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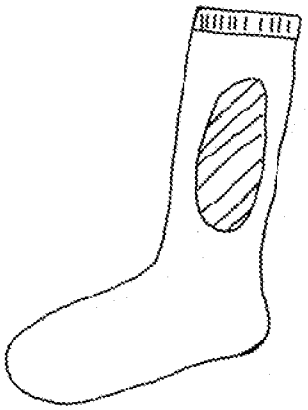


Figure 1

(57) Abstract: The present invention relates to a reinforced sock comprising: a tubular portion suitable for extending up a leg from the ankle, and optionally a distinct toe, optionally a distinct heel, and a sole, wherein said tubular portion comprises a reinforced section arranged and adapted to protect, at least, the inner calf portion of the leg from abrasion during riding. At least part of said reinforced section is provided by anti-slip print, such as ABS print.

SOCK

The present invention relates to reinforced socks, particularly suitable for use when riding a horse, which prevent abrasion and damage of a wearer's calves and processes for preparing the same.

Horse riding is a common pastime of many individuals. It requires special equipment, which in many instances is relatively expensive. One important piece of equipment is riding boots. Amongst other things the boots function to protect the rider's calves and inner lower legs from abrasion, during riding, by contact with the horse and parts of the saddle such as the stirrups.

Whilst long boots perform an important function they are also very restrictive to the rider, because usually the leather is very stiff. The leather also reduces the amount of sensation that the rider receives from contact with the horse. This can be disadvantageous because riding requires two-way communication between the horse and the rider and much of this communication is from contact of the rider's leg with the barrel of the horse.

Although boots would generally be worn in competitions and formal events, when riding informally, many riders prefer to wear chaps. Chaps are sturdy coverings for the legs consisting of leggings and a belt. They are buckled on over trousers with the chaps integrated belt, but unlike trousers they have no seat and are not joined at the crotch. They are designed to provide protection for the legs when riding a horse through brushy terrain and are usually made of leather or a leather-like material. They are most commonly associated with the cowboy culture of the American West.

Half chaps are also available which are supports or strapping for the lower leg. They prevent abrasion of the inner lower leg during riding. These have been available for many years and are widely used. They are intended for use, for example over jodhpurs and often have a strap which, in use, extends under the sole, at about the heel of the boot, for security.

The present invention relates to an alternative to chaps or long boots, which protects the rider's lower leg and in particular the calf from abrasion during riding, whilst allowing free communication between the rider and horse.

There is provided a reinforced sock comprising a tubular portion suitable for extending up a rider's leg from the ankle, wherein said tubular portion comprises a reinforced section arranged and adapted to protect, at least, the inner calf portion of the leg from abrasion.

Figure 1 shows a reinforced sock with a compression band wherein the reinforcing element is in the form of a pad.

Figure 2 shows a reinforced sock with a compression band where the reinforcing element is in the form of a panel.

Figure 3 shows a reinforced sock with a compression band where the reinforcing element is in the form of a band.

Figure 4 shows a reinforced sock with a compression band where the reinforcing element is a multitude of discrete protuberances.

Figure 5 is a diagrammatic representation of a sock with certain dimensions thereof labelled.

The socks of the invention are required to extend, at least, past the calf to accommodate the reinforced section and will generally be knee length. Of course the socks may be longer but it is expected that knee length will be the most practical. Clearly the socks of the present invention cannot be in the form of ankle socks.

In one embodiment the sock may be a tube sock, which does not comprise a defined heel and sole portions but instead the tubular portion extends from the toe along the foot, over the heel, past the ankle and up the leg.

In one embodiment the sock according to the invention comprises a distinct toe section. That is to say an element specifically shaped and adapted to accommodate the toe. In contrast to a sock that is in a unitary tubular form, as described above.

In one embodiment the sock according to the invention comprises a distinct heel section. That is to say an element specifically shaped and adapted to accommodate the heel. In contrast to a sock that is in a unitary tubular form, as described above.

In one embodiment the sock according the invention comprises a distinct sole, for example defined between a distinct heel and toe portion.

In one embodiment a sock according to the invention terminates at the toe with a seam.

In one embodiment a sock according to the invention terminates in toe portion, for example similar in the form of a sort of cap. In one embodiment this toe section consists of cotton and nylon. In one embodiment the toe section does not comprise any elastane.

In one embodiment a sock according to the invention comprises a heel portion. In one embodiment this heel section consists of cotton and nylon. In one embodiment the heel section does not comprise any elastane.

Cushioning in the sole may also be provided for the comfort of the rider. Suitable cushioning would include material such as sandwich terry fabric, which is known in the art.

The toe and/or heel of the socks according to the invention may also be reinforced, to provide longer lasting socks. Suitable reinforcing materials include nylon

In one embodiment the material of the sock insulates the foot and/or leg from heat loss whilst, for example allowing the foot/leg to breathe.

In one embodiment the foot part of the sock according to the invention is a different material from the tubular portion, for example the foot portion may be cotton and the tubular portion may be a synthetic, elasticated material.

The reinforced sock of the invention has the advantage that is provides very little restriction to the rider whilst simultaneously providing protection, in particular from abrasion during riding. The socks may be worn under or over jodhpurs/leggings. Alternatively, the rider may wear knee length jodhpurs and knee length socks according to the invention. This minimises the amount of layers and restriction for the rider, which may make riding more comfortable and pleasurable. In warm or hot weather conditions the rider may be cooler, especially if the socks are made from a material such as cotton.

Whilst socks with reinforced toes and heels are known and socks are commercially available with Kevlar soles, for example for canoeing (see Palm 4mm Kevlar socks available from psm outdoors) we believe that is has never been suggested to provided socks with reinforced calf areas for use in horse riding.

However, this simple garment will be extremely useful to those in the riding community and is expected to be widely embraced.

Generally the fabric of the sock will be knitted.

In one embodiment the knit is loose. As employed herein loose-knit is intended to refer to a fabric or garment made by intertwining yarn or thread in a series of connected loops either by hand, with knitting needles, or on a machine. It also may refer to a knit, which after application of an appropriate ABS (anti-slip print) is still able to expand sufficiently to be fit for purpose.

Reinforcing as used herein is intended to refer where the sock provides a surface that absorbs, blocks or otherwise inhibits the abrasive forces contacting the inner leg during riding a horse, pony or the like. The reinforcing will generally have different properties to those of the major component of the sock by virtue of its components or arrangement. The reinforcing area and/or material may be, for example stronger than the major component of the sock.

Major component as used herein is intended to refer the base fabric used to make the sock (it may or may not in fact be the major component).

The socks may be made from any suitable material for example wool including merino, cashmere or Smartwool®; cotton; silk; synthetic material such as nylon, polypropylene, polyester, Holofibre®; or mixtures thereof.

In one embodiment material employed in the sock comprises cotton, suitable quantities may be 70% or over, particularly 80% over and more particularly about 82%.

In one embodiment material employed in the sock comprises nylon, suitable quantities may be 30% or less, particularly 20% or less and more particularly about 17%.

The sock according to the invention may also include varying amounts of other components such as elastane for example Lycra®. Suitable quantities may be in the range 1 to 15%, for example 1% or 2 to 10%, such as 3, 4, 5, 6, 7, 8 or 9%. The amounts in particular portions, such as the compression band and/or the tubular leg section, may be higher, as appropriate.

Clearly the intended use will influence the materials employed, for example in warmer climates a cotton and/or silk blend may be most appropriate, whilst in cooler climates a wool and silk or cotton blend may be most suitable.

In one embodiment materials are employed to reduce the friction between the sock and the rider's footwear.

The reinforced section may be soft leather, for example, overlaid onto the backing material of the sock and fixed by stitching, adhesion or any other suitable means. Alternatively, the material in the area of reinforcing may be thickened and more durable than the remainder of the sock, for example the material in the area of reinforcing may be two layers thick, such as 2-ply. The two layers may be the same or different and may be selected from any suitable materials, for example the material listed herein.

In one embodiment the reinforced section comprises an area of terry fabric for example sandwich terry or standard terry.

In one embodiment the terry fabric comprises cotton, suitable quantities are as defined herein.

In one embodiment the terry fabric comprises nylon, suitable quantities are as defined herein.

In one embodiment the terry fabric comprises elastane, suitable quantities are as defined herein.

Thus in one specific embodiment a terry fabric portion comprise about 82% cotton, about 17% nylon and about 1% elastane.

This reinforced terry section may on the exterior of the sock be printed with an anti-slip substance, for example ABS print, in a design the suitably of which is discussed in more detail below.

In one embodiment a second reinforced layer, which comes into contact with the horse, is selected from a synthetic material such as nylon, polypropylene, polyester, Kevlar or a mixture thereof.

Of course material which is available as fibres or yarn, may be woven or knitted into the sock to provide the reinforced element. Thus the reinforcing may be provided by a tighter, stronger and/or thicker weave comprising a reinforcing fibre or yarn component.

Clearly the internal face of the sock for contact with the rider's skin should not have seams or abrasive surfaces that would cause irritation of the skin.

In one embodiment the reinforced element is a pad, for example in the form of an oval, square or similar section located at an appropriate position to protect, at least, the calf of the rider. A pad is intended to refer to an isolated element that may or may not have a largest dimension vertically along the length of the tubular portion of sock and which is not a band or panel. In effect the pad is an island of reinforcement in the tubular portion of the sock.

In another embodiment the reinforced element is provided as a panel, for example running from the ankle to above the calf or as far as the knee. The panel will be orientated to protect the portion of

the lower leg in contact with the horse. A panel is intended to refer to an element containing a largest dimension vertically along the length of the tubular portion of the sock.

In a further embodiment the sock comprises a reinforced band extending around the circumference of the tubular portion. This band should be deep enough to protect at the least the calf but may extend from the ankle to above the calf or to as far as the knee. Generally a band has a significant dimension in the circumference of the tubular portion of the sock, for example 50, 60, 70, 80, 90 or 100% of said circumference.

In one embodiment the reinforcement is in the form of stripes/strips of reinforcing material further presented in the form of a pad, panel or band. Between each strip is non-reinforced material.

In yet a further embodiment, the reinforced portion of the sock comprises a multitude of discrete protuberances organised together, such that as a group they provide reinforcing.

In one embodiment the protuberances are provided as a recurring or repeating pattern.

Each discrete protuberance may be shaped for example: as an irregular shaped dot or spot; as a more regular shape such as a circle, square, triangle, rhombus, rectangle; as a more elaborate decorative design such as tracks or tread; as a design intended to appeal aesthetically to the rider, for example horse shoes or horse heads or horses arranged in a repeating pattern; or a mixture thereof.

The protuberances should be spaced so as to ensure that the reinforcing is achieved, i.e. that, at least, the inner leg is protected sufficiently from abrasion during riding.

The protuberances can be provided in the form of a pad, panel, or band, each of which are described above.

The protuberances can be formed by printing, painting, spraying the desired design on to the sock, with a polymeric material or other reinforcing material or by dipping the sock to produce the desire design.

In one embodiment the number of protuberances is in the range 1 to 500, for example 2 to 250, such as 3 to 100 or 4 to 75.

In one embodiment the reinforcement such as stripes/strips and/or protuberances are applied to the sock by 3D printing, such as ABS/anti slip printing.

In one embodiment comprising multiple protuberances the group comprises protuberances of at least two different size, such as 2, 3, 4 or more different sizes, for example small protuberances around the periphery of the reinforced area.

In one embodiment the reinforcement such as stripes/strips and/or protuberances are screen printed through custom made screens, for example adapted to reproduce an desired pattern for a given sock size range. Thus in one embodiment the size and shape of the custom screen is varied according to the size of the sock.

The design of the screen also controls the depth of material deposited on the sock surface. The depth thereof can be manipulated as desired. Suitable average depth of the protuberances may, for example be in the range 0.1 to 5mm, such as 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, .0.9, 1, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2.0, 2.5, 3.0, 3.5 and 4mm.

The density of the ABS design can have an adverse affect on the stretch characteristics of the sock and this must be kept in mind when setting the technical specification for the final product.

The advantage of the protuberances is that that because there are arranged with, for example 1 to 10mm such as 2, 3, 4, 5, 6, 7, 8 or 9mm between each protuberance, then this facilitates overall flexibility in the reinforced area, which allows free movement for the rider, whilst still providing protection.

Nevertheless, the invention extends to where a pad, panel or band is provided as "solid" surface layer of polymeric material on the sock.

Liquid polymeric materials may be applied to the main body of the sock. Once applied the liquid polymeric material hardens as a result of for example, drying, setting or curing. Suitable liquid polymeric materials include solutions/suspensions/emulsions of polymer in organic solvents or water; thermoplastic polymers in molten form; and liquids comprising pre-polymers and reactants (such as glues/adhesives). Examples of suitable polymers include natural rubber, synthetic polyisoprenes, silicone rubbers, nitrile rubbers, PVC, polyurethanes, acrylics, butyl rubber, polyolefins or other elastomers. The skilled person will be aware that regions, such as Europe, have regulation on use of materials such as PVC and for example materials need to be phthalate free.

It will also be appreciated to one skilled in the art that it may be necessary to add other agents to the liquid polymeric materials such as stabilisers, surfactants, defoamers, cross-linking agents, pigments, colourants, flame retardants, plasticizers, viscosifiers, tackifiers etc to obtain a liquid polymeric material with properties suitable for applying to the external surface of a sock.

A low density polymer may provide superior comfort to the rider and/or superior traction because it will be flexible and will conform to a surface against which it is held. The density, when cured, may be lowered by inclusion of a foaming agent, such as those employed in expanding inks, into the liquid polymeric material applied to the sock.

The polymeric material partially impregnates the material of the sock and adheres thereto. Thus the non-slip material may be applied in the form of a liquid polymeric material which embeds fibres of the knitted material of the sock and "hardens" after application to the external surface of the sock.

The reinforcing elements of the sock, including the polymeric materials described above, as employed herein are distinct from materials that impregnate the material of the sock for waterproofing purposes and the like. These latter materials do not leave a surface component that is upstanding from the surface of the sock and so are not reinforcing elements according to the invention.

In one embodiment the polymeric material applied to the sock is not tacky or sticky after drying and/or curing.

In one embodiment, the reinforced section is manufactured from a non-slip material which provides improved traction against the barrel of the horse. A non-slip material may be any material suitable for reinforcing a sock as described above which has a substantially higher co-efficient of friction than the knitted materials comprising the main body of the sock. This non-slip feature can be provided by careful selection of a polymer material or use of a patch, panel or band of non-slip material.

This non-slip element may provide the benefit of making the rider feel more secure by ensuring sufficient contact between the rider's leg and the horse.

In one embodiment the non-slip material is napped leather such as suede or a synthetic version thereof, such as Alcantara.

In another embodiment the non-slip material is natural rubber or a synthetic rubber or plastic, for example one or more of the polymeric materials listed above. The non-slip characteristics of these materials may be improved by the creation of a textured surface, for example stippled or dimpled, which contacts the horse. Non-slip materials and technology are disclosed, for example in US 4, 149,274, US 5, 617, 585, US 2005/0144703 and US 2008/032056.

In one embodiment the non-slip material is silicone.

In another embodiment, the non-slip material is provided as a yarn (such as spandex and similar materials) which is integrally woven or knitted into the body of the sock so that loops of non-slip material are exposed on the surface of the sock in contact with the horse.

The tubular portion of the sock should be a snug fit around the rider's lower leg to ensure that the reinforced element remains in the desired location. A snug fit can be achieved by employing suitable materials, for example incorporating elastane to provide compression against the leg and hence a snug fit. Thus in one embodiment part or all of the tubular section, such as all the leg contacting tubular section is elasticated.

In one embodiment the lateral stretch of the garment 20 cm or more, for example 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, particularly 26, 27 or 29 cm.

In one embodiment the tubular portion (leg length) is 35 cm or more, for example 36, 37, 38, 39 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, particularly 39, 48 or 54 cm.

In one embodiment the foot portion is in the range 20 to 30 cm long, for example, 21, 22, 23, 24, 25, 26, 27, 28 or 29 cm, particularly 24, 26 or 28 cm.

In one embodiment the foot portion is in the range 6 and 12 cm wide, for example 7, 8, 9, 10, 11, particularly 8.5, 9 or 9.5 cm.

In one embodiment the rib depth is 1 to 10 cm, for example, 2, 3, 4, 5, 6, 7, 8, 9, particularly 2.5 cm.

In one embodiment the rib width is in the range 6 and 10 cm, for example 7, 8, 9, particularly 7.5, 8 or 8.5 cm.

In one embodiment the top of the reinforced patch starts form the position in the range 3 to 8 cm from the bottom of the ribbed band of the tubular portion, for example, 4, 5, 6, 7 cm, particularly 5.5 cm. This may correspond to about 6 to 11 cm from the top edge of the sock.

In one embodiment a sock according to the invention, for example a left and/or right sock comprises a motif/design. The motif/design may for example comprises nylon ends, which suitably are knitted into the sock and held in place by the structure of the sock.

In the field of socks, socks with different levels of compression are available. Socks with moderate compression are commonly available and those with higher levels of compression, such as flight-socks for the prevention of thrombosis, are also available. Thus socks with low, moderate or high compression can be prepared, as required.

If, for example the compression in the tubular portion of the sock is low then support for holding the sock up, in use, may need to be supplemented by a compression band at the top of the sock. This band may be located, for example just under the knee and may comprise elastane or the like to allow the band to expand and contract. This band should be designed to assist in securing the sock in the desired location without the discomfort to the rider.

In one embodiment a sock according to the invention comprises a compression band, also referred to herein as a rib.

In one embodiment the socks according to the invention are weather proofed, for example they are impregnated with a waterproof material, for example polytetrafluoroethylene.

The socks of the present invention may be worn with lining socks such as silk lining socks of the sort often employed by hikers. This may further aid the comfort of the rider.

The socks may be for adults or children, as required.

Generally the socks should be manufactured from materials which withstand routine laundering, although when materials such as genuine leather are employed then special clean precautions may be required.

In one embodiment there is provided packaging comprising two or more pairs of socks at least one pair of which is are socks according to the invention, for example one pair of lining socks and one pair of socks according to the invention. Alternatively, packaging may comprise 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12 pairs of socks according to the invention.

In one embodiment the socks are packaged with a sock header card, for example a standard sock “over rider”. This means that the header card is placed over the sock, whether that is the rib top, or the heel / toe. This packaging may be effected by hand using a kimballing gun. In one embodiment the socks are folded into a header card such that the reinforced section of the sock and the tubular portion of the sock are easily accessible, in particular where the reinforced section is visible.

In another embodiment the invention provides a package comprising a pair of socks according to the invention and a pair or riding gloves.

In another embodiment the invention provides a packaging comprising a pair of socks according to the invention and a riding jacket, wherein the socks and riding jacket are optionally matching or co-ordinated fabrics.

In another embodiment the invention provides a packaging comprising a pair of socks according to the invention and a riding blanket, wherein the socks and horse blanket are optionally matching fabric or co-ordinated fabrics.

The invention also provides a process for manufacturing reinforced socks suitable for protecting the inner leg of a horse rider from abrasion comprising the step:

printing, painting, spraying a tubular portion of a long sock or material for employing therein with a liquid polymeric material, or

dipping a tubular portion of a long sock or material for employing therein into a liquid polymeric material,

wherein the polymer hardens or dries after application to provide a reinforcing section suitable for protecting the inner leg of a horse rider from abrasion during riding.

In one embodiment the printing is effected on the relevant portion of the leg by inserting a spatula or separator into the tubular portion thereof and printing on at least one exterior surface of the sock supported by said spatula.

In one embodiment the method according to the invention employs ABS printing.

In one embodiment there is provided use of anti-slip printing, such as ABS, on the leg/tubular portion of a sock.

Given that often in the socks according to the present invention the reinforced section will only be present on the inside part of the sock which will contact with the horse, these socks are not simply a pair but rather need to be manufactured as a right sock intended to be worn on the right foot/leg and a separate left sock intended to be worn on the left foot/leg. Thus in one embodiment the right sock is manufactured separately from the left sock and they are, for example brought together part way through the manufacturing process or at the end of the manufacturing process.

The ABS print on the inside of the calf portion of the sock does affect the stretch of the sock and the knitting machine may need to be set to manufacture loosely to ensure a suitable final product.

The invention also provides a process for manufacturing reinforced socks suitable for protecting the inner leg of a horse rider from abrasion comprising the step stitching or adhering a reinforcing element, for example in the form of a patch, panel or band onto a tubular portion of a long sock or material for employing therein, wherein the reinforcing element is suitable for protecting the inner leg of a horse rider from abrasion during riding.

Long sock as used herein is intended to refer to at least calf length socks, but will generally refer to at least knee length socks.

“Material for employing therein” is intended to refer to where the material used to prepare the sock is printed before the sock are made.

In the context of this specification "comprising" is to be interpreted as "including". Aspects of the invention comprising certain elements are also intended to extend to alternative embodiments "consisting" or "consisting essentially" of the relevant elements.

EXAMPLES

Example 1
Specification for small sock, UK shoe size 12-3, with terry foot bottom wherein A, B, C, D, E and F are defined in Figure 5.

RIB DEPTH	**A**	2.5cms
RIB WIDTH	**B**	7.5 cms
LEG LENGTH	**C**	39.0cms
LEG WIDTH	**D**	8.5 cms
FOOT LENGTH (cushion sole)	**E**	24.0 cms
FOOT WIDTH	**F**	8.5 cms
Finished Lateral Stretch		
RIB LATERALS	**B**	26 cm
LEG LATERALS	**D**	26 cm
FOOT LATERALS	**F**	26 cm
ABS printing position-cms down from the bottom of the ribbed band		5.5cm

The sock must stretch to the laterals required when print has been applied to the leg.

Example 2
Specification for medium sock, UK shoe size 4-7, with terry foot bottom wherein A, B, C, D, E and F are defined in Figure 5.

RIB DEPTH	**A**	2.5cms
RIB WIDTH	**B**	8.0 cms
LEG LENGTH	**C**	48.0 cms
LEG WIDTH	**D**	9.0 cms
FOOT LENGTH (cushion sole)	**E**	26.0cms
FOOT WIDTH	**F**	9.0 cms
Finished Lateral Stretch		
RIB LATERALS	**B**	27cm
LEG LATERALS	**D**	27cm
FOOT LATERALS	**F**	27cm

ABS printing position-cms down from the bottom of the ribbed band		5.5cm

The sock must stretch to the laterals required when print has been applied to the leg.

Example 3
Specification for large sock, UK shoe size 9-11, with terry foot bottom

RIB DEPTH		2.5cms
RIB WIDTH		8.5cms
LEG LENGTH - full terry		54.0cms
LEG WIDTH		9.5cms
FOOT LENGTH (cushion sole)		28.0cms
FOOT WIDTH		9.5cms
Finished Lateral Stretch		
RIB LATERALS		29cm
LEG LATERALS		29cm
FOOT LATERALS		29cm

ABS printing position-cms down from the bottom of the ribbed band 5.5cm.

The sock must stretch to the laterals required when print has been applied to the leg.

Claims

1. A reinforced sock comprising:

   a tubular portion suitable for extending up a leg from the ankle, and

   optionally a distinct toe,

   optionally a distinct heel, and

   a sole,

   wherein said tubular portion comprises a reinforced section arranged and adapted to protect, at least, the inner calf portion of the leg from abrasion during riding and where at least part of said reinforcing is provided by anti-slip print (such as ABS print).

2. A reinforced sock according to claim 1, wherein the reinforced element is a pad, panel or band.

3. A reinforced sock according to claim 1 or 2, further comprising a reinforced toe.

4. A reinforced sock according to any one of claims 1 to 3, which further comprises a reinforced heel.

5. A reinforced sock according to any one of claims 1 to 5, which further comprises a cushioned sole.

6. A reinforced sock according to any one of claims 1 to 5, comprising merino, cashmere or Smartwool®; cotton; silk; synthetic material such as nylon, polypropylene, polyester, Holofibre®; or mixtures thereof.

7. A reinforced sock according to any one of claims 1 to 6, wherein the reinforced section comprises two layers.

8. A reinforced sock according to any one of claims 1 to 7, wherein the reinforced section further comprises leather.

9. A reinforced sock according to any one of claims 1 to 7, wherein the reinforced section comprises a synthetic material such as nylon, polypropylene, polyester or Kevlar.

10. A reinforced sock according to any one of claims 1 to 7, wherein the reinforced section is silicone.

11. A reinforced sock according to any one of claims 1 to 10, wherein all the reinforcing is provided by anti-slip print.

12. A reinforced sock according to any one of claims 1 to 11, where the reinforced section comprises an area of terry, such as standard terry or sandwich terry, to support the anti-slip print.

13. A reinforced sock according to any one of claims 1 to 12, wherein the reinforced portion of the sock comprises a multitude of discrete protuberances organised together, such that as a group they provide reinforcing.

14. A reinforced sock according to claim 13, wherein the protuberances are selected from an irregular shaped dot or spot; as a more regular shape such as a circle, square, triangle, rhombus, rectangle; as a more elaborate decorative design such as tracks or tread; as a design intended to appeal aesthetically to the rider, for example horse shoes or horse heads or horses arranged in a repeating pattern; or a mixture thereof

15. A reinforced sock according to any one of claims 1 to 14, wherein the reinforcement is the form of stripes/strips of reinforcing material.

16. A reinforced sock according to any one of claims 1 to 15, wherein the reinforced material is also non-slip.

17. A packaging comprising two or more pairs of socks at least one pair of which is a pair of socks as defined in any one of claims 1 to 16.

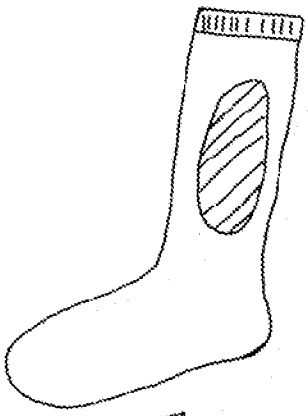


Figure 1

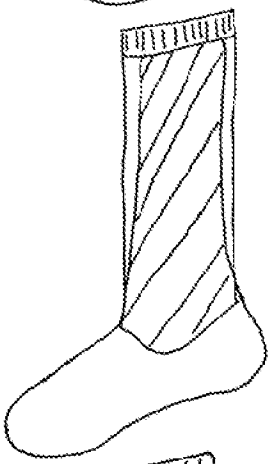
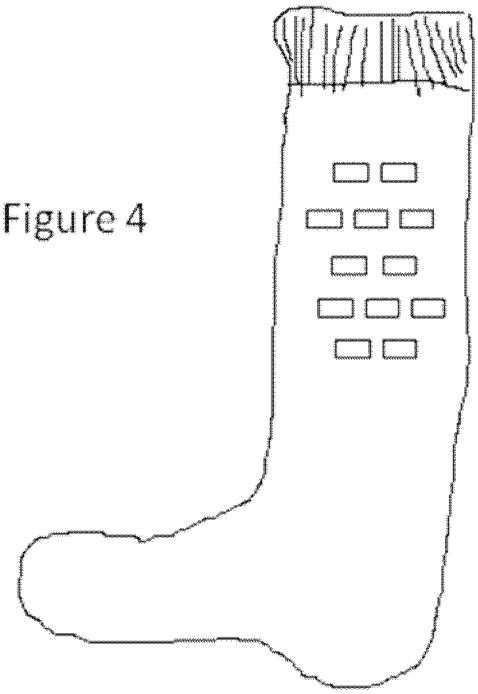


Figure 2

Figure 3

Figure 4



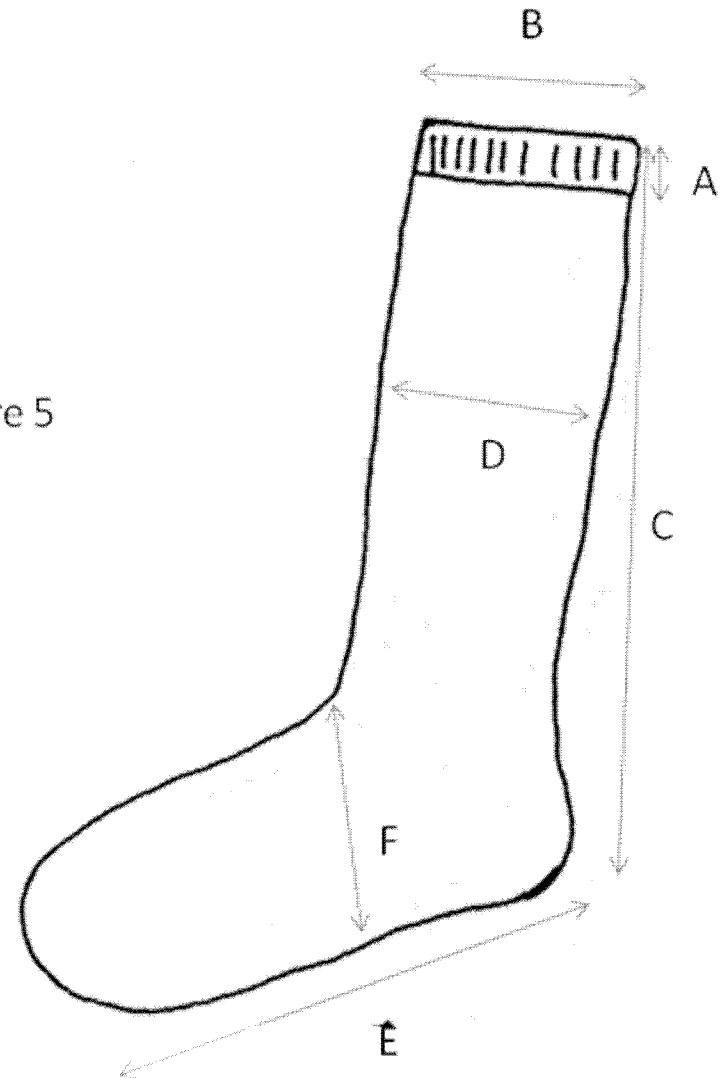


Figure 5

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2010/050839

A. CLASSIFICATION OF SUBJECT MATTER
INV. A41B11/00 A41B11/02
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)
A41B

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2 668 040 A1 (ETABLISSEMENTS LOUIS BLANCHARD S.A.) 24 April 1992 (1992-04-24) page 2, line 11 - line 21	1,2,7
A	US 5 133 088 A (A.R. DUNLAP) 28 July 1992 (1992-07-28) column 2, line 48 - column 3, line 27	1,2,7,11
A	US 4 728 538 A (P.D. KASPAR; W. MELVIN, JR.) 1 March 1988 (1988-03-01) column 1, line 10 - line 23 column 3, line 66 - column 4, line 28	1,7,10, 11,13,14

☐ 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

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"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
30 July 2010	09/08/2010

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	Goodall, Colin

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

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/GB2010/050839

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2668040 A1	24-04-1992	NONE	
US 5133088 A	28-07-1992	NONE	
US 4728538 A	01-03-1988	NONE	