底层，其表层和底层之间采用不规则的编织方法，表层和底层间采用纱线连接或采用纱线连接与未采用纱线连接交替设置，未采用纱线连接处形成间隙层，间隙内可填充棉絮、毛绒或海绵等弹性物质，使间隙部分凸起，从而使编织布整体具有不同的层次效果。



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1. 一种单色或多色双层间隔提花经编布的编织方法，其特征在于：所述经编布在双针床贾卡经编机上进行编织，所述编织方法包括以下步骤：

（1）采用电脑设计经编布的提花图案；

（2）编织准备：所述经编机配置六把导纱梳栉，从机前向机后排列依次为梳栉 GB1、贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4、贾卡梳栉 JB5 和梳栉 GB6，其中：

A）梳栉 GB1 和梳栉 GB6 采用全机号的导纱针块；贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 采用半机号的导纱针块；

B）所述梳栉 GB1 和梳栉 GB6 的针满穿纱线；

所述贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 上的针均穿 238 条纱线，一半的针穿纱线一半的针未穿纱线，穿纱线的针和未穿纱线的针间隔设置；纱线的送经量为 1000-2800mm/ 腊克；

C）所述梳栉 GB1 采用编链组织；

所述贾卡梳栉 JB2 和贾卡梳栉 JB3 采用相同的移针方法和相同颜色的纱线，所采用的移针方法为编链组织、经平组织或经绒组织；

所述贾卡梳栉 JB4 和贾卡梳栉 JB5 采用相同的移针方法和相同颜色的纱线，所采用的移针方法为编链组织、经平组织或经绒组织；

所述梳栉 GB6 采用编链组织；

D）所述梳栉 GB1 编织形成经编布的表层；

所述梳栉 GB6 编织形成经编布的底层；

所述贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 共同编织连接表层和底层；表层和底层之间连接纱线，或连接纱线和不连接纱线交替设置，不连接纱线处形成间隔层；

（3）在贾卡经编机上输入参数，上机编织，得到预设图案的双层间隔提花经编布。

2. 根据权利要求 1 所述的单色或多色双层间隔提花经编布的编织方法，其特征在于：所述经编机上还配置有第七把导纱梳栉，为梳栉 GB7，梳栉 GB7 采用全机号的导纱针块，梳栉 GB7 的针穿 476 条纱线；梳栉 GB7 采用衬纬组织或经绒组织。

3. 根据权利要求 1 所述的单色或多色双层间隔提花经编布的编织方法，其特征在于：所述步骤（3）之后，还包括染色步骤：将步骤（3）得到的编织布放入染缸中，投入相应款式色彩的染料和白色防污剂，将染缸温度提高至 98-102℃，保温 1 个小时，继续提高染缸温度至 118-122℃，保温 1 个小时，再次提高染缸温度至 128-132℃，保温 1 个小时，完成纱布染色。

4. 根据权利要求 1 所述的单色或多色双层间隔提花经编布的编织方法，其特征在于：所述贾卡梳栉 JB2 与贾卡梳栉 JB3 在双针床贾卡经编机的第一针床上提花，送经量一致；贾卡梳栉 JB4 和贾卡梳栉 JB5 在双针床贾卡经编机的第二针床上提花，同步也在第一针床上参与编织，贾卡梳栉 JB4 和贾卡梳栉 JB5 穿的纱线的张力由双层弹簧补偿装置进行张力补偿。

5. 根据权利要求 2 所述的单色或多色双层间隔提花经编布的编织方法，其特征在于：所述梳栉 GB1 采用编链组织编织经编布的表层；梳栉 GB6 采用编链组织编织经编布的底层；梳栉 GB7 采用衬纬组织或经绒组织，所述贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡

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梳栉 JB5 均采用经半组织编织连接表层和底层。

6. 根据权利要求 2 所述的单色或多色双层间隔提花经编布的编织方法，其特征在于：所述梳栉 GB1 采用编链组织编织经编布的表层；梳栉 GB6 采用编链组织编织经编布的底层；梳栉 GB7 采用衬纬组织或经绒组织，所述贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 均采用编链组织编织连接表层和底层。

7. 根据权利要求 2 所述的单色或多色双层间隔提花经编布的编织方法，其特征在于：所述梳栉 GB1、贾卡梳栉 JB2 和贾卡梳栉 JB3 穿的纱线为涤纶纤维、锦纶纤维、有色纤维、阳离子纤维、涤锦复合丝或机械包覆纱；

所述贾卡梳栉 JB4、贾卡梳栉 JB5 和梳栉 GB6 穿的纱线为涤纶纤维、锦纶纤维、有色纤维、阳离子纤维、涤锦复合丝或机械包覆纱；

所述梳栉 GB7 穿的纱线为涤纶纤维、锦纶纤维、阳离子纤维、有色纤维、涤锦复合丝或机械包覆纱；

所述机械包覆纱为其外均匀缠绕有纤维长丝的芯丝氨纶。

8. 一种如权利要求 1-7 之一所述的编织方法编织的单色或多色双层间隔提花经编布。

9. 根据权利要求 8 所述的单色或多色双层间隔提花经编布，其特征在于：所述经编布包括表层和底层，表层和底层间采用纱线连接，或采用纱线连接与未采用纱线连接交替设置，未采用纱线连接处形成间隙层。

10. 根据权利要求 9 所述的单色或多色双层间隔提花经编布，其特征在于：所述间隙层中填充有弹性物质，该弹性物质为棉絮、毛绒或海绵 。

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一种单色或多色双层间隔提花经编布及其编织方法

技术领域

[0001] 本发明涉及贾卡经编机上进行编织经编布的方法，尤其涉及一种单色或多色双层间隔提花经编布及其编织方法。

背景技术

[0002] 市场双针床单贾卡机只能编织得到一体成型单面提花鞋面，无法得到双面提花、超薄效果的提花编织鞋面。目前，市面上也已经有一体成型的三层经编布，其包括表层、中间层和底层，其中，中间层为表层和底层的支撑层，表层跟底层之间无法做到不规则连接，透气性比较差。

发明内容

[0003] 为了克服现有技术的不足，本发明的目的在于提供一种实现单色或多色、轻便、透气、舒适、健康、环保和节能，表层和底层之间无需中间支撑层的单色或多色双层间隔提花经编布，本发明还提供了实现这种表层和底层之间不规则编织的编织方法。

[0004] 本发明的技术方案为：一种单色或多色双层间隔提花经编布的编织方法，所述经编布在双针床贾卡经编机上进行编织，所述编织方法包括以下步骤：

（1）采用电脑设计经编布的提花图案；

（2）编织准备：所述经编机配置六把导纱梳栉，从机前向机后排列依次为梳栉 GB1、贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4、贾卡梳栉 JB5 和梳栉 GB6，其中：

A）梳栉 GB1 和梳栉 GB6 采用全机号的导纱针块；贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 采用半机号的导纱针块；

B）所述梳栉 GB1 和梳栉 GB6 的针满穿纱线；所述贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 上的针均穿 238 条纱线，一半的针穿纱线一半的针未穿纱线，穿纱线的针和未穿纱线的针间隔设置；纱线的送经量为 1000-2800mm/ 腊克；

C）所述梳栉 GB1 采用编链组织；所述贾卡梳栉 JB2 和贾卡梳栉 JB3 采用相同的移针方法和相同颜色的纱线，所采用的移针方法为编链组织、经平组织或经绒组织；所述贾卡梳栉 JB4 和贾卡梳栉 JB5 采用相同的移针方法和相同颜色的纱线，所采用的移针方法为编链组织、经平组织或经绒组织；所述梳栉 GB6 采用编链组织；

D）所述梳栉 GB1 编织形成经编布的表层；所述梳栉 GB6 编织形成经编布的底层；所述贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 共同编织连接表层和底层；表层和底层之间连接纱线，或连接纱线和不连接纱线交替设置，不连接纱线处形成间隔层；

（3）在贾卡经编机上输入参数，上机编织，得到预设图案的双层间隔提花经编布。本发明采用以上的编织方法，配置六把导纱梳栉，其中，梳栉 GB1 和梳栉 GB6 均为地梳，贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 均为贾卡梳。

[0005] 本发明采用以上的编织方法，得到的经编布具有表层和底层，且表层和底层的表面均有提花，且花纹不一，表层和底层之间使用纱线连接，或交替使用连接纱线和不连接纱

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线半衡用纱量，以使表层和底层之间形成不规则连接的间隔，得到的双层提花经编布具有轻便、透气、舒适、健康、环保等多功能。通过本发明的编织方法不仅让编织布具有靓丽的表面图案，还赋予了间隔经编布表层和底层的独特性能，大大增加了市场的需求。

[0006] 所述步骤（3）之后，还包括染色步骤：将步骤（3）得到的编织布放入染缸中，投入相应款式色彩的染料和白色防污剂，将染缸温度提高至 98-102℃，保温 1 个小时，继续提高染缸温度至 118-122℃，保温 1 个小时，再次提高染缸温度至 128-132℃，保温 1 个小时，完成纱布染色。

[0007] 进一步，本发明所述经编机上还配置有第七把导纱梳栉，为梳栉 GB7，梳栉 GB7 采用全机号的导纱针块，梳栉 GB7 的针穿 476 条纱线；梳栉 GB7 采用衬纬组织或经绒组织。

[0008] 所述贾卡梳栉 JB2 与贾卡梳栉 JB3 在双针床贾卡经编机的第一针床上提花，此两把梳栉不参与其他梳栉编织，所以送经量一致；贾卡梳栉 JB4 和贾卡梳栉 JB5 在双针床贾卡经编机的第二针床上提花，同步也在第一针床上参与编织，起到局部连接与不连接，形成布面有连接间隔与不连接间隔，这样整体张力就会发生变化，有连接点处张力大，无连接点处张力小，所以贾卡梳栉 JB4 和贾卡梳栉 JB5 穿的纱线的张力由双层弹簧补偿装置进行张力补偿。同时，还可通过分段送经进行大面积有规则的整调张力，而局部小面积无规则调整张力只能靠工艺花型及弹簧片来补偿。

[0009] 本发明中因编织得到的编织布的表层和底层间采用纱线连接，或采用纱线连接和未采用纱线连接交替设置，使整体送经量达到平衡的效果。而现有普通提花编织布采用中间层（支撑层）连接，编织布的表层及底层间无法做到不规则连接。

[0010] 进一步，本发明所述梳栉 GB1 采用编链组织编织经编布的表层；梳栉 GB6 采用编链组织编织经编布的底层；梳栉 GB7 采用衬纬组织或经绒组织，所述贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 均采用经平组织编织连接表层和底层。

[0011] 更进一步，本发明所述梳栉 GB1 采用编链组织编织经编布的表层；梳栉 GB6 采用编链组织编织经编布的底层；梳栉 GB7 采用衬纬组织或经绒组织，所述贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 均采用编链组织编织连接表层和底层。

[0012] 本发明中，各梳栉上的针可穿各种材料的纱线，使编织的编织布具有弹性或未具有弹性，具体为：所述梳栉 GB1、贾卡梳栉 JB2 和贾卡梳栉 JB3 穿的纱线为涤纶纤维、锦纶纤维、有色纤维、阳离子纤维、涤锦复合丝或机械包覆纱；所述贾卡梳栉 JB4、贾卡梳栉 JB5 和梳栉 GB6 穿的纱线为涤纶纤维、锦纶纤维、有色纤维、阳离子纤维、涤锦复合丝或机械包覆纱；所述梳栉 GB7 穿的纱线为涤纶纤维、锦纶纤维、有色纤维、阳离子纤维、涤锦复合丝或机械包覆纱；所述机械包覆纱为其外均匀缠绕有纤维长丝的芯丝氨纶。

[0013] 本发明还提供所述的编织方法编织的单色或多色双层间隔提花经编布。

[0014] 进一步，本发明所述经编布包括表层和底层，表层和底层间采用纱线连接，或采用纱线连接与未采用纱线连接交替设置，未采用纱线连接处形成间隙层。

[0015] 更进一步，所述间隙层中填充有弹性物质，该弹性物质为棉絮、毛绒或海绵等。

[0016] 本发明采用的编织方法独特，合理控制各纱线的送经量及张力，得到的单色或多色双层间隔提花经编布包括表层和底层，其表层和底层之间采用不规则的编织方法，表层和底层间采用纱线连接或采用纱线连接与未采用纱线连接交替设置，未采用纱线连接处形成间隙层，间隙内可填充棉絮、毛绒或海绵等弹性物质，使间隙部分凸起，从而使编织布整

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体具有不同的层次效果。

附图说明

[0017] 下面结合附图和具体实施方式对本发明作进一步详细的说明：

图 1 为本发明实施例 1 得到的经编布的结构示意图；

图 2 为本发明实施例 2 得到的经编布的结构示意图；

图 3 为本发明实施例 3 得到的经编布的结构示意图。

具体实施方式

[0018] 下面结合具体实施方式对本发明作进一步详细的说明。

[0019] 本发明一种单色或多色双层间隔提花经编布的编织方法，所述经编布在双针床贾卡经编机上进行编织，所述编织方法包括以下步骤：

（1）采用电脑设计经编布的提花图案；

（2）编织准备：所述经编机配置六把导纱梳栉，从机前向机后排列依次为梳栉 GB1、贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4、贾卡梳栉 JB5 和梳栉 GB6，其中：

A）梳栉 GB1 和梳栉 GB6 采用全机号的导纱针块；贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 采用半机号的导纱针块；

B）所述梳栉 GB1 和梳栉 GB6 的针满穿纱线；所述贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 上的针均穿 238 条纱线，一半的针穿纱线一半的针未穿纱线，穿纱线的针和未穿纱线的针间隔设置；纱线的送经量为 1000-2800mm/ 腊克；

C）所述梳栉 GB1 采用编链组织；所述贾卡梳栉 JB2 和贾卡梳栉 JB3 采用相同的移针方法和相同颜色的纱线，所采用的移针方法为编链组织、经平组织或经绒组织；所述梳栉 GB6 采用编链组织；所述贾卡梳栉 JB4 和贾卡梳栉 JB5 采用相同的移针方法和相同颜色的纱线，所采用的移针方法为编链组织、经平组织或经绒组织；

D）所述梳栉 GB1 编织形成经编布的表层；所述梳栉 GB6 编织形成经编布的底层；所述贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 共同编织连接表层和底层；表层和底层之间连接纱线，或连接纱线和不连接纱线交替设置，不连接纱线处形成间隔层；

（3）在贾卡经编机上输入参数，上机编织，得到预设图案的双层间隔提花经编布。

[0020] 所述步骤（3）之后，还包括染色步骤：将步骤（3）得到的编织布放入染缸中，投入相应款式色彩的染料和白色防污剂，将染缸温度提高至 98-102℃，保温 1 个小时，继续提高染缸温度至 118-122℃，保温 1 个小时，再次提高染缸温度至 128-132℃，保温 1 个小时，完成纱布染色。

[0021] 进一步，本发明所述经编机上还配置有第七把导纱梳栉，为梳栉 GB7，梳栉 GB7 采用全机号的导纱针块，梳栉 GB7 的针穿 476 条纱线；梳栉 GB7 采用衬纬组织或经绒组织。

[0022] 所述贾卡梳栉 JB2 与贾卡梳栉 JB3 在双针床贾卡经编机的第一针床上提花，此两把梳栉不参与其他梳栉编织，所以送经量一致；贾卡梳栉 JB4 和贾卡梳栉 JB5 在双针床贾卡经编机的第二针床上提花，同步也在第一针床上参与编织，起到局部连接与不连接，形成布面有连接间隔与不连接间隔，这样整体张力就会发生变化，有连接点处张力大，无连接点处张力小，所以贾卡梳栉 JB4 和贾卡梳栉 JB5 穿的纱线的张力由双层弹簧补偿装置进行张力

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补偿。同时，还可通过分段送经进行大面积有规则的整调张力，而局部小面积无规则调整张力只能靠工艺花型及弹簧片来补偿。

[0023] 本发明中因编织得到的编织布的表层和底层间采用纱线连接，或采用纱线连接和未采用纱线连接交替设置，使整体送经量达到平衡的效果。而现有普通提花编织布采用中间层（支撑层）连接，编织布的表层及底层间无法做到不规则连接。

[0024] 进一步，本发明所述梳栉 GB1 采用编链组织编织经编布的表层；梳栉 GB6 采用编链组织编织经编布的底层；梳栉 GB7 采用衬纬组织或经绒组织，所述贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 均采用经平组织编织连接表层和底层。

[0025] 更进一步，本发明所述梳栉 GB1 采用编链组织编织经编布的表层；梳栉 GB6 采用编链组织编织经编布的底层；梳栉 GB7 采用衬纬组织或经绒组织，所述贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 均采用编链组织编织连接表层和底层。

[0026] 本发明中，各梳栉上的针可穿各种材料的纱线，使编织的编织布具有弹性或不具有弹性，具体为：所述梳栉 GB1、贾卡梳栉 JB2 和贾卡梳栉 JB3 穿的纱线为涤纶纤维、锦纶纤维、阳离子纤维、涤锦复合丝或机械包覆纱；所述贾卡梳栉 JB4 和贾卡梳栉 JB5、梳栉 GB6 穿的纱线为涤纶纤维、锦纶纤维、有色纤维、阳离子纤维、涤锦复合丝或机械包覆纱；所述梳栉 GB7 穿的纱线为涤纶纤维、锦纶纤维、有色纤维、阳离子纤维、涤锦复合丝或机械包覆纱；所述机械包覆纱为其外均匀缠绕有纤维长丝的芯丝氨纶。

[0027] 本发明还提供所述的编织方法编织的单色或多色双层间隔提花经编布。

[0028] 进一步，本发明所述经编布包括表层和底层，表层和底层间采用纱线连接，或采用纱线连接与未采用纱线连接交替设置，未采用纱线连接处形成间隙层。

[0029] 更进一步，所述间隙层中填充有弹性物质，该弹性物质为棉絮、毛绒或海绵等。

[0030] 下面结合具体例子进行详细说明。

[0031] 实施例 1

一种经编布在双针床贾卡经编机上进行编织，所述编织方法包括以下步骤：

（1）采用电脑设计经编布的提花图案，如图 1 所示；

（2）编织准备：所述经编机配置六把导纱梳栉，从机前向机后排列依次为梳栉 GB1、贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4、贾卡梳栉 JB5 和梳栉 GB6，其中：

A）梳栉 GB1 和梳栉 GB6 采用全机号的导纱针块；贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 采用半机号的导纱针块；

B）所述梳栉 GB1 和梳栉 GB6 的针满穿纱线；所述贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 上的针均穿 238 条纱线，一半的针穿纱线一半的针不穿纱线，穿纱线的针和未穿纱线的针间隔设置；纱线的送经量为 2000-2350 mm/ 腊克；贾卡梳栉 JB4 和贾卡梳栉 JB5 上的纱线的张力由双层弹簧补偿装置进行张力补偿；

C）所述梳栉 GB1 采用编链组织，梳栉 GB1 的针穿的纱线为涤纶纤维；所述贾卡梳栉 JB2 和贾卡梳栉 JB3 采用相同的移针方法和相同颜色的纱线，所采用的移针方法为编链组织，所采用的纱线为涤纶纤维；所述贾卡梳栉 JB4 和贾卡梳栉 JB5 采用相同的移针方法和相同颜色的纱线，所采用的移针方法为经平组织，所采用的纱线为有色纤维（蓝色涤纶纤维）；所述梳栉 GB6 采用编链组织，梳栉 GB6 的针穿的纱线为锦纶纤维；

D）所述梳栉 GB1 编织经编布的表层；所述梳栉 GB6 编织经编布的底层；所述贾卡梳栉

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JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 共同编织连接表层和底层；表层和底层之间连接纱线，以使表层和底层之间形成连成一体；

（3）在贾卡经编机上输入参数，上机编织，得到预设图案的双层间隔提花经编布。

[0032] 本实施例编织的经编布包括表层和底层，表层和底层间采用纱线连接，实现两面不同提花图案，两面透孔等。

[0033] 实施例 2

一种经编布在双针床贾卡经编机上进行编织，所述编织方法包括以下步骤：

（1）采用电脑设计经编布的提花图案，如图 2 所示；

（2）编织准备：所述经编机配置六把导纱梳栉，从机前向机后排列依次为梳栉 GB1、贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4、贾卡梳栉 JB5 和梳栉 GB6，其中：

A）梳栉 GB1 和梳栉 GB6 采用全机号的导纱针块；贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 采用半机号的导纱针块；

B）所述梳栉 GB1 和梳栉 GB6 的针满穿纱线；所述贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 上的针均穿 238 条纱线，一半的针穿纱线一半的针未穿纱线，穿纱线的针和未穿纱线的针间隔设置；纱线的送经量为 2000-2800 mm/ 腊克；

C)所述梳栉 GB1 采用编链组织，梳栉 GB1 的针穿的纱线为涤纶纤维；所述贾卡梳栉 JB2 和贾卡梳栉 JB3 采用相同的移针方法和相同颜色的纱线，所采用的移针方法为经平组织，所采用的纱线为涤纶纤维；所述贾卡梳栉 JB4 和贾卡梳栉 JB5 采用相同的移针方法和相同颜色的纱线，所采用的移针方法为经绒组织，所采用的纱线为锦纶纤维；所述梳栉 GB6 采用编链组织，梳栉 GB6 的针穿的纱线为锦纶纤维；

D）所述梳栉 GB1 编织经编布的表层；所述梳栉 GB6 编织经编布的底层；所述贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 共同编织连接表层和底层；贾卡梳栉 JB4 和贾卡梳栉 JB5 进行局部不规则连接织造，采用纱线连接或未采用纱线连接，两种结构交替设置，未采用纱线连接处形成间隙层。由于表层和底层之间采用纱线连接或未采用纱线连接造成纱线张力松紧相差较大，纱线的张力由选择工艺编织及双层弹簧补偿装置进行张力补偿；当大面积整幅规则连接时，整幅采用纱线连接或未采用纱线连接，可以采用（EBC）分段送经调整张力；

（3）在贾卡经编机上输入参数，上机编织，得到预设图案的双层间隔提花经编布。

[0034] （4）将步骤（3）得到的编织布放入染缸中，投入相应款式色彩的染料和白色防污剂，将染缸温度提高至 100℃，保温 1 个小时，继续提高染缸温度至 118℃，保温 1 个小时，再次提高染缸温度至 132℃，保温 1 个小时，完成纱布染色。在不同温度下，不同纱线对对应染料进行吃色，并且在防止污染剂的作用下防止与相邻的其他纱线混染，由此在一次染浴的过程变可以完成两种颜色的染色。

[0035] 本实施例编织的经编布包括表层和底层，表层和底层间采用纱线连接或未采用纱线连接，两种结构交替设置，未采用纱线连接处形成间隙层。间隙层中填充有弹性物质，该弹性物质为棉絮、毛绒或海绵等。

[0036] 实施例 3

一种经编布在双针床贾卡经编机上进行编织，所述编织方法包括以下步骤：

（1）采用电脑设计经编布的提花图案，如图 3 所示；

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（2）编织准备：所述经编机配置七把导纱梳栉，从机前向机后排列依次为梳栉 GB1、贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4、贾卡梳栉 JB5、梳栉 GB6 和梳栉 GB7，其中：

A）梳栉 GB1、梳栉 GB6 和梳栉 GB7 采用全机号的导纱针块；贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 采用半机号的导纱针块；

B）所述梳栉 GB1、梳栉 GB6 和梳栉 GB7 的针满穿纱线；所述贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 上的针均穿 238 条纱线，一半的针穿纱线一半的针未穿纱线，穿纱线的针和未穿纱线的针间隔设置；纱线的送经量为 2000-2350 mm/ 腊克； C）所述梳栉 GB1 采用编链组织，梳栉 GB1 的针穿的纱线为涤纶纤维；所述贾卡梳栉 JB2 和贾卡梳栉 JB3 采用相同的移针方法和相同颜色的纱线，所采用的移针方法为经半组织，所采用的纱线为涤纶纤维；所述贾卡梳栉 JB4 和贾卡梳栉 JB5 采用相同的移针方法和相同颜色的纱线，所采用的移针方法为经平组织，所采用的纱线为锦纶纤维；所述梳栉 GB6 采用编链组织，梳栉 GB6 的针穿的纱线为锦纶纤维； 梳栉 GB7 采用经绒组织，梳栉 GB7 的针穿的纱线为阳离子纤维；

D）所述梳栉 GB1 编织经编布的表层；所述梳栉 GB6 编织经编布的底层；所述贾卡梳栉 JB2、贾卡梳栉 JB3、贾卡梳栉 JB4 和贾卡梳栉 JB5 共同编织连接表层和底层；表层和底层之间连接纱线，以使表层和底层之间形成连成一体；

（3）在贾卡经编机上输入参数，上机编织，得到预设图案的双层间隔提花经编布。

[0037] （4）将步骤（3）得到的编织布放入染缸中，投入相应款式色彩的染料和白色防污剂，将染缸温度提高至 100℃，保温 1 个小时，继续提高染缸温度至 118℃，保温 1 个小时，再次提高染缸温度至 130℃，保温 1 个小时，完成纱布染色。在不同温度下，不同纱线对对应染料进行吃色，并且在防止污染剂的作用下防止与相邻的其他纱线混染，由此在一次染浴的过程变可以完成三种颜色的染色。

[0038] 本实施例编织的经编布包括表层和底层，表层和底层间采用纱线连接，实现多色效果，两面不同提花图案，两面透孔等。

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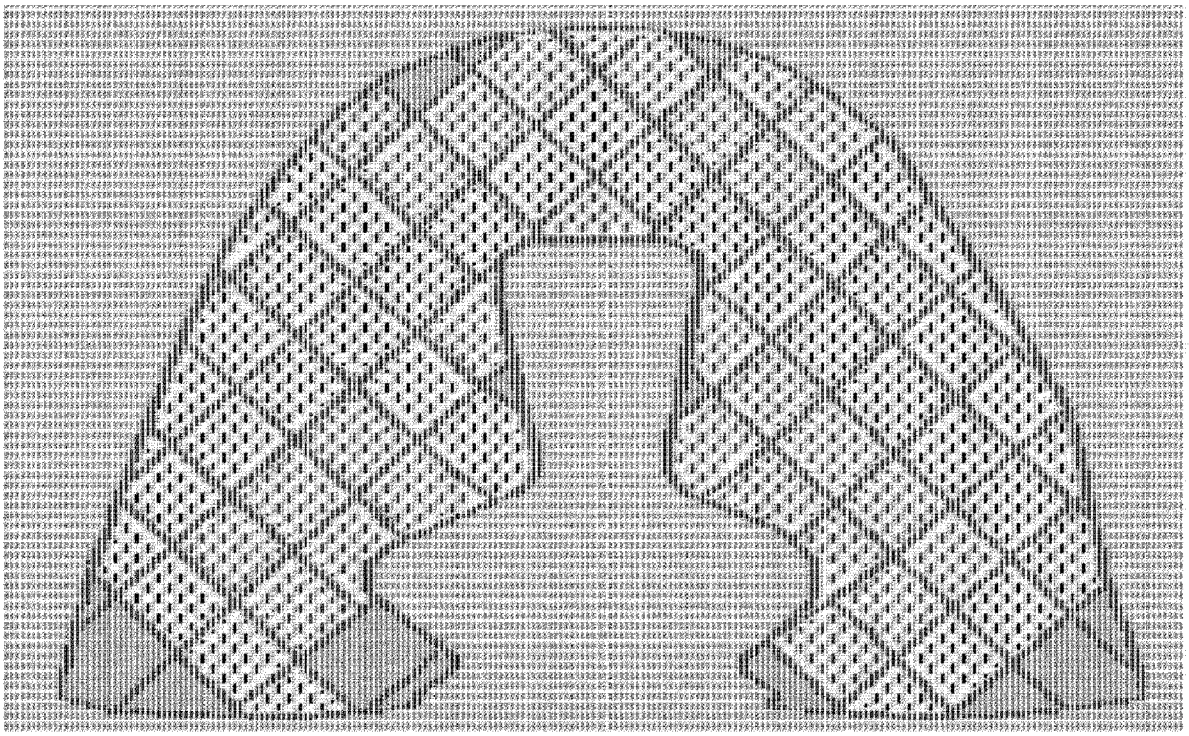


图 1

Skechers EX1013-p. 1341
Skechers v Nike

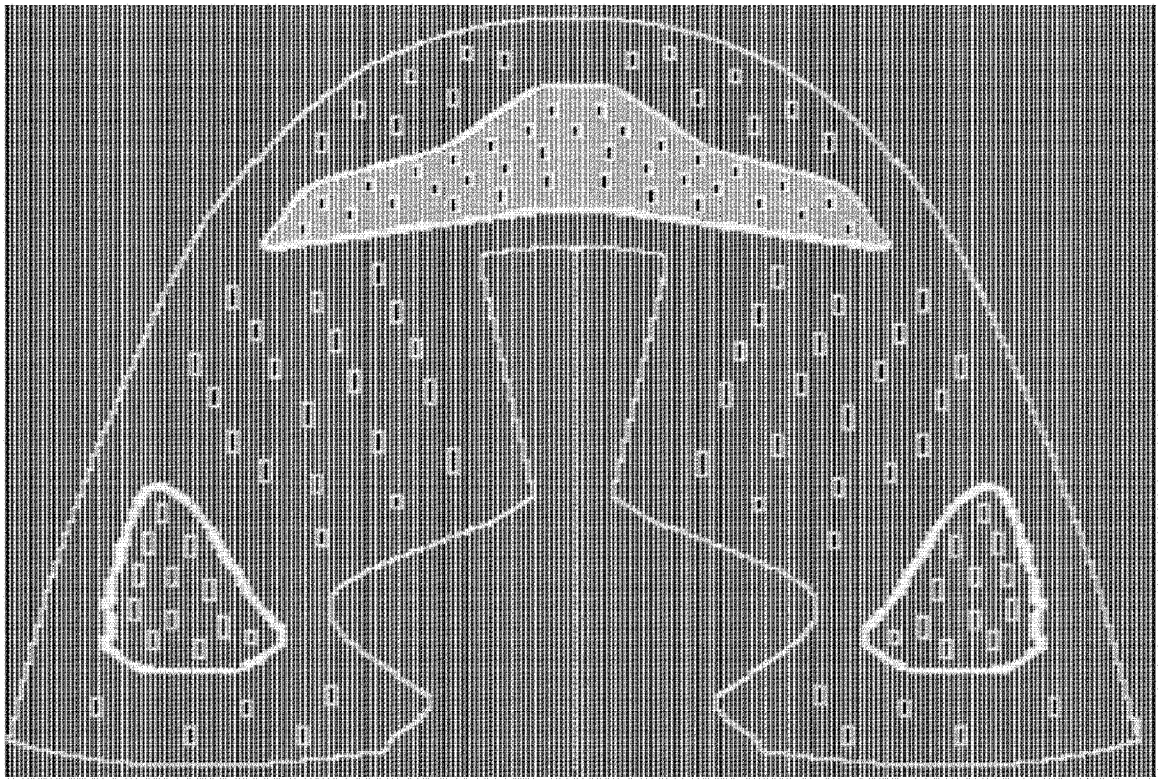


图 2

Skechers EX1013-p. 1342
Skechers v Nike

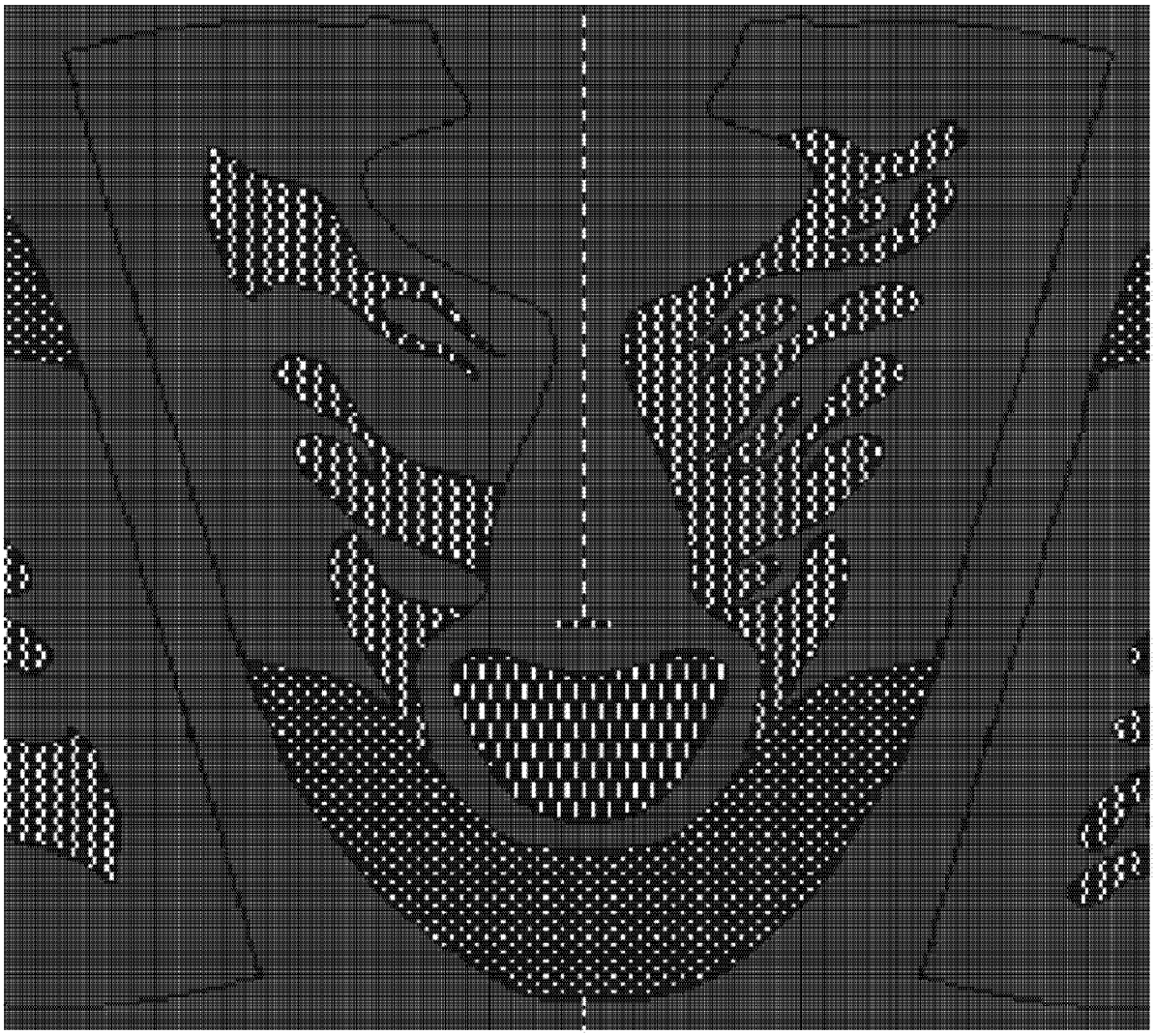


图 3

Skechers EX1013-p. 1343
Skechers v Nike

Espacenet

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Sportschuh mit gestricktem oder gewebtem Oberteil

No documents available for this priority number.

Inventor(s):

Applicant(s): CURT GEISSLER ± (CURT GEISSLER)

Classification:
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24. APRIL 1929

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PATENTSCHRIFT

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G 73632 VII/71a

Tag der Bekanntmachung über die Erteilung des Patents: 11. April 1929

Curt Geißler in Zeitz

Sportschuh mit gestricktem oder gewebtem Oberteil

475 363

Curt Geißler in Zeitz

Sportschuh mit gestricktem oder gewebtem Oberteil

Patentiert im Deutschen Reiche vom 22. November 1927 ab

Die Erfindung bezieht sich auf Sportschuhe o. dgl., deren Oberteil sich ohne weitere Hilfsmittel fest an den Fuß und gegebenenfalls an das Bein anschließt und die im ganzen elastisch sind und sich den Bewegungen des Fußes in jeder Lage und Stellung anpassen.

Zu diesem Zweck ist erfindungsgemäß das Oberteil aus mehreren zusammengearbeiteten oder -genähten Teilen mit verschiedenen Webrichtungen zusammengesetzt, deren an die Sohle grenzenden Teile undehnbar sind, während der darüberliegende Vorderteil quer zur Spanne und der Fersenteil quer zur Ferse zweckmäßig unter Verwendung von Gummizügen dehnbar sind. Der an die Sohle angrenzende undehnbare Teil und die Kappe bestehen vorzugsweise aus weichem Leder oder Stoff. An das Oberteil kann ein rund um das Bein dehnbarer Beinansatz gearbeitet sein.

Es sind bereits Schuhe mit gestrickten oder gewirkten, elastischen Einsätzen bekannt geworden. Diese hatten aber den Nachteil, daß sie starr verarbeitet waren, steife Hinter- und Vorderkappen und steife Ledersohlen besaßen. Infolgedessen hatte auch das elastische Gewebe keinen Sinn, weil es sich nach kurzer Tragezeit so ausdehnte und weitete, daß der Schuh nicht mehr getragen werden konnte.

Erfindungsgemäß wird alles vermieden, was steif und unelastisch ist. Steife Hinter- und Vorderkappen sind vollkommen ausgeschaltet, damit der Fuß Gelegenheit hat, sich in seiner natürlichen Lage und in seinen Gelenken frei zu bewegen. Die Verbindung des Schaftes mit der Sohle ist elastisch und biegsam. Ein Aufweiten des Schaftes ist dadurch unmöglich gemacht, daß jede Bewegung des Fußes infolge dieser Verbindung mit der Sohle nur auf die Sohle wirken kann. Auch die Sohle ist elastisch. Das Oberteil ist aus mehreren Einzelteilen mit verschiedenen Webrichtungen derart zusammengesetzt, daß diese Teile sich in der bestimmten Richtung dehnen können, die zur freien und ungehinderten Beweglichkeit des Fußes in Betracht kommt.

Auf diese Weise wird ein Sportschuh geschaffen, der allen Anforderungen des modernen Sportes gerecht wird und einerseits einen festen Schluß am Fuß auch nach langer Tragezeit gewährleistet, anderseits eine Freiheit gibt, die dem unbekleideten Fuß gleichkommt, ihn jedoch vor Verletzungen schützt und gleichzeitig das Eindringen von Sand o. dgl. verhindert.

Auf der Zeichnung sind zwei Ausführungsbeispiele des Sportschuhes nach der Erfindung dargestellt.

Abb. 1 zeigt einen Schuh mit Leder- oder Stoffteilen oberhalb der Sohle und Leder- oder Stoffkappen.

Abb. 2 zeigt einen niedrigen Schuh mit verschiedenartig gewebten Einzelteilen.

In den Abb. 1 und 2 ist mit 1 der an die Sohle grenzende Teil des Oberteils bezeichnet, an den sich die Kappe oder das kappenartige Gewebe 2 und der Fersenteil 3 anschließt. Die Sohle 4 ist mit dem Oberteil durch Klebstoff oder Nähte verbunden. An den der Sohle benachbarten Teil schließt sich der über der Spanne liegende Teil 5 an, dessen Web- und Dehnungsrichtung entsprechend der Schraffierung auf der Zeichnung verläuft.

Nach der Ausführungsform der Abb. 1 schließt sich an den Teil 5 über der Spanne des Fußes unter Änderung der Web- und Dehnungsrichtung des Gewebes ein Beinansatz 6 an, der mit dem über der Ferse liegenden Teil mit gleicher Web- und Dehnungsrichtung verbunden ist.

Bei dem Ausführungsbeispiel nach Abb. 2 fehlt der Beinansatz. An dessen Stelle ist ein niedrig gehaltener Fersenteil 7 vorgesehen, dessen Web- und Dehnungsrichtung quer zu der des Teiles über der Spanne liegt.

Patentansprüche:

1. Sportschuh mit gestricktem oder gewebtem Oberteil, dadurch gekennzeichnet, daß das Oberteil aus mehreren zusammengearbeiteten oder -genähten Teilen mit verschiedenen Webrichtungen besteht, deren an die Sohle grenzende Teile undehnbar sind, während der darüberliegende Vorderteil quer zur Spanne und der Fersenteil quer zur Ferse zweckmäßig unter Verwendung von Gummizügen dehnbar sind.

2. Sportschuh nach Anspruch 1, dadurch gekennzeichnet, daß an das Oberteil ein rund um das Bein dehnbarer Beinansatz gearbeitet ist.

3. Sportschuh nach Anspruch 1, dadurch gekennzeichnet, daß der an die Sohle grenzende undehnbare Teil und die Kappe aus weichem Leder oder Stoff besteht.

Hierzu 1 Blatt Zeichnungen

BERLIN. GEDRUCKT IN DER REICHSDRUCKEREI

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Skechers v Nike

Zu der Patentschrift 475 363
Kl. 71a Gr. 1

Abb. 1.

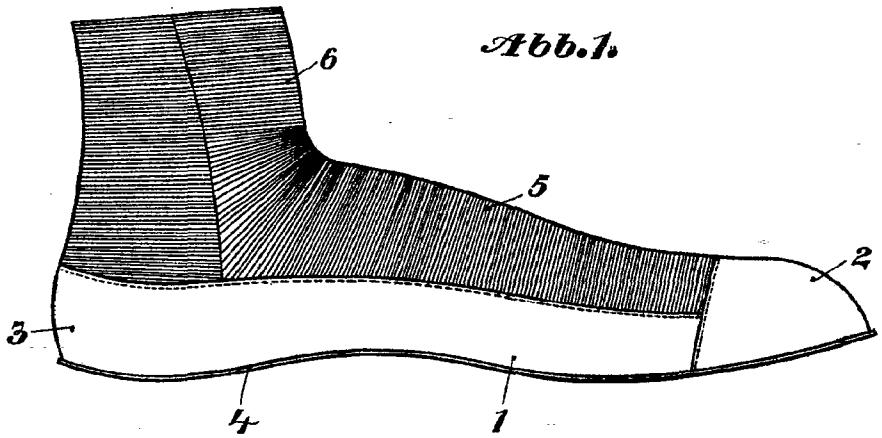


Abb. 2.

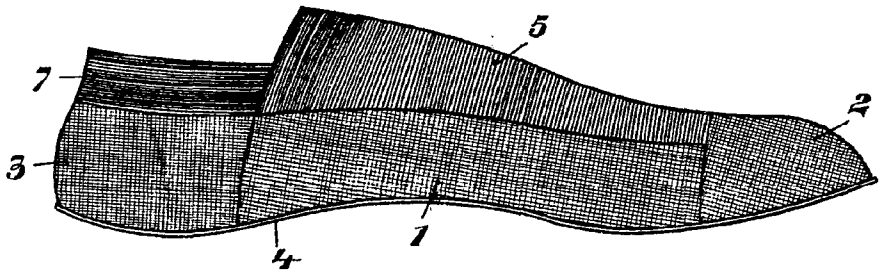
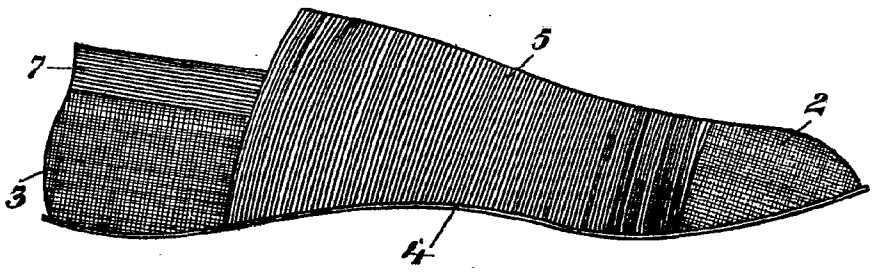


Abb. 3.



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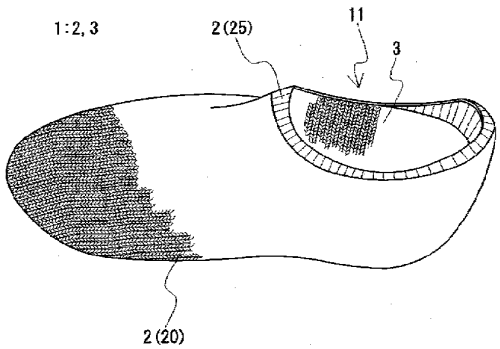
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(54) FOOTWEAR, AND KNITTING METHOD FOR KNIT FABRIC

(57) Provided is a footwear that excels in productivity and shape retaining property. Footwear 1 is knitted seamlessly with a flat knitting machine having at least a pair of a front and a back needle bed and includes a base knit fabric portion 2 having a mixed section 20 knitted using a first knitting yarn and a second knitting yarn interwoven along the first knitting yarn. The first knitting yarn configuring the mixed section 20 of the footwear 1 is a knitting yarn that is not a heat-fusible yarn, and the second knitting yarn is a heat-fusible yarn having thermal adhesiveness and heat-shrinkable properties. The second knitting yarn preferably has a configuration including a core made from a material that contracts by heat, and a sheath made from a material having a lower fusing point than the core.

Fig. 1



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Description

TECHNICAL FIELD

[0001] The present invention relates to a footwear such as socks, shoes, and the like knitted seamlessly with a flat knitting machine, and a knitting method for a knit fabric of producing the footwear.

BACKGROUND ART

[0002] For example, patent document 1 discloses a pair of shoes, which is one type of footwear. The shoe includes an upper (denoted as an instep covering portion in patent document 1), and a sole attached to the upper, and a part of the upper includes an "interwoven portion" in which the fiber of synthetic resin is interwoven. Because of such "interwoven portion" formed at the upper, when the upper is subjected to thermal processing while being placed over a last (denoted as shoe form in patent document 1), the upper can be formed to a shape that lies along the shape of the last.

PRIOR ART DOCUMENT

PATENT DOCUMENT

[0003] [Patent Document 1] Japanese Patent Publication No. 3865307

SUMMARY OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

[0004] The conventional shoes have a problem in that the productivity is poor. Since the shoes are formed by three-dimensionally sewing a plurality of parts, it is troublesome to prepare each part and the task of sewing each part is also complicated. Furthermore, the shoes of patent document 1 also have a problem that the shape retaining property is poor since the "interwoven portion" of the shoes is made only from the fiber of the synthetic resin.

[0005] The present invention has been made in view of the above situation, and an object of the present invention is to provide a footwear that excels in productivity and shape retaining property. Another object of the present invention is to provide a knitting method for a knit fabric of producing the footwear of the present invention.

MEANS FOR SOLVING THE PROBLEMS

[0006] A footwear according to the present invention is a footwear knitted seamlessly with a flat knitting machine having at least a pair of a front and a back needle bed, and includes a base knit fabric portion including a mixed section knitted using a first knitting yarn and a second knitting yarn interwoven along the first knitting yarn. The first knitting yarn used in the mixed section of the footwear of the present invention is a knitting yarn that is not a heat-fusible yarn, and the second knitting yarn is a heat-fusible yarn having thermal adhesiveness and heat-shrinkable properties.

[0007] The footwear of the present invention includes socks, tabi (mitten socks), shoes or the upper of the shoes, and the like. The mixed section in the footwear of the present invention may be arranged over the entire footwear or may be arranged at a part of the footwear. Further, the mixed section in the footwear of the present invention does not need to be uniformly formed. For example, the knitting structure, the type of knitting yarn to use, the count of the knitting yarn, and the like may differ between the mixed section at a certain part of the footwear and the mixed section at another part of the footwear (the type, count, and the like may, of course, be the same).

[0008] According to one aspect of the footwear of the present invention, the heat-fusible yarn configuring the second knitting yarn is a heat-fusible yarn having a core-sheath structure including a core that contracts by heat and a sheath having a lower fusing point than the core.

[0009] The fusing point of the core and the sheath of the heat-fusible yarn having the core-sheath structure is a temperature higher than the temperature of the general usage environment of the footwear. For example, the fusing point of the core and the sheath is preferably higher than or equal to 120°C.

[0010] According to another aspect of the footwear of the present invention, the mixed section arranged in the footwear is knitted by plating knitting using the first knitting yarn and the second knitting yarn.

[0011] If the plating knitting (see e.g., International Laid-Open Publication No. 2008/139710, Japanese Patent Publication No. 3899269) of feeding the first knitting yarn and the second knitting yarn from different yarn feeders is carried out, a main yarn fed from the preceding yarn feeder is arranged on the front surface side of the mixed section, and a plating yarn fed from the following yarn feeder is arranged on the back surface side of the mixed section. Thus, it is apparent that the mixed section is formed by plating knitting by looking at the mixed section. The mixed section may be knitted by feeding the first knitting yarn and the second knitting from one yarn feeder. In this case, the first knitting yarn and the second knitting yarn supplied from different knitting yarn cones may be put together in one yarn feeder, or the first knitting yarn and the second knitting yarn may be put together in advance by twisting and the like and then fed from one yarn feeder. In addition, the second kitting yarn may be interwoven along the first knitting yarn by tucking the second knitting yarn to the stitches knitted with the first knitting yarn.

[0012] According to another aspect of the present invention, the footwear further includes an additional knit fabric portion arranged on an inner side or an outer side of the base knit fabric portion when wearing the footwear;

wherein the base knit fabric portion and the additional knit fabric portion are connected seamlessly at a position of a foot-inserting part of the footwear. The additional knit fabric portion may also include the mixed section knitted using the first knitting yarn and the second knitting yarn.

[0013] According to another aspect of the footwear of the present invention in which the mixed section of the base knit fabric portion is knitted by plating knitting and an additional knit fabric portion is arranged, a surface on which the second knitting yarn is arranged in the mixed section is arranged to face the additional knit fabric portion.

[0014] In the mixed section performed with the plating knitting as described above, the second knitting yarn, which is the heat-fusible yarn, is arranged on either the front surface side or the back surface side of the mixed section. The second knitting yarn, which is the heat-fusible yarn, is arranged between the base knit fabric portion and the additional knit fabric portion by arranging the surface, on which the second knitting yarn is arranged in the mixed section, to face the additional knit fabric portion when the additional knit fabric portion is arranged on the inner side or the outer side of the base knit fabric portion. If the additional knit fabric portion also includes the mixed section, the surface on which the second knitting yarn is arranged in the base knit fabric portion and the surface on which the second knitting yarn is arranged in the additional knit fabric portion preferably face each other.

[0015] According to another aspect of the footwear of the present invention, the footwear is retained in a shape corresponding to a last by being thermally processed while being placed over the last. In this case, the second knitting yarn fused by being thermally processed and the first knitting yarn are integrated in the mixed section of an outer side knit fabric portion of the footwear. In particular, if the second knitting yarn is the heat-fusible yarn having the core-sheath structure, the core of the second knitting yarn and the first knitting yarn are integrated in a paralleled state by the sheath of the second knitting yarn fused by the thermal processing.

[0016] The footwear described above is produced by a knitting method for a knit fabric of the present invention of seamlessly knitting a knit fabric using a flat knitting machine having at least a pair of a front and a back needle bed facing each other. In other words, in the knitting method for the knit fabric of the present invention, a first knitting yarn, which is not a heat-fusible yarn, and a second knitting yarn, which is a heat-fusible yarn having thermal adhesiveness and heat-shrinkable properties, are prepared; and at least a part of the footwear is knitted with the first knitting yarn and the second knitting yarn interwoven along the first knitting yarn.

EFFECTS OF THE INVENTION

[0017] The footwear of the present invention excels in productivity as it is knitted seamlessly. The footwear of the present invention is a footwear that excels in shape retaining property by being thermally processed while being attached to the last. This is because the second knitting yarn fused by the thermal processing is integrated with the first knitting yarn, so that the first knitting yarn becomes the skeleton in the mixed section and the fused second knitting yarn reinforces such skeleton. The footwear of the present invention also has excellent appearance. This is because the first knitting yarn is not a heat-fusible yarn and thus the first knitting yarn in the mixed section of the footwear is not fused even if the footwear of the present invention is thermally processed, and the knitting structure of the mixed section is retained in a state at the time of knitting.

[0018] The footwear of the present invention knitted using the second knitting yarn having the core-sheath structure exhibits superior shape retaining property. When the footwear is attached to the last and thermally processed, the core of the second knitting yarn contracts and the shape of the footwear lies along the last, and furthermore, the core and the first knitting yarn are integrated by the sheath of the second knitting yarn.

[0019] The footwear of the present invention in which the mixed section is formed by the plating knitting has excellent appearance. According to the plating knitting, the main yarn (one of the first knitting yarn and the second knitting yarn) is arranged on the front side of the mixed section, and the plating yarn (the other one of the first knitting yarn and the second knitting yarn) is hidden on the back side of the mixed section and is difficult to be seen from the front side of the mixed section, that is, the first knitting yarn and the second knitting yarn are not seen as mottles. Which one of the first knitting yarn or the second knitting yarn to be assumed as the knitting yarn fed from the preceding yarn feeder is not particularly limited, but the first knitting yarn is preferably the knitting yarn fed from the preceding yarn feeder. This is because the first knitting yarn is the knitting yarn that determines the outer appearance of the mixed section.

[0020] The footwear of the present invention including the additional knit fabric portion in addition to the base knit fabric portion has excellent comfortableness. This is because the additional knit fabric portion facing the foot of the wearer may be formed to have a texture different from the base knit fabric portion.

[0021] The adherence property of the base knit fabric portion and the additional knit fabric portion can be enhanced by arranging, on the side of the additional knit fabric portion, the surface on which the second knitting yarn is arranged in the mixed section formed by plating knitting.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022]

Fig. 1 is a schematic perspective diagram of a shoe shown in an embodiment.

Fig. 2 is a schematic diagram showing a state before

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thermal processing of the shoe shown in Fig. 1.

Fig. 3 is a knitting image diagram of the shoe shown in Fig. 2.

MODE FOR CARRYING OUT THE INVENTION

[0023] An example of knitting a shoe 1 as a footwear of the present invention will now be described with reference to Figs. 1 to 3.

[0024] The shoe 1 shown in Fig. 1 is a shoe in which an upper that covers an instep side of a foot, and a sole that covers a sole side are integrated. A reinforcement sole material (not shown) such as resin, rubber, and the like, for example, may be attached to the outer side of the sole of the shoe 1. The reinforcement sole material is preferably attached to the sole with an adhesive. Of course, the reinforcement sole material may be formed by impregnating the sole with the resin, rubber, and the like.

[0025] The shoe 1 of the present embodiment includes an outer side knit fabric portion (base knit fabric portion) 2 arranged on the outer side of the shoe 1, and an inner side knit fabric portion (additional knit fabric portion) 3 arranged on the inner side of the shoe 1. The outer side knit fabric portion 2 and the inner side knit fabric portion 3 are connected at a position of a foot-inserting part 11 of the shoe 1. A distinctive feature of the shoe 1 is that (1) the entire shoe 1 is a knit fabric seamlessly knitted using a flat knitting machine, and (2) at least a part (mixed section 20) of the outer side knit fabric portion 2 configuring the shoe 1 is knitted with a first knitting yarn, which is not a heat-fusible yarn, and a second knitting yarn, which is a heat-fusible yarn interwoven along the first knitting yarn.

[0026] To produce the shoe 1 shown in Fig. 1, the knit fabric (shoe 1) in which the outer side knit fabric portion 2 and the inner side knit fabric portion 3 are seamlessly connected is first knitted as shown in Fig. 2 using a flat knitting machine. In this case, the inner side knit fabric portion 3 is preferably formed to a shape substantially lying along the shape of the last, to be described later and slightly larger than the size of the last, and the outer side knit fabric portion 2 is preferably formed slightly larger than the inner side knit fabric portion 3. The flat knitting machine to be used for the knitting is not particularly limited, and may be, for example, a two-bed flat knitting machine or a four-bed flat knitting machine.

[0027] Fig. 3 shows the knitting image diagram schematically showing the knitting steps of the shoe 1 shown in Fig. 2. Portions α to ν shown in Fig. 3 correspond to portions α to ν of Fig. 2. The squared letters next to the portions α to ν of Fig. 3 indicate the needle beds (F = front needle bed, B = back needle bed) for knitting the relevant portion.

[0028] As shown in Fig. 3, the knitting is first started from the portion α corresponding to the roots of the toes on the instep side of the inner side knit fabric portion 3, and the portion β of the inner side knit fabric portion 3 surrounding the toes is knitted. Next, the portions γ, δ, ε, ζ, η of the inner side knit fabric portion 3 are formed so as to correspond to the irregularities of the foot while using narrowing and widening (portion γ is knitted with tubular kitting using F, B, and portion δ is knitted with C-shaped knitting using F, B). The portion θ is knitted with a rib structure, the portions t, κ, λ, μ of the outer side knit fabric portion 2 are knitted so as to correspond to the irregularities of the foot while again using widening and narrowing (portion κ is knitted with C-shaped knitting using F, B and portion λ is knitted with tubular knitting using F, B) and knitting is finished at the portion ν corresponding to the roots of the toes.

[0029] In the present embodiment, the knitting yarn for knitting the inner side knit fabric portion 3 and the knitting yarn for knitting the outer side knit fabric portion 2 are different. The inner side knit fabric portion 3 is arranged to face the foot of the wearer, and hence is knitted using a knitting yarn that enhances the comfortableness of the wearer. For such knitting yarn, a knitting yarn having at least one of the properties of hygroscopic property, antibromic property, and antibacterial property, for example, can be used. The heat-fusible yarn is preferably not adopted for the knitting yarn of the inner knit fabric portion 3 since the feeling degrades once the heat-fusible yarn is fused by thermal processing.

[0030] In the outer side knit fabric portion 2, a section other than a rib structure section 25 is a mixed section 20 knitted with the first knitting yarn (knitting yarn of a different type from the knitting yarn of the inner side knit fabric portion 3), which is not the heat-fusible yarn, and the second knitting yarn, which is the heat-fusible yarn, in a paralleled state. In the present embodiment, plating knitting of feeding the first knitting yarn from a preceding yarn feeder, and feeding the second knitting yarn from a following yarn feeder is carried out, so that the first knitting yarn, which is not the heat-fusible yarn, appears on the outer surface of the shoe 1. Only the first knitting yarn is used for the knitting of the rib structure section 25 so that the foot can be easily inserted from the foot-inserting part 11 of the shoe 1.

[0031] The knitting yarn, which is not the heat-fusible yarn, is used for the first knitting yarn. The material of the knitting yarn is preferably polyester, nylon, and the like, but is not limited thereto. The knitting yarn may be a monofilament yarn, or may be a multi-filament yarn. In particular, the multi-filament yarn is preferable, and the multi-filament yarn is adopted for the first knitting yarn in the present embodiment.

[0032] The heat-fusible yarn having a core-sheath structure including a core made from a material that contracts by heat, and a sheath made from a material having a lower fusing point than the core is used for the second knitting yarn, which is the heat-fusible yarn. A contraction starting temperature (lower than the fusing point) of the core of the heat-fusible yarn and the fusing point of the sheath are preferably higher than or equal to 120°C, for example. Such heat-fusible yarn includes, for example,

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DIAFLORA (registered trademark of Toyobo Co. Ltd.).

[0033] The second knitting yarn is not limited to the core-sheath structure. For example, the knitting yarn having thermal adhesiveness and the knitting yarn having heat-shrinkable properties may be respectively prepared, and such knitting yarns may be paralleled at the time of knitting to obtain the second knitting yarn, or such knitting yarns may be twisted before the knitting to obtain the second knitting yarn.

[0034] After the knit fabric (shoe 1) of Fig. 2 having the configuration described above is knitted, the inner side knit fabric portion 3 of the knit fabric is folded into the interior of the outer side knitted fabric portion 2 through the rib structure section 25, and such knit fabric is placed over the last and thermally processed at a temperature of higher than or equal to the fusing point of the sheath of the second knitting yarn, the temperature being higher than or equal to the contraction starting temperature of the core and lower than the fusing point of the core. Thus, the outer side knit fabric portion 2 and the inner side knit fabric portion 3 are formed into a shape that exactly lies along the last with the contraction of the core of the second knitting yarn. In this case, the sheath of the fused second knitting yarn surrounds the outer circumference of the first knitting yarn and enters the gap of each filament of the first knitting yarn thus strongly integrating the core of the second knitting yarn and the first knitting yarn. The fused sheath also has a role of bonding the outer side knit fabric portion 2 and the inner side knit fabric portion 3 together.

[0035] Finally, the shoe 1 shown in Fig. 1 is obtained by detaching, from the last, the knit fabric that has subjected to the thermal processing. The obtained shoe 1 has a shape that lies along the last, and excels in shape retaining property. The shoe 1 excels in the shape retaining property because the first knitting yarn and the core of the second knitting yarn configure the skeleton in the outer side knit fabric portion 2, and the shape of the skeleton is retained by the sheath of the fused second knitting yarn. Further, in the shoe 1, the foot-inserting part 11 can be easily stretched since the foot-inserting part 11 is the rib structure section 25 made of a knitting yarn which is not the heat-fusible yarn, and hence the shoe 1 is easy to wear.

[0036] The present invention is not limited to the embodiment described above, and can be appropriately modified and implemented within a scope not deviating from the gist of the present invention. For example, unlike the first embodiment, the shoe 1 without the inner side knit fabric portion 3 may be realized. Moreover, in the mixed section 20 of the outer side knit fabric portion 2, the type and count of the first knitting yarn and second knitting yarn may be partially changed. For example, the first knitting yarn may be thickened at the portion corresponding to the heel to enhance the strength of the relevant portion, and the contractility of the second knitting yarn may be increased at the portion corresponding to the arch to strengthen the tightening of the foot by the relevant portion. Of course, in the shoe 1, the mixed section 20 may be arranged only at a specific portion such as the portion corresponding to the heel, the portion corresponding to the arch, and the like.

DESCRIPTION OF REFERENCE NUMERALS

[0037]

1	shoe (footwear)
11	foot-inserting part
α to ν	portion
2	outer side knit fabric portion (base knit fabric portion)
20	mixed section
25	rib structure section
3	inner side knit fabric portion (additional knit fabric portion)

Claims

1. A footwear knitted seamlessly with a flat knitting machine having at least a pair of a front and a back needle bed, comprising:

   a base knit fabric portion including a mixed section and knitted using a first knitting yarn and a second knitting yarn interwoven along the first knitting yarn; wherein
   the first knitting yarn is a knitting yarn that is not a heat-fusible yarn; and
   the second knitting yarn is a heat-fusible yarn having thermal adhesiveness and heat-shrinkable properties.

2. The footwear according to claim 1, wherein the heat-fusible yarn includes a core that contracts by heat and a sheath having a lower fusing point than the core.

3. The footwear according to claim 1 or 2, wherein the mixed section is knitted by plating knitting using the first knitting yarn and the second knitting yarn.

4. The footwear according to any one of claims 1 to 3, further comprising:

   an additional knit fabric portion arranged on an inner side or an outer side of the base knit fabric portion when wearing the footwear; wherein
   the base knit fabric portion and the additional knit fabric portion are connected seamlessly at a position of a foot-inserting part of the footwear.

5. The footwear according to claim 4, wherein
   the mixed section of the base knit fabric portion is knitted by the plating knitting using the first knitting

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yarn and the second knitting yarn; and
a surface on which the second knitting yarn is arranged in the mixed section is arranged to face the additional knit fabric portion.

6. The footwear according to any one of claims 1 to 5, wherein
the footwear retained in a shape held to a shape corresponding to a last by being thermally processed while being placed over the last; and
in the mixed section, the second knitting yarn fused by the thermal processing is integrated with the first knitting yarn.

7. A knitting method for a knit fabric for knitting a knit fabric seamlessly using a flat knitting machine having at least a pair of a front and a back needle bed facing each other; wherein
the knit fabric is a footwear;
a first knitting yarn, which is not a heat-fusible yarn, and a second knitting yarn, which is a heat-fusible yarn having thermal adhesiveness and heat-shrinkable properties, are prepared; and
at least a part of the footwear is knitted with the first knitting yarn and the second knitting yarn interwoven along the first knitting yarn.

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Fig. 1

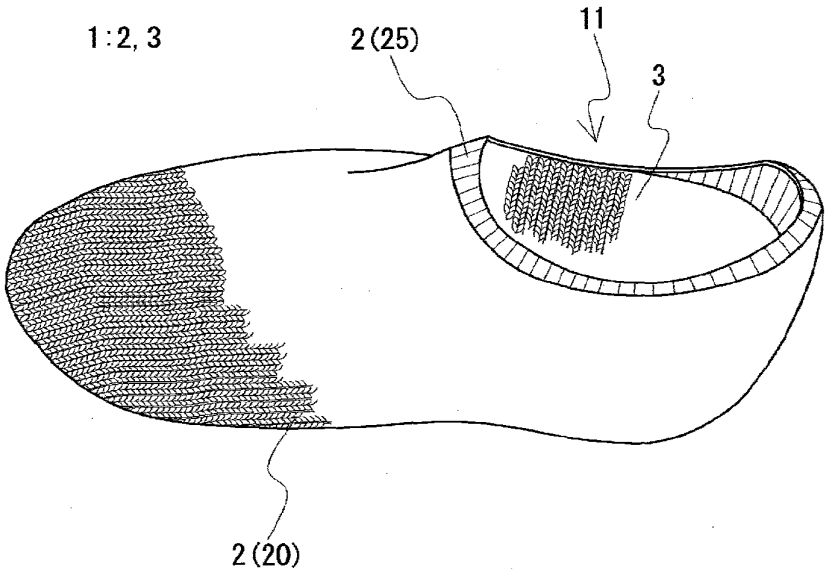
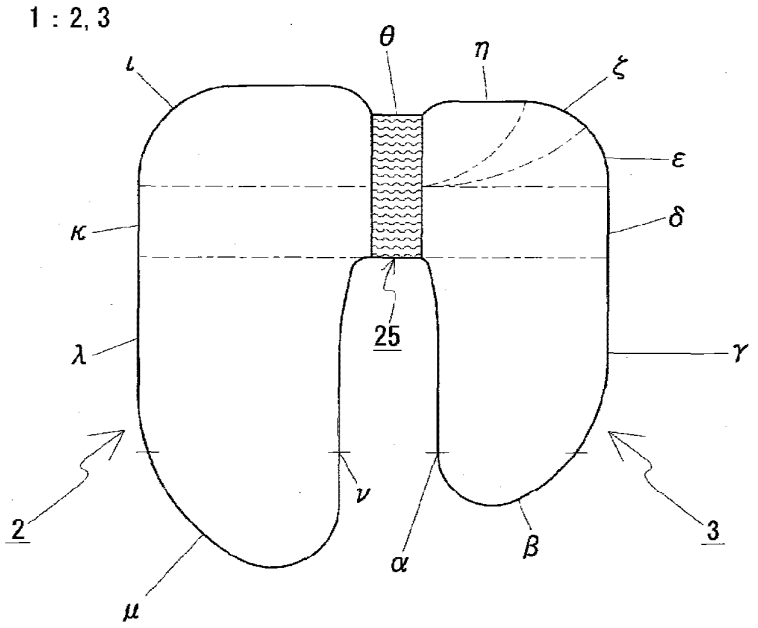
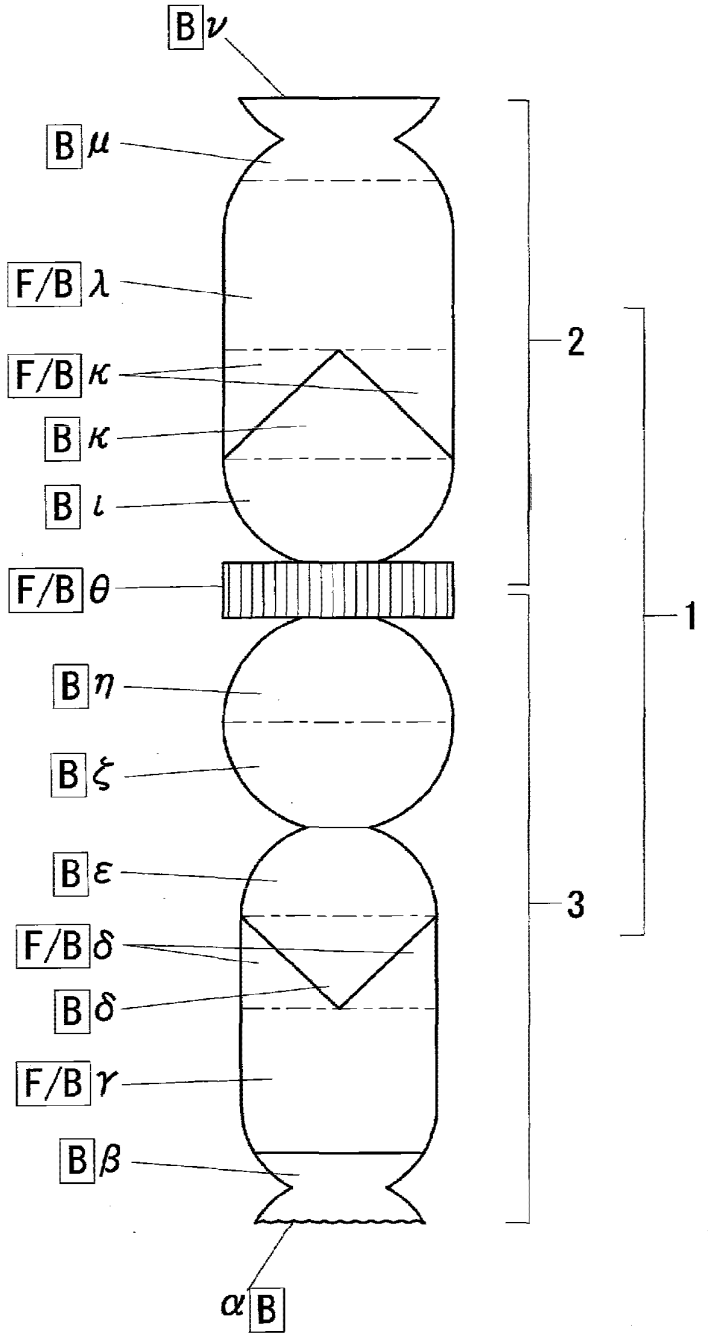


Fig. 2



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Fig. 3



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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2012/081747

A. CLASSIFICATION OF SUBJECT MATTER
A43B23/02(2006.01)i, *A41B11/00*(2006.01)i, *A43D21/00*(2006.01)i, *D04B1/16*(2006.01)i, *D04B1/22*(2006.01)i

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)
A43B1/00-23/30, A41B11/00, D04B1/16, D04B1/22

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2013
Kokai Jitsuyo Shinan Koho 1971-2013 Toroku Jitsuyo Shinan Koho 1994-2013

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 59-53701 A (Shima Idea Center Co., Ltd.), 28 March 1984 (28.03.1984), page 3, lines 2 to 20 (Family: none)	1-7
A	JP 2009-179907 A (Asahi Sports Yugen Kaisha), 13 August 2009 (13.08.2009), abstract (Family: none)	1-7

☒ 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
19 February, 2013 (19.02.13)	05 March, 2013 (05.03.13)
Name and mailing address of the ISA/ Japanese Patent Office	Authorized officer
Facsimile No.	Telephone No.

Form PCT/ISA/210 (second sheet) (July 2009)

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2012/081747

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 59399/1980(Laid-open No. 160905/1981) (Datsushiyuman Kabushiki Kaisha), 30 November 1981 (30.11.1981), all drawings (Family: none)	1-7
A	JP 2011-226019 A (Shima Seiki Mfg., Ltd.), 10 November 2011 (10.11.2011), claims (Family: none)	1-7
A	JP 2006-511306 A (Nike, Inc.), 06 April 2006 (06.04.2006), paragraph [0020] & US 2004/0118018 A1 & EP 1571938 A & WO 2004/060093 A1	1-7
A	JP 2008-303492 A (Teijin Fibers Ltd.), 18 December 2008 (18.12.2008), paragraph [0005] (Family: none)	1-7

Form PCT/ISA/210 (continuation of second sheet) (July 2009)

Skechers EX1013-p. 1357
Skechers v Nike

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- JP 3865307 B **[0003]**
- JP 2008139710 A **[0011]**
- JP 3899269 B **[0011]**

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Skechers v Nike

N° 12,787 A.D. 1903

Date of Application, 6th June, 1903

Complete Specification Left, 3rd Mar., 1904—Accepted, 6th June, 1904

PROVISIONAL SPECIFICATION.

"Improvements in and relating to the Manufacture of Boots or Shoes."

I, KARL DAUT, of Mannheim, in the Empire of Germany, Hosiery Manufacturer, do hereby declare the nature of this invention to be as follows:—

This invention has for its object a boot or shoe the upper of which consists of machine knitted material and which is provided with a leg portion which is also formed of machine knitted or worked material constituted by right and left knitting so that it is elastic and yielding and therefore readily conforms to the shape of the leg.

According to this invention the upper instead of being formed of leather, felt or other usual material consists of machine knitted or worked fabric to which is joined a leg portion of any desired length which also consists of machine knitted or worked fabric which is elastically knitted in the manner of the top of a stocking. The upper and leg portion form one piece; the leg portion is turned down inwards so that it consists of a double layer of material.

Owing to the elasticity of this leg portion the boot may be readily drawn on to the foot, and by reason of its capacity to readily conform to the shape of the leg a good fit is ensured. By suitably selecting the material for the upper and the leg portion the foot may be kept warm up to the calf. The upper is preferably lined with felt.

A further advantage of machine knitted material as compared with that which is hand knitted is that any desired patterns may be formed therein during manufacture which is not the case with hand worked material.

This material is therefore adapted to serve as a substitute for embroidery or crewel work.

The patterns may of course vary according to taste, or if preferred they may be dispensed with altogether. The same applies to the patterns on the leg portion. The stitch employed for the leg portion may vary as desired.

The sole may be of leather, felt or any other appropriate material.

Dated this 6th day of June 1903.

HASELTINE, LAKE & Co.,
45 Southampton Buildings, London, W.C.
Agents for the Applicant.

COMPLETE SPECIFICATION.

"Improvements in and relating to the Manufacture of Boots or Shoes".

I, KARL DAUT, of Mannheim, in the Empire of Germany, Hosiery Manufacturer, do hereby declare the nature of this invention and in what manner

[*Price 8d.*]

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Improvements in and relating to the Manufacture of Boots or Shoes.

the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention has for its object a boot or shoe the upper of which consists of machine knitted material and which is provided with a leg portion which is also formed of machine knitted or worked material constituted by right and left knitting so that it is elastic and yielding and therefore readily conforms to the shape of the leg.

The invention is illustrated in the accompanying drawing.

The upper *a* instead of being formed of leather, felt or other usual material consists of machine knitted or worked fabric to which is joined a leg portion *b* of any desired length which also consists of machine knitted or worked fabric which is elastically knitted in the manner of the top of a stocking. The upper *a* and leg portion *b* form one piece; the leg portion *b* is turned down inwards so that it consists of a double layer of material.

Owing to the elasticity of this leg portion the boot may be readily drawn on to the foot, and by reason of its capacity to readily conform to the shape of the leg a good fit is ensured. By suitably selecting the material for the upper and the leg portion the foot may be kept warm up to the calf. The upper *a* is preferably lined with felt *c*.

A further advantage of machine knitted material as compared with that which is hand knitted is that any desired patterns may be formed therein during manufacture which is not the case with hand worked material.

This material is therefore adapted to serve as a substitute for embroidery or crewel work.

The patterns may of course vary according to taste, or if preferred they may be dispensed with altogether. The same applies to the patterns on the leg portion. The stitch employed for the leg portion may vary as desired.

The sole may be of leather, felt or any other appropriate material.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

Boot or shoe, characterised by the fact that the upper, and leg portion consist of machine knitted or worked material, the leg portion being elastically knitted and turned down inwardly so as to form a double layer substantially as described and for the purpose specified.

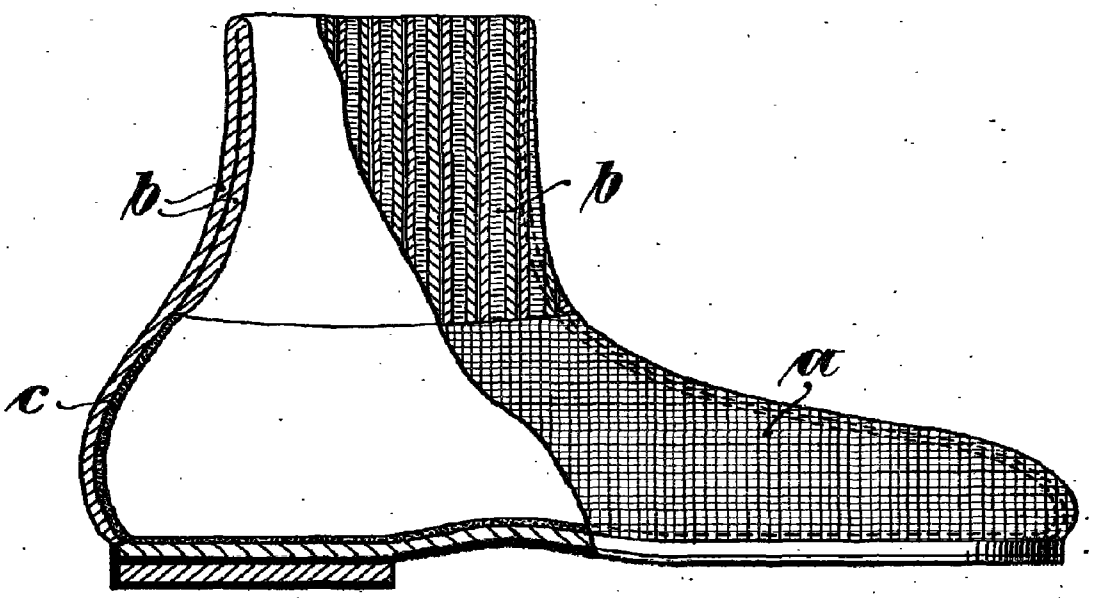
Dated this 3rd day of March 1904.

HASELTINE, LAKE & Co.,
7 & 8 Southampton Buildings, London, W.C.,
Agents for the Applicant.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1904.

A.D. 1903. JUNE 6. Nº 12,787.

DAUT'S COMPLETE SPECIFICATION. *(1 SHEET)*



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[This Drawing is a full-size reproduction of the Original.]

Malby & Sons, Photo-Litho.

Espacenet

Bibliographic data: TWI228158 (B) — 2005-02-21

Multilayer elastic knitted fabric and production process thereof, forming clothing material, knitting method of circular elastic knitted fabric, and yarn feeding apparatus

Inventor(s): KONDOU TOSHIYUKI [JP]; YOSHIDA TOMOAKI [JP]; FURUYA KAZUO [JP] ± (KONDOU, TOSHIYUKI, ; YOSHIDA, TOMOAKI, ; FURUYA, KAZUO)

Applicant(s): ASAHI KASEI FIBERS CORP [JP] ± (ASAHI KASEI FIBERS CORPORATION)

Classification: **- international:** ***D04B1/18; D04B15/48; D04B15/50; D04B21/18;*** (IPC1-7): D04B1/00

- cooperative: **D04B1/18**; **D04B15/48**; **D04B15/50**; **D04B21/18**; D10B2403/021

Application number: TW20020123852 20021016

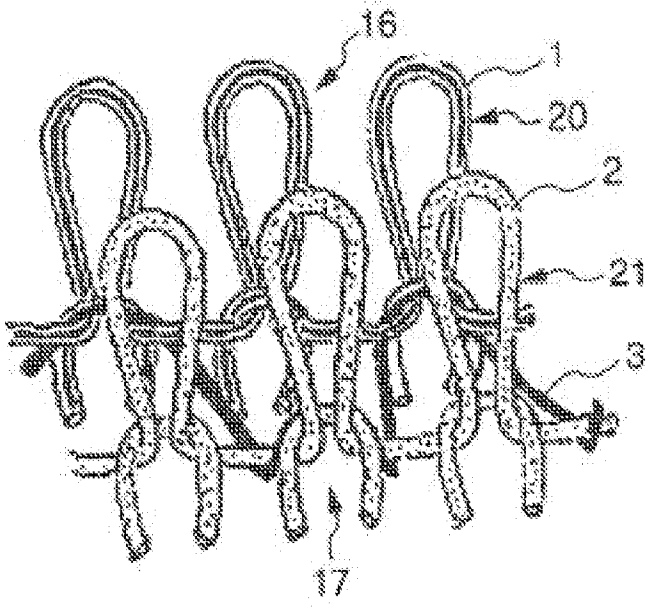
Priority number(s): JP20010335172 20011031 ; JP20020004973 20020111 ; JP20020103403 20020405 ; JP20020178782 20020619

Also published as: EP1449946 (A1) EP1449946 (A4) EP1449946 (B1) AT420231 (T) WO03038173 (A1) more

Abstract of TWI228158 (B)

The present invention relates to a multiplayer elastic knitted fabric and production process thereof, knitting method and apparatus for producing circular elastic knitted fabric of the present invention (elastic yarn feeding apparatus). For an elastic knitted fabric having a multilayer structure made by binding separate front and back two-layer ground knitted fabrics together, the above described two-layer ground knitted fabrics are bound together with only a bare string(s) of polyurethane based elastic fibers of 17 to 3000 dtex.

FIG. 1



（由本局填寫）

承辦人代碼：	A6 B6
大　　類：	
ＩＰＣ分類：	

本案已向：

國（地區）	申請專利，申請日期：	案號：	，□有　□無主張優先權
日本	2001 年 10 月 31 日	2001-335172	☑有主張優先權
日本	2002 年 1 月 11 日	2002-004973	☑有主張優先權
日本	2002 年 4 月 5 日	2002-103403	☑有主張優先權
日本	2002 年 6 月 19 日	2002-178782	☑有主張優先權

有關微生物已寄存於：　　，寄存日期：　　，寄存號碼：

（請先閱讀背面之注意事項再填寫本頁各欄）

裝　訂　線

經濟部智慧財產局員工消費合作社印製

五、發明說明（1 ）

（技術領域）

本發明係以結合紗來結表裏二層之基布料而構成之具有多層構造之圓織彈性布料，經編彈性布料，其製造方法，及製造本發明之圓織彈性布料用之裝置。再詳細的說，本發明係有關形態，貼合了表裏二層之基布料之三層構造，或在於表裏二層之基布料間具有空隙之具有立體構造之彈性布料。即本發明係一面具備優異之伸縮特性，且緻密又輕量且優於形態安定性。又該立體構造之彈性布料乃對於反複之負荷也不容易扁塌，備有優異之壓縮性及壓縮回復性，且優於通氣性及保溫性之彈性布料，及其製造方法，以及編成裝置。（本案中下面稱彈性布料即指彈性針織布料）。

（背景技術）

以往多數被提案之使用緯編機或經編機所製作之立體構造布料上，做爲接合表面與裏面之連繫紗（結合紗）而使用通常之紗（單紗，仮撚紗，紡績紗等等一般之紗）爲多。這些係主要用於一般資材或衣服之裏布等，這雖然具有賦予適當之隔熱性之效果，惟在於壓縮性及壓縮回復性上劣。

再者，使用熱融著紗爲接合紗之立體構造布料亦屬習知。如有日本專利公報特開平4-240252號所揭示之例。這布料係利用熱融著紗之成形性之成形體，對於適合於成形性之熱壓機等之加壓成形上雖爲良好，惟幾乎沒有壓縮性及壓縮回復性，根本沒有考慮反復負載時之扁塌性等等。

再記述於日本專利公報特開平7-316959號之布料之例乃

（請先閱讀背面之注意事項再填寫本頁）
裝
訂
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五、發明說明（2 ）

，揭示熱融著紗與高捲縮紗之組合所成之連結紗之圓織瓦楞織布，在此公報上也有記述使用聚氨基甲酸酯等纖維爲連結紗。又於同公報特開2001-164444號記述有使用結合紗之立體構造布料。這是藉由高捲縮紗及伸縮性紗來賦予緩衝性或減少對於反複負載之扁塌性之用。惟使用熱融著紗爲連結紗時，由於熱融著紗之軟化點低，所以在於染色加工等時，在於布料上容易起皺。整形後此皺仍留存，有時該做爲連結紗之熱融著紗融著，而固定了表裏之布料，因此布料全體而言幾乎沒有伸縮性。又不能發揮高捲縮紗及伸縮性紗之效果所致之緩衝性，耐扁塌性，壓縮性及壓縮回復性也不佳，發生由反複負載而扁塌之問題。

再者，由於使用於連結紗及基布料之非彈性纖維之熱融著之結果，使布料整體變硬，雖然可利用於產業資材上，惟使用於人所著用或使用於靠近於肌膚時之一般資材或副資材上即不合適，在這些領域即不合實用者。

另一方面，做爲同樣之製品而有，以雙面拉舍爾經編機所製造之三層構造編織物已有市販。此布料係使用單絲爲結合紗。使用單絲之理由係藉由大的彈性率來提高緩衝性者。惟這些之立體構造也由於單絲之剛直性而致使布料整體成爲剛硬，故與上述者相同不適合於人之裝著之用。

於同公報特開平5-106146號揭示，以彈性紗連結一方之布料與另一方之布料，採用唯一在於橫編機才可能編成之線圈之橫列(course)之增減或返回編之手法，以形成富於凹凸起伏，布身剛強之布料之編成方法。惟橫編機係織針間

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五、發明說明（3 ）

距G粗所以需將拉齊數條之粗之纖度之紗條，例如具有膨鬆性之毛線或經高捲縮加工之粗之合成纖維長纖維加工紗來編成。所編成之布料也是編目粗之如毛線衣等，而無法獲得本案發明之目的物之緻密且輕量之布料。又由於織針間距G粗，因此將結合紗加粗之下仍然無法獲得安定之立體形狀，並非可以滿足布料之經緯伸度之平衡。又此先行技術乃雖然備有沿著人體之輪廓地立體的編成布料之技術思想，惟欠缺使布料本身具有空隙之立體構造之概念。再者橫編機係喂紗口與走車一齊行往復動作，由此喂紗口而供紗，反復實施編成運動，惟編成彈性紗時，如裸紗之原狀時在於布料之寬方向地延伸倍率會一致改變。由而具有無法獲均一的編目之致命問題。因此無法使用裸紗，而使用預先將非彈性纖維捲繞於彈性紗之裸紗之所謂包芯加工紗做爲彈性紗而使用，此乃同業者間之常識。

又於EP發明公告第431984號係揭示：以彈性性紗連結裏面係只以撥水性纖維所成，表面係由吸水性纖維與彈力惟紗之添紗編所成之二層之布料，由而將身體之水份容易發散於外部之衣類用之布料。在於表面布料使用彈力性紗之目的係，使表面布料之編目緊密，防止外氣之侵入於布料內者，所以與本發明技術課題及目的均不同。此構成之布料係由於表裏之伸縮性不同，所以易發生彎曲，惟在於裏面使用彈力性紗而賦予伸縮性即其目的所不容許。換言之在此布料中，在於裏面採用彈力性紗，而使其編目緊密時，即身體之水份由布料移行至另一布料，無法將水份發

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五、發明說明（4 ）

散於水份。所以此構成之布料中無法抑制彎曲欲製成衣料時有問題。

又從以前，在於圓織機上編成聚氨基甲酸系彈性纖維之裸紗時，由裝置性的限制，在於織機上之全部之斯潘德克斯彈性纖維紗(spandex yarn)只能以同一速度地供給於織機，而以聚氨基甲酸系纖維而編成不同之組織時，只能以供給量較近似之條件才能編成。該結果，聚氨基甲酸系纖維係在於編成時，發生由於過度之延伸所致之斷紗，或由延伸不足所致之纖維之從卷裝(筒子)之拉出不足，結果而言組織之限制大，編成條件也受限。因此布料成爲過於緻密，無法獲得充分之伸縮性。

(發明之揭示)

本發明之目的乃提供：貼合表裏二層之基布料之三層構造，或有關於表裏二層之基布料間具有空隙之立體構造之彈性布料，一方面具備優異之伸縮特性，且緻密且輕量而且具有優異之形態安定性。具有柔軟之手感，人之著用或使用於靠近肌膚部份所使用之衣料或一般資材或副材上最適宜之彈性布料。

本發明之其他目的乃，提供一種立體構造之彈性布料，而對於反複負載而不但不容易扁塌，具有優異之壓縮性及壓縮回復性。且通氣性及保溫性優異之彈性布料。而爲了製造它之製造方法，以及提供實現它之編成裝置，供紗裝置。

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五、發明說明（5 ）

詳述之本發明之要點乃如下述：

(1) 一種多層彈性針織布料，針對結合表面與裏面之獨立之二層之基布料而成之具有多層構造之彈性針織布料，

其特徵爲：上述二層之基布料係只以17~3000dtex之聚氨基甲酸系彈性裸紗所結合。

(2) 如申請專利範圍第1項所述之多層彈性針織布料，其中

上述彈性針織布料乃，表面及裏面之獨立之二層之基布料係分別以一枚針床所形成之圓織布料，該二層之基布料係只以由33~3000dtex之聚氨基甲酸系彈性纖維裸紗所成之結合紗且以集圈線圈(tuck loop)來結合，該結合紗乃，對於表面及裏面之基布料之編目密度粗之一方之25%以上之編目相結合，且對於上述表面及裏面之獨立之圓織布料之其中之較短之線圈長度之該結合紗之線圈長度之比係在於0.6~2.3之範圍。該彈性布料係在於表裏基布料之間具有空隙，具有立體構造。

(3) 如申請專利範圍第1項所述之多層彈性針織布料，其中

上述彈性針織布料乃，該表面及裏面之獨立之二層之基布料係分別由一枚針床所形成之圓織布料，該二層之基布料係只以由17~1500dtex之聚氨基甲酸系彈性纖維裸紗所成之結合紗來結合，至少一方之基布料係與該結合紗以集合線圈(tuck loop)來結合，該結合紗乃對於表面及裏面之基布料之編目密度粗之一方之25%以上之編目相結合，且對於

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五、發明說明（6 ）

上述表面及裏面之獨立之圓織布料其中之較短線圈長度之一方，而該結合紗之線圈長度之比係在於0.2~0.6之範圍，該彈性布料係具有三層構造者。

(4) 如申請專利範圍第1項所述之多層彈性針織布料，其中

上述二層之基布料乃由經編構造所成，上述結合紗係對於表面及裏面之基布料之編目密度之粗之一方之25%以上之編目結合。

這些上述之彈性布料係，再在於基布料中含有聚氨基甲酸系(聚烏拉丹系)纖維也可以。

再者本發明人乃創作出改變在於織機上斯潘德克斯彈性纖維之供給量用之裝置，尋覓出使用它之製造方法由而達成往未曾存在之一方面具有優異之伸縮特性，又緻密且輕量，而且形態安定性優異，具有柔輕之觸感・手感，最適合於人所著用或於靠近肌膚之處可使用之衣料，一般資材或副資材之彈性布料，而完成了本發明。

(實施發明之最佳形態)

下面詳細的說明本發明。

本發明之具有多層構造之彈性布料乃，如第1圖及第7圖中之符號16，17以及第2圖及第8圖中之符號18，19所表示之表面及裏面之基布料係分別獨立的形成。而結合上述兩基布料之第1圖中之符號3，第2圖中之符號6表示之結合紗係只以聚氨基甲酸系彈性纖維之裸紗所構成。由於結合兩

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五、發明說明（7 ）

基布料之結合紗係聚氨基甲酸系彈性纖維之裸紗，所以得對於被結合之具有多層構造之彈性布料能賦予對於經緯方向之伸縮而不限制其伸長之良好之伸縮特性。

本發明所使用之聚氨基甲酸系彈性纖維之裸紗之纖維爲17~3000dtex。

下面詳細的說明本發明之合宜之態樣。此合宜之態樣之彈性布料係由下述之三個構造所成。

其第1之合宜之構造乃，如於第1圖上表示該線圈構造圖所示，表面及裏面之獨立之基布料係，於具有二層之針床之圓織機之各個之針床上分別獨立形成。此兩基布料係只以聚氨基甲酸系纖維之裸紗來結合。此時結合紗係至少一方之基布料以集合線圈(掛紗線圈)(tuck loop)來結合。使結合紗之供給量加多，由而可以形成在於表裏二層之基布料間具有空隙上立體構造。而第1圖中之符號3所示之該結合紗係對於表面及裏面之基布料之編目密度粗之一方之25%以上之編目相結合，且對於上述表面及裏面之獨立之圓織布料之其中之較短之線圈長度之該結合紗之線圈長度之比係0.6~2.3爲其特徵。這是由於使結合紗之線圈長度之比例對於基布料之線圈長度地比較的加大，由而表裏二層之基布料係如第7圖中之符號3所示：成爲以聚氨基甲酸系彈性纖維而具備有空隙地被結合而成之立體構造者。

此比例(T)係未滿0.6時，所獲得之立體布料之壓縮性回復性，及編成上有發生不合宜之情形之可能，爲了獲得良好之觸感手感之立體編物起見此比例(T)係2.3以下爲宜，超

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過2.3時表面及裏面之布料中聚氨基甲酸系彈性紗係凸出而降低編物之品位。

本發明中，藉由聚氨基甲酸系彈性纖維裸紗之基布料之結合係與表裏基布料之中之至少一方之基布料而以集合線圈(掛紗)之編成來實施。結合數係對於表面及裏面之基布料之編目密度之疏粗之一方之25%以上之編目相結合爲宜。

所使用之聚氨基甲酸系彈性纖維之裸紗之立體形狀保持性，由壓縮之回復性及對於反複疲勞之耐扁塌性之點而言33~3000dtex之範圍爲宜。70~2000dtex之範圍即更合宜。

未滿33dtex時，在於本發明之立體構造之對於彈性布料之不耐於剪斷力之故不容易保持立體形狀。對於壓縮之回復性也有不能滿足的獲得之情形。又超過3000dtex地變粗時，彈性布料本身之重量變大，有時即不能使用於衣料等。

又，聚氨基甲酸系彈性纖維裸紗之基布料之結合方法係亦得採用一面用集合線圈(掛紗)，另一面用編成線圈(knit loop)來結合，惟爲了獲得聚氨基甲酸系彈性裸紗之不致於影響於表裏之布料地結合，可以促進基布料之薄布料化，且具有優異之伸長回復性，觸感良好，形態安定性及表面品位優異之伸縮性布料起見，對於兩基布料均以集合線圈(tuck)方式地結合爲合宜。

做爲結合紗而使用之聚氨基甲酸系彈性纖維裸紗之編入方法不做限定，惟爲了獲得良好之薄料感及伸縮回復性起見，以對於基布料之編目數之結合比率係50%之鋸形結合乃，在於表裏基布料間保持適度之空隙且立體形狀之保持

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性優異而合宜。再者與兩基布料均以集合線圈(tuck)方式來結合，且令表之基組織及裏之基組織之結合數相等係由於彈性布料之表裏布料表面可以呈平坦，由而合宜。

本發明中所謂之「具有立體構造」之意思係，表裏二層之基布料係實質上呈非接觸之狀態，而以聚氨基甲酸系彈性纖維之裸紗而柱狀地支承表裏二層之基布料，於該二層之基布料間保持空隙之狀態而言。

下面說明本發明之具有立體構造之彈性布料之製造方法之例子。

織(編)機係使用具有通常之二列針床之所謂雙面針織物用之圓織機。最好是有多數之給紗口數，同時地可以供給複數條之紗之給紗口者爲合宜。織機之針數G係由使用目的而適當的選定，惟通常使用18~40G之織機。在於上述之雙面針織機(圓織機)以外亦例如使用42G之織機而實施每1針地實施抽針，做爲相當於21G而使用，又雖然亦可以使用粗於18G之圓織機，惟此時較18G粗之針床係只使用針盤或針筒其中之一方，另一方係18G以上，即爲了獲得本發明之目的之緻密且輕量之布料上很合宜。

使用於表面及裏面之布料之第1圖中之符號1，2及第2圖中之符號4，5所示之紗之粗細雖不限定，惟以總纖度22~1220dtex之範圍爲宜。34~310dtex之範圍更合宜。單紗之纖度即以0.1~610dtex之範圍爲合宜。1~100dtex之範圍更爲合宜。

表面及裏面之基布料(組織)也不做特別限定，惟以圓織

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機之一枚針床所成之編組織爲合宜。可舉出例如平編之基本組織，集圈組織(tuck knit)，浮線組織，半畦組織，花邊網目組織，添紗組織等等。

本發明之第2之合宜構造係，如第2圖所示之線圈構造圖所示，與上述之最初之構造及編組織雖相同，該結合紗乃對於表面及裏面之基布料之編目密度粗之一方之25%以上之編目相結合。且對於上述表面及裏面之獨立之圓織布料其中之線圈長度短之一方之聚氨基甲酸系彈性纖維所成之結合紗之線圈長度之比係在於0.6~2.3範圍爲其特徵。對於由圓織構造所成之基布料之線圈長度之由聚氨基甲酸系彈性纖維所成之結合紗之線圈長度之比係比較小，表裏二層之基布料乃成爲由聚氨基甲酸系彈性纖維所貼合之三層構造。此時所使用之聚氨基甲酸系彈性纖維之裸紗之纖度乃由伸縮性，布料表面品位等之觀點以17~1500dtex之範圍爲宜。22~640dtex之範圍係更合宜。

又，聚氨基甲酸系彈性纖維裸紗之破斷伸度以400%~1100%爲合宜，且在於染色加工時之預定形等之乾熱處理溫度190℃附近而不會損及伸縮性者爲合宜。

再者，本發明中，做爲結合紗之聚氨基甲酸系彈性纖維裸紗之線圈長度，與對於表裏之緯布料其中之較短方之線圈長度之比，具體的說，對於構成一方之面之針桶編目之線圈長度或構成另一方之面之針盤編目之線圈長度之其中之一之短方之線圈長度之線圈長度之比例係以0.2~0.6爲宜。最合宜爲0.2~0.5之範圍。聚氨基甲酸系彈性纖維裸紗之

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五、發明說明（11）

線圈長度比未滿0.2時，在布料中之彈性纖維之伸長率變高。在於編織中發生斷紗或布料表面之品位之降低，又彈性纖維係容易從布料之端部脫落。做爲衣服而反復了著用之伸長時就有發生不合宜之情形。又線圈長度比超過0.6時無法使表裏布料密著，使薄料感低落，又由於布料中之彈性纖維之伸長率低落由而有致使伸長回復性劣化之可能。

本案中所指之線圈長度之比(例)係指：對於從一定寬度之布料鬆開取出之構成一線圈橫列份之基布料之線之長度L-g之結合紗之放鬆狀態之長度L-c之比(L-c/L-g)而言。

本構造中，藉由聚氨基甲酸系彈性纖維裸紗之基布料之結合乃，與表裏布料之中，至少一方之基布料而藉集圈線圈(tuck)之編成來實施，惟結合數係對於表面及裏面之基布料之編目密度之粗疎之一方之25%以上之編目相結合也。

爲了獲得良好之薄料感及伸縮回復性起見，採用對於基布料之編目數之結合比率爲50%之鋸形結合係優而合宜。再者，結合紗之對於表裏基布料之結合乃兩面均以集圈線圈方式之結合，且令對於表之基布料及裏布料之結合數相等時，可以獲得平坦之彈性布料之外觀，因此很合宜。

本發明之第3之合宜之構造乃，結合表面及裏面之獨立之基布料所構成之多層布料，上述二層之基布料係由經編構造所成，該基布料乃只以17~3000dtex之聚氨基甲酸系彈性纖維之裸紗來結合，該結合紗係對於表面及裏面之基布料之編目密度之疎粗之一方之編目之25%以上結合而成爲其特徵之具有多層構造之彈性經編布料。

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五、發明說明（12）

第3圖表示本發明之彈性經編布料之一例。該彈性經編布料乃以具有二列針床之經編機來編成。換言之本發明之具有多層構造之彈性經編布料之表裏二層之基布料7，8係經編構造、編鍊組織、經平組織、經絨組織、網目組織等任一組織均可用。對於表面之布料及裏面之布料組合了抽針者等亦無妨。只以聚氨基甲酸系彈性纖維裸紗9來連結該基布料就可以獲得本發明之彈性經編布料也。

本發明中，藉由聚氨基甲酸系彈性纖維裸紗之基布料之結合可以爲編成線圈(knit loop)之結合或集合線圈(tuck loop)之結合，惟在於貼合表裏基布料之形狀之三層經編構造時以前者之結合爲合宜。惟在於表裏基布料間具有空隙之立體構造時，即編成線圈方式或集合線圈方均任一者都可以。結合數即對於表面及裏面之基布料之編目密度之疎粗之一方之25%以上之編目結合，與50%以上結合爲合宜。

所使用之聚氨基甲酸系彈性纖維裸紗之纖維係由立體形狀保持性，對壓縮之回復性，對反複疲勞之耐扁塌性等觀點而以33~3000dtex之範圍爲宜，再70~2000dtex之範圍更合宜。未滿33dtex時，對於本發明之立體構造之彈性布料而以弱之剪斷力就不能保持立體形狀無法滿足的獲得對壓縮之回復性。又超過3000dtex程度地變粗時，彈性布料本身之重量變大，不能使用於衣料。

在本發明中，爲了使上述之三種構造之具有多層構造之彈性布料更爲高度，滿足其目的起見，表裏基布料之至少一方之基布料乃含有彈性複合紗爲宜。

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五、發明說明（13）

本類所指之複合紗係，以種種之方法複合了聚氨基甲酸系彈性纖維與非彈性紗條而成之紗條而言。可舉出例如：以聚氨基甲酸系彈性纖維爲芯，而以聚醯胺長纖維爲鞘(包紗)施予包紗加工而成之複合紗，或以聚氨基甲酸系彈性纖維爲芯，在其周圍採用了棉等之短纖維做成紡績紗之包芯紗(core spunyarn)等等。

由於在於表裏基布料之至少一方，含有彈性複合紗，於是對於本發明之多層彈性布料可以賦予伸縮性。由結合紗而可以補布料寬度方向之伸縮性，並且對於布料之縱長方向亦可賦予伸縮性。於是成爲經緯二軸方向具有良好伸縮性之多層構造之彈性布料。又藉彈性紗之伸長回復力而使基布料之編目變小緻密化，由而牢固地結合於結合紗，使多層構造成爲安定之構造。再者如基布料整體均用彈性紗由而高密度化時，連結紗密度也可提高，具有立體構造之彈性布料中，基布料與結合紗之結合角近乎垂直，於是壓縮反撥性及回復率均可提高。

彈性複合紗乃只要編入於表裏二層之基布料中之其中之一方就可以獲得上述之效果，惟編入於兩基布料時，就使表裏之布料之平衡提高，可以解消布料之耳部或端部之蹺曲之現象，因此很合宜。

又彈性布料乃以它本身來形成基布料亦可以或與別的非彈性紗拉齊地形成編目亦可以，或與非彈性紗條交編亦可以。

下面說明，在於本發明之具有多層構造之彈性布料中，

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五、發明說明（14）

表面及裏面之兩基布料乃均將裸紗之狀態地含有聚氨基甲酸系彈性纖維，而該聚氨基甲酸系彈性纖維裸紗與非彈性紗條係被拉齊之狀態地形成編目之情形。

此時，與含有彈性複合紗之彈性布料同樣，對於多層彈性布料可賦予伸縮性。可以補全由結合紗所致之布料寬度方向之伸縮性，且對於布料之縱長方向也可賦予伸縮性，於是成爲經緯二軸方向具有良好之伸縮性之多層構造之彈性布料。藉由彈性紗之伸長回復力而可以使基布料之編目緻密化而變小，使結合紗之密度增加，又基布料16，17與結合紗3之交叉之角度(結合角)靠近90°，由而可以提高具有立體構造之彈性布料之壓縮反撥性及回復率也。

採用聚氨基甲酸系彈性紗之裸紗做爲結合紗，由而據於立體構造之中間位置之結合部之纖維填充密度降低而可以擴張空間。換言之聚氨基甲酸系彈性紗之裸紗係由於數條之單絲之融著之形式地單條單絲化，所以結合部之空隙中之空隙很大，相對於，以聚氨基甲酸系彈性紗爲芯以單條或複數條之非彈性纖維所被覆(包覆)而成之複合彈性紗乃，由它本身變粗，或由聚氨基甲酸系彈性紗之伸縮，而在於連結部使被覆纖維膨鼓，結果使空隙中之空間變狹。

使用聚氨基甲酸系彈性紗之裸紗爲結合紗之結果，可以大幅度地改善布料整體之通氣性，且可達成輕量化。

再者，使用聚氨基甲酸系彈性紗之裸紗爲結合紗，由而在於連結部中，連結紗與連結紗之接觸面積可以變小，由而可以降低熱傳導性，更是由於多含空氣層由而可以提

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五、發明說明（15）

高布料整體之保溫性。

本案中所指之聚氨基甲酸系彈性紗之裸紗乃指：從一個以上之紡絲口，將紡絲原液壓出於紗絲筒內。例如被集束而在於各單絲之接觸部位融著，看起來以單絲狀態地被捲取而成之紗而言，在此裸紗上被覆了非彈性纖維複單絲等之被覆彈性紗，或捲繞了棉等之短纖維之包芯花紗並不包括之。

含於表裏二層之基布料之聚氨基甲酸系彈性纖維乃(第1圖中之符號20，21及第2圖中之符號22及23。但是圖中符號21及23係由非彈性紗所遮蔽而看不見)。對於同布料中之非彈性紗而以重量比2%以上，60%以下地存在爲合宜。4%以上20%以下更合宜。

隨著聚氨基甲酸系彈性纖維之含有率之變小，布料整體之伸長性能會減少。彈性紗之含有率未滿2%時，由於彈性紗之量少由而有布料整體之伸長性能之減少之可能，因此無法將充分之伸縮性能賦予布料整體，超過60%以上即布料密度變高，單位面積重量變爲過高，有減少通氣性能之可能。因此將彈性紗之含有率定爲4%以上，20%以下時就可以獲得具有伸縮性，柔軟，具有適度之平坦拉性及懸吊性之最適宜之布料。

如連續在於基布料上由聚氨基甲酸系彈性纖維之裸紗有編目形成時，就由裸紗形成平編組織，此時，在於編目之接點而裸紗與裸紗係線圈結節狀地接觸，將此基布料施予精鍊染色精加工時之定形處理或染色處理中發生熱融著，

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五、發明說明（16）

因此雖然基布料係以平編組織或鍊鎖組織來編成之下，也不會發生由布料端編目鬆脫之情形。加上，如於結合紗與基布料之結節部位而結合紗與基布料之聚氨基甲酸系彈性纖維之裸紗相互接觸，而以此狀態施加精鍊染色時，由乾熱定形成染色時之濕熱處理而使該接觸部熱融著。此時，如在於布料整體發生應變，或有應力之作用時，仍然不會有組織之偏移成爲安定之布料，由而在於具有三層構造之彈性圓織布料中。該聚氨基甲酸酯之反撥性係迅速的傳遞於布料整體，增加了布料之瞬間回復性。又在於具有立體構造之彈性圓布料中，對於立體之厚度方向之壓縮而增加回復力，對於剪斷力而言，由於在於表裏基布料中，基布料與結合紗之聚氨基甲酸系彈性纖維發生融著，所以可耐受變形得復原於原來之形狀也。

再者，將本發明之布料縫製製成衣服時，以往需要以縫縫機等來縫合布料端，惟依本發明之布料時，由於基布料之聚氨基甲酸系纖維與結合紗已融著，所以切離之狀態下就可以使用於衣服。此時表裏二層之基布料均須編入聚氨基甲酸系彈性紗之裸紗才行。

再者，對處於由於著用時之布料之伸縮而結合紗之容易自縫目脫出之問題，在於基布料中編入聚氨基甲酸系彈性纖維之裸紗就合宜。如縫入於兩基布料就更合宜。

如上所述，在於表裏二層之基布料中編入聚氨基甲酸系彈性纖維之裸紗之結果可以對於具有三層構造之彈性圓布料，及具有立體構造之彈性圓布料賦予很多之利點。

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五、發明說明（17）

按非彈性之熱融著紗或聚酯等之熱可塑性合成纖維係在於立體構造中熱融著時，如上述成爲布料整體變硬，彎曲剛性變大，不耐於使用於人所著用或靠近肌膚之處所之使用。惟只有聚氨基甲酸系彈性纖維與聚氨基甲酸系彈性纖維融著時，雖然接著點被固定，惟紗本身仍可以伸縮，因此成爲布料整體而言，具有伸縮性，柔軟，具有適度之平坦拉性及懸吊性之布料也。

下面說明，只有表裏基布料中之一方係以拉齊將裸紗之聚氨基甲酸系彈性纖維及非彈性紗條之狀態地形成編目，且以聚氨基甲酸系彈性纖維之裸紗來結合兩基布料之情形。

按此時由於表裏基布料間之伸縮力量不相同，由於含有聚氨基甲酸系彈性纖維之基布料之伸縮力量會大於另一方。因此將它做爲內側會發生布料彎曲之問題。無法獲得具有實用性之彈性布料，此缺點係在於立體構造之彈性圓織布料也會發生，惟三層構造之彈性圓布料即特別顯著。因此採用一方之基布料中，編入聚氨基甲酸系彈性纖維之裸紗時，爲了緩和布料伸縮力量之不平衡，須要與基布料之聚氨基甲酸系彈性纖維之纖度比較將結合紗之纖度加大其纖度才行。

本發明人等處心積慮於此問題，尋找出：對於基布料中之聚氨基甲酸系彈性纖維之纖度(D-g)之欲結合之聚氨基甲酸系彈性纖維之纖度(D-c)之比爲(D-c/D-g)爲2倍以上，就可以減輕彎曲性，3倍以上即更合宜，由而提供可耐於實用

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五、發明說明（18）

之三層構造之彈性圓布料也。

本發明之具有立體構造之彈性圓(織)布料及彈性經(編)布料之壓縮性能及壓縮回復性能乃，由彈性布料之厚度，及使用於結合紗之彈性紗之纖度而有所改變。詳述之，使用於結合紗3之彈性紗之纖度愈大壓縮性能及壓縮回復性能愈可提高，另一方面，彈性布料之厚度愈厚壓縮性能及壓縮回復性能愈降低。

本發明中，基布料之任意1cm^{2}之面積內所結合之結合紗3之總纖度(D)(dtex)與該面積部份之布料之厚度(T)(mm)之比爲滿足$5\times 10^3 \leqq D/T \leqq 5\times 10^5$之條件爲合宜。

$5\times 10^3 > D/T$時，無法達到充分之壓縮性能及壓縮回復性能之提高之虞。而$D/T > 5\times 10^5$時，壓縮阻抗及布料整體之抗彎剛性而變爲過大之傾向，因此通常很難使用於人之身邊零件之用。

具有立體構造之彈性圓(織)布料時，結合紗係以集合線圈(掛紗)編成而以基布料之編目相結合，具有立體構造之彈性經布料時結合紗乃以編成組織(knit)及/或集合線圈(掛紗)(tuck)組織而與基布料之編合結合。

表裏二層之基布料之任意部位之1cm^{2}內之編目中，與連結紗結合之編目之比率(R)乃25%以上爲宜。編目之比率(R)未滿25%時，即由於連結紗之條數太少由而有時無法獲得充分之壓縮反撥性及回復性之可能。將所使用之連結紗之纖度加粗由而雖然有可以改善壓縮反撥性及回復性，惟在於基布料上發生由連結所致之凹凸，由而有致使損及布

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料表面之平面性之情形。

除了全部之編目有連結紗與編目有所連結之情形之外，於任意之編織之橫列(下面簡稱橫列(course))中，連結紗之連結於基布料之圖樣係不相同，惟如果在於任意之橫列而隔一編目地以單數序號之編目而連結於連結紗，下一序橫列即一編目地將連結紗連結於偶數序號之編目，如此之結果，基布料表面得於呈均一，且壓縮反撥性及壓縮回復性也布料部位別地容易均一，因而很合宜。在每編橫列地挪移連結部之位置，而反複地實施之結果就可以獲得良好之布料。

接著，本發明人等，處心積慮於研討由人之動作之皮膚之伸長以及追隨它之布料之伸長特性。尋出：如申請專利範圍第5項，第6項，或第7項其中之一項所述之具有多層構造之彈性布料。

詳述之，經及緯方向之各自之伸度係於3.5N/cm之負載下80~150%，9.8N/cm之負載下100~200%。

以下述式(1)及(2)所表示之經及緯方向之伸度比(A)及伸度比(B)均爲0.8~1.2之範圍。

伸度比(A)=3.5N/cm負載下之經方向之伸度(%)÷緯方向之伸度(%)……(1)

伸度比(B)=9.8N/cm負載下之經方向之伸度(%)÷緯方向之伸度(%)……(2)

換言之，尋覓出追隨於人之身高方向之動作而使布料伸長時之伸長方向之應力，及在於人體之周方向之布料之

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應力係大大地影響於著用感。如布料之經及緯方向均具備預定之伸長時，就可以獲得運動追隨性及著脫性優異，且著用時有舒適之彈性布料。又抑制布料之不必要之伸度就可以提高布料之耐久性之事實。而達到了本發明。

上述之伸度係指藉：一軸固定二軸伸長試驗機(STRIP BIAIAL TENSIL TESTER KGS-G2-SB1卡特特克斯公司製)所測定之值。將布料之一方向予以拘束，測定另一方向之布料伸長就可以做到合乎實用之伸度。

按以往之伸度之測定方向係，只固定伸長方向，另一方向即不拘束之狀態實施測定之方向，因此在於把持間中央部而布料寬度會改變，因此有無法測定著用時之布帛上所作用之二方向之應力變化之缺點。

按本發明所採用之3.5N/cm之負載係相當於人的平均的拉動之力道。人之周方向之須軟(輕)力或強勁(硬)之感覺係由商品之感覺或個人之喜好而不同，惟在於3.5N/cm之負載下之彈性布料之經方向之伸度係未滿80%時通常屬布料之伸長度不足，在於著脫時須多費力氣。另一方面，緯方向之伸度未滿時，在於彎腰動作人之伸長方向之皮膚之伸長會爲最大50%，所以會發生壓縮感，又用做束腰件時即腰線或大腿部之裾部之被摩擦之不舒感。

又彈性布料之經及緯方向之各伸度爲3.5N/cm之負載下超過200%時，彈性紗之伸縮疲勞變大，降低其耐久性，而布料之強度會降低。

再者，9.8N/cm之負載係相當於布料之延伸限度之伸度，

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相當於會發生由消費者之布料之突破事故之力量。爲了預防此事故，伸長限度伸度須抑制於200%以上以迴避布料之粗化才行。由此觀點來說，9.8N/cm負載下之伸度乃以較小爲合宜。惟確保著脫時之舒適性起見，在於9.8N/cm負載下而100%以上之伸度係有其必要。伸度比係0.80以下時，緯方向之伸度係與經方向之伸度相比而大。又伸度平衡係1,200以上時，經方向之伸度比較於緯方向之伸度大，因此很難獲得舒適之著用感之事實也查明。

最好的是，兩基布料均其結合紗6之以集合線圈組織地結合者即，在於裁剪時，不會有耳部蹺曲之彎曲現象之安定性優異者。

又以往之編結品乃只能獲得經緯方向之力量不相同者，惟以本發明之集合線圈(tuck)組織來編成之結果，亦可能做到只有橫列方向之力量之提昇，將伸度、力量之經緯可以做到0.8乃至1.2。

使用於本發明之聚氨基甲酸系彈性織乃，當然包含聚氨基甲酸系彈性纖維，也包含聚醚酯系彈性纖維。

做爲聚氨基甲酸系彈性纖維乃可使用例如經乾式紡紗或熔融紡紗者，不受聚合物或紡紗方法之限度。纖維之纖度乃通常17~3000dtex，最好爲22~620dtex。破斷伸度爲400%~1200%時即其伸縮性優良所以很合宜。又在於染色加工時之預定形過程之通常之處理溫度之180℃近邊而不會損及伸縮性者爲合宜。

此種聚氨基甲酸系彈性纖維可舉出，例如由聚烷撐乙

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五、發明說明（22）

醚二醇共聚合體，主要係由4,4二苯甲烷二異氰酸酯所成之芳香族二異氰酸酯及二官能性二胺所獲得之聚氨基甲酸酯所成。聚氨基甲酸酯之氨基甲酸酯部份之數平均分子量爲6000~9000。而尿素部份之數平均分子量爲650~950。300%模數係0.20g/dtex以下之聚氨基甲酸酯，惟不侷限於它。

構成本發明之具有立體布料之表面及裏面之基布料之非彈性紗乃，單絲紗或紡績紗其中之一均可以。具體的說，單絲紗係以由：黏膠人造絲、銅氨人造絲、醋酯纖維、聚醯胺纖維、聚酯纖維、聚三甲撐對苯二甲酸酯纖維、丙烯腈纖維、聚丙烯纖維、氯化乙烯纖維等之化合纖維等所成爲合宜。而其纖維之形態即，未經加工之原絲、假撚加工紗、先染紗等任一種均可以這些之複合紗也可以。

紡績紗乃以使用：棉、羊毛、麻等之天然纖維、黏膠人造絲、銅氨人造絲、醋酯纖維、聚醯胺纖維、聚酯纖維、丙烯腈纖維、聚丙烯纖維、氯化乙烯纖維等之化合纖維所成之短纖維者爲宜，這些之單獨或混紡者均可以。

使用於構成表面及裏面之基布料之紗之總纖度係以22~1220dtex之範圍爲合宜，33~310dtex之範圍更合宜。

單絲纖度以0.1~310dtex之範圍爲宜，0.2~20dtex之範圍更合宜。

本發明之具有多層構造之彈性布料乃，具有容易熱成型加工之特徵。

由本發明之熱成型而被形成固定了凹部及/或凸部之多層構造之彈性布料乃，在其表面或裏面之基布料中含有彈

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五、發明說明（23）

性纖維爲宜。表面及裏面兩方地均含有彈性纖維更爲合宜。布料中之聚氨基甲酸系彈性纖維之混率雖不做限定，惟以5~60質量%爲合宜。在於表面或裏面含有彈性纖維之布料乃可以提高成型加工性，可賦予成型後之伸縮性，又具有由外壓而變形之後仍容易復原至原來形狀之特徵。

彈性纖維乃以聚氨基甲酸系彈性纖維爲宜，與使用於結合紗之聚氨基甲酸系彈性纖維相同或不相同者都可用。

如上所述，本發明之具有多層構造之彈性布料乃以聚氨基甲酸系彈性纖維來形成彈性布料之骨格。所以藉由聚氨基甲酸系彈性纖維之熱固定性能而容易實施凹凸之賦型加工。且賦型後之凹凸形狀係得於牢固地留存。此特徵乃在於表裏二層之基布料間具有空隙之立體構造之彈性布料上特別的顯著。具有立體構造之彈性布料乃藉其剛性而該凹凸形狀之保持性係非常高且良好。當然該形成基布料之非彈性紗條亦採用具有優異之熱可塑性之聚酯纖維，或比較的低融點之聚丙烯纖維等爲合宜。以這些熱的性質不同之非彈性紗條係表裏個別的形成亦可以。藉由賦型加工時之溫度及時間之控制，例如可以做成裏面係硬化成如樹脂，表面即接觸於人之肌膚時有舒適之柔軟觸感者等等。

多層構造之彈性布料之原布料係施予開匹，經前處理之後，再經染色過程而可實施包含樹脂加工之精加工定形等。

本發明之具有多層構造之彈性布料乃藉由熱成型加工來形成・固定凹部或凸部爲其特徵。熱成型加工之方法即

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不限定。使用過熱板可以獲得，具有優異之形態固定性，有外力之施加而凹陷後可復原至原來形狀之復原力優異之彈性布料。

做爲使用過熱後之熱成型加工，例如，將表面部設置於所欲之凹形之母型模上，接著由裏面部使用凸形之公型模來推壓，由預先加熱爲高溫之母型模及被加熱爲較母型模低溫之公型母來加熱成型該兩層部。此時之母型模與公模之間隔乃，分離成所必要之形態固定厚度地施予加熱壓接成型爲宜。此時之加熱成型溫度、加熱成型時間、加熱成型間隔等即配合於所欲之形態地適當的選定就可以。

本發明之立體構造布料乃以容積保持係數0.5以上爲宜。0.6以上更合宜。

容積保持係數乃，熱成型用模之成型容積爲A，被熱成型加工之立體構造布料之成型容積爲B時，以B/A可算出。

熱成型形態之容積保持係數未滿0.5時成型加工後之布料之形態保持不充分。如採用此種立體構造布料而獲得成型體時，須要加大熱成型加工時之布料伸長率，因此容易發生斷紗等等會降性工程性。

例如從立體構造布料採取經30cm、緯30cm之試料片，對於中心部施予安全帽狀之公・母型壓模加工，由而將壓模加工狀態就可以使用於安全帽之中材，可以獲得具有立體構造之安全帽緩衝材。再者採取經20cm，緯45cm之試料片施予奶罩杯模製加工，只留存所必要之部份，將週邊施予拷克縫紉機之縫製，由而可以獲得競賽用奶罩。

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五、發明說明（25）

本發明之立體構造布料乃由於表面與裏面之布料獨立，因此改變表面與裏面之使用胚材之組合由而可以獲得所欲之布料。表面與裏面之布料係如果使用由聚氨基甲酸系彈性紗所成之連結紗而以集合線圈(tuck)組織來編成時，使用於護具(帶)(supportor)時，具有緩衝外力施加之衝擊力之功效，因此很合宜。

本發明之多層構造之彈性布料乃，在於施予熱成型加工，成爲所欲之立體構造體之一部份之後，藉縫製來接合加工成所欲之形狀而使用也可以，施予植絨加工，將一面或雙面施予起毛加工也可以。

本發明之具有多層構造之彈性布料乃，在於基布料上使用複數之非彈性紗條，藉由提花編成(Jacqurd knit)等而在於基布料賦予圖案花樣也可以。

再者，在於本發明之具有立體構造之彈性圓布料或彈性經編布料中，令表裏二層之基布料之一部份之以接觸狀態地接觸由而可以形成立體部位及線狀或面狀之三層構造部位，結果對於布料整體可賦予具有凸凹之立體的花樣也。

再者，具有立體構造之彈性圓(織)布料，及具有三層構造之彈性圓(織)布料，以及這些之複合而成之上述之立體部位以及形成線狀或面狀之三層構造部位，結果而言，在於布料整體被賦予具有凹凸之立體花樣之本發明之彈性布料乃亦可適用於一部份之未開匹，維持筒狀一部份縫製之無縫成形衣料上。換言之本發明乃可以具體的實現衣服之部

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位別地所必要之機能。換言之，以自行車賽車用短褲爲例，在於座鞍部位置之部份即施予立體的編成，對於腰圍部份即形成比較的力道強勁之三層構造之彈性圓織布料就可以。

本發明乃有關於編成含有彈性紗之布料之編成方法，特別是在於圓織機上，從1台之供紗裝置供給至少二個之彈性紗包裝(紗筒)時，得至少以二種以上之供給速度來供給彈性紗爲其特徵之彈性圓織布料之編成方法。

又，本發明人等係尋覓出，使編成基布料之聚氨基甲酸系彈性纖維裸紗之供給速度(V-g)，及結合表裏布料之聚氨基甲酸系彈性纖維裸紗之供給速度(V-c)爲特徵之具有多層構造之彈性布料之製造方法，且發明使它具體實現之裝置。

由裝著於一台之圓織機上之聚氨基甲酸系彈性纖維之裸紗之卷裝中，將聚氨基甲酸系彈性纖維供給於織針之積極的供紗之方法中，至少以二種之供給量的送出，由而達成以往不可能編成之特別是具有多層構造之彈性圓織布料之編成。

再者尋覓出，以控制於延伸部率2倍以下的供給該結合表裏基布料之聚氨基甲酸系彈性纖維裸紗由而從貼合表裏二層之基布料狀態之三層構造基布料而可以製造出，在於兩基布料間具有空隙之立體構造之彈性圓織布料。

本發明人等創作出，製造本發明之多層彈性圓織布料時所必要之送出聚氨基甲酸系彈性纖維之裸紗之裝置。

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五、發明說明（27）

按先前日本專利公報特公平4-9222號公報中，所提案之供紗裝置乃，具有，延伸於主體(支架)之左右之一對支承輥，而由與織機連動之確動皮帶所驅動。而在於支承於支架上之一對支承-驅動輥上令複數之彈性紗卷裝(紗筒)得自由也地旋轉者。

惟，在於該裝置係，如與織機連動之確動皮帶爲一個時聚氨基甲酸系彈性纖維之給紗量將全部成爲同一量。因此本發明人等創作出，增加確動皮帶，變更聚氨基甲酸系彈性纖維之給紗量之方法。惟此時，由於在於一台之供紗裝置上，裝著四個聚氨基甲酸系彈性纖維之卷裝(紗筒)，所以供給量之變更成爲四個單位，具有自由度少之問題。所以又創作出以一個確動皮帶之驅動下，由一台給紗裝置由彈性纖維卷裝中，將不同之紗速安定的供給該紗之裝置。詳述之，旋轉自如地支承於支架，且互相平行地延伸之一對紗筒支承-驅動輥係從上述支架而凸出於各相反之方向狀地予以配置，且具備令該紗筒支承-驅動輥旋轉之驅動手段。製備有：一對之紗筒支承-驅動輥之表面速度係在於上述支架之相反之方向地呈顯不同地裝備有外徑不同之紗筒支承-驅動輥及/或裝備有令相反方向之一對紗筒支承-驅動輥變速驅動之手段爲其特徵之供紗裝置。

一對紗筒支承-驅動輥係由於需裝卸自如地固定於驅動軸，所以在於圓筒芯上備有插入孔，且，備有固定用之零件。此供紗裝置係再具備，較以同速之表面速度旋轉之一對紗筒支承-驅動輥爲高速之表面速度旋轉之別的預延伸輥

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五、發明說明（28）

爲其特徵。

本發明係提供一種須要改變二種速度地供給(紗)之彈性布料之編成用之彈性紗供給方法及裝置。以往之交織(交編)了彈性裸紗之布料乃其代表例爲平布料。這是對於非彈性紗條將彈性紗拉齊，做成添紗編而成者。又另一例子有羅紋布料，惟此性彈性紗係在於針盤針形成平布料者。這些情形中彈性紗組織只有一種，所以在通常之編織機上，以一系統之彈性紗供紗裝置就可以對應並無問題，而本發明人等乃隨著需要不同之供紗紗速之新穎組織之發明而一併的發明了需要不同速度之供紗之裝置及方法。

換言之本發明之彈性紗供紗裝置乃，主要係同心地安裝於圓織機之周圍之被捲繞成紗筒子狀之彈性纖維之裸紗之，得於以一定之速度地解舒，延伸控制地供給於織(編)機者。

下面於第4圖具體的表示其裝置之外觀，並予以說明。

又,第5圖係由側面觀視本發明之供紗裝置之支架15之內部之側面圖。第6圖係本發明之供紗裝置之正面圖。

供紗裝置乃，支架(15)，及旋轉自如地被支承並互相平行的延伸之一對紗筒支承-驅動輥(11-a及11-b)係從上述支架(15)而凸出於相反之方向地被配置，且做爲該紗筒支承-驅動輥之驅動手段具備確動皮帶(13)及驅動傳遞裝置。而令一對之紗筒支承-驅動輥之表面速度係在於上述支架之相反之方向而會不相同地，紗筒支承-驅動輥(11-a)與(11-b)係外徑不相同。

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一對之支承-驅動輥係在於圓筒芯上，備有插入孔。而在該驅動軸上可以固定支承輥之構造。而對於不同之紗速比而適宜的可能變更。再者較一對之紙筒支承-驅動輥(11-a)或(11-b)而更高速之表面速度而旋轉之預延伸輥(12-a)及(12-b)及彈性紗之解舒後，被延伸控制之位置之紗筒支承-驅動輥(11-a)與預延伸輥(12-a)之間具備有斷紗感測器(14)。

紗筒支承-驅動輥之徑係從1cm~10cm。因此對於低紗速輥之旋轉速度之高紗速輥之旋轉速度可達10倍。再者，預延伸輥(12-a)或(12-b)係對於對應之紗筒支承-驅動輥(11-a)或(11-b)相比得以1.2倍以上2.0倍以下之高速之表面速度而可以旋轉。又符號(10-a)(10-b)係將聚氨基甲酸系彈性紗之裸紗捲繞於紙筒之紗筒。

本發明之作用效果係使用：例如日本專利公報特公平4-9222號所示之以往一般所用之彈性紗供紗裝置時，由於其紗速係一定，因此爲了供給本發明之多層構造編成條件一般之需不同之速度供給彈性紗時必需要爲了增設驅動系統用之成本及裝置設置空間，又彈性紗係雖然微少係具有黏著性，對於高速舒開或低延伸舒開時往往發生不能舒開之問題，本發明之裝置係對於前者之問題以低成本，對於後者之問題即藉設置預延伸輥來解決也。

下面以實施例具體的說明本發明。

本發明中所使用之物性乃以下述之方法來測定。

(1)單位面積重量(基重)

依據JIS-L-1018之每平方公尺之質量試驗方法測定之。

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五、發明說明（30）

(2)厚度

使用加藤特克(股)製KES-EB3壓縮試驗機測之。

將試料挾持於具有面積25cm^{2}之圓形表面之銅板間(壓縮速度0.02mm/sec)，壓縮力Pm 0.5g/cm^{2}而以5處測定試料之厚度，採取其平均值。

(3)壓縮率及回復率

依據JIS-L-1018測定之。

將立體布料裁斷爲2cm× 2cm之尺寸，在測定台上放置1枚，測定從上部對於厚度方向4cm^{2}之面積上賦加初負載20cN時之厚度A。接著對於4cm^{2}之面積施加負載300cN，測定1分鐘後之厚度B之後，除去負載放置1分鐘，測定回復至初負載時之厚度C。此測定實施3次，依下式計算壓縮率及回復率，求其平均值。

壓縮率(%)={(A-B)/A}× 100

回復率(%)={(C-B)/(A-B)}× 100

(4)通氣性

使用加藤特克(股)製KES-F8-API通氣性試驗機，測定5次之通氣阻抗，採其平均值。

(5)布料之觸感

依5名測試者之感官測試之結果來判斷。

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五、發明說明（31）

(6)伸長率及伸長回復率

將布料裁斷成2.5cm×15cm之尺寸，以定速伸長試驗機(擔錫倫東洋波爾特雨印公司製)而以把持長度10cm，伸長速度100%分鐘而實施最大負載9.8N/cm爲止之伸長及回復時之結果來製成伸長回復曲線。

由此曲線圖讀取9.8N/cm爲止之伸長率，伸長比係由下式求之。

伸度比(A)=3.5N/cm負載下之經方向之伸度(%)÷緯方向之伸度(%)

伸度比(B)=9.8N/cm負載下之經方向之伸度(%)÷緯方向之伸度(%)

伸長回復率乃由於9.8N/cm負載下之伸長量(c)及回復時負載之成爲零時之伸長量(d)而由下式求之。

伸長回復率(%)=(c-d)×100/c。

(7)彈性纖維拉拔阻抗力

將布料，以彈性纖維之方向爲經裁切爲長度7.5cm，寬2.5cm之尺寸。接著經方向之1/3爲止，裁切寬方向中央部之彈性纖維1支之兩側，從布料取出彈性纖維，接著在此彈性纖維布料中2.5cm之處以剪刀裁切彈性纖維，製作測定片，以下述之測定條件做測定。

(測定條件)：以定速伸長試驗機(擔錫倫東洋波爾特雨

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五、發明說明（32）

印公司製)分別把持布料部及彈性纖維。以伸長速度30cm/分鐘而拉伸彈性纖維，記錄此時之阻抗力採取拉伸應力峰值之平均值。

(8)容積保持係數

布料之成型容積乃，將熱可塑性薄片(於乾熱80~100℃而軟化之合成樹脂薄片)載置於成型後之布料之表面，以乾熱風(以吹風機吹至軟化溫度)，而沿著布料之凹部或凸部而保持同型狀之後，以冷風而使熱可塑性薄片固定。將對於布料之凹凸部之形狀原狀地使之保持之熱可塑性薄片中灌入水測定容積。

將成型所用之金屬模之容積做爲熱成型容積。測定成型後之布料之容積，而以下式求出容積保持係數。

容積保持係數=(成型加工後之布料所保持之成型容積)/(熱成型容積)

(實施例1)

做爲使用於立體布料之表面之布料及使用於裏面之布料所使用紗而使用84(dtex)，30單絲之聚酯假撚加工紗(蒂克乃法印(商標譯名);旭化成(股)而以平組織(天竺組織)來形成布料。用於結合表裏之布料之紗(結合紗)而使155dtex之聚氨基甲酸系彈性纖維裸紗(魯衣卡(商標譯名); 旭化成(股)。

以28G，30英寸徑，60口兩面圓針織機(福原製機(股)，機種V-LEC6)，而以全針實施結合編成，而以針桶間定爲

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五、發明說明（33）

4mm獲得圓織布料，此之聚氨基甲酸系彈性纖維裸紗之線圈長度爲800cm，構成表面及裏面之布料之線圈長度係827cm，該結果線長比(T)係1.0。

所獲得之圓織布料予以開匹，以液流染色機而以80℃×30分鐘之條件施予精練，做爲預定形，而以拉幅精加工機而5%拉幅於寬度方向，以溫度190℃，60秒鐘而實施熱處理。接著使用高壓液流染色機，以130℃×60分鐘之條件實施染色，做爲製品定形而使用拉幅精加工機，而在於寬方向拉幅3%之下，以熱處理條件170℃×45秒鐘處理獲得染色布匹。此時之編成內容及布料示於表1及表2。

所獲得之立體布料係厚度2.65mm，壓縮率60%，回復率92.0%，通氣性0.45乃觸感良好之立體(編物)布料。

此立體布料係在於鞋靴等之中敷材或床墊等非常合宜者。

(實施例2)

與實施例1同樣地編成了立體布料之表面布料及裏面布料，結合表裏布料之紗係使用310dtex之聚氨基甲酸系彈性纖維裸紗(魯依卡(商標譯名);旭化成(股))。此時之編成即由全部之織針行之。所獲得之布料上施予與實施例1同樣之處理。

此時之編成內容及布料特性表示於表1及表2。

所獲得之立體布料係厚度3.12mm，壓縮率55%，回復率99.4%，通氣性0.41，觸感良好者，此立體布料係適合於鞋

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靴等之中敷材或生活資材之床墊等。

（實施例3）

結合編成條件係以1/2之針來結合，其他完全與實施例2同樣地實施編成。此時之編成內容及編成特性表示於表1及表2。

所獲得之立體布料係厚度3.00mm，壓縮率60%，回復率97.4%，通氣性0.55，觸感良好者。此立體布料係適合於鞋靴之中敷材或生活資材之床墊等用途。

（實施例4）

結合編成條件係以1/4之針來結合，其他完全與實施例2同樣地實施編成。此時之編成內容及布料特性表示於表1及表2。

所獲得之立體布料係厚度2.85mm，壓縮率71%，回復率91.6%，通氣性0.62，觸感良好者。此立體布料係非常適合於鞋靴之中敷材或生活資材之床墊等等。

（實施例5）

於立體布料之表面之布料使用棉紡積紗40支紗，裏面之布料使用167dtex 48單絲之聚氨基甲酸假撚加工紗（蒂克諾法印（商標譯名）;旭化成（股）以平組織形成兩面之布料。

結合紗係使用310dtex之聚氨基甲酸系彈性纖維裸紗（魯依卡（商標譯名）;旭化成（股）），以全針實施結合編成。

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五、發明說明（35）

使用22G，30英寸徑，36口之兩面圓針織機(MAyerc公司機種OVJ-36)，而以針桶間爲5mm，編成圓織布料。

此時之聚氨基甲酸系彈性纖維裸紗之線圈長度爲2160cm，構成表面及裏面之布料之線圈長度爲1063cm，結果線圈比(T)爲2.0。

對於此圓布料上，實施與實施例1同樣之製品加工獲得本發明之立體布料，此時之編成內容及編成特性表示於表1及表2。

所獲得之立體布料爲厚度3.35mm，壓縮率65%，回復率99.0%，通氣性1.18，觸感良好者。

此立體布料係非常適合於鞋靴之中敷材或生活資料之床墊等等者。

(實施例6)

與實施例5同樣地編成了立體布料之表面之布料及裏面之布料。結合表裏布料之結合紗係使用34dtex之聚氨基甲酸系彈性纖維裸紗(魯依卡(商標譯名);旭化成(股)。

對於獲得之圓織布料實施與實施例5同樣處理，此時之編成內容及布料特性表示於表1及表2。

所獲得之立體布料係厚度2.23mm，壓縮率72%，回復率86.2%，通氣性0.45，觸感良好者。

此立體布料係非常適合於鞋靴等之中敷材或生活資材之床墊等等。

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（比較例1）

與實施例1同樣地編成立體布料之表面之布料及裏面之布料。

結合表裏布料之結合紗係使用：155dtex之聚氨基甲酸系彈性纖維裸紗（魯依卡（商標譯名）;旭化成（股），及83dtex，24條單絲之聚酯芯鞘型（包紗）之熱融著紗（貝爾卡普爾（商標譯名）;鐘紡合纖（股））。

一面將彈性纖維伸長2.5倍，與熱融著紗複條單絲拉齊，以下述之條件實施交絡加工，接著使用下述之合撚機而以設定撚數600回/m而合撚於Z撚方向，作入合撚紗。

<交絡加工>交絡機：（東普力西順（股）製PC-220型，空氣壓：2.0kg/cm^{2}G

<合撚>撚紗機：伊大利撚紗機（久保田（股）製TKT型）

以所獲得之合撚紗，對於表裏布料以全針地結合編成圓織布料，對於所獲得之圓織布料施予與實施例1同樣之處理加工，該時之編成內容及布料特性表示於表1及表2。

所獲得之圓織布料乃，厚度1.87mm，壓縮率5%，回復率82.0%，通氣性1.33。

此立體布料之壓縮性欠缺，觸感上無立體感之硬邦邦者。不適合於生活資材之床墊之用。

（比較例2）

與實施例5同樣地編成了立體布料之表面布料及裏面布料。結合表裏布料之紗係使用15dtex之聚氨基甲酸系彈性纖

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五、發明說明（37）

維裸紗(魯依卡(商標譯名);旭化成(股)製)，其他與實施例同而編成立體布料，此時之編成內容及編成特性表示於表1及表2。

所獲得之圓織布料乃，厚度1.5mm，壓縮率80%，回復率45%，通氣性0.23，觸感柔軟，在於壓縮回復性，觸感上不適合於生活資材之床墊等者。

(實施例7)

使用28G，30英寸徑，60口之兩面圓針織機(福原製機製，機種V-LEC6)，編成具有三層構造之伸縮性圓織布料，針桶間係設定於1mm。

使用於彈性圓織布料之表面之布料及裏面之布料之紗係56dtex，30單絲之聚酯假撚加工紗(蒂克諾法印(旭化成製商標(譯名)下面同)及聚氨基甲酸系彈性纖維裸紗22dtex(魯依卡(旭化成製，商標譯名，下面同)，而以平組織編成布料(編織布料)。

結合表裏之布料之結合紗即使用聚氨基甲酸系彈性纖維裸紗155dtex(魯依卡)，而以表裏1針交互之總針數之1/2以集合線圈組織(tuck)來連結。

此時之做爲結合紗之聚氨基甲酸系彈性纖維裸紗之織機一周之線圈長度爲190cm(A)，構成一方之面及另一方之面之布料之聚酯假撚加工紗之紗圈長度爲850cm(B)，結合紗之線圈長度比(A/B)爲0.22。

將所獲得之圓織布料予以開匹，以液流染色機80℃ x 30

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五、發明說明（38）

分鐘之條件來精練，使用拉幅精加工機施予預定形，一面在於寬方出拉幅5%，以溫度190℃，時間60秒而施予熱處理。接著使用高壓液流染色機以130℃ x 60分鐘之條件施予染色。

做爲製品加工而使用拉幅精加工機，一面在幅方向拉幅3%，以170℃ x 45秒施予熱處理，獲得染上布匹。此時之編成內容及布料特性表示於表3及表4。

獲得之彈性圓織布料係表裏基布料之貼合而成之三層構造。厚度0.58mm，伸長率縱向130%，橫向158%，伸長回復率縱91%，橫93%，彈性纖維拉拔應力係80g觸感良好者。

此彈性圓織布料乃不會發生從布料端之紗之脫落，不需要端面之縫製，做爲婦女用緊腰衣而觸身感及補形機能之優異者。

(實施例8)

在於實施例7中，將該結合彈性圓織布料之表面之布料與裏面之布料之紗條而使用，聚氨基甲酸系彈性纖維裸紗44dtex(魯依卡)，以全部之針實施結合編成之外，其他均以與實施例7同樣之編成條件實施編成，實施同樣之處理，獲得三層構造之彈性圓織布料。

所獲得之彈性圓織布料乃厚度0.55mm，伸長率縱133%，橫181%，伸長回復率縱92%，橫93%，彈性纖維拉拔應力係50g以上，觸感良好者。

此彈性布料乃不會發生從布料端之紗之脫落，不需要

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五、發明說明（39）

端面之縫製，做爲婦女束腰件而觸身感及補形機能良好者。

（實施例9）

在於實施例8中，做爲編成條件，以1/2之針來結合之外，其他即與實施例8同樣地獲得了彈性圓織布料。所獲得之三層構造之彈性圓織布料係厚度0.55mm，伸長率縱向135%，橫向183%，伸長回復率縱向91%，橫向93%，彈性纖維拉拔應力係50g以上，

觸感良好。

此彈性圓織布料係不發生從布料端之脫紗，因此不需要端面之縫製，做爲婦女束腰件而具有良好之接觸感及補形機能者。

（實施例10）

在於實施例8中，做爲結合編成條件係以1/4之針結合之外，均與實施例8同樣地獲得了彈性圓織布料。

所獲得之彈性圓織布料係厚度0.55mm，伸長率縱137%，橫185%，伸長回復率縱91%，橫92%，彈性纖維拉拔應力係50g以上，觸感良好者。

此彈性圓織布料係不會發生從布料端之脫紗，不需要端面之縫製，縫製時之操作性良好，做爲婦女之束腰件而肌接感及補形機能均優異者。

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五、發明說明（40）

（實施例11）

使用18G，30英寸徑36口之圓織機（麥亞西（股）製，OVJ-36型），而編成了圓織布料。

使用於彈性圓織布料之表面之布料之紗係，使用拉齊：線紡積紗40支，及22dtex之聚氨基甲酸系彈性紗（魯依卡（商標譯名）；旭化成（股）製）爲芯紗，而被覆了尼龍加工紗34dtex，/12單絲之彈性紗。使用於裏面之紗係聚酯假撚加工紗167D48單絲（蒂克諾法印），而以平編織組織，由而分別形成各面之布料，做爲結合該表裏之布料之結合紗而使用聚氨基甲酸系彈性纖維裸紗142dtex（魯依卡），以總針數之1/2實施集合線圈（tuck）組織來編成。

此時之聚氨基甲酸系彈性纖維裸紗之線圈長度係190cm，構成一方之面與另一方之面之布料之線圈長度係共計950cm，線圈長度比係0.20。

所獲得之伸縮性布料係，厚度0.78mm，伸長率縱向80%，橫向100%，伸長回復率縱向92%，橫向93%，彈性纖維拉拔應力係80g，觸感良好惟發生布料之彎曲（蹺曲）。

此伸縮性布料係會發生從布料端之脫紗所以縫製了端面，縫製時之操作性良好，做爲婦女之束腰件而貼合感良好及補形機能良好者。

（實施例12）

將實施例之織機變更爲羅紋出針，第1及第3給紗口係設定爲針盤平織，針桶1/2針集合線圈（掛紗）組織，第2，第

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五、發明說明（41）

4給紗口係設定爲針桶平織，針盤1/2針集合線圈(掛紗)組織。

而在於針桶側之表面紗即使用棉紡績紗40支，針盤側之裏面所使用紗係使用聚酯假撚加工167dtex 48單絲(蒂克諾法印)而做爲編成平織(天竺組織)時之表裏布料之結合紗而使用聚氨基甲酸系彈性纖維裸紗34dtex(魯依卡)在於各給紗口而一面編成平織(天竺部)之同時，實施對於相對於針列而以1支交互地做成可能掛紗(tuck)編成之複合給紗。

換言之，連結紗係一面編結(knit)，對應面掛紗(tuck)之彈性紗連結。其他即與實施例5同樣，獲得伸縮性布料係，厚度0.74mm，伸長率縱向80%，橫向130%，伸長回復率縱向93%，橫向92%，彈性纖維拉拔應力50g以上，觸感良好者。

此伸縮性布料係從布料端發生脫紗，因此縫製了端面，縫製時之操作性良好，做爲婦女之束腰件而在於貼合感及補形機能良好者。

(比較例3)

使用18G，30英寸徑 36口之圓織機(麥亞西(股)製，OVJ-36型)，來編織圓織布料。

使用於伸縮性布料之表面之布料之紗係棉紡績紗40支，使用於裏面布料之紗爲聚酯假撚加工紗167dtex，48單絲(蒂克諾法印)，在於編成單面胖花(片袋)組織時，以1/2之給紗口而將聚氨基甲酸系彈性纖維裸紗142dtex(魯依卡)，襯墊(in lay)插入編結。

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五、發明說明（42）

此時之聚氨基甲酸系彈性纖維裸紗之線圈長度係190cm，構成一方之面及另一方之面之布料之線圈長度均760cm，線圈長度比爲0.25。

所獲得之伸縮性布料係，厚度0.80mm，伸長率縱向45%，橫向100%，伸長回復率縱向66%，橫向75%，拉拔應力係40g以上，此伸縮性布料之伸長率劣，縫製時之彈性纖維容易拔取，操作性不良。

(比較例4)

與實施例7同樣地編成了伸縮性布料之表面之布料，以及裏面之布料。結合表裏布料之紗條係，使用聚氨基甲酸系彈性纖維裸紗155dtex(魯依卡)，及聚醯胺複支單絲44dtex，34單絲(麗歐那)，而將彈性纖維一面伸長至2.5倍，與聚醯胺複支單絲拉齊之後以下述條件實施交絡加工，接著使用下述之合撚機以設定撚數600次/m Z撚方向合撚製成合撚紗。

<交絡加工>

交絡機：(東麗・普力西順(公)製PC-220型)

空氣壓：2.0kg/cm²G

<合撚> 撚紗機：伊大利撚紗機(久保田(公)製TKT型)，將所獲得之合撚紗使用於結合表裏布料之結合紗條，以結合數之1/2集合線圈(掛紗)組織編成製成圓織布料。

所獲得之伸縮性布料係厚度0.60mm，伸長率縱向100%，

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五、發明說明（43）

橫向120%，伸長回復率縱向75%，橫向60%，彈性纖維拉拔應力係100gr，呈顯凹凸之外觀。

此伸縮性布料係結合紗浮出於表面，外觀不佳，伸縮性也不良，不適合使用於婦女束腰件者。

(比較例5)

在於實施例12中，用於結合表裏布料之紗條而使用了聚氨基甲酸系彈性纖維裸紗11dtex(魯依卡)之外，其他即與實施例5同樣，獲得了伸縮性布料。

所獲得之布料係厚度0.75mm，縱伸長率40%，橫伸長率87%，縱伸長回復率89%，橫伸長回復率75%，布料係欠缺伸縮性者。

(實施例13)

使用於立體布料之表面及裏面布料之紗係使用：84dtex，30單絲之聚酯假撚加工紗(蒂克諾法印(商標譯名)；旭化成(股)製，及聚氨基甲酸系彈性纖維裸紗22dtex(魯依卡(商標譯名)；旭化成(股)製)，將二條紗拉齊以平織(天竺組織)形成布料。

結合表裏之布料之連結紗係使用聚氨基甲酸系彈性纖維裸紗155dtex(魯依卡(商標譯名)；旭化成(股)製)。

使用28G，30英寸徑 60口之兩面針織機(福原精機(股)製，機種V-LEC6)來編成，針筒間設爲4.0mm獲得圓織布料。

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五、發明說明（44）

所獲得之圓織布料予以開匹，以液流染色機80℃ x 30分鐘之條件施予精練，做爲預定形而以拉幅精加工機而一面寬方向拉幅5%，一面以190℃ x 60秒之條件施予熱處理。

接著使用高壓染色機，以130℃ x 60分鐘之條件實施染色，做爲製品定形而使用拉幅精加工機，一方面在寬方向拉幅3%，一面以170℃ x 45秒之熱處理。獲得染上布匹。對於獲得之布料使用昇溫至乾熱190℃之容積300cm^{3}之熱成型用模，實施45秒間之熱成型加工，此時之編成內容及布料特性顯示於表5及表6。

所獲得之立體構造布料係，每單位面積重量(基重)350g/m^2，厚度2.2mm，熱成型加工後之容積210cm^3，容積保持係數0.7。

此立體構造布料乃在形態固定形及由外力而凹下之後之復原至原形之復原力優異，很適合於成型地使用之鞋材，奶罩杯材，泳衣，連身內衣及爲了維持形態而固定之肩墊，束身衣，帽子等以及收容箱之內模外模材等等。

(實施例14)

與實施例13地，做爲使用立體布料之表面之布料及裏面之布料之紗係84dtex，30單絲之聚酯假撚加工紗(蒂克諾法印(商標譯名)；旭化成(股)製)及聚氨基甲酸系彈性纖維裸紗22D，(低溫高定形紗)，魯依卡BX(商標譯名)；旭化成製(股)製，將二條拉齊以平組織(天竺組織)而來編成。結合表裏之布料之紗條係使用聚氨基甲酸系彈性纖維之裸紗155dtex(魯

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依卡(商標譯名)；旭化成(股)製。

所獲得之布料係實施與實施例13同樣之處理。

所獲得之立體布料係單位面積重量爲400g/m^2，厚度2.5mm熱成型加工後之布料容積270cm^3，容積保持係數0.9。

此立體構造布料係形態固定性及由外力凹入之回復原形之復原力優異，非常適合於被成型使用之鞋材，奶罩杯材，泳衣，連身衣及維持形態而固定使用之肩墊，束腰件，帽子之外，收納箱之內模，外模材等等。

(實施例15)

使用於立體布料之表面之布料及裏面之布料之紗係84dtex，30單絲之聚酯假撚加工紗(蒂克諾法印(商標譯名)；旭化成(股)製，及聚氨基甲酸系彈性纖維裸紗22D(低溫高定形型紗)魯依卡BX(商標譯名)；旭化成(股)製，而將二條拉齊形成平織(天竺組織)形成布料。結合表裏之布料之紗條係使用聚氨基甲酸系彈性纖維之裸紗78dtex(魯依卡(商標譯名)；旭化成(股)製。

其他即與實施例13同樣地實施編成及處理。

所獲得之立體構造布料係單位面積重量230g/m^2，厚度2.1mm，熱成型加工後之布料之容積240cm^3，容積保持係數0.8。

此立體構造布料係形態固定性及由外力而凹入復原之原形之復原力優異，非常適合於被成型使用之鞋材，奶罩杯材，泳衣，連身衣及維持形態固定使用之肩墊，束腰件，

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帽子等之外，收納箱之內模，外模材等等。

（比較例6）

使用於立體布料之表面之布料及裏面之布料所使用之紗係，84dtex，30單絲之聚酯假撚加工紗（蒂克諾法印（商標譯名）；旭化成（股）製，而以平織（天竺組織）來形成布料。

結合表裏之布料之紗條係使用84dtex，30單絲之聚酯假撚加工紗（蒂克諾法印（商標譯名）；旭化成（股）製，其他即與實施例13同樣地實施編成及處理。

所獲得之布料之單位面積重量爲250g/m^2，厚度1.8mm，熱成型加工後之布料之容積120cm^3，容積保持係數0.4。

由於沒有形態保持性（不成形），不適合於生活資材等等之用途。

（實施例16）

結合立體布料之表面之裏面布料之結合紗係使用155dtex之聚氨基甲酸系彈性纖維紗（魯依卡（商標譯名）；旭化成（股）製）之裸紗直接單獨使用。裏面之基布料係使用84detx/30單絲之聚酯假撚加工紗（蒂克諾法印（商標譯名）；旭化成（股）製，及22dtex之聚氨基甲酸系彈性紗（魯依卡（商標譯名）；旭化成（股）製）之裸紗，將它拉齊以平織（天竺組織）形成布料。在表面之基布料係使用尼龍78dtex/34單絲之假撚加工紗及同上之22dtex之聚氨基甲酸系彈性紗，而與裏面之布料之形成同樣地予以編成。

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五、發明說明（47）

使用之針織機係，雙圓織機28G，30英寸徑，60口之兩面圓織機(福原精機(股)製，機種V-LEC6型)。將織機之針盤針與針桶針之齒口定爲4mm。從給紗口1而將用於形成表基布料之非彈性紗之尼龍之假撚加工紗，以編機1回轉給紗長(線圈長度)827cm地供給於針桶針，而從給紗口2供給形成裏基布料之非彈性紗之聚酯之假撚加工紗，同樣之給紗長(線圈長度)827cm/編機1回轉地供給於針盤之針。

使用了對於形成基布料之主胚材拉齊地(添紗)之聚氨基甲酸系彈性紗以原狀地從卷裝(筒子)而積極的送出之裝置。(供紗裝置)。

對於圓織機之第1給紗口及第2給紗口以410cm/織機1回轉之給紗長度(此時之聚氨基甲酸系彈性紗之編成時之延伸倍率係2.0倍)，而供給於織針，以添紗方式實施編成，形成各個表・裏基布料。

從第3給紗口而以兩面集合線圈組織(tuck組織)地，以給紗長800cm/編機1回轉，而對於針盤針，針桶針均供給於短檔針，而以集合線圈組織來連結該以第1給紗口及第2給紗口所形成之基布料。第4給紗口及第5給紗口即反複第1給紗口及第2給紗口之編成動作。第6給紗口即與第3給紗口一般地將聚氨基甲酸系彈性紗供給於針盤針，針桶針之高檔針。

將上述做爲一完全組織，以60口來實施編成。

由於採用每編成橫列地交互地以短檔針及高檔針而以兩面集合線圈(掛紗)(tuck)組織來組成，因此連結紗所結合

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五、發明說明（48）

之基布料之編目比率成爲50%，並且連結部位係成爲反復編成橫列地有相位移位之構造。

將獲得之圓織布料予以開匹，以液流染色機，以80℃×30分鐘之條件施予精練，做爲預定形，以拉幅精加工機而一面寬方向拉幅5%，以溫度190℃時間60秒施予熱處理之後，以高壓液流染色機，以100℃×60分鐘之條件而將使用酸性染料染色了尼龍部份，做爲製品定形，以拉幅精加工機而一面寬方向拉幅3%，以熱處理條件170℃×45秒獲得染上布匹。

所獲得之立體布料係厚度1.8mm，編結密度25.5橫列/cm×14.6緯條/cm平方cm之總連結條數係373條。每平方cm單位之連結紗之總dtex(D)係57,780dtex，D/T=32,100。

此彈性布料之壓縮率係54%，回復率100%，具有充分之壓縮性能，通氣阻抗係0.24KPa-s/m。

本布料之經緯兩方向均富於伸縮性，成爲裏面與表面而可以完全的翻面使用之布料。

(實施例17)

在於連結基布料之連結紗之聚氨基甲酸系彈性纖維而直接使用78dtex之聚氨基甲酸酯彈性紗(魯依卡(商標譯名)；旭化成(股)製)之裸紗，在於表裏基布料即使用84dtex/30單絲之聚酯原絲(蒂克諾法印(商標譯名)；旭化成(股)製)之裸紗，及22dtex之聚氨基甲酸系彈性紗(魯依卡(商標譯名)；旭化成(股)製)之裸紗。

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五、發明說明（49）

織機係使用裝備有五片梳櫛之雙拉斯徹(double Raschel)經編機18G(卡爾麥亞公司製)，針板間(釜間)設定4mm者。而將基布料之聚酯原絲及聚氨基甲酸系彈性紗從第1梳櫛(Guid bar)及第2梳櫛而只供給於前針，以資編成雙梳櫛經平組織。

從第4梳櫛及第5梳櫛而同樣地將二種之紗條只供給於後針，編成了半(half)組織。而從第3梳櫛而做爲連結紗以全穿經(full-set)地對於前針及後針之兩方交互地供給聚氨基甲酸系彈性紗之裸紗，編成了編結(knit)線圈而連結於基布料。

將所獲得之經編布料以連續精鍊機，以80℃ × 30分鐘來精鍊，做爲預定形而以拉幅精加工機而以寬方向以5%拉幅，而以溫度190℃，時間60秒之後，以高壓液流染色機，以130℃ × 60分鐘之條件而染色。

做爲製品定形而以拉幅精加工機而以一方面以拉幅3%以熱處理條件170℃ × 45秒處理獲得染上之布匹。

所獲得之彈性布料係，厚度2.5mm，編結密度係23.6橫列/cm× 11.8緯條/cm。每平方cm之總連結條數爲558條。

每平方cm之連結紗之總dtex爲43524dtex，D/T=17,410。

此彈性布料之壓縮率爲69%，回復率爲99.4%，具有充分之壓縮性能，通氣阻抗係0.33，係成爲布料經緯兩方向均富於伸縮性之布料。使用鋁製之具有凸凹之人面模而將所獲得之彈性布料，以乾熱180℃以30秒模製成型而成爲附賦有人面臉之眼罩而最適宜之布料。

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五、發明說明（50）

（實施例18）

使用與實施例16同樣之織機，在於裏面之基布料上，不使用彈性紗。表面之基布料使用22dtex之聚氨基甲酸系彈性紗（魯依卡（商標譯名）；旭化成（股）製）爲芯，而被覆尼龍加工紗34dtex/12單絲之彈性紗。其他之外即與實施例16一樣，而將該非彈性纖維之二條以一條之比例而拉齊以平織（天竺組織）而形成布料。

所獲得之彈性布料係，厚度2.0mm，18橫列/cm×11緯條/cm連結紗總條數爲198條，D/T=17,050。

此彈性布料之壓縮率69%，回復率爲99.9%，具有充分之壓縮性能。布料係經緯兩方向均富於伸縮性，成爲鞋靴之面上材最適合之布料。

（實施例19）

使用具備可藉由選針之提花花樣機構之22G兩面圓織機，在於針桶側供給尼龍78dtex/34單絲假撚加工紗及聚酯84dtex/30單絲之生紗，以資有花樣之二色提花布，同時以聚氨基甲酸系彈性紗（魯依卡（商標譯名）；旭化成（股）製）44dtex以裸紗現狀地予以添紗。以資形成之基布料。

在於針盤針上，供給聚酯84dtex/30單絲之生紗。編成平織之同時，將聚氨基甲酸系彈性紗（魯依卡（商標譯名）；旭化成（股）製），44dtex之裸紗實施添紗，形成裏面之基布料。

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五、發明說明（51）

連結紗使用310dtex之聚氨基甲酸系彈性紗(魯依卡(商標譯名)；旭化成(股)製)，與實施例16一樣，以短檔針及高檔針而交互地編結兩面雙合線圈(tuck)編結，以資結合表裏二層之基布料。

將獲得之圓織布料開匹後，以液流染色機而以80℃×30分鐘之條件而予以精鍊，做爲預定形而以拉幅精加工機而一方面寬方向拉幅5%一方面以溫度190℃時間60秒施予熱處理之後，以高壓液流染色機而以100℃×60分鐘之條件將尼龍部份使用酸性染料來染色。做爲製品定形而以拉幅精加工機，一面在於寬方向拉幅3%之下，以熱處理條件170℃×45秒施予熱處理獲得染好布匹。

所獲得之布料係厚度5mm，28橫列/cm×15緯條/cm，連結紗總條數爲420條，D/T=26,040。此彈性布料之壓縮率爲50%，回復率爲100%，具有充分之壓縮性能。布料之經緯兩方向均富於伸縮性，在於表面編成聚酯所編成之編目係白色狀地留存(顯現)，成爲具備花樣之最適合於保溫泳衣最適合之彈性布料。

(實施例20)

使用於實施例17所使用之雙拉斯徹(double Rachel)經編機同樣之用紡方法而在於編成本發明之彈性布料時，與實施例一樣實施80橫列之編成，接著之10橫列即以前針及後針之兩方將第2之梳櫛之聚酯原絲予以編成編結線圈，此間連結紗即避免與基布料之連結而以浮紗狀態地插入於二層

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五、發明說明 (52)

之基布料間。

接著，回至原來之編結組織編成80橫列而反復上述編成。所獲得之彈性布料，即以立體部位係布料之經方向以每3cm地隔開之花邊狀之凹凸地被形成。

此彈性布料係由於具有凹部，因此布料整體容易彎曲，很適合於捲繞於人體而使用之護身帶者。

(比較例7)

使用與實施例16同樣之織機，以實施例16同樣之組織及條件而編成布料。此時之基布料之紗之使用方式係與實施例16相同，結合紗係使用聚酯167dtex/48單絲之假撚加工紗。

所獲得之布料係與實施例16同樣之過程及條件地實施染色精(製品)加工。

此布料係厚度2.2mm，編結密度25.5橫列/cm× 14.6緯條/cm，每平方cm之總連結條數373條，每平方cm連結紗之總dtex(D)爲62,291dtex，D/T=22,246。

此布料之壓縮率爲62%，回復率68.8%，通氣阻抗0.64KPa・-s/m。布料之經緯兩方向均富於伸縮性，惟厚度方向之壓縮時之彈力性差，且壓縮回復也不充分，回復時間很拖久，永久應變係長久地留存於布料表面。又於連結部填充有纖維因此通氣性即與本發明之彈性布料劣，又此布料係被繩條狀態地被染色，因此製品定形之後也在表面留存有繩條狀態之皺紋。此布料捲繞於人體時，沿著人體

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五、發明說明（53）

之曲線地在於布料內側表面發生摺皺紋。此摺皺在將布料回復至布料狀態之後仍然留存。

(比較例8)

使用與實施例16同樣之織機，與實施例1同樣之組織及條件來編成布料。此時表裏之基布料均不使用聚氨基甲酸系彈性紗，而在於連結紗使用，以155dtex之聚氨基甲酸系彈性紗爲芯，捲繞聚酯(包芯紗)芯鞘型之熱融著紗167dtex/16單絲之被覆彈性紗。此時之彈性紗之被覆牽引爲2.5倍，包芯紗之撚數爲300回/m。由於連結紗係被覆彈性紗，因此不使用習用之將聚氨基甲酸系彈性紗以裸紗地編入所使用之積極型供紗裝置。

其他與實施例16同樣之方法編成布料，染色製品加工也同樣地實施。

所獲得之布料係厚度1.4mm。編結密度係14橫列/cm×11.5緯條/cm，每平方cm之總連結條數爲161條，每平方cm之連結紗之總dtex(D)爲24,955dtex。D/T=17,825。

此彈性布料之壓縮率係58%，回復率爲72.0%，通氣阻抗爲0.14Kpa・-s/m。

此布料雖然通氣阻抗低，惟厚度方向之壓縮回復性不佳，發生由壓縮之塑性變形，不是本發明之目的之布料。又連結紗係在於染色加工時發生熱融著。連結紗與基布料之結合係良好，惟熱融著部份硬，致使布料全體之觸感也硬，不容易彎曲，不適合於本發明之目的之人所著用或使

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五、發明說明（54）

用於靠近肌膚之處之使用。又與比較例7一樣具有彎曲布料時在於布料之內部發生摺皺，此摺皺係布料回復於原狀態時仍然不會有消失。

（產業上之利用之可能性）

本發明之具有三層構造之彈性圓織布料及彈性經編布料乃，不會發生布料耳部之蹺曲之彎曲情形，形態安定性優異，又伸長回復性，薄料感及表面品位也優良。

又與習用之單面圓織機或單面經編機可以製造之伸縮布料比較時，經緯之伸度平衡良好，可以提供用於內衣、緊身衣、運動衣、護身帶、等最適宜之彈性布料。

又由使用之目的適當的選擇所使用之聚氨基甲酸系彈性纖維之纖度，因此在於補形用途上，可以提供以往曾有之伸縮性能之布料。

本發明之具有立體構造之彈性圓織布料及彈性經編布料乃，很合宜地使用於鞋中敷材、鞋靴之上面材、拖鞋等之鞋材種類、皮包材、眼鏡或攜帶電話之保護盒等盒材料類、床墊、奶罩杯、肩墊等之墊類、枕頭蓋等之蓋材料類、口罩、眼罩、面罩等之罩類、護身帶、傷口保護材、護具、尿褲等之醫療副資材、褲襪・襪類、膝材類、保護短褲、滑動用褲、跳高用褲等之運動衣類、保溫內衣等之內衣類以及夾克等等須挺之外衣類上。

圖式之簡單說明

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五、發明說明（55）

第1圖係本發明之立體構造體之線圈(組織)圖。

第2圖係本發明之三層構造體之線圈(組織)圖。

第3圖係本發明之拉舍爾經編構造體之線圈(組織)圖。

第4圖係本發明之彈性紗供紗裝置之外觀圖。

第5圖係本發明之彈性紗供紗裝置之支架側面圖。

第6圖係本發明之彈性紗供紗裝置之正面圖。

第7圖係本發明之立體構造體之斷面照片。

第8圖係本發明之三層構造體之斷面照片。

符號說明

1　紗

2　紗

3　結合紗

4　紗

5　紗

6　結合紗

7　表面基布料

8　裏面基布料

9　裸紗

10a,10b　卷裝(筒子)

11a,11b　筒子支承-驅動輥

12a,12b　預延伸輥

13　確動皮帶

14　斷紗感測器

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五、發明說明（56）

15　支架

16　表面基布料

17　裏面基布料

18　表面基布料

19　裏面基布料

20,21,22,23　聚氨基甲酸系彈性紗

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五、發明說明（57）

表1

	使用紗					線圈長度		線圈長度比	編成組織	
	表面		裏面		結合紗	基布料	結合紗		結合紗	
	非彈性紗	彈性紗	非彈性紗	彈性紗		(短方)			結合數	彈性紗
實施例1	PET84	無	PET84	無	PU155	827	800	1.0	ALL	集合線圈組織
實施例2	PET84	無	PET84	無	PU310	827	800	1.0	ALL	集合線圈組織
實施例3	PET84	無	PET84	無	PU310	827	800	1.0	1/2	集合線圈組織
實施例4	PET84	無	PET84	無	PU310	827	800	1.0	1/4	集合線圈組織
實施例5	棉40	無	PET167	無	PU310	1063	2160	2.0	ALL	集合線圈組織
實施例6	棉40	無	PET167	無	PU34	1063	2160	2.0	ALL	集合線圈組織
比較例1	PET84	無	PET84	無	(熱融著紗 PU)合撚紗 827		800	1.0	ALL	集合線圈組織
比較例2	棉40	無	PET167	無	PU15	1063	2160	2.0	ALL	集合線圈組織

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五、發明說明（58）

表 2

	布料性量	布料物性		
	厚度	壓縮率	壓縮回復	通氣阻抗
	mm	%	%	KPa
實施例 1	2.65	60	92.0	0.45
實施例 2	3.12	55	99.4	0.41
實施例 3	3.00	60	97.4	0.55
實施例 4	2.85	71	91.6	0.62
實施例 5	3.35	65	99.0	1.18
實施例 6	3.23	72	86.2	0.45
比較例 1	1.87	5	82.0	1.33
比較例 2	1.95	80	45.0	0.23

（請先閱讀背面之注意事項再填寫本頁）
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表 3

	使用紗					線圈長度		線圈	編成組織	
	表面		裏面		結合紗	基布料	結合紗	長度比	結合紗	
	非彈性紗	彈性紗	非彈性紗	彈性紗		(短方)			結合數	彈性紗
實施例 7	PRT56	PU22	PRT56	PU22	PU155	850	190	0.22	1/2	集合線圈
實施例 8	PRT56	PU22	PRT56	PU22	PU44	850	190	0.22	ALL	集合線圈
實施例 9	PRT56	PU22	PRT56	PU22	PU44	850	190	0.22	1/2	集合線圈
實施例 10	PRT56	PU22	PRT56	PU22	PU44	850	190	0.22	1/4	集合線圈
實施例 11	棉 40	PU/Ny 被覆紗	PET167		PU1422	950	190	0.20	1/2	集合線圈
實施例 12	棉 40		PET167		PU34	950	350	0.37	1/2	集合線圈/編結
比較例 3	PET167		棉 40		PU1422	760	190	0.25	1/2	鑲嵌
比較例 4	PRT56	PU22	PRT56	PU22	(Ny/PU) 合撚紗	850	190	0.22	1/2	集合線圈
比較例 5	PET167		棉		PU11	1130	170	0.15	1/2	集合線圈

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表4

	布料性量				伸度(%)			伸長回復率(%)		連結紗拉拔應力	布料外觀
	厚度	荷重3.5N/cm時之伸度			荷重9.8N/cm時之伸度			經	緯	(CN)	
	mm	經	緯	伸度比(A)	經	緯	伸度比(B)				
實施例7	0.58	80	75	107	130	158	82	91	93	80	良好
實施例8	0.55	120	120	100	133	181	73	92	93	切斷	良好
實施例9	0.55	120	130	92	135	183	74	91	93	切斷	良好
實施例10	0.55	120	110	109	137	185	74	91	92	切斷	良好
實施例11	0.78	80	70	114	80	100	80	92	93	切斷	良好
實施例12	0.74	120	130	92	80	130	62	93	92	切斷	良好
比較例3	0.8	40	70	57	45	100	45	60	75	40	良好
比較例4	0.6	80	120	67	100	120	83	75	60	100	凹凸不良
比較例5	0.75	35	60	58	40	87	46	89	74	切斷	凹凸不良

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表5

	使用紗					線圈長度		線圈長度比	編成組織	
	表面		裏面		結合紗	基布料(短方)	結合紗		結合紗	
	非彈性紗	彈性紗	非彈性紗	彈性紗					結合數	彈性紗
實施例 13	PET84	PU22	PET84	PU22	PU155	850	800	0.94	1/2	集合線圈
實施例 14	PET84	PU22	PET84	PU22	PU155	850	800	0.94	1/2	集合線圈
實施例 15	PET84	PU22	PET84	PU22	PU78	850	800	0.94	1/2	集合線圈
比較例 6	PET84		PET84		PET84	850	800	0.94	1/2	集合線圈
實施例 16	Ny78	PU22	PET84	PU22	PU155	827	800	0.97	1/2	集合線圈
實施例 17	PET84	PU22	PET84	PU22	PU78				ALL	編結
實施例 18	Ny78	PU/Ny被覆紗	PET84		PU155				1/2	集合線圈
實施例 19	Ny78/PET84	PU44	PET84	PU44	PU310				1/2	集合線圈
實施例 20	PET84	PU22	PET84	PU22	PU78				1/4	編結
比較例 7	Ny78	PU22	PET84	PU22	PET167	827	800	0.97	1/2	集合線圈
比較例 8	Ny78		PET84		PU/PET被覆紗	827	800	0.97	1/2	集合線圈

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五、發明說明（62）

表 6

	布料性量	布料物性			容積保持係數
	厚度 mm	壓縮率 %	壓縮回復 %	通氣阻抗 KPa	
實施例 13	2.2				0.7
實施例 14	2.5				0.9
實施例 15	2.1				0.8
比較例 6	1.8				0.4
實施例 16	1.8	17	100	0.24	
實施例 17	2.5	69	99.4	0.33	
實施例 18	2	36	99.9	-	
實施例 19	5	20	100	-	
實施例 20	-	-	-	-	
比較例 7	2.4	62	79	0.64	
比較例 8	1.4	37	88	0.14	

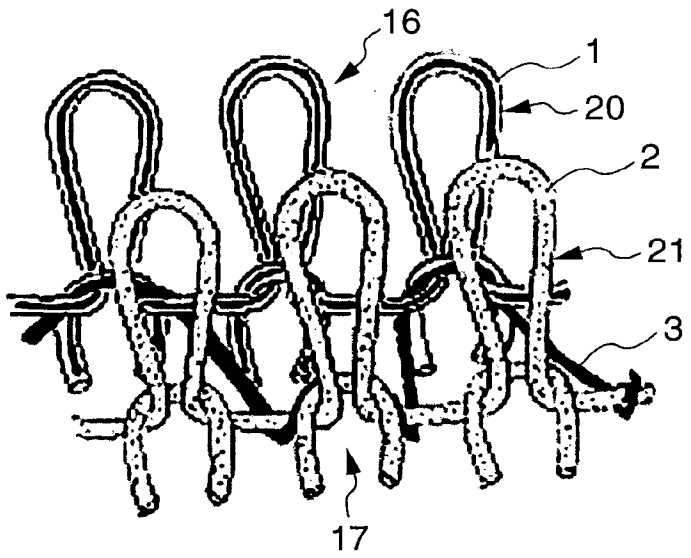
（請先閱讀背面之注意事項再填寫本頁）

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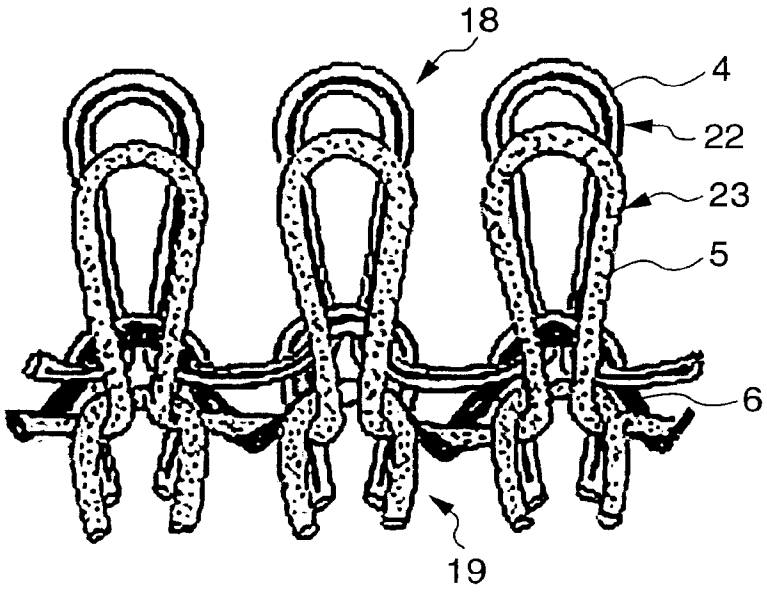
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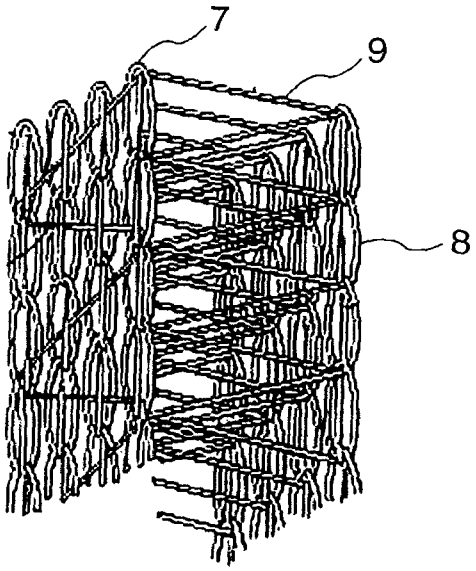
第 1 圖



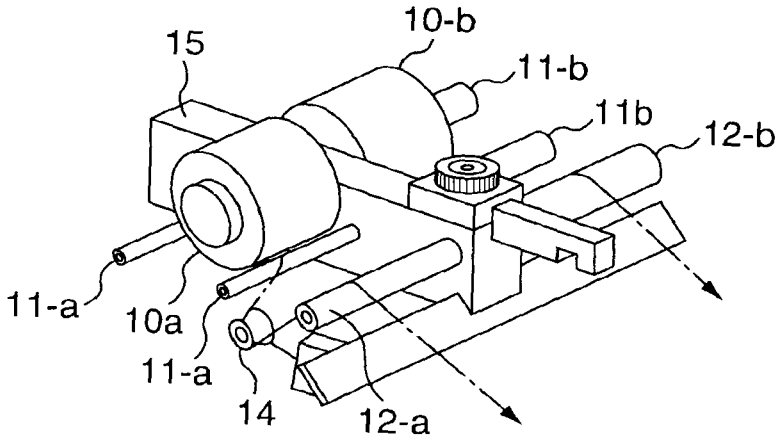
第 2 圖



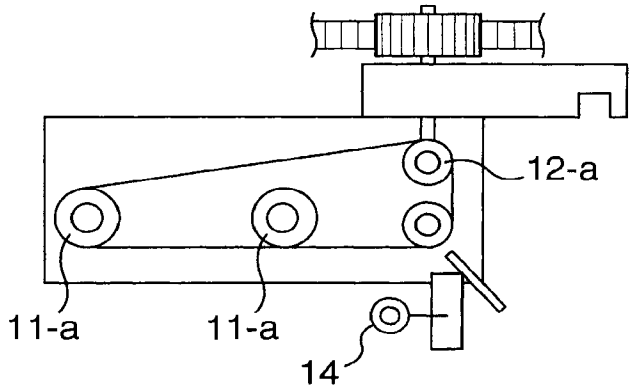
第 3 圖



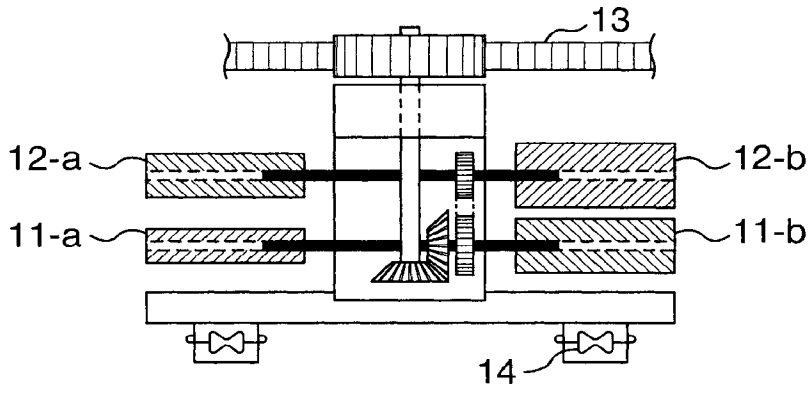
第 4 圖



第 5 圖



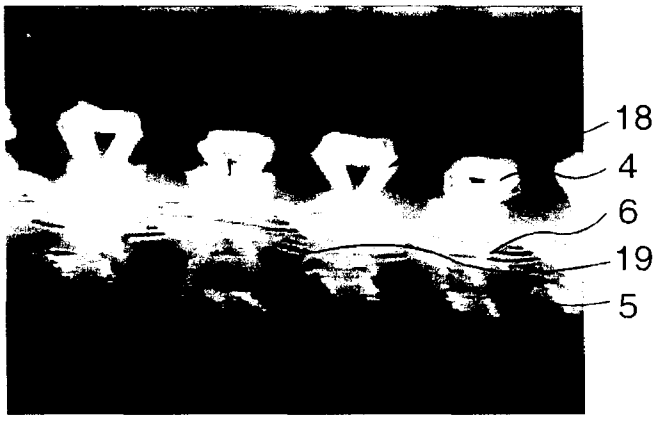
第 6 圖



第 7 圖



第 8 圖



申請日期	91 年 10 月 16 日
案號	91123852
類別	D04B1/00

A4
C4

（以上各欄由本局填註）

發明 新型 專利說明書

一、發明 新型 名稱	中文	多層彈性針織布料及其製造方法、以及成形衣料、彈性圓織布料之編成方法、供紗裝置
	英文	Multilayer stretch knitted fabric and production procss of the same, forming clothing material, knitting method of stretch circular knitted fabric, and thread supply apparatus
二、發明 創作 人	姓名	(1) 近藤敏之 (2) 吉田友昭 (3) 古家一雄
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	國籍	(1) 日本
	住、居所（事務所）	(1) 日本國大阪府大阪市北區堂島浜一丁目二番六號
	代表人 姓名	(1) 坂本正樹

裝 訂 線

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93年8月-5日修正/更/正補充 A5 B5

四、中文發明摘要（發明之名稱：多層彈性針織布料及其製造方法、以及成形衣料、彈性圓織布料之編成方法、供紗裝置）

本發明係有關於多層彈性針織布料，及其製造方法，編成方法，以及製造本發明之圓織布料之裝置(彈性紗供紗裝置等)。

針對結合表面及裏面之獨立之二層之基布料而成之具有多層構造之彈性布料，上述二層之基布料係只由17~3000dtex之聚氨基甲酸系彈性纖維之裸紗所結合。

英文發明摘要（發明之名稱：）

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六、申請專利範圍

第 91123852 號專利申請案

中文申請專利範圍修正本

民國 93 年 8 月 5 日修正

1.一種多層彈性針織布料，針對結合以兩排針床所編織的表面與背面之獨立之二層之基布料而成之具有多層構造之彈性針織布料,其特徵爲:

至少一方之基布料，是將裸紗之聚氨酯系彈性纖維、及非彈性紗條以拉齊之狀態形成編目，上述二層之基布料係只以17~3000dtex之聚氨酯系彈性纖維裸紗所結合。

2.如申請專利範圍第1項所述之多層彈性針織布料，其中上述彈性針織布料，其表面及背面之獨立之二層之基布料係分別以單層針床所形成之圓織布料，該二層之基布料係只以由33~3000dtex之聚氨酯系彈性纖維裸紗所成之結合紗且以集圈線圈(tuck loop)來結合，該結合紗乃對於表面及背面之基布料之編目密度粗之一方之25%以上之編目相結合，且對於上述表面及背面之獨立之圓織布料之其中之較短之線圈長度之該結合紗之線圈長度之比係在於0.6~2.3之範圍，該彈性布料係在於表背基布料之間具有空隙，具有立體構造。

3. 如申請專利範圍第1項所述之多層彈性針織布料，其中上述彈性針織布料，其該表面及背面之獨立之二層之基布料係分別由單層針床所形成之圓織布料，該二層之基布料係只以由17~1500dtex之聚氨酯系彈性纖維裸紗所成之結合紗來結合，至少一方之基布料係與該結合紗以集圈線

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六、申請專利範圍

圈(tuck loop)來結合，該結合紗乃對於表面及背面之基布料之編目密度粗之一方之25%以上之編目相結合，且對於上述表面及背面之獨立之圓織布料其中之較短線圈長度之一方，而該結合紗之線圈長度之比係在於0.2~0.6之範圍，該彈性布料係具有三層構造者。

4. 如申請專利範圍第1項所述之多層彈性針織布料，其中上述二層之基布料乃由經編構造所成，上述結合紗係對於表面及背面之基布料之編目密度之粗之一方之25%以上之編目結合。

5. 如申請專利範圍第1、2、3或4項所述之多層彈性針織布料，其中至少一方之基布料係含有彈性複合紗。

6. 如申請專利範圍第1、2、3或4項所述之多層彈性針織布料，其中表面及背面之基布料乃將裸紗之聚氨酯系彈性纖維、及非彈性紗條以拉齊之狀態形成編目。

7. 如申請專利範圍第1、2、3或4項所述之多層彈性針織布料，其中至少一方之基布料是將裸紗之聚氨酯系彈性纖維、及非彈性紗條以拉齊之狀態形成編目，

對於基布料中之聚氨酯系彈性纖維之纖度(D-g)之將結合聚氨酯系彈性纖維之纖度(D-c)之比係滿足(D-c/D-g)≧2。

8. 如申請專利範圍第1、2或4項所述之多層彈性針織布料，其中是具有上述的立體構造，其結合基布料1cm^{2}之結合紗之總纖度：D(dtex)與該彈性布料之厚度：T(mm)之比係滿足下述條件，

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六、申請專利範圍

$5\times 10^3 \leqq D/T \leqq 5\times 10^5$。

9. 如申請專利範圍第6項所述之多層彈性針織布料，其中經及緯方向之各自之伸度在於3.5N/cm之負荷下爲80~150%，在於9.8N/cm之負荷下100~200%，

以下述式(1)及(2)所表示之經及緯方向之伸度比(A)及伸度比(B)均在於0.6~1.2之範圍，

伸度比(A)=3.5N/cm負荷下之經方向之伸度(%)÷緯方向之伸度(%)……(1)

伸度比(B)=9.8N/cm負荷下之經方向之伸度(%)÷緯方向之伸度(%)……(2)。

10. 如申請專利範圍第1、2、3或4項所述之多層彈性針織布料，其中由熱成型加工形成凹部或凸部，且被固定，並具有立體構造。

11. 如申請專利範圍第10項所述之多層彈性針織布料，其中由熱成型加工成形之模型之下述地予以定義之容積保持係數爲0.5以上，

容積保持係數=(成形加工後之彈性布料所保持之成形容積)/(熱成型容積)。

12. 如申請專利範圍第1、2、3或4項所述之多層彈性針織布料，其中至少一方之基布料上使用了二種以上之非彈性紗條，而由此二種以上之非彈性紗條而賦予提花花樣。

13. 如申請專利範圍第2或4項所述之多層彈性針織布料，其中於表背二層之基布料間，具有空隙之立體構造之

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六、申請專利範圍

彈性布料之一部份是由：結合紗及/或形成基布料之一部份之非彈性紗條而以接觸狀態地結合。

14.一種成形衣料，針對於至少一部份爲無縫製之筒狀圓織布料所形成之成形布料，其特徵爲：

該筒狀圓織布料係申請專利範圍第1項~第13項其中之任一項所述之彈性布料之成形衣料。

15. 一種彈性圓織布料之編成方法，含有以圓織機來編織含有彈性紗之布料之彈性圓織布料之編成方法，其特徵爲：

當由1台之給紗裝置供給至少二個彈性紗卷裝時，以不同之至少二種之供給速度而供給彈性紗裸紗者。

16. 一種彈性針織布料之製造方法，針對於包含以圓織機來編成含有彈性紗之布料之申請專利範圍第6項~第9項其中之任一項所述之彈性布料之製造方法，其特徵爲：該供給用於編成基布料之聚氨酯系彈性裸紗之供給速度(V-g)、與用於結合表背布料之聚氨酯系彈性纖維裸紗之供給速度(V-c)係不相同。

17. 如申請專利範圍第16項所述之彈性針織布料之製造方法，其中將結合表面及背面之二層之基布料之聚氨酯系彈性纖維裸紗之延伸倍率控制於2倍以下地予以供給者。

18. 一種供紗裝置，針對包括、支架、一對之紗筒支承-驅動輥、及旋轉該輥之驅動手段之供紗裝置，其特徵爲：捲繞成紗筒形狀之彈性纖維之裸紗係一面控制延伸倍率地一面供給於圓織機，該一對之紗筒支承一驅動輥係旋轉自

（請先閱讀背面之注意事項再填寫本頁）

裝 訂

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六、申請專利範圍

如地支承於上述支架，互相平行地延伸，從上述支架而凸出於相反方向地予以配置，該一對之紗筒支承－驅動輥之表面速度乃在上述支架之相反之方向而會不相同地，令該紗筒支承－驅動輥之外徑不相同，及／或具備令該相反方向之該一對紗筒支承－驅動輥變速驅動之手段。

19. 一種供紗裝置，針對包括：支架、一對之紗筒支承-驅動輥、及使該輥旋轉之驅動手段，固定於圓織機而使用之彈性纖維之供紗裝置，其特徵爲：

該一對之紗筒支承-驅動輥係旋轉自如地支承於該支架，互相平行地延伸，從該支架凸出於相反方向地予以配置，

再具備：較以同速之表面速度地旋轉之一對紗筒支承－驅動輥更高速之表面速度地旋轉之其他之預延伸輥。

（請先閱讀背面之注意事項再填寫本頁）
裝
訂

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(19)中華民國智慧財產局
(12)發明說明書公開本 (11)公開編號：TW 201402030 A
(43)公開日： 中華民國 103 (2014) 年 01 月 16 日

(21)申請案號：102105769 (22)申請日： 中華民國 102 (2013) 年 02 月 19 日
(51)Int. Cl.： *A43B23/02 (2006.01)* *A43B23/26 (2006.01)*
(30)優先權：2012/02/20 美國 13/400,511
(71)申請人：耐基國際有限公司 (百慕達) NIKE INTERNATIONAL LTD. (BM)
美國
(72)發明人：塔特勒 達倫P TATLER, DAREN P. (GB)；波德哈尼 丹尼爾A PODHAJNY, DANIEL A. (UY)
(74)代理人：陳長文
申請實體審查：有 申請專利範圍項數：21 項 圖式數：39 共 121 頁

(54)名稱

包含具有鞋舌之編織組件的鞋具

ARTICLE OF FOOTWEAR INCORPORATING A KNITTED COMPONENT WITH A TONGUE

(57)摘要

本發明揭示一種鞋具，其可具有包含一編織元件及一鞋舌之一鞋面。該編織元件界定該鞋面之一外部表面及一相對內部表面之一部分，其中該內部表面界定用於接納一腳之一內腔。該鞋舌與該編織元件一起由單一編織構造形成且延伸穿過該鞋面之一鞋幫口區域。製造一鞋具之一編織組件之方法可包含編織一鞋舌。將該鞋舌固持於一編織機之織針上。在將該鞋舌固持於該等織針上之同時，藉助該編織機形成一編織元件之一第一部分。然後將該鞋舌接合至該編織元件之該第一部分。另外，藉助該編織機形成該編織元件之一第二部分。

131：編織元件
170：編織鞋舌/鞋舌

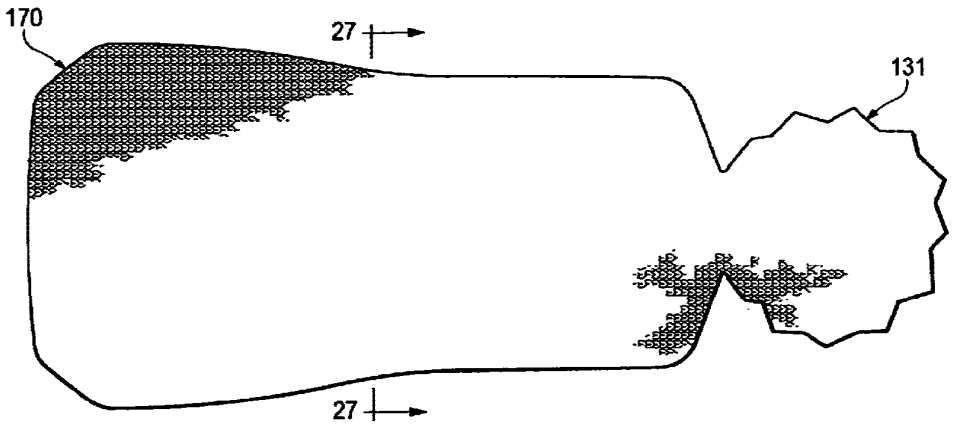


圖 26

(19)中華民國智慧財產局
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(54)名稱

包含具有鞋舌之編織組件的鞋具

ARTICLE OF FOOTWEAR INCORPORATING A KNITTED COMPONENT WITH A TONGUE

(57)摘要

本發明揭示一種鞋具，其可具有包含一編織元件及一鞋舌之一鞋面。該編織元件界定該鞋面之一外部表面及一相對內部表面之一部分，其中該內部表面界定用於接納一腳之一內腔。該鞋舌與該編織元件一起由單一編織構造形成且延伸穿過該鞋面之一鞋幫口區域。製造一鞋具之一編織組件之方法可包含編織一鞋舌。將該鞋舌固持於一編織機之織針上。在將該鞋舌固持於該等織針上之同時，藉助該編織機形成一編織元件之一第一部分。然後將該鞋舌接合至該編織元件之該第一部分。另外，藉助該編織機形成該編織元件之一第二部分。

131：編織元件
170：編織鞋舌/鞋舌

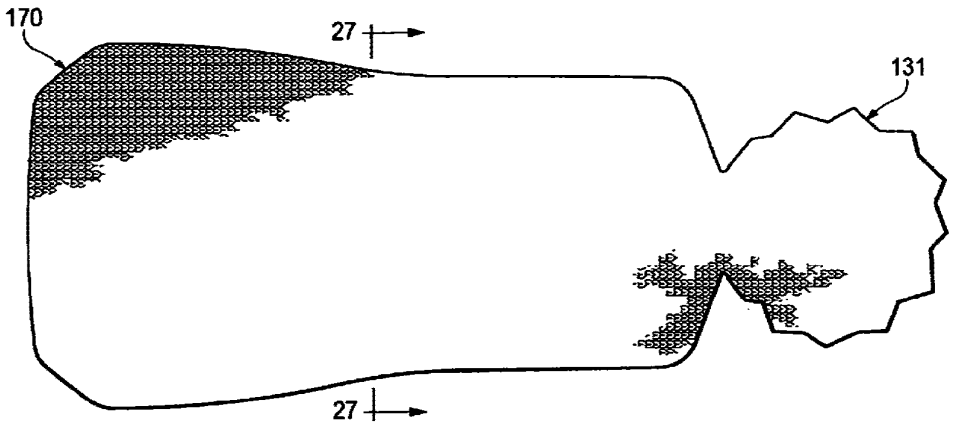


圖 26

201402030

發明專利說明書

（本說明書格式、順序，請勿任意更動）

【發明名稱】

包含具有鞋舌之編織組件的鞋具

ARTICLE OF FOOTWEAR INCORPORATING A KNITTED COMPONENT WITH A TONGUE

【先前技術】

習用鞋具通常包含兩個主要元件，一鞋面及一鞋底結構。鞋面固定至鞋底結構且在鞋之內部上形成一內腔以用於舒適且牢固地接納一腳。鞋底結構固定至鞋面之一下部區域，藉此定位於鞋面與地面之間。在運動鞋中，舉例而言，鞋底結構可包含一中底及一外底。中底通常包含一聚合物發泡體材料，該聚合物發泡體材料在步行、跑步及其他走動活動期間減弱地面反作用力以減少腳及腿上之應力。另外，中底可包含流體填充室、板、緩衝體(moderator)或進一步減弱力、增強穩定性或影響腳運動之其他元件。外底固定至中底之一下表面且提供由一耐久且耐磨材料(諸如橡膠)形成之鞋底結構之一抓地(ground-engaging)部分。鞋底結構亦可包含定位於內腔內且鄰近腳之一下表面之一鞋墊以增強鞋之舒適性。

鞋面在腳的腳背及腳趾區域上方沿著腳之內側及外側在腳下方及圍繞腳之足跟區域大體延伸。在某些鞋具(諸如籃球鞋及靴)中，鞋面可向上且圍繞腳踝延伸以爲腳踝提供支撐或保護。通常藉由鞋之一足跟區中之一腳踝開口提供對鞋面之背部上之內腔的接達。一綁帶系統通常併入至鞋面中以調整鞋面之合腳性，藉此准許腳自鞋面內之內腔進入及移出。綁帶系統亦准許穿用者修改鞋面之某些尺寸(特定而言圍長)以適應變化尺寸之腳。另外，鞋面可包含在綁帶系統下方延

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伸以增強鞋之可調整性之一鞋舌，且鞋面可併入有一足跟穩定器(heel counter)以限制足跟之移動。

慣常使用各種材料元件(例如，紡織品、聚合物發泡體、聚合物薄片、皮革、合成皮革)來製造鞋面。在運動鞋中，舉例而言，鞋面可具有各自包含各種經接合材料元件之多個層。作爲實例，材料元件可經選擇以賦予鞋面之不同區域抗拉伸性、耐磨性、靈活性、透氣性、可壓縮性、舒適性及濕氣芯吸性。爲賦予鞋面之不同區域不同性質，材料元件通常經裁剪成期望形狀且然後接合在一起，通常藉助縫合或黏接(adhesive bonding)。此外，材料元件通常經接合成一分層組態以賦予相同區域多個性質。隨著併入至鞋面中之材料元件之數目及類型增加，與運輸、貯存、裁剪及接合材料元件相關聯之時間及費用亦可增加。由裁剪及縫合製程所致之廢料亦隨著併入至鞋面中之材料元件之數目及類型增加而累積至一較大程度。此外，與由較少類型及數目之材料元件形成之鞋面相比，具有大量材料元件之鞋面可較難以回收。藉由減少鞋面中所用之材料元件之數目，因此，可減少廢物同時增加鞋面之製造效率及可回收性。

【發明內容】

一鞋具之各種組態可具有一鞋面及固定至鞋面之一鞋底結構。該鞋面包含一編織元件及一鞋舌。該編織元件界定該鞋面之一外部表面及該鞋面之一相對內部表面中之一部分，其中該內部表面界定用於接納一腳之一內腔。該鞋舌與該編織元件一起由單一編織構造形成且延伸穿過該鞋面之一鞋幫口區域。

製造用於一鞋具之一編織組件之方法可包含藉助一編織機編織一鞋舌。將該鞋舌固持於該編織機之織針上。在將該鞋舌固持於該等織針上之同時，藉助該編織機形成一編織元件之一第一部分。然後將該鞋舌接合至該編織元件之該第一部分。另外，藉助該編織機形成該

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編織元件之一第二部分。

編織方法亦可包含提供具有一可修改欄位之一編織型樣。用表示一第一文數字元之資料更新該可修改欄位。形成具有該第一文數字元之一編織結構之一第一組件 用表示一第二文數字元之資料更新該可修改欄位，該第二文數字元不同於該第一文數字元。另外，形成具有該第二文數字元之一編織結構之一第二組件。

在隨附申請專利範圍中特定指出表徵本發明之態樣之新穎性之優點及特徵。然而，爲獲得對新穎性之優點及特徵之一經改良理解，可參考闡述及圖解說明關於本發明之各種組態及概念之以下說明性事項及隨附圖。

【圖式簡單說明】

當結合附圖閱讀時將較佳理解前述發明內容及以下實施方式。

圖1係一鞋具之一透視圖。

圖2係鞋具之一外側立面圖。

圖3係鞋具之一內側立面圖。

圖4A至圖4C係如由圖2及圖3中之剖面線4A至4C所界定之鞋具之剖面圖。

圖5係形成鞋具之一鞋面之一部分之一第一編織組件之一俯視平面圖。

圖6係第一編織組件之一仰視平面圖。

圖7A至圖7E係如由圖5中剖面線7A至7E所界定之第一編織組件之剖面圖。

圖8A及圖8B係展示第一編織組件之編織結構之平面圖。

圖9係可形成鞋具之鞋面之一部分之一第二編織組件之一俯視平面圖。

圖10係第二編織組件之一仰視平面圖。

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圖11係展示編織區之第二編織組件之一示意性俯視平面圖。

圖12A至圖12E係如由圖9中之剖面線12A至12E所定義之第二編織組件之剖面圖。

圖13A至圖13H係編織區之線圈圖。

圖14A至圖14C係與圖5對應且繪示第一編織組件之進一步組態之俯視平面圖。

圖15係一編織機之一透視圖。

圖16至圖18係編織機之一組合進料機之立面圖。

圖19係與圖16對應且展示組合進料機之內部組件之一立面圖。

圖20A至圖20C係與圖19對應且展示組合進料機之操作之立面圖。

圖21A至圖21I係使用組合進料機及一習用進料機之一編織製程之示意性透視圖。

圖22A至圖22C係展示組合進料機及習用進料機之位置之編織製程之示意性剖面圖。

圖23係展示編織製程之另一態樣之一示意性透視圖。

圖24係編織機之另一組態之一透視圖。

圖25係具有一第一編織鞋舌之第一編織組件之一俯視平面圖。

圖26係具有第一編織鞋舌之第一編織組件之一部分俯視平面圖。

圖27係如由圖26中之剖面線27所界定之第一編織鞋舌之一剖面圖。

圖28係具有一第二編織鞋舌之第二編織組件之一俯視平面圖。

圖29係具有第二編織鞋舌之第二編織組件之一部分俯視平面圖。

圖30係如由圖29中之剖面線30所界定之第二編織鞋舌之一剖面

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圖。

圖31係具有一第三編織鞋舌之一第三編織組件之一俯視平面圖。

圖32係具有第三編織鞋舌之第三編織組件之一部分俯視平面圖。

圖33係如由圖32中之剖面線33所界定之第三編織鞋舌之一剖面圖。

圖34係具有一第四編織鞋舌之一第四編織組件之一俯視平面圖。

圖35係如由圖34中之剖面線35所界定之第四編織組件及第四編織鞋舌之一剖面圖。

圖36A至圖36G係用於形成具有第一編織鞋舌之第一編織組件之一編織製程之示意性立面圖。

圖37係繪示編織製程之又一實例性步驟之一示意性立面圖。

圖38係編織機之一示意性方塊圖。

圖39A至圖39C係與圖26對應且繪示第一編織鞋舌中之順序變化之部分俯視平面圖。

【實施方式】

以下論述及附圖揭示與編織組件及編織組件之製造有關之各種概念。雖然編織組件可用於各種產品中，但作爲一實例，下文揭示併入有編織組件中之一者之一鞋具。除鞋之外，編織組件亦可用於其他類型之服裝(例如，襯衫、褲子、襪子、夾克、內衣)、運動設備(例如，高爾夫球袋、棒球及足球手套、英式足球限制結構)、容器(例如，背包、提包)及用於傢具(例如，椅子、長沙發、汽車座椅)之裝飾品。編織組件亦可用於床單(例如，被單、毛毯)、桌布、毛巾、旗幟、帳篷、帆及降落傘。編織組件出於工業目的可用作工業用紡織

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品，包含用於汽車及航空航天應用之結構、過濾材料、醫用紡織品(例如，繃帶、棉棒、植入體)、用於加固堤防之土工織物、用於農作物保護之農用紡織品及保護或絕緣以抗熱及輻射之工業服裝。因此，既出於個人目的又出於工業目的，編織組件及本文中所揭示之其他概念可併入至各種產品中。

鞋組態

一鞋具100在圖1至圖4C中經繪示爲包含一鞋底結構110及一鞋面120。雖然鞋100經圖解說明爲具有適於跑步之一一般組態，但與鞋100相關聯之概念亦可應用於各種其他運動鞋類型，舉例而言，包含棒球鞋、籃球鞋、自行車專用鞋、足球鞋、網球鞋、英式足球鞋、訓練鞋、步行鞋及徒步靴。概念亦可應用於通常認爲係非運動之鞋類型，包含時裝鞋、平底便鞋、涼鞋及工作靴。因此，關於鞋100所揭示之概念應用於廣泛各種鞋類型。

出於參考目的，鞋100可換分成三個一般區：一前足區101、一中足區102及一足跟區103。前足區101通常包含與腳趾及連接蹠骨與趾骨之關節對應之鞋100之部分。中足區102通常包含與腳之一足弓區域對應之鞋100之部分。足跟區103通常與腳之後部分(包含跟骨)對應。鞋100亦包含延伸穿過區101至103中之每一者且與鞋100之相對側對應之一外側104及一內側105。更特定而言，外側104與腳之一外部區域(即，背對另一腳之表面)對應，且內側105與腳之一內部區域(即，面朝另一腳之表面)對應。區101至103及側104至105並不意欲劃界鞋100之精確區域。而是，區101至103及側104至105意欲表示鞋100之一般區域以有助於以下論述。除鞋100之外，區101至103及側104至105亦可應用於鞋底結構110、鞋面120及其個別元件。

鞋底結構110固定至鞋面120且當鞋100被穿上時在腳與地面之間延伸。鞋底結構110之主要元件係一中底111、一外底112及一鞋墊

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113。中底111固定至鞋面120之一下表面且可由一可壓縮聚合物發泡體元件(例如，一聚氨基甲酸酯或乙烯醋酸乙烯酯發泡體)形成，該可壓縮聚合物發泡體當在步行、跑步或其他走動活動期間在腳與地面之間壓縮時減弱地面反作用力(即，提供減震)。在進一步組態中，中底111可併入有板、緩衝體、流體填充室、鉗幫元件、或進一步減弱力、增強穩定性或影響腳之運動之運動控制部件，或中底21可主要由一流體填充室形成。外底112固定至中底111之一下表面且可由經刻紋以賦予牽引力之一耐磨橡膠材料形成。鞋墊113位於鞋面120內且經定位以在腳之一下表面下方延伸以增強鞋100之舒適性。雖然鞋底結構110之此組態提供可結合鞋面120一起使用之一鞋底結構之一實例，但亦可使用鞋底結構110之各種其他習用或非習用組態。因此，鞋底結構110或與鞋面120一起使用之任何鞋底結構之特徵可顯著變化。

鞋面120相對於鞋底結構110在鞋100內界定一內腔用於接納及固定一腳。內腔經塑形以容納腳且沿著腳之一外側、沿著腳之一內側、在腳上方、圍繞足跟及在腳下方延伸。藉由位於至少足跟區103中之一腳踝開口121提供對內腔之接達。一鞋帶122延伸穿過鞋面120中之各種鞋帶孔隙123且准許穿用者修改鞋面120之尺寸以適應腳之比例。更特定而言，鞋帶122准許穿用者將圍繞腳之鞋面120變緊，且鞋帶122准許穿用者鬆開鞋面120以促成腳容易自內腔(即，穿過腳踝開口121)進入及移出。另外，鞋面120包含在鞋帶122及鞋帶孔隙123下方延伸以增強鞋100之舒適性之一鞋舌124。在又一組態中，鞋面120可包含額外組件，諸如：(a)在足跟區103中之一足跟穩定器，其用於增強穩定性；(b)在前足區101中之一護趾板，其由一耐磨材料形成；及(c)標誌、商標及具有洗滌說明(care instruction)及材料資訊之標牌。

舉例而言，諸多習用鞋鞋面由透過縫合或結合而接合之多種材料元件(例如，紡織品、聚合物發泡體、聚合物薄片、皮革、合成皮

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革)形成。相比而言，大部分鞋面120由一編織組件130形成，編織組件130穿過區101至103中之每一者、沿著外側104及內側105兩者、在前足區101上方及圍繞足跟區103延伸。另外，編織組件130形成鞋面120之一外部表面與一相對內部表面兩者之部分。如此，編織組件130在鞋面120內界定內腔之至少一部分。在某些組態中，編織組件130亦可在腳下方延伸。然而，參考圖4A至圖4C，一strobel鞋墊125固定至編織組件130及中底111之一上表面，藉此形成在鞋墊113下方延伸之鞋面120之一部分。

編織組件組態

編織組件130在圖5及圖6中經繪示與鞋100之一其餘部分分離。編織組件130由單一編織構造形成。如本文中所使用，一編織組件(例如，編織組件130)在透過一編織製程形成爲一單件式元件時定義爲由「單一編織構造」形成。亦即，編織製程在不需要顯著額外製造步驟或製程之情況下實質上形成編織組件130之各種特徵及結構。雖然編織組件130之部分可在編織製程之後彼此接合(例如，編織組件130之邊緣接合在一起)，但編織組件130仍是由單一編織構造形成，此乃因其形成爲一單件式編織元件。此外，當其他元件(例如，鞋帶122、鞋舌124、標誌、商標、具有洗滌說明及材料資訊之標牌)在編織製程之後添加時，編織組件130仍是由單一編織構造形成。

編織組件130之主要元件係一編織元件131及一嵌花股線132。編織元件131由至少一條紗線形成，該至少一條紗線經操縱(例如，藉助一編織機)以形成界定各種橫列(course)及縱行(wale)之複數個交織線圈。亦即，編織元件131具有一編織紡織品之結構。嵌花股線132延伸穿過編織元件131且在編織元件131內之各種線圈之間通過。雖然嵌花股線132通常沿著編織元件131內之橫列延伸，但嵌花股線132亦可沿著編織元件131內之縱行延伸。嵌花股線132之優點包含提供支撐、穩

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定性及結構。舉例而言，嵌花股線132輔助固定圍繞腳之鞋面120，限制鞋面120之區域中之變形(例如，賦予抗拉伸性)且結合鞋帶122一起操作以增強鞋100之合腳性。

編織元件131具有藉由一周邊邊緣133、一對足跟邊緣134及一內邊緣135而輪廓化之一大體U形組態。當併入至鞋100中時，周邊邊緣133抵靠中底111之上表面安放且接合至strobel鞋墊125。足跟邊緣134彼此接合且在足跟區103中垂直延伸。在鞋100之某些組態中，一材料元件可覆蓋足跟邊緣134之間的一接縫以加固接縫且增強鞋100之美觀訴求。內邊緣135形成腳踝開口121且延伸朝向鞋帶122、鞋帶孔隙123及鞋舌124位於其中之一區域。另外，編織元件131具有一第一表面136及一相對第二表面137。第一表面136形成鞋面120之外部表面之一部分，而第二表面137形成鞋面120之內部表面之一部分，藉此在鞋面120內界定內腔之至少一部分。

如上文所述，嵌花股線132延伸穿過編織元件131且在編織元件131內之各種線圈之間通過。更特定而言，嵌花股線132位於編織元件131之編織結構內，該編織結構可在嵌花股線132之區域中且在表面136與137之間具有一單個紡織品層之組態，如圖7A至圖7D中所繪示。當編織組件130併入至鞋100中時，因此，嵌花股線132位於鞋面120之外部表面與內部表面之間。在某些組態中，嵌花股線132之部分可在表面136及137中之一者或兩者上可見或曝露。舉例而言，嵌花股線132可抵靠表面136及137中之一者，或編織元件131可形成嵌花股線穿過其之凹口或孔隙。使嵌花股線132位於表面136與137之間的一優點係編織元件131保護嵌花股線132以免磨損及鉤絲。

參考圖5及圖6，嵌花股線132按以下方式重複地延伸：自周邊邊緣133朝向內邊緣135且毗鄰於一個鞋帶孔隙123之一側、至少部分圍繞鞋帶孔隙123至一相對側，且往回至周邊邊緣133。當編織組件130

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併入至鞋100中時，編織元件131自鞋面120之一鞋幫口區域(即，鞋帶122、鞋帶孔隙123及鞋舌124所位於之位置)延伸至鞋面120之一下部區域(即，編織元件131與鞋底結構110接合之位置)。在此組態中，嵌花股線132亦自鞋幫口區域延伸至下部區域。更特定而言，嵌花股線重複地穿過編織元件131自鞋幫口區域至下部區域。

雖然編織元件131可以各種方式形成，但編織結構之橫列通常沿與嵌花股線132相同之方向延伸。亦即，橫列可沿在鞋幫口區域與下部區域之間延伸之方向延伸。如此，大部分嵌花股線132沿著編織元件131內之橫列延伸。然而，在毗鄰鞋帶孔隙123之區域中，嵌花股線132亦可沿著編織元件131內之縱行延伸。更特定而言，平行於內邊緣135之嵌花股線132之節段可沿著縱行延伸。

如上文所論述，嵌花股線132往返穿過編織元件131。參考圖5及圖6，嵌花股線132亦在周邊邊緣133處重複離開編織元件131且然後在周邊邊緣133之另一位置處重新進入編織元件131，藉此沿著周邊邊緣133形成線圈。此組態之一優點係在鞋幫口區域與下部區域之間延伸的嵌花股線132之每一階段可在鞋100之製造製程期間獨立地張緊、鬆開或以其他方式調整。亦即，在將鞋底結構110固定至鞋面120之前，嵌花股線132之節段可獨立地經調整至恰當張力。

與編織元件131相比，嵌花股線132可呈現較大抗拉伸性。亦即，嵌花股線132之拉伸性可小於編織元件131。假定嵌花股線132之眾多節段自鞋面120之鞋幫口區域延伸至鞋面120之下部區域，嵌花股線132爲在鞋幫口區域與下部區域之間的鞋面120之部分賦予抗拉伸性。此外，將張力施加於鞋帶122上可爲嵌花股線132賦予張力，藉此促使鞋幫口區域與下部區域之間的鞋面120之部分抵靠腳。如此，嵌花股線132結合鞋帶122一起操作以增強鞋100之合腳性。

編織元件131可併入有爲鞋面120之單獨區域賦予不同性質之各

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種類型之紗線。亦即，編織元件131之一個區域可由賦予一第一組性質之一第一類型紗線形成，且編織元件131之另一區域可由賦予一第二組性質之一第二類型紗線形成。在此組態中，性質可藉由針對編織元件131之不同區域選擇特定紗線而在整個鞋面120中變化。一特定類型之紗線將賦予編織元件131之一區域之性質特定而言取決於紗線內形成各種長絲及纖維之材料。舉例而言，棉線可提供一軟手感、自然美觀及可生物分解性。彈性纖維及拉伸聚酯各自提供實質拉伸及恢復，其中拉伸聚酯亦提供可回收性。嫘縈(Rayon)提供高光澤及濕氣吸收性。除了絕緣性質及可生物分解性以外，毛料亦提供高濕氣吸收性。尼龍係具有相對高強度之一耐久及抗磨性材料。聚酯係亦提供相對高耐久性之一疏水材料。除了材料以外，針對編織元件131選擇之紗線之其他態樣亦可影響鞋面120之性質。舉例而言，形成編織元件131之一紗線可係一單絲紗線或一多絲紗線。紗線亦可包含各自由不同材料形成之單獨長絲。另外，紗線可包含各自由兩種或兩種以上不同材料形成之長絲，諸如一雙組分紗線具有具有一鞘芯組態之長絲或由不同材料形成之兩個半體。不同撚度及捲曲度以及不同纖度亦可影響鞋面120之性質。因此，形成紗線及紗線之其他態樣兩者之材料可經選擇以爲鞋面120之單獨區域賦予各種性質。

如同形成編織元件131之紗線，嵌花股線132之組態亦可顯著變化。除了紗線以外，嵌花股線132亦可具有(舉例而言)一長絲(例如，一單絲)、線、繩、織物帶、纜或鏈之組態。與形成編織元件131之紗線相比，嵌花股線132之厚度可較大。在某些組態中，嵌花股線132可具有顯著大於編織元件131之紗線之一厚度。雖然嵌花股線132之剖面形狀可係圓形、但亦可使用三角形、正方形、矩形、橢圓或不規則形狀。此外，形成嵌花股線132之材料可包含用於編織元件131內之紗線之任何材料，諸如棉線、彈性纖維、聚酯、嫘縈、毛料及尼龍。如上

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文所述，嵌花股線132可呈現大於編織元件131之抗拉伸性。如此，嵌花股線132之適合材料可包含用於高抗拉強度應用之各種工程長絲，包含玻璃、聚芳醯胺(例如，對聚芳醯胺及間聚芳醯胺)、超高分子量聚乙烯及液晶聚合物。作爲另一實例，一編帶聚酯線亦可用作嵌花股線132。

圖8A中繪示編織組件130之一部分之一適合組態之一實例。在此組態中，編織元件131包含形成界定多個水平橫列及垂直縱行之複數個交織線圈之一紗線138。嵌花股線132沿著橫列中之一者延伸且在位於(a)由紗線138形成之線圈之後與(b)在由紗線138形成之線圈之前之間交替。實質上，嵌花股線132編入穿過由編織元件131形成之結構。雖然紗線138形成此組態中之每一橫列，但額外紗線可形成橫列中之一或多者或可形成橫列中之一或多者之一部分。

圖8B中繪示編織組件130之一部分之一適合組態之另一實例。在此組態中，編織元件131包含紗線138及另一紗線139。紗線138及139經接結且協作地形成界定多個水平橫列及垂直縱行之複數個交織線圈。亦即，紗線138及139彼此平行延續。如同圖8A中之組態，嵌花股線132沿著橫列中之一者延伸且在(a)位於由紗線138及139形成之線圈之後與(b)在由紗線138及139形成之線圈之間交替。此組態之一優點係紗線138及139中之每一者之性質可存在於編織組件130之此區域中。舉例而言，紗線138及139可具有不同色彩，其中紗線138之色彩主要存在於編織元件131中之各種組織之一面上且紗線139之色彩主要存在於編織元件131中之各種組織之一反面。作爲另一實例，紗線139可由接觸腳比紗線138較柔軟且較舒適之一紗線形成，其中紗線138主要存在於第一表面136上且紗線139主要存在於第二表面137上。

繼續圖8B之組態，紗線138可由一熱固聚合物材料及天然纖維(例如，棉線、毛料、絲)中之至少一者形成，而紗線139可由一熱塑

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聚合物材料形成。一般而言，一熱塑聚合物材料在被加熱時熔化且當冷卻時返回至一固態。更特定而言，熱塑聚合物材料當經受足夠熱時自一固態轉變成一軟化或液態，且然後該熱塑聚合物材料當足夠冷卻時自軟化或液態轉變成固態。如此，熱塑聚合物材料通常用於將兩個物件或元件接合在一起。在此情形中，紗線139可用於：(a)將紗線138之一部分接合至紗線138之另一部分；(b)將紗線138及嵌花股線132彼此連接在一起或(c)將另一元件(例如，標誌、商標及具有洗滌說明及材料資訊之標牌)接合至編織組件130，舉例而言。如此，假定紗線139可用於熔接編織組件130之部分或以其他方式彼此結合編織組件130之部分，可將該紗線139視爲一可熔紗線。此外，假定紗線138並非由通常能夠熔接編織組件130之部分或以其他方式彼此結合編織組件130之部分之材料形成，可將該紗線138認爲一非可熔紗線。亦即，紗線138可係一非可熔紗線，而紗線139可係一可熔紗線。在編織組件130之某些組態中，紗線138 (即，非可熔紗線)可實質上由一熱固聚合物材料形成且紗線139 (即，可熔紗線)可至少部分由一熱塑聚合物材料形成。

經接結紗線之使用可爲編織組件130賦予優點。當紗線139經加熱且且經熔接至紗線138及嵌花股線132時，此製程可具有硬化或剛化編織組件130之結構之效應。此外，(a)將紗線138之一部分接合至紗線138之另一部分或(b)將紗線138及嵌花股線132彼此接合具有固定或鎖定紗線138及嵌花股線132之相對位置，藉此賦予抗拉伸性及硬度之效應。亦即，紗線138之部分當與紗線139熔接在一起時可不相對於彼此滑動，藉此防止編織元件131由於編織結構之相對移動而翹曲或永久拉伸。另一益處係關於若編織組件130之一部分被損壞或紗線138中之一者被切斷則限制拆散。此外，嵌花股線132可不相對於編織元件131滑動，藉此防止嵌花股線132之部分自編織元件131向外拉動。因

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此，編織組件130之區域可自在編織元件131內使用可熔及非可熔紗線兩者獲益。

編織組件130之另一態樣係關於毗鄰於腳踝開口121且至少部分地圍繞腳踝開口121延伸之一經襯填區域。參考圖7E，經襯填區域由可由單一編織構造形成之兩個重疊且至少部分共同延伸編織層140以及在編織層140之間延伸之複數個浮紗141形成。雖然編織層140之側或邊緣彼此固定，但一中心區域通常未經固定。如此，編織層140有效地形成一管或管狀結構，且浮紗141可位於或嵌花於編織層140之間以穿過管狀結構。亦即，在編織層140之間延伸之浮紗141通常平行於編織層140之表面，且一穿過且填充編織層140之內體積。儘管大部分編織元件131係由經機械操作以形成交織線圈之紗線形成，但浮紗141在編織層140之間的內體積內通常自由或以其他方式嵌花其內。作爲一額外事項，編織層140可係至少部分地由一拉伸紗線形成。此組態之一優點係編織層將有效壓縮浮紗141且提供爲毗鄰腳踝開口121之經襯填區域提供一彈性態樣。亦即，編織層140內之拉伸紗線可在形成編織組件130之編織製程期間張緊，藉此使編織層140壓縮浮紗141。雖然拉伸紗線之拉伸度了顯著變化，但拉伸紗線可在編織組件130之諸多組態中可拉伸至少百分之百。

浮紗141之存在爲毗鄰腳踝開口121之經襯填區域賦予一可壓縮態樣，藉此增強腳踝開口121之區域中之鞋100之舒適性。諸多習用鞋具將聚合物發泡體元件或其他可壓縮材料併入至毗鄰於一腳踝開口之區域中。與習用鞋具相比而言，與編織組件130之一剩餘部分一起由單一編織構造形成之編織組件130之部分可形成毗鄰於腳踝開口121之經襯填區域。在鞋100之其他組態中，類似經襯填區域可位於編織組件130之其他區域中。舉例而言，類似經襯填區域可經定位作爲與蹠骨及鄰近趾骨之間的關節對應之之一區域以爲關節賦予襯墊。作爲一

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替代方案，一毛圈線圈結構亦可用於爲鞋面120之區域賦予某一程度之襯墊。

基於以上論述，編織組件130爲鞋面120賦予各種特徵。此外，編織組件130提供優於某些習用鞋面組態之各種優點。如上文所述，舉例而言，習用鞋面由透過縫合或結合而接合之多種材料元件(例如，紡織品、聚合物發泡體、聚合物薄片、皮革、合成皮革)形成。隨著併入至一鞋面中之材料元件之數目及類型增加，與運輸、貯存、裁剪及接合材料元件相關聯之時間及費用亦可增加。由裁剪及縫合製程所致之廢料亦隨著併入至鞋面中之材料元件之數目及類型增加而累積至一較大程度。此外，與由較少類型及數目之材料元件形成之鞋面相比，具有大量材料元件之鞋面可較難以回收。藉由減少鞋面中所用之材料元件之數目，因此，可減少廢物同時增加鞋面之製造效率及可回收性。爲此，編織組件130形成鞋面120之一實質部分，同時增加製造效率、減少廢物及簡化可回收性。

其他編織組件組態

一編織組件150繪示於圖9及圖10中且可用於替換鞋100中之編織組件130。編織組件150之主要元件係一編織元件151及一嵌花股線152。編織元件151由經操縱(例如，藉助一編織機)以形成界定各種橫列及縱行之複數個交織線圈之至少一個紗線形成。亦即，編織元件151具有一編製紡織品之結構。嵌花股線152延伸穿過編織元件151且在編織元件151內之各種線圈之間通過。雖然嵌花股線152通常沿著編織元件151內之橫列延伸，但嵌花股線152亦可沿著編織元件151內之縱行延伸。如同嵌花股線132，嵌花股線152賦予抗拉伸性，且當併入至鞋100中時，結合鞋帶122一起操作以增強鞋100之合腳性。

編織元件151具有藉由一周邊邊緣153、一對足跟邊緣154及一內邊緣155而輪廓化之一大體U形組態。另外。編織元件151具有一第一

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表面156及一相對第二表面157。第一表面156可形成鞋面120之外部表面之一部分，而第二表面157可形成鞋面120之內部表面之一部分，藉此界定鞋面120內之內腔之至少一部分。在諸多組態中，編織元件151可在嵌花股線152之區域中具有一單個紡織品層之組態。亦即，編織元件151可係表面156與157之間的一單個紡織品層。另外，編織元件151界定複數個鞋帶孔隙158。

類似於嵌花股線132，嵌花股線152按以下方式重複地延伸：自周邊邊緣153朝向內邊緣155、至少部分圍繞鞋帶孔隙158中之一者，且往回至周邊邊緣153。然而，與嵌花股線132相比而言，嵌花股線152之某些部分朝後成角度且延伸至足跟邊緣154。更特定而言，與大部分後部鞋帶孔隙158相關聯之嵌花股線152之部分以以下方式延伸：自足跟邊緣154中之一者朝向內邊緣155、至少部分地圍繞最後部鞋帶孔隙158中之一者，且往回至足跟邊緣154中之一者。另外，嵌花股線152之某些部分並不圍繞鞋帶孔隙158中之一者延伸。更特定而言，嵌花股線152之某些節段延伸朝向內邊緣155，在毗鄰於鞋帶孔隙158中之一者之區域中轉向，且往回延伸朝向周邊邊緣153或足跟邊緣154中之一者。

雖然編織元件151可以各種方式形成，但編織結構之橫列通常沿與嵌花股線152相同之方向延伸。然而，在毗鄰於鞋帶孔隙158之區域中，嵌花股線152亦可沿著編織元件151內之縱行延伸。更特定而言，平行於內邊緣155之嵌花股線152之階段可沿著縱行延伸。

與編織元件151相比，嵌花股線152可呈現較大抗拉伸性。亦即，嵌花股線152之拉伸性可小於編織元件151。假定嵌花股線152之眾多節段延伸穿過編織元件151，嵌花股線152可爲在鞋幫口區域與下部區域之間的鞋面120之部分賦予抗拉伸性。此外，將張力施加於鞋帶122上可爲嵌花股線152賦予張力，藉此促使鞋幫口區域與下部區域

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之間的鞋面120之部分抵靠腳。另外，假定嵌花股線152之眾多節段延伸朝向足跟邊緣154，嵌花股線152可爲足跟區103中之鞋面120之部分賦予抗拉伸性。此外，將張力施加於鞋帶122上可使足跟區103中之鞋面120之部分抵靠腳。如此，嵌花股線152結合鞋帶122一起操作以增強鞋100之合腳性。

編織元件151可併入有上文針對編織元件131所論述之各種類型之紗線中之任何者。嵌花股線152亦可由上文針對嵌花股線132所論述之組態及材料中之任何者形成。另外，相對於圖8A及圖8B所論述之各種編織組態亦可用於編織組件150。更特定而言，編織元件151可具有由一單個紗線、兩個經接結紗線或一可熔紗線及一非可熔紗線形成，其中可熔紗線(a)將非可熔紗線之一部分接合至非可熔紗線之另一部分或(b)將非可熔紗線及嵌花股線152彼此接合。

大部分編織元件131經繪示爲由一相對未變形紡織品及一共同或單個編織結構(例如，一管狀編織結構)形成。相比而言，編織元件151併入有爲編織組件150之不同區域賦予特定性質及優點之各種編織結構。此外，藉由將各種紗線類型與編織結構組合，編織組件150可爲鞋面120之不同區域賦予一系列圍性質。參考圖11，編織組件150之一示意圖展示具有不同編織結構之各種區160至169，現在將詳細論述該等編織結構中之每一者。出於參考目的，圖11中展示區101至103及側104及105中之每一者以在編織組件150併入至鞋100中時提供對編織區160至169之位置之一參考。

一管狀編織區160沿著大部分周邊邊緣153且穿過側104及105兩者上之區101至103中之每一者延伸。管狀編織區160亦在大約位於一介面區101及102處之一區域中之側104及105中之每一者向內延伸以形成內邊緣155之一前部分。管狀編織區160形成一相對非變形編織組態。參考圖12A，繪示穿過管狀編織區160之一區域之一剖面圖，且

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表面156及157實質上彼此平行。管狀編織區160爲鞋100賦予各種優點。舉例而言，管狀編織區160具有比某些其他編織結構大之耐久性及耐磨性，尤其當管狀編織區160中之紗線藉助一可熔紗線接結時。另外，管狀編織區160之相對非變形態樣簡化將strobel鞋墊125接合至周邊邊緣153之製程。亦即，沿著周邊邊緣153定位之管狀編織區160之部分促成鞋100之鉗幫製程。出於參考目的，圖13A繪示管狀編織區160藉助一編織製程形成之方式之一線圈圖。

兩個拉伸編織區161自周邊邊緣153向內延伸且經定位以與腳之蹠骨與鄰近趾骨之間的關節之一位置對應。亦即，拉伸區在大約位於介面區101及102處之區域中自周邊邊緣向內延伸。如同管狀編織區160，拉伸編織區161中編織組態可係一管狀編織結構。然而，與管狀編織區160相比而言，拉伸編織區161由爲編織組件150賦予拉伸及恢復性質之一拉伸紗線形成。雖然拉伸紗線之拉伸程度可顯著變化，但拉伸紗線可在編織組件150之諸多組態中拉伸至少百分之百。

一管狀及雙羅紋集圈編織區162沿著至少中足區102中之內邊緣155之一部分延伸。管狀及雙羅紋集圈編織區162亦形成一相對非變形編織組態，但具有大於管狀編織區160之厚度。在剖面上，管狀及雙羅紋集圈編織區162類似於圖12A，其中表面156及157係彼此實質上平行。管狀及雙羅紋集圈編織區162爲鞋100賦予各種優點。舉例而言，管狀及雙羅紋集圈編織區162具有大於某些其他編織結構之抗拉伸性，此在鞋帶122將管狀及雙羅紋集圈編織區162及嵌花股線152張緊時有益。出於參考目的，圖13B繪示管狀及雙羅紋集圈編織區162藉助一編織製程形成之方式之一線圈圖。

一1×1網眼編織區163位於前足區101中且與周邊邊緣153向內間隔開。1×1網眼編織區具有一C形組態且形成延伸穿過編織元件151且自第一表面156延伸至第二表面157之複數個孔隙，如圖12B中所繪

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示。該等孔隙增強編織組件150之滲透性，此允許空氣進入鞋面120且允許濕氣自鞋面120逃逸。出於參考目的，圖13C繪示1×1網眼編織區163藉助一編織製程形成之方式之一線圈圖。

一2×2網眼編織區164毗鄰於1×1網眼編織區163延伸。與1×1網眼編織區163相比，2×2網眼編織區164形成較大孔隙，該等孔隙可進一步增強編織組件150之滲透性。出於參考目的，圖13D繪示2×2網眼編織區164藉助一編織製程形成之方式之一線圈圖。

一3×2網眼編織區165位於2×2網眼編織區164內，且另一3×2網眼編織區165毗鄰於拉伸區161中之一者定位。與1×1網眼編織區163及2×2網眼編織區164相比，3×2網眼編織區165形成甚至較大孔隙，此可進一步增強編織組件150之滲透性。出於參考目的，圖13E繪示3×2網眼編織區165藉助一編織製程形成之方式之一線圈圖。

一1×1仿網眼編織區166位於前足區101中且圍繞1×1網眼編織區163延伸。與形成穿過編織元件151之孔隙之網眼編織區163至165相比而言，1×1仿網眼編織區166在第一表面156中形成凹口，如圖12C中所繪示。除了增強鞋100之美觀，1×1仿網眼編織區166亦可增強靈活性且減少編織組件150之總質量。出於參考目的，圖13F繪示1×1仿網眼編織區166藉助一編織製程形成之方式之一線圈圖。

兩個2×2仿網眼編織區167位於足跟區103中且毗鄰於足跟邊緣154。與1×1仿網眼編織區166相比，2×2仿網眼編織區167在第一表面156中形成較大凹口。在其中嵌花股線152延伸穿過2×2仿網眼編織區167中之凹口之區域中，如圖12D中所繪示，嵌花股線152可在凹口之一下部區域中可見且曝露。出於參考目的，圖13G繪示2×2仿網眼編織區167藉助一編織製程形成之方式之一線圈圖。

兩個2×2混合編織區168位於中足區102中且在2×2仿網眼編織區167之前方。2×2混合編織區168共用2×2網眼編織區164及2×2仿網眼

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編織區167之特性。更特定而言，2×2混合編織區168形成具有2×2網眼編織區164之大小及組態之孔隙，且2×2混合編織區168形成具有2×2仿網眼編織區167之大小及組態之凹口。在其中嵌花股線152延伸穿過2×2混合編織區168中之凹口之區域，如圖12E中所繪示，嵌花股線152可見且曝露。出於參考目的，圖13H繪示2×2混合編織區168藉助一編織製程形成之方式之一線圈圖。

編織組件150亦包含兩個經襯填區169，該等經襯填區具有上文針對編織組件130所論述之毗鄰腳踝開口121且至少部分地圍繞腳踝開口121延伸之經襯填區域之一般組態。如此，經襯填區169藉由可由單一編織構造形成之兩個重疊且至少部分共同延伸編織層及在編織層之間延伸之複數個浮紗形成。

圖9與圖10之間的比較揭示編織元件151中之大部分變形位於第一表面156而非第二表面157上。亦即，由仿網眼編織區166及167形成之凹口以及2×2混合編織區168中之凹口形成於第一表面156中。此組態具有增強鞋100之舒適性之一優點。更特定而言，此組態使第二表面157之相對非變形組態抵靠腳。圖9及圖10之間的又一比較揭示嵌花股線152之部分曝露於第一表面156而非第二表面157上。此組態亦具有增強鞋100之舒適性之一優點。更特定而言，藉由藉助編織元件151之一部分將嵌花股線152與腳間隔開，嵌花股線152將不接觸腳。

圖14A至圖14C中繪示編織組件130之額外組態。雖然相對於編織組件130論述，但與此等組態中之每一者相關聯之概念亦可與編織組件150一起使用。參考圖14A，編織組件130不存在嵌花股線132。雖然嵌花股線132爲編織組件130之區域賦予抗拉伸性，但某些組態可不需要來自嵌花股線132之抗拉伸性。此外，某些組態可自鞋面120中之較大拉伸獲益。參考圖14B，編織元件131包含與編織元件131之一其餘部分一起由單一編織構造形成且沿著周邊邊緣133處之編織組件130

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之長度延伸之兩個襟片142。當併入至鞋100中時，襟片142可替代strobel鞋墊125。亦即，襟片142可協作形成在鞋墊113下方延伸且固定至中底111之上表面之鞋面120之一部分。參考圖14C，編織組件130具有限制於中足區102之一組態。在此組態中，其他材料元件(例如，紡織品、聚合物發泡體、聚合物薄片、皮革、合成皮革)可透過縫合或結合而接合至編織組件130 (舉例而言)以形成鞋面120。

基於以上論述，編織組件130及150中之每一者可具有爲鞋面120賦予特徵及優點之各種組態。更特定而言，編織元件131及151可併入有爲鞋面120之不同區域賦予特定性質之各種編織結構及紗線類型，且嵌花股線132及152可延伸穿過編織結構以爲鞋面120之區域賦予抗拉伸性且結合鞋帶122一起操作以增強鞋100之合腳性。

編織機及進料機組態

雖然編織可手動執行，但編織組件之商業製造通常藉由編織機執行。圖15中繪示適於生產編織組件130及150中任一者之一編織機200之一實例。出於實例之目的，編織機200具有一V床式橫編織機之一組態，但編織組件130及150中之每一者或編織組件130及150之態樣可以其他類型之編織機生產。

編織機200包含兩個織針床201，該兩個織針床相對於彼此成角，藉此形成一V床。織針床201中之每一者包含置於一共同平面上之複數個各別織針202。亦即，來自一個織針床201之織針202置於一第一平面上，且來自另一織針床201之織針202置於一第二平面上。第一平面及第二平面(即，兩個織針床201)相對於彼此成角度且交會以形成沿著編織機200之一寬度之大部分延伸之一相交點。如下文更詳細闡述，織針202各自具有其中其縮回之一第一位置及其中其延伸之一第二位置。在第一位置中，織針202與其中該第一平面與該第二平面交會之相交點間隔開。然而，在第二位置中，織針202穿過其中該

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第一平面與該第二平面交會之相交點。

一對軌道203在織針床201之相交點上面且平行於其延伸且爲多個標準進料機204及組合進料機220提供附接點。每一軌道203具有兩側，每一側容納任一個標準進料機204或一個組合進料機220。如此，編織機200可包含總計四個進料機204及220。如所繪示，最前方之軌道203在相對側上包含一組合進料機220及一個標準進料機204，且最後方軌道203在相對側上包含兩個標準進料機204。雖然繪示兩個軌道203，但編織機200之其他組態可併入有額外軌道203以爲更多進料機204及220提供附接點。

由於一托架205之動作，進料機204及220沿著軌道203及織針床201移動，藉此爲織針202供應紗線。在圖15中，一紗線206藉由一捲軸207而被提供至組合進料機220。更特定而言，紗線206在進入組合進料機220之前自捲軸207延伸至各種紗線導引件208、一紗線收回彈簧209及一紗線張緊器210。雖然未繪示，但額外捲軸207可用於爲進料機204提供紗線。

標準進料機204習用用於一V床式橫編織機，諸如編織機200。亦即，現有編織機併入有標準進料機204。每一標準進料機204具有供應織針202操縱以編織、集圈及浮織(float)之一紗線之能力。作爲一比較，組合進料機220具有供應織針202編織、集圈及浮織之一紗線(例如，紗線206)之能力，且組合進料機220具有嵌花紗線之能力。此外，組合進料機220具有嵌花各種不同股線(例如，長絲、線、繩、織物帶、纜或鏈或紗線)之能力。因此，組合進料機220呈現比每一標準進料機204大之多功能性。

如上文所述，組合進料機220除了編織、集圈及浮織紗線之外亦可在嵌花一紗線或其他股線時使用。未併入有組合進料機220之習用編織機亦可嵌花一紗線。更特定而言，供應有一嵌花進料機之習用編

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織機亦可嵌花一紗線。一V床式橫編織機之一習用嵌花進料機包含結合操作以嵌花紗線之兩個組件。嵌花進料機之組件中之每一者經固定以分離兩個毗鄰軌道上之附接點，藉此佔據兩個附接點。儘管一個別標準進料機204僅佔據一個附接點，但當一嵌花進料機用於將一紗線嵌花至一編織組件時兩個附接點通常被佔據。此外，儘管一習用嵌花進料機佔據兩個附接點，但組合進料機220僅佔據一個附接點。

假定編織機200包含兩個軌道203，四個附接點在編織機200中可用。若一習用嵌花進料機與編織機200一起使用，則僅兩個附接點將用於標準進料機204。然而，當在編織機200中使用組合進料機220時，三個附接點可用於標準進料機204。因此，當嵌花一紗線或其他股線時，可使用組合進料機220，且組合進料機220具有僅佔據一個附接點之一優點。

組合進料機220在圖16至圖19中個別經繪示爲包含一托架230、一進料機臂240及一對致動部件250。雖然大部分組合進料機220可由金屬材料(例如，鋼、鋁、鈦)形成，但舉例而言，托架230、進料機臂240及致動部件250之部分可由聚合物、陶瓷或複合材料形成。如上文所論述，組合進料機220除了編織、集圈及浮織一紗線之外亦可在嵌花一紗線或其他股線時使用。特定而言，參考圖16，紗線206之一部分經繪示以圖解說明一股線與組合進料機220介接之方式。

托架230具有一大體矩形組態且包含藉由四個螺栓233接合之一第一罩部件231及一第二罩部件232。罩部件231及232界定進料機臂240及致動部件250之部分位於其中之一內部腔。托架230亦包含自第一罩部件231向外延伸用於將進料機220固定至軌道203中之一者之一附接元件234。雖然附接元件234之組態可變化，但附接元件234經繪示爲包含形成一鳩尾形狀之兩個經間隔開凸出區域，如圖17中所繪示。軌道203中之一者上之一相反鳩尾組態可延伸至附接元件234之鳩

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尾形狀中以有效將組合進料機220接合至編織機200。亦應注意，第二罩部件232形成一居中定位且伸長之槽235。如圖18中所繪示。

進料機臂240具有穿過托架230 (即，罩部件231及232之間的腔)且自托架230之一下部側延伸之一大體伸長組態。除了其他組件以外，進料機臂240亦包含一致動螺栓241、一彈簧242、一滑輪243、一環圈244及一分配區域245。致動螺栓241自進料機臂240向外延伸且位於罩部件231與232之間的腔內。致動螺栓241之一側亦位於第二罩部件232中之槽235內，如圖18中所繪示。彈簧242固定至托架230及進料機臂240。更特定而言，彈簧242之一端固定至托架230，且彈簧242之一相對端固定至進料機臂240。滑輪243、環圈244及分配區域245存在於進料機臂240上以與紗線206或另一股線介接。此外，滑輪243、環圈244及分散區域245經組態以確保紗線206或另一股線平滑地穿過組合進料機220，藉此可靠地供應至織針202。再次參考圖16，紗線206圍繞滑輪243延伸、穿過環圈244且延伸至分配區域245。另外，紗線206自係進料機臂240之一端區的一分配尖端246延伸出，以然後供應織針202。

致動部件250中之每一者包含一臂251及一板252。在致動部件250之諸多組態中，每一臂251形成爲具有板252中之一者之一單件式元件。儘管臂251位於托架230之外部且在托架230之一鞋面側處，但板252位於托架250內。臂251中之每一者具有界定一外端253及一相對內端254之一伸長組態，且臂251經定位以界定內端254兩者之間的一空間255。亦即，臂251彼此間隔開。板252具有一大體平面組態。參考圖19，板252中之每一者界定具有一傾斜邊緣257之一孔隙256。此外，進料機臂240之致動螺栓241延伸至每一孔隙256中。

上文所論述之組合進料機220之組態提供促成進料機臂240之一平移移動之一結構。如下文更詳細論述，進料機臂240之平移移動將

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分配尖端246選擇性地定位於在織針床201之相交點上面及下面之一位置處。亦即，分配尖端246具有往復運動穿過織針床201之相交點之能力。進料機臂240之平移移動之一優點係組合進料機220 (a)在分配尖端246定位於織針床201之相交點上面時供應用於編織、集圈及浮織之紗線206及(b)在分配尖端246定位於織針床201之相交點下面時供應用於嵌花之紗線206或另一股線。此外，進料機臂240取決於使用組合進料機220之方式而在兩個位置之間往復運動。

在往復穿過織針床201之相交點時，進料機臂240自一縮回位置平移至一延伸位置。當在縮回位置時，分配尖端246定位於織針床201之相交點上面。當在延伸位置時，分配尖端246定位於織針床201之相交點下面。分配尖端246在進料機臂240位於縮回位置中時比在進料機臂240位於延伸位置中時更接近於托架230。類似地，分配尖端246在進料機臂240位於延伸位置中時比在進料機臂240位於縮回位置中時離托架230較遠。換言之，分配尖端246在位於延伸位置中時移動遠離托架230，且分配尖端246在位於縮回位置中時移動較接近於托架230。

出於在圖16至圖20C以及稍微所論述之其他圖中參考之目的，一箭頭221毗鄰於分配區域245而定位。當箭頭221向上或朝向托架230指向時，進料機臂240位於縮回位置中。當箭頭221向下或遠離托架230指向時，進料機臂240位於延伸位置中。因此，藉由參考箭頭221之位置，可容易確定進料機臂240之位置。

進料機臂240之自然狀態係縮回位置。亦即，當無顯著力施加至組合進料機220之區域時，進料機臂保持位於縮回位置中。參考圖16至圖19，舉例而言，無力或其他影響經展示爲與組合進料機220相互作用，且進料機臂240位於縮回位置中。然而，當一足夠力施加至臂251中之一者時，進料機臂240之平移移動可發生。更特定而言，當一足夠力施加至外端253中之一者且經引導朝向空間255時，進料機臂

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240之平移移動發生。參考圖20A及圖20B，一力222作用於外端253中之一者且經引導朝向空間255，且進料機臂240經展示爲已平移至延伸位置。然而，在移除力222之後，進料機臂240將旋即返回至縮回位置。亦應注意，圖20C將力222繪示爲作用於內端254上且經向外引導，且進料機臂240保持位於縮回位置中。

由於上文所論述，進料機204及220由於托架205之動作而沿著軌道203及織針床201移動。更特定而言，托架205內之一驅動螺栓接觸進料機204及220以沿著織針床201推動進料機204及220。相對於組合進料機220，驅動螺栓可接觸外端253中之一者或內端254中之一者以沿著織針床201推動組合進料機220。當驅動螺栓接觸外端253中之一者，進料機臂240平移至延伸位置且分配尖端246在織針床201之相交點下面通過。當驅動螺栓接觸內端254中之一者且位於空間255內時，進料機臂240保持位於縮回位置中且分配尖端246在織針床201之相交點上面。因此，其中托架205接觸組合進料機220之位置判定進料機臂240是位於縮回位置中或是位於延伸位置中。

現在將論述組合進料機220之機械動作。圖19至圖20B繪示之組合進料機220，其中第一罩部件231被移除，藉此曝露托架230中之腔內之元件。藉由比較圖19與圖20A及圖20B，力222促使進料機臂240平移之方式可顯而易見。當力222作用於外端253中之一者上時，致動部件250中之一者沿垂直於進料機臂240之長度之一方向滑動。亦即，致動部件250中之一者在圖19至圖20B中水平滑動。致動部件250中之一者之移動致使致動螺栓241嚙合傾斜邊緣257中之一者。假定致動部件250之移動限制於垂直於進料機臂240之長度之方向，致動螺栓241抵靠傾斜邊緣257滾動或滑動且促使進料機臂240平移至延伸位置。在移除力222之後，彈簧242將進料機臂240自延伸位置拉動至縮回位置。

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基於上文之論述，組合進料機220取決於一紗線或其他股線是用於編織、集圈或浮織或是用於嵌花而在縮回位置與延伸位置之間往復運動。組合進料機220具有其中力222之施加促使進料機臂240自縮回位置平移至延伸位置且力222之移除促使進料機臂240自延伸位置平移至縮回位置之一組態。亦即，組合進料機220具有其中力222之施加及移除致使進料機臂240在織針床201之相對側之間往復運動之一組態。通常，外端253可視爲致動區域，其促使進料機臂240之移動。在組合進料機220之其他組態中，致動區域可在其他位置中或可對應於其他刺激以促使進料機臂240之移動。舉例而言，致動區域可係耦合至控制進料機臂240之移動之伺服機構之電輸入。因此，組合進料機220可具有以與上文所論述之組態相同之一般方式操作之各種結構。

編織製程

現在將詳細論述編織機200操作以製造一編織組件之方式。此外，以下論述將證實在一編織製程期間組合進料機220之操作。參考圖21A，繪示包含各種織針202、軌道203、標準進料機204及組合進料機220之編織機200之一部分。儘管組合進料機220固定至軌道203之一前側，但標準進料機204固定至軌道203之一後側。紗線206穿過組合進料機220，且紗線206之一端自分配尖端246向外延伸。雖然繪示紗線206，但其他股線(例如，長絲、線、繩、織物帶、纜或鏈或紗線)可穿過組合進料機220。另一紗線211穿過標準進料機204且形成一編織組件260之一部分，且形成編織組件260中之一最上方橫列之紗線211之線圈藉由位於織針202之端部上之鉤固持。

本文中所論述之編織製程係關於編織組件260之形成，編織組件260可係任何編織組件，包含類似於編織組件130及150之編織組件。出於論述之目的，圖中僅展示編織組件260之一相對小節段以便准許圖解說明編織結構。此外，編織機200與編織組件260之各種元件之比

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例尺或比例可經增大以較佳地圖解說明編織製程。

標準進料機204包含具有一分配尖端213之一進料機臂212。進料機臂212經成角度以將分配尖端213定位於(a)居中於織針202之間及(b)在織針床201之一相交點上面之一位置中。圖22A繪示此組態之一示意性剖面圖。注意，織針202置於不同平面上，該等平面相對於彼此成角度。亦即，來自織針床201之織針202置於不同平面上。織針202各自具有一第一位置及一第二位置。在第一位置(其以實線展示)中，織針202縮回。在第二位置(其以虛線展示)中，織針202延伸。在第一位置中，織針202與其中織針床201置於其上之平面交會之相交點間隔開。然而，在第二位置中，織針202延伸且穿過其中織針床201在其上之平面交會之相交點。亦即，織針202在延伸至第二位置時彼此交叉。應注意，分配尖端213位於平面之相交點上面。在此位置中，出於編織、集圈及浮織之目的，分配尖端213爲織針202供應紗線211。

組合進料機220位於縮回位置中，如由箭頭221之定向所表明。進料機臂240自托架230向下延伸以將分配尖端246定位於(a)居中於織針202之間且(b)在織針床201之相交點上面之一位置中。圖22B繪示此組態之一示意性剖面圖。注意，分配尖端246定位於與圖22A中之分配尖端213相同之相對位置中。

現在參考圖21B，標準進料機204沿著軌道203移動且一新橫列在編織組件260中由紗線211形成。更特定而言，織針202拉動紗線211之節段穿過先前橫列之線圈，藉此形成新橫列。因此，橫列可藉由使標準進料機204沿著織針202移動而添加至編織組件260，藉此准許織針202操縱紗線211且由紗線211形成額外線圈。

繼續編織製程，進料機臂240現在自縮回位置平移至延伸位置，如圖21C中所繪示。在延伸位置中，進料機臂240自托架230向下延伸以將分配尖端246定位於(a)居中於織針202之間及(b)在織針床201之相交

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點下面之一位置中。圖22C繪示此組態之一示意性剖面圖。注意，分配尖端246由於進料機臂240之平移移動而在圖22B中定位於分配尖端246之位置下面。

現在參考圖21D，組合進料機220沿著軌道203移動且紗線206放置於編織組件260之線圈之間。亦即，紗線206以一交替型樣而位於某些線圈之前方且其他線圈之後方。此外，紗線206放置於由來自一個織針床201之織針202固持之線圈之前方，且紗線206置於由來自另一織針床201之織針202固持之線圈之後方。注意，進料機臂240保持位於延伸位置中以便將紗線206放置於在織針床201之相交點下方之區域中。此有效地將紗線206放置於在圖21B中由標準進料機204新近形成之橫列內。

爲完成將紗線206嵌花至編織組件260中，標準進料機204沿著軌道203移動以由紗線211形成一新橫列，如圖21E中所繪示。藉由形成新橫列，紗線206有效地編織於編織組件260之結構內或以其他方式整合至其中。在此階段，進料機臂240亦可自延伸位置平移至縮回位置。

圖21D及圖21E展示進料機204及220沿著軌道203之單獨移動。亦即，圖21D展示組合進料機220沿著軌道203之一第一移動，且圖21E展示標準進料機204沿著軌道203之一第二及隨後移動。在諸多編織製程中，進料機204及220可有效地同時移動以嵌花紗線206且由紗線211形成一新橫列。然而，組合進料機220向前或在標準進料機204之前方移動以便在由紗線211形成新橫列之前定位紗線206。

上文論述中所概述之一般編織製程提供嵌花股線132及152可位於編織元件131及151中之方式之一實例。更特定而言，編織組件130及150可藉由使用組合進料機220來將嵌花股線132及152有效地插入至編織元件131中而形成。假定進料機臂240之往復運動動作，嵌花股線

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可在形成一新橫列之前位於一先前形成之橫列內。

繼續編織製程，進料機臂240現在自縮回位置平移至延伸位置，如圖21F中所繪示。組合進料機220然後沿著軌道203移動且紗線206放置於編織組件260之線圈之間，如圖21G中所繪示。此將紗線206有效地放置於在圖21E中由標準進料機204形成之橫列內。爲了完成將紗線206嵌花至編織組件260中，標準進料機204沿著軌道203移動以由紗線211形成一新橫列，如圖21H中所繪示。藉由形成新橫列，紗線206有效地編織於編織組件260之結構內或以其他方式整合至其中。在此階段，進料機臂240亦可自延伸位置平移至縮回位置。

參考圖21H，紗線206在兩個嵌花節段之間形成一線圈214。在上文對編織組件130之論述中，注意到，嵌花股線132在周邊邊緣133處重複離開編織元件131且然後在周邊邊緣133之另一位置處重新進入編織元件131，藉此沿著周邊邊緣133形成線圈，如圖5及圖6中所見。線圈214以一類似方式形成。亦即，線圈214在紗線206離開編織組件260之編織結構且然後重新進入編織結構之情況下形成。

如上文所論述，標準進料機204具有供應織針202操縱以編織、集圈及浮織之一紗線(例如，紗線211)之能力。然而，組合進料機220具有供應織針202編織、集圈或浮織亦即嵌花紗線之一紗線(例如，紗線206)之能力。上文對編織製程之論述闡述組合進料機220嵌花一紗線同時位於延伸位置中之方式。組合進料機220亦可供應用於編織、集圈及浮織之紗線同時位於縮回位置中。參考圖21I，舉例而言，組合進料機220沿著軌道203移動同時位於縮回位置中且形成編織組件260之一橫列同時位於縮回位置中。因此，藉由使進料機臂240在縮回位置與延伸位置之間往復運動，組合進料機220可出於編織、集圈、浮織及嵌花之目的而供應紗線206。因此，與標準進料機204相比，組合進料機220之一優點係關於其供應可用於較大數目個功能之一紗線

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之多功能性。

組合進料機220供應用於編織、集圈、浮織及嵌花之紗線之能力基於進料機臂240之往復運動動作。參考圖22A及圖22B，分配尖端213及246相對於織針220位於完全相同位置處。如此，進料機204及220兩者皆可供應用於編織、集圈及浮織之一紗線。參考圖22C，分配尖端246位於一不同位置處。如此，組合進料機220可供應用於嵌花之一紗線或其他股線。因此，組合進料機220之一優點係關於其供應可用於編織、集圈、浮織及嵌花之一紗線之多功能性。

其他編織製程考量事項

現在將論述關於編織製程之額外態樣。參考圖23，編織組件260之上部橫列由紗線206及211兩者形成。更特定而言，橫列之一左側由紗線211形成，而橫列之一右側由紗線206形成。額外，紗線206嵌花至橫列之左側。爲形成此組態，標準進料機204可初始由紗線211形成橫列之左側。組合進料機220然後將紗線206置於橫列之右側同時進料機臂240位於延伸位置中。隨後，進料機臂240自延伸位置移動至縮回位置且形成橫列之右側。因此，組合進料機可將一紗線嵌花至一橫列之一部分中且然後出於編織該橫列之一其餘部分而供應紗線。

圖24繪示包含四個組合進料機220之編織機200之一組態。如上文所論述，組合進料機220具有供應用於編織、集圈、浮織及嵌花之一紗線(例如，紗線206)之能力。假定此多功能性，標準進料機204可在編織機200中或各種習用編織機中替換爲多個組合進料機220。

圖8B繪示編織組件130之一組態，其中兩個紗線138及139經接結以形成編織元件131，且嵌花股線132延伸穿過編織元件131。上文所論述之一般編織製程亦可用於形成此組態。如圖15中所繪示，編織機200包含多個標準進料機204，且標準進料機204中之兩者可用於形成編織元件131，其中組合進料機220安置(deposit)嵌花股線132。因

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此，上文在圖21A至圖21I中所論述之編織製程可藉由添加另一標準進料機204以供應一額外紗線而修改。在其中紗線138係一非可熔紗線且紗線139係一可熔紗線之組態中，編織組件130可在編織製程之後經加熱以熔接編織組件130。

圖21A至圖21I中所繪示之編織組件260之部分具有帶有規則且不間斷橫列及縱行之一羅紋編織紡織品之組態。亦即，編織組件260之部分不具有(舉例而言)類似於網眼編織區163至165之任何網眼區域或類似於仿網眼編織區166及167之仿網眼區域。爲在編織組件150及260中之任一者中形成網眼編織區163至165，使用一架式織針床201與組織線圈在不同架式位置中自前織針床201至後織針床201及自後織針床201至前織針床201之移圈(transfer)之一組合。爲形成類似於仿網眼編織區166及167之仿網眼區域，使用一架式織針床及組織線圈自前織針床201至後織針床201之一移圈之一組合。

一編織組件內之橫列通常彼此平行。假定大部分嵌花股線152沿循編織元件151內之橫列，可建議嵌花股線152之各種階段應彼此平行。參考圖9，舉例而言，嵌花股線152之某些節段在邊緣153與155之間延伸且其他節段在邊緣153與154之間延伸。嵌花股線152之各種節段因此並不平行。形成縫褶之概念可用於爲嵌花股線152賦予此非平行組態。更特定而言，各種長度之橫列可形成爲有效地將楔形形狀結構插入於嵌花股線152之節段之間。形成於編織組件150中之結構因此在嵌花股線152之各種節段不平行之情況下可透過縫褶之製程完成。

雖然大部分嵌花股線152沿循編織元件151內之橫列，但嵌花股線152之某些節段沿循縱行。舉例而言，毗鄰於且平行於內邊緣155之嵌花股線152之節段沿循縱行。此可藉由首先沿著一橫列之一部分插入嵌花股線152之一節段且將其插入至其中嵌花股線152意欲沿循一縱行之一點來完成。然後使嵌花股線152折回(kick back)以使嵌花股線

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152自路徑移出，且橫列完成。隨著形成隨後橫列，使嵌花股線152再次折回以使嵌花股線152在其中嵌花股線152意欲沿循縱行之點處自該路徑移出，且橫列完成。重複此製程直至嵌花股線152沿著縱行延伸一期望距離爲止。類似概念可用於編織組件130中之嵌花股線132之部分。

各種程序可用於減少(a)編織元件131與嵌花股線132或(b)編織元件151與嵌花股線152之間的相對移動。亦即，各種程序可用於防止嵌花股線132及152自編織元件131及151滑動、通過、拉出或以其他方式位移。舉例而言，將由熱塑聚合物材料形成之一或多個紗線熔接至嵌花股線132及152可防止嵌花股線132及152與編織元件131及151之間的移動。另外，嵌花股線132及152可在被週期性地進料至編織織針作爲一集圈元件時固定至編織元件131及151。亦即，嵌花股線132及152可在沿著其長度之點(例如，每公分一次)處形成爲集圈組織(tuck stitch)以便將嵌花股線132及152固定至編織元件131及151且防止嵌花股線132及152之移動。

在上文所闡述之編織製程之後，各種操作可經執行以增強編織組件130及150中之任一者之性質。舉例而言，一拒水塗層或其他防水處理可經應用以限制編織結構吸收及保持水之能力。作爲另一實例，編織組件130及150可經蒸汽處理以改良彈性(loft)且促使紗線之熔接。如上文關於圖8B所論述，紗線138可係一非可熔接紗線且紗線139可係一可熔接紗線。當經蒸汽處理時，紗線139可熔化或以其他方式軟化以便自一固態轉變成一軟化或液態，且然後當經足夠冷卻時自軟化或液態轉變成固態。如此，舉例而言，紗線139可用於將(a)紗線138之一部分接合至紗線138之另一部分，(b)將紗線138及嵌花股線132彼此接合，或(c)將另一元件(例如，標誌、商標及具有洗滌說明及材料資訊之標牌)接合至編織組件130。因此，一蒸汽處理製程可用於

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促使熔接編織組件130及150中之紗線。

雖然與蒸汽處理製程相關聯之程序可大大改變，但一種方法涉及在蒸汽處理期間將編織組件130及150中之一者別住(pin)至一夾具。將編織組件130及150中之一者別住至一夾具之一優點係可控制編織組件130及150之特定區域之所得尺寸。舉例而言，夾具上之別針可經定位以固持對應於編織組件130之周邊邊緣133之區域。藉由保持周邊邊緣133之特定尺寸，周邊邊緣133將具有用於將鞋面120接合至鞋底結構110之鉗幫製程之一部分之正確長度。因此，編織組件130及150之別住區域可用於控制在蒸汽處理製程之後編織組件130及150之所得尺寸。

上文針對形成編織組件260所闡述之編織製程可應用於製造鞋100之編織組件130及150。編織製程亦可應用於製造各種其他編織組件。亦即，使用一或多個組合進料機或其他往復運動進料機之編織製程可用於形成各種編織組件。如此，透過上文所闡述之編織製程或一類似製程形成之編織組件亦可用於其他類型之服裝(例如，襯衫、褲子、襪子、夾克、內衣)、運動設備(例如，高爾夫球袋、棒球及足球手套、英式足球限制結構)、容器(例如，背包、提包)及用於傢具(例如，椅子、長沙發、汽車座椅)之裝飾品。編織組件亦可用於床單(例如，被單、毛毯)、桌布、毛巾、旗幟、帳篷、帆及降落傘。編織組件出於工業目的可用作工業用紡織品，包含用於汽車及航空航天應用之結構、過濾材料、醫用紡織品(例如，繃帶、棉棒、植入體)、用於加固堤防之土工織物、用於農作物保護之農用紡織品及保護或絕緣以抗熱及輻射之工業服裝。因此，既出於個人目的又出於工業目的，透過上文所闡述之編織製程或一類似製程所形成之編織組件可併入至各種產品中。

具有鞋舌之編織組件

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在鞋100中，鞋舌124與編織組件130分離且可能藉助縫合、一黏合劑或熱結合而接合至編織組件130。此外，鞋舌124經論述爲在編織製程之後添加至編織組件130。然而，如圖25及圖26中所繪示，編織組件130包含與編織元件131一起由單一編織構造形成之一編織鞋舌170。亦即，編織元件131及鞋舌170透過一編織製程形成爲一單件式元件，此將在下文更詳細論述。雖然鞋舌124或另一鞋舌可在形成編織組件130之後接合至編織元件131，但鞋舌170或另一編織鞋舌可在編織製程期間形成且與編織組件130之一部分一起由單一編織構造形成。

鞋舌170位於編織組件130之一鞋幫口區域(即，鞋帶122及鞋帶孔隙123所位於之位置)且沿著鞋幫口區域延伸。當併入至鞋100中時，舉例而言，鞋舌170自鞋幫口區域之一前部分延伸至腳踝開口121。如同編織元件131，鞋舌170經繪示爲由一相對未變形紡織品及一共同或單個編織結構形成。鞋舌170亦在圖27中經繪示爲具有一大體平面組態。可將此組態賦予給鞋舌170之編織結構以及編織元件131之實例係上文所論述之編織區160至162中之各種編織結構中之任何者。然而，在其他組態中，孔隙可藉由使用網眼編織區163至165之編織結構而形成於鞋舌170之區域中，凹口可藉由使用仿網眼編織區166或167之編織結構而形成於鞋舌170之區域中，或孔隙與凹口之一組合可藉由使用混合編織區168之編織結構而形成於鞋舌170之區域中。另外，鞋舌170之區域可具有(舉例而言)類似於經襯填區169之在形成爲具有若干層及浮紗之一經襯填態樣。因此，出於實例目的而展示鞋舌170之未變形及平面態樣，且可透過使用不同編織結構而賦予各種特徵。

參考圖28及圖29，一編織鞋舌175經繪示爲與編織組件150之編織元件151一起由單一編織構造形成。鞋舌175具有與鞋舌170相同之大體形狀，但可具有帶有較大厚度之一經襯填態樣。更特定而言，鞋

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舌175在圖30中經繪示爲包含可由單一編織構造形成之兩個重疊且至少部分共同延伸編織層176，及位於層176之間的複數個紗線線圈177。雖然層176之側或邊緣彼此固定或編織，但一中心區域通常未經固定。如此，層176有效地形成一管或管狀結構，且紗線線圈177位於層176之間且自其中之一者向外延伸。實際上，紗線線圈177填充層176之間的一內體積且爲鞋舌175賦予一可壓縮或經襯填天涯。亦應注意，層176及紗線線圈177中之每一者可在形成編織組件150之編織製程期間由單一編織構造形成。

另一編織組件180在圖31中經繪示爲包含一編織元件181、一嵌花股線182及一編織鞋舌183。惟鞋舌183之存在除外，編織組件180具有Dua之美國專利申請公開案2010/0154256中所揭示之一編織組件之一大體結構，該美國專利申請公開案以引用方式併入本文中。鞋舌183與編織元件181一起由單一編織構造形成且包含各種編織結構。參考圖32，舉例而言，鞋舌183之周邊區域呈現可在編織區160至162中具有各種編織結構中之任何者之一未變形組態。鞋舌183之至少兩個區域併入有孔隙且可在網眼編織區163至165中之各種編織結構中之任何者，參考圖33，鞋舌183之一中心區具有可由單一編織構造形成之包含兩個重疊且至少部分共同延伸之編織層184及在層184之間延伸之複數個浮紗185之一可壓縮或經襯填態樣。因此，鞋舌183之中心區域可呈現經襯填區169之編織結構。雖然層184之側或邊緣經彼此固定，但一中心區域通常未經固定。如此，層184有效地形成一管或管狀結構，且浮紗185可位於或嵌花於層184之間以穿過管狀結構。亦即，浮紗185在層184之間延伸，通常平行於層184之表面，且亦穿過且填充層184之間的一內體積。儘管大部分鞋舌183由經機械操縱以形成腳趾紗圈之紗線形成，但浮紗185通常自由或以其他方式嵌花於層184之間的內體積內。作爲一額外事項，層184可至少部分由一拉伸紗線形成

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以將上文所論述之優點賦予給編織層140及浮紗141。

鞋舌183提供可使用各種編織結構之方式之一實例。如上文所論述，鞋舌183之周邊區域呈現一未變形組態，鞋舌183之兩個區域併入有孔隙，且鞋舌183之中心區域包含編織層184及浮紗185以提供一可壓縮或經襯填態樣。亦可使用仿網眼編織結構及混合編織結構。因此，各種編織結構可併入至鞋舌183或任何其他編織鞋舌(例如，鞋舌170及175)中以賦予不同性質或美觀。

鞋舌170固定至編織元件131之鞋幫口區域之一前部分。亦即，鞋舌170透過編織接合至編織元件131在最接近於鞋100中之前足區101之鞋幫口區域之一部分中。鞋舌175及183中之每一者分別固定或編織至編織組件150及180中之一類似位置。然而，參考圖34及圖35，一編織鞋舌190沿著並不包含嵌花股線132或鞋帶孔隙123之編織組件131之一組態之鞋幫口區域之一長度固定。更特定而言，鞋舌190之邊緣經編織至自內邊緣135向外間隔開之編織元件131之一區域。因此，鞋舌170、175、183及190之組態中之任何者可固定(例如，透過單一編織構造)至編織組件130、150及180之鞋幫口區域中之各種位置。

在編織製程期間構造鞋舌170之優點及單一編織構造之優點係較高效製造及共同性質。更特定而言，製造效率可藉由在編織製程期間形成編織組件130之大部分及消除通常人工執行之各種步驟(例如，製作一單獨鞋舌、固定鞋舌)而增加。鞋舌170及編織元件131亦可在由相同紗線(或紗線類型)形成時具有共同性質或具有類似編織結構。舉例而言，在鞋舌170及編織元件131之兩者中使用相同紗線賦予類似耐久性、強度、拉伸性、耐磨性、可生物分解性、熱及疏水性質。除了物理性質以外，在鞋舌170及編織元件131之兩者中使用相同紗線亦可賦予共同美觀或觸覺性質，諸如，色彩、光澤及紋理。在鞋舌170及編織元件131之兩者中使用相同編織結構亦可賦予共同物理性質及美

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觀性質。當編織元件131之至少一部分及鞋舌170之至少一部分由一共同紗線(或紗線類型)形成時此等優點亦可存在。

鞋舌175在層176之間包含紗線線圈177，且鞋舌183在層184之間包含浮紗185。紗線線圈177及浮紗185之一益處係形成可壓縮或經襯填區域。除了紗線線圈177及浮紗185以外，亦可使用其他類型之自由紗線節段。出於本申請案之目的，「自由紗線節段」或其變體經界定爲非直接形成一編織結構之交織線圈(例如，界定橫列及縱行)之紗線之段或部分，諸如例如，浮紗、嵌花紗線、毛圈線圈、紗線毛頭及紗線切段。此外，應注意，自由紗線節段可係一個別紗線之一部分，其中紗線之其他部分形成編織結構之交織線圈。舉例而言，形成毛圈線圈之一紗線之部分(例如，自由紗線節段)可位於形成一編織結構之交織線圈之紗線之部分之間。作爲自由紗線節段之一替代方案，發泡體材料或其他類型之可壓縮材料可用於鞋舌175及183中之任一者內。

作爲一最終事項，雖然鞋舌170結合編織組件130一起被揭示，但鞋舌170亦可與編織組件150及180以及其他編織組件一起使用。類似地，鞋舌175、183及190可與編織組件130、150及180中之任何者以及其他編織組件一起使用。因此，本文中所揭示之組合係出於實例之目的且亦可使用其他組合。此外，鞋舌170、175、183及190之特定組態亦意欲提供實例且亦可顯著變化。舉例而言，層184及浮紗185之位置可經放大、移動至鞋舌183之一周邊、或自鞋舌183移除。因此，各種組合及組態意欲提供實體，且亦可使用其他組合及組態。

鞋舌編織製程

現在將詳細論述編織機200操作以製造具有一鞋舌之一編織組件之方式。此外，以下論述將證實編織元件131及鞋舌170由單一編織構造形成之方式，但類似製程可用於其他編織組件及鞋舌。參考圖36A至圖36G，編織機200之一部分經示意性繪示爲包含織針床201、一個

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軌道203、一標準進料機204及一個組合進料機220。應理解，雖然編織組件130形成於織針床201之間，編織組件130經展示毗鄰於織針床201以(a)在論述編織製程期間較可見及(b)展示編織組件130之部分相對於彼此及織針床201之位置。此外，雖然繪示一個軌道203、一個標準進料機204及一個組合進料機220，但可使用額外軌道203、標準進料機204及組合進料機220。因此，出於闡釋編織製程之目的，簡化編織機200之大體結構。

初始地，鞋舌170之一部分藉由編織機200形成，如圖36A中所繪示。在形成鞋舌170之此部分中，標準進料機204沿著軌道203重複移動且各種橫列由至少紗線211形成。更特定而言，織針202將紗線211之節段拉動穿過一先前橫列之線圈，藉此形成另一橫列。此動作繼續直至鞋舌170實質上形成爲止，如圖36B中所繪示。應注意，在此階段，雖然鞋舌170經繪示爲由一個紗線211形成，但額外紗線可自其他標準進料機204併入至鞋舌170中。舉例而言，一可熔紗線可併入至至少鞋面或鞋舌170之最終橫列中以輔助確保鞋舌170與編織元件131恰當地接合或編織在一起。另外，鞋舌170之至少最終橫列可包含具有一相對拉緊或密集編織之集圈組織以確保鞋舌170在編織製程之稍後階段期間保持恰當地定位於織針202上。

根據先前所論述之編織製程，編織機200現在開始形成編織元件131之製程，如圖36C中所繪示。隨著編織製程繼續，亦根據先前所論述之編織製程，組合進料機220嵌花紗線206以形成嵌花股線132，如圖36D中所繪示。透過圖36C與圖36D之一比較，鞋舌170相對於織針床201保持靜止，而編織元件131向下移動且可隨著在編織元件131中形成連續橫列而重疊鞋舌170。上述情況繼續直至形成意欲將鞋舌170接合至編織元件131之一橫列爲止。更特定而言，鞋舌170在形成編織組件131之部分時相對於織針床201保持靜止。然而，在圖36E中

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所繪示之點處，形成(a)跨越包含交錯集圈組織之鞋舌170之最終橫列延伸且(b)與鞋舌170之最終橫列接合在一起之一橫列。實際上，此橫列將鞋舌170接合至編織元件131。在此節段，因此，編織元件131及鞋舌170有效地由單一編織構造形成。

一旦鞋舌170接合至編織元件131，編織機200繼續形成橫列之製程，藉此形成編織元件131之大部分，如圖36F中所繪示。假定鞋舌170現在接合至編織元件131，鞋舌170隨著形成連續橫列而與編織元件131一起向下移動，如透過圖36E與圖36F之一比較所見。向前進展，編織機200繼續在編織元件131中形成橫列之製程直至實質上形成編織組件130爲止，如圖36G中所繪示。

現在呈現與將編織組件130形成爲包含鞋舌170相關聯之一般製程，將論述編織製程之額外態樣。如上文所述，一可熔紗線可併入至鞋舌170之至少最終橫列中以輔助確保鞋舌170與編織元件131恰當接合或編織在一起。在某些編織製程中，裁剪形成鞋舌170之最終橫列之紗線。藉由將可熔紗線併入至鞋舌170之最終橫列中，可強化鞋舌170與編織元件131之介面處之編織結構。亦即，熔化可熔紗線將使紗線之節段熔化或以其他方式接合於該介面處且防止經裁剪紗線拆散

亦如上文所述，鞋舌170之至少最終橫列可包含具有一相對拉緊或密集編織之交錯集圈組織以確保鞋舌170在編織製程之稍後階段恰當保持定位於織針202上。在形成編織元件131之編織製程之大部分期間，鞋舌170相對於織針床201保持靜止。然而，編織機200之移動、振動或其他動作可將最終橫列之部分自織針202逐出，藉此形成下降組織。藉由形成具有一相對拉緊或密集編織之交錯集圈組織，形成較少下降組織。此外，若形成下降組織，則最終橫列內之可熔紗線將使下降組織熔接或以其他方式接合於編織結構內。

一旦編織鞋舌170，各種織針202即在形成編織元件131時將鞋舌

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170固持於適當位置中。實質上，固持鞋舌170之織針202不可用於進一步編織直至鞋舌170與編織元件131接合在一起。因此，僅定位超過鞋舌170之邊緣(即，至右側及至左側)之彼等織針202可用於形成編織元件131。因此，鞋舌170之最終橫列應具有等於或小於其中鞋舌170與編織元件131接合在一起之區域中之內邊緣135之相對側之間的距離的寬度。換言之，編織組件130之設計應計及(a)鞋舌170之最終橫列之長度及(b)供用於在形成編織元件131時固持鞋舌170之織針202之數目。

在上文所論述之編織製程，鞋舌170及編織元件131兩者皆由紗線211形成。儘管鞋舌170在編織製程之一部分中相對於織針床201保持靜止，但編織元件131之部分隨著形成連續橫列而向下移動。假定紗線211之一段可自鞋舌170之最終橫列延伸至編織元件131之第一橫列(即，編織元件131之底部邊緣)，紗線之此段應具有足夠長度以計及編織元件131之第一橫列之向下移動。實質上，圖36C至圖36E之一比較證實編織元件131之第一橫列隨著形成編織元件131而向下移動且遠離鞋舌170之第一橫列。因此，若紗線211之一段自鞋舌170之最終橫列延伸至編織元件131之第一橫列，則紗線之此段應具有足夠長度以計及鞋舌170之最終橫列與編織元件131之第一橫列之間的增長距離。

雖然各種方法可用於計及鞋舌170之最終橫列與編織元件131之第一橫列之間的增長距離，但圖37將一擴展節段195繪示爲在鞋舌170之形成之後形成。擴展節段195可然後自織針202脫離。隨著鞋舌170之最終橫列與編織元件131之第一橫列之間的距離增加，擴展節段195可拆散且加長。亦即，擴展節段195之拆散可用於有效地加長鞋舌170之最終橫列與編織元件131之第一橫列之間的紗線211之節段。在某些組態中，擴展節段195可形成爲一平針織物以促成拆散。

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各種圖36A至圖36G將編織組件130展示爲係單獨形成。然而，在某些編織製程中，一廢棄元件在形成編織組件130之前編織。廢棄元件嚙合對編織組件130提供一向下力之各種輥子。向下力確保橫列隨著形成稍後橫列而移動遠離織針202。

基於上文論述，編織元件131及鞋舌170可透過一單個編織製程而由單一編織構造形成。如所闡述，鞋舌170首先形成且在形成編織元件131時在織針床201上保持靜止。在形成接合編織元件131及鞋舌170之一橫列之後，編織元件131及鞋舌170隨著形成編織元件131之其他部分而一起向下移動。

順序變更

編織機200包含一編織機構270、一型樣280及一計算裝置290以及其他元件，如圖38中所示意性繪示。編織機構270包含機械操縱紗線206及211以形成一編織組件(例如，編織組件130)之編織機200之機械組件(例如，織針202、進料機204及220、托架205)中之多者。型樣280包含關於編織組件之資料，舉例而言，包含用於每一組織之紗線、由每一組織形成之編織結構之類型及用於每一組織之特定織針202及進料機204及220。編織機200之操作藉由計算裝置290控管，計算裝置290自型樣280讀取資料且引導編織機構270之對應操作。

多個且實質上完全相同編織組件可藉由編織機200形成。更特定而言，計算裝置290可重複讀取型樣280且引導編織機構270形成實質上完全相同編織組件。通常，因此，形成之每一編織組件將實質上完全相同於基於一特定型樣280形成之其他編織組件。然而，參考圖39A至圖39C，展示鞋舌170之三個版本。儘管圖39A將鞋舌170繪示爲包含具有形成「1/100」之文數字元之一編織結構(例如，具有不同色彩之紗線)，但圖39B及圖39C分別將鞋舌170繪示爲包含具有形成「2/100」及「3/100」之文數字元之編織結構。

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完成圖39A至圖39C中所示之類型之順序變更之一種方式係形成多個圖案。實際上，圖39A至圖39C中所示之鞋舌170之組態中之每一者可具有一不同圖案。作爲一替代方案，由計算裝置290運行之一應用程式(例如，一軟體)可變更型樣280同時每一連續鞋舌170形成爲提供順序變更。舉例而言，型樣280可包含一可修改欄位281，該可修改欄位281係可藉由計算裝置290更新或改變之型樣280之一區域。出於參考之目的，與圖39A至圖39C中之「1」、「2」及「3」對應之型樣280之部分可藉由可修改欄位281控管。計算裝置290可包含一計數器，舉例而言，該計數器藉助所形成之每一連續編織組件更新可修改欄位281。因此，型樣280之順序變更可透過使用由計算裝置290運行之一應用程式而自動化，藉此修正對用於鞋舌170之每一順序變化之不同型樣280之需求。

在操作中，舉例而言，具有可修正欄位281之型樣280由一操作者、設計者或製造者提供。計算裝置290可藉助對可修改欄位281之一預設設定而形成一第一編織組件或可根據其他指令或資料更新可修改欄位281。如此，舉例而言，圖39A之鞋舌170可以「1/100」進行編織。計算裝置290現在用表示另一文數字元(在計算裝置290包含一計數器時，可能爲一順序文數字元)之資料更新可修改欄位281，且圖39B之鞋舌170可以「2/100」進行編織。程序重複且計算裝置290用表示另一文數字元之資料更新可修改欄位281且圖39C之鞋舌170可以「3/100」進行編織。因此，型樣280之可修改欄位可用表示不同文數字元(可能順序文數字元)之資料重複更新。

參考各種組態在上文及在附圖中揭示本發明。然而，揭示內容所達成之目的係提供與本發明相關之各種特徵及概念之一實例，而非限制本發明之範疇。熟習相關此項技術者將認識到，可在不背離本發明之範疇之情況下對上文所闡述之組態作出眾多變化及修改，如隨附

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申請專利範圍所界定。

【符號說明】

100	鞋具/鞋
101	前足區/區/介面區
102	中足區/區/介面區
103	足跟區/區
104	外側/側
105	內側/側
110	鞋底結構
111	中底
112	外底
113	鞋墊
120	鞋面
121	腳踝開口
122	鞋帶
123	鞋帶孔隙
124	鞋舌
125	strobel鞋墊
130	編織組件
131	編織元件
132	嵌花股線
133	周邊邊緣
134	足跟邊緣
135	內邊緣
136	第一表面/表面
137	第二表面/表面

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138	紗線
139	紗線
140	編織層
141	浮紗
142	襟片
150	編織組件
151	編織元件
152	嵌花股線
153	周邊邊緣/邊緣
154	邊緣/足跟邊緣
155	邊緣/內邊緣
156	第一表面/表面
157	第二表面/表面
158	鞋帶孔隙
160	區/編織區/管狀編織區
161	區/編織區/拉伸編織區
162	區/編織區/管狀及雙羅紋集圈編織區
163	區/編織區/1×1網眼編織區/網眼編織區
164	區/編織區/網眼編織區/2×2網眼編織區
165	區/編織區/網眼編織區/3×2網眼編織區
166	區/編織區/1×1仿網眼編織區/仿網眼編織區
167	區/編織區/仿網眼編織區/2×2仿網眼編織區
168	區/編織區/2×2混合編織區/混合編織區
169	區/編織區/經襯填區
170	編織鞋舌/鞋舌
175	編織鞋舌/鞋舌

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176 編織層/層

177 紗線線圈

180 編織組件

181 編織元件

182 嵌花股線

183 編織鞋舌/鞋舌

184 編織層/層

185 浮紗

190 編織鞋舌/鞋舌

195 擴展節段

200 編織機

201 織針床

202 織針

203 軌道

204 標準進料機/進料機

205 托架

206 紗線

207 捲軸

208 紗線導引件

209 紗線收回彈簧

210 紗線張緊器

211 紗線

212 進料機臂

213 分配尖端

214 線圈

220 組合進料機/進料機

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221	進料機臂之位置/箭頭
222	力
230	托架
231	罩部件/第一罩部件
232	第二罩部件/罩部件
233	螺栓
234	附接元件
235	槽
240	進料機臂
241	致動螺栓
242	彈簧
243	滑輪
244	環圈
245	分配區域
246	分配尖端
250	致動部件/托架
251	臂
252	板
253	外端
254	內端
255	空間
256	孔隙
257	傾斜邊緣
260	編織組件
270	編織機構
280	型樣

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281 可修改欄位

290 計算裝置

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發明摘要

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【發明名稱】

包含具有鞋舌之編織組件的鞋具

ARTICLE OF FOOTWEAR INCORPORATING A KNITTED COMPONENT WITH A TONGUE

【中文】

本發明揭示一種鞋具，其可具有包含一編織元件及一鞋舌之一鞋面。該編織元件界定該鞋面之一外部表面及一相對內部表面之一部分，其中該內部表面界定用於接納一腳之一內腔。該鞋舌與該編織元件一起由單一編織構造形成且延伸穿過該鞋面之一鞋幫口區域。製造一鞋具之一編織組件之方法可包含編織一鞋舌。將該鞋舌固持於一編織機之織針上。在將該鞋舌固持於該等織針上之同時，藉助該編織機形成一編織元件之一第一部分。然後將該鞋舌接合至該編織元件之該第一部分。另外，藉助該編織機形成該編織元件之一第二部分。

【英文】

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.

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申請專利範圍

1. 一種具有一鞋面及固定至該鞋面之一鞋底結構之鞋具，該鞋面包括：

一編織元件，其界定該鞋面之一外部表面及該鞋面之一相對內部表面中之至少一者之一部分，該內部表面界定用於接納一腳之一內腔；及

一鞋舌，其與該編織元件一起由單一編織構造形成且延伸穿過該鞋面之一鞋幫口區域。

2. 如請求項1之鞋具，其中該鞋舌在該鞋幫口區域之一前部分中固定至該編織元件且延伸至該鞋面之一腳踝開口。

3. 如請求項1之鞋具，其中該編織元件之至少一部分及該鞋舌之至少一部分由一共同紗線形成。

4. 如請求項1之鞋具，其中該編織元件之至少一部分及該鞋舌之至少一部分由一共同編織結構形成。

5. 如請求項1之鞋具，其中該鞋舌之至少一部分包含一第一編織層、一第二編織層及複數個自由紗線節段，該第一編織層及該第二編織層彼此毗鄰且由單一編織構造形成，且該等自由紗線節段位於該第一編織層與該第二編織層之間。

6. 如請求項1之鞋具，其中該鞋舌之至少一部分包含複數個編織孔隙。

7. 如請求項1之鞋具，其中該編織元件自該鞋幫口區域延伸至該鞋面之一下部區域，且一嵌花股線自該鞋幫口區域穿過該編織元件延伸至該下部區域。

8. 如請求項7之鞋具，其中該嵌花股線至少部分地圍繞該鞋幫口區域中之孔隙延伸。

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9. 如請求項8之鞋具，其中該嵌花股線位於該鞋幫口區域中該外部表面與該內部表面之間。

10. 如請求項7之鞋具，其中該嵌花股線自該鞋幫口區域重複地延伸至該下部區域。

11. 一種製造用於一鞋具之一編織組件之方法，該方法包括：

藉助一編織機編織一鞋舌；

將該鞋舌固持於該編織機之織針上；

在將該鞋舌固持於該等織針上之同時，藉助該編織機編織一編織元件之一第一部分；

將該鞋舌接合至該編織元件之該第一部分；及

藉助該編織機編織該編織元件之一第二部分。

12. 如請求項11之方法，其進一步包含將該編織機選擇爲一橫編織機之一步驟。

13. 如請求項11之方法，其進一步包含在編織該鞋舌之該步驟之後編織一擴展節段之一步驟，且其中編織該編織元件之該第一部分之該步驟包含拆散該擴展節段。

14. 如請求項11之方法，其中編織該鞋舌之該步驟包含將該鞋舌之一橫列形成爲包含(a)一可熔紗線及(b)交錯集圈組織中之至少一者。

15. 如請求項11之方法，其中接合該鞋舌之該步驟包含藉助該編織機形成將該鞋舌接合至該編織元件之一橫列。

16. 一種製造用於一鞋具之一編織組件之方法，該方法包括：

藉助一編織機編織一鞋舌；

藉助該編織機編織一編織元件之一第一部分，該鞋舌在編織該編織元件之該第一部分期間相對於該編織機之一織針床靜止，且該編織元件之該第一部分在編織該編織元件之該第一部

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分期間相對於該鞋舌移動；

藉助該編織機形成將該鞋舌接合至該編織元件之一橫列；及

藉助該編織機編織該編織元件之一第二部分，該鞋舌及該編織元件之該第一部分在編織該編織元件之該第二部分期間一起移動。

17. 如請求項16之方法，其進一步包含將該編織機選擇爲一橫編織機之一步驟。

18. 如請求項16之方法，其進一步包含在編織該鞋舌之該步驟之後編織一擴展節段之一步驟，且其中編織該編織元件之該第一部分之該步驟包含拆散該擴展節段。

19. 如請求項16之方法，其中編織該鞋舌之該步驟包含將該鞋舌之一最終橫列形成爲包含(a)一可熔紗線及(b)交錯集圈組織中之至少一者。

20. 一種編織方法，其包括：

提供具有一可修改欄位之一編織型樣；

用表示一第一文數字元之資料更新該可修改欄位；

編織具有該第一文數字元之一編織結構之一第一組件；

用表示一第二文數字元之資料更新該可修改欄位，該第二文數字元不同於該第一文數字元；及

編織具有該第二文數字元之一編織結構之一第二組件。

21. 如請求項20之方法，其中該第二文數字元自該第一文數字元係順序的。

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