



US 20130014311A1

(19) **United States**

(12) **Patent Application Publication**
CHAPUIS

(10) **Pub. No.: US 2013/0014311 A1**

(43) **Pub. Date: Jan. 17, 2013**

(54) **ARTICLE OF CLOTHING**

(52) **U.S. Cl.** 2/69; 2/227; 2/228

(75) **Inventor:** Serge CHAPUIS, Lepin Le Lac (FR)

(73) **Assignee:** SALOMON S.A.S., Metz-Tessy (FR)

(57) **ABSTRACT**

(21) **Appl. No.:** 13/547,319

(22) **Filed:** Jul. 12, 2012

The invention provides an article of clothing that includes:

(30) **Foreign Application Priority Data**

Jul. 13, 2011 (FR) 11/02208

a snugly fitting inner portion having at least one connecting band extending along at least one member (arm, leg, neck) of the body;

Publication Classification

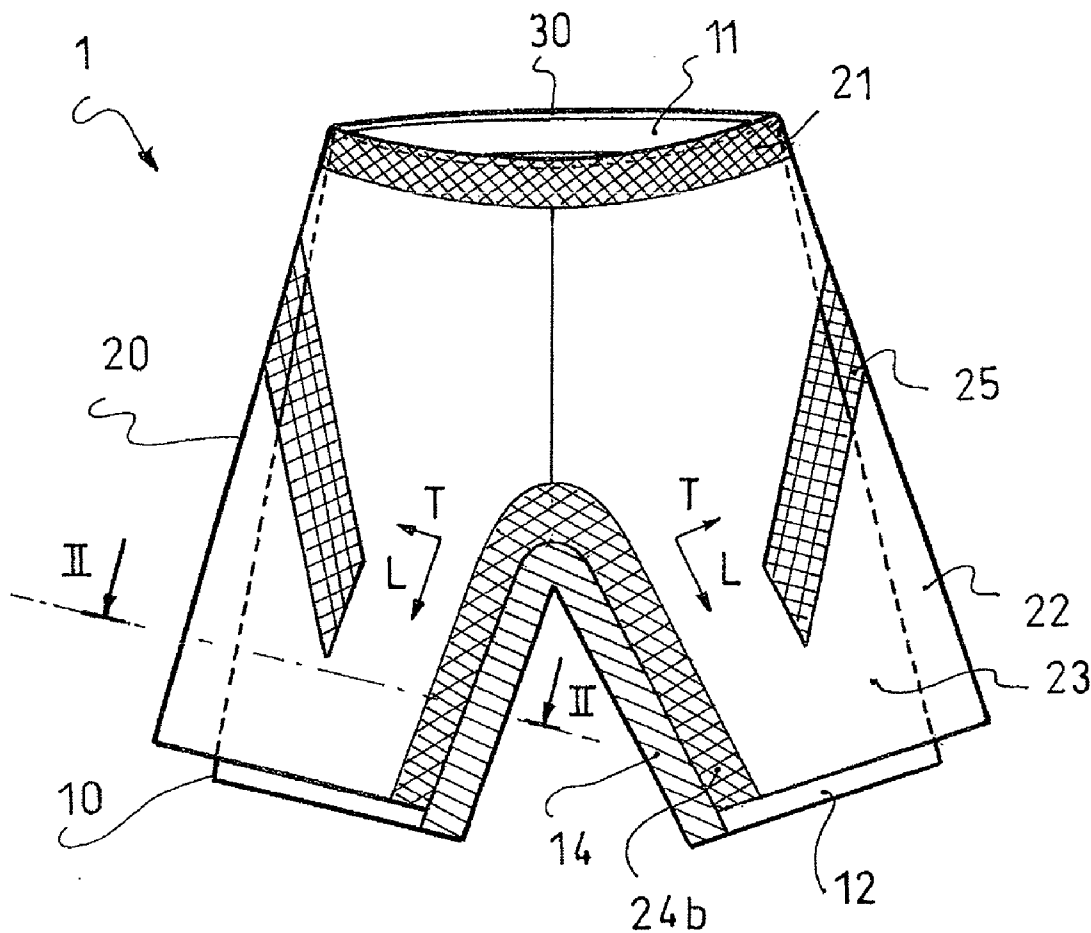
a more loosely fitting outer portion partially covering the inner portion, the outer portion being connected to the connecting band;

(51) **Int. Cl.**

A41D 1/06 (2006.01)

A41D 1/00 (2006.01)

the outer portion including at least one interface band extensible along at least one direction, an edge of which is connected to the connecting band.



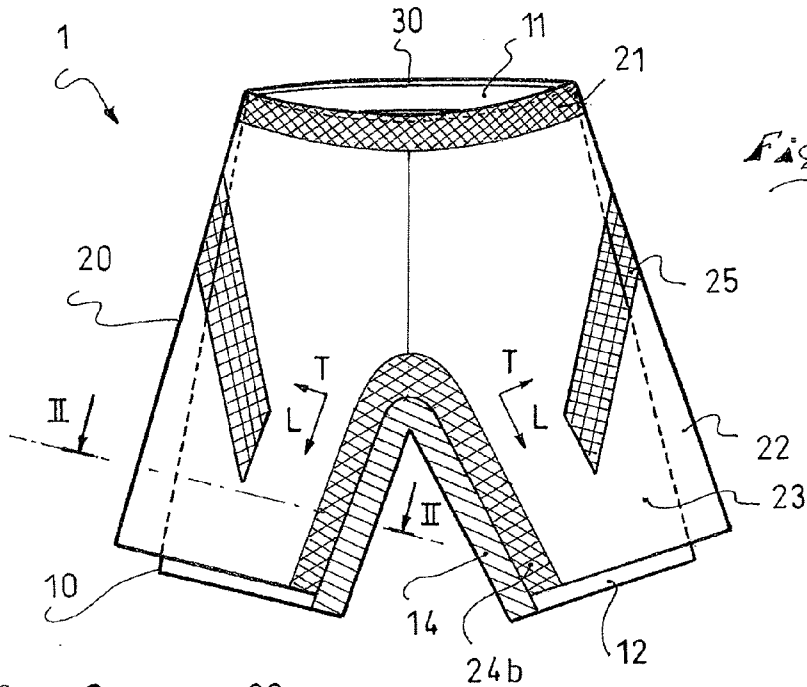


Fig. 1

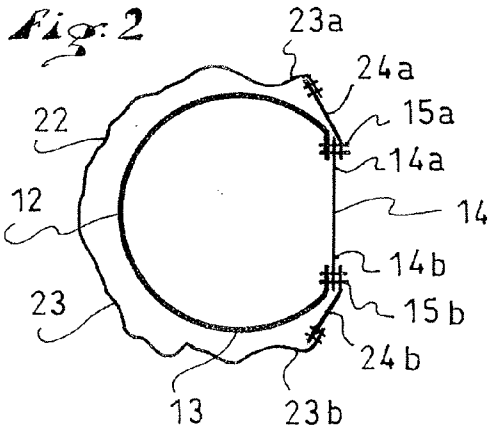


Fig. 2

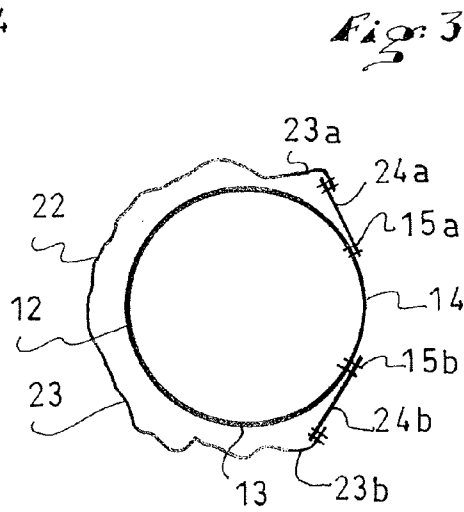
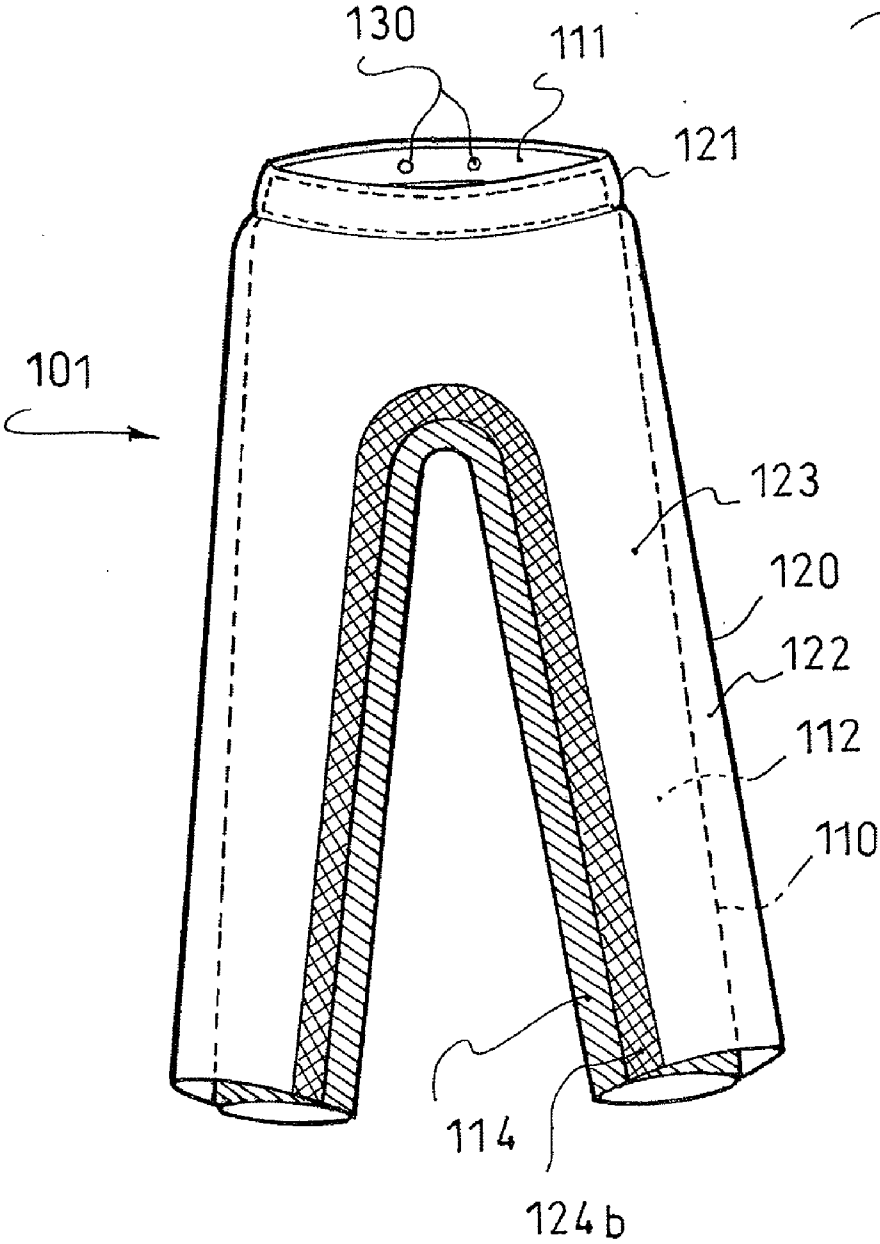


Fig. 3

Fig. 4



ARTICLE OF CLOTHING

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is based upon French Patent Application No. 11/02208, filed Jul. 13, 2011, the disclosure of which is hereby incorporated by reference thereto in its entirety, and the priority of which is claimed under 35 U.S.C. §119.

BACKGROUND

[0002] 1. Field of the Invention

[0003] The present invention relates to an article of clothing comprising at least one extensible portion.

[0004] 2. Background Information

[0005] This invention provides an improvement to the article of clothing disclosed in the French Patent Application Publication No. 2 853 498 and corresponding U.S. Pat. No. 7,849,522. A garment according to these documents includes a snugly fitting inner portion and a loosely fitting outer portion, the portions being assembled together by a connecting band extending along at least one member of the body, such as an arm, a leg, or the neck. This design makes it possible to partially or completely hide the snugly fitting inner portion while minimizing the risk of local wear of the more loosely fitting portion.

[0006] However, that solution has some disadvantages during use, especially during movement of the parts of the body, or body members, that are dressed with the garment. Indeed, the outer portion is generally made of a flexible, low-stretch fabric, such as polyester. However, during practice of a sport, an athlete is typically required to perform many large movements of his/her body, including the parts of the body covered with such garment. The inner portion is particularly suited for this type of range of motion. This is however not the case for the fabric of the outer portion. This aspect is not a hindrance if the outer envelope is separate from the inner portion. The problem arises from the junction between the inner portion and outer portion in the area of the connecting band extending along the moving member. The lack of elasticity of the outer portion in the vicinity of the connecting band imparts rigidity on the inner portion. As a result, this may limit the freedom of movement and cause discomfort, depending upon the materials used and/or the morphology of the wearer.

[0007] Beyond a certain range of motion, the athlete may be hindered and the garment may become damaged. The discomfort of the wearer is expressed by localized muscle support that can generate local pain. The garment can also be torn in the area of the outer portion, or the seam may come undone locally due to the excessive deformation of the outer portion. Moreover, this connection between the two shorts can cause unpleasant friction.

[0008] Furthermore, the relative stiffness of the outer portion in the area of junction with the connecting band results in a deformation of the moving garment, which is visually not desired: folds appear, thereby making the line of the garment unsightly.

SUMMARY

[0009] The present invention overcomes the aforementioned disadvantages and particularly provides an article of clothing combining a pleasant external appearance and good

support and/or heating/proprioceptive sensing with minimal limiting effect on the freedom of movement of the athlete.

[0010] To this end, an article of clothing according to the invention includes a snugly fitting inner portion, comprising at least one connecting band extending along at least one member (arm, leg, neck, e.g.) of the body, and an outer, more loosely fitting portion partially covering the inner portion, the outer portion being connected to the connecting band.

[0011] The outer portion of the article of clothing includes at least one interface band extensible along at least one direction, an edge of which is connected to the connecting band.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Other features and advantages of the invention will be better understood from the following description, with reference to the annexed drawings illustrating, by way of non-limiting embodiments, how the invention can be embodied, and in which:

[0013] FIG. 1 is a plan view of an article of clothing, such as shorts, incorporating the invention;

[0014] FIG. 2 is a cross-sectional view, along the line II-II of FIG. 1, of a first variant thereof;

[0015] FIG. 3 is a cross-sectional view, along the line II-II of FIG. 1, of a second variant thereof; and

[0016] FIG. 4 is a view similar to FIG. 1, illustrating a second exemplary embodiment of the invention, illustrating a pair of pants.

DETAILED DESCRIPTION

[0017] FIGS. 1 and 2 illustrate an article of clothing, such as shorts according to the invention.

[0018] These shorts 1 are comprised of two portions, namely:

[0019] inner snugly fitting shorts 10 made at least partially of a stretch fabric;

[0020] outer loosely fitting shorts 20 comprised of portions 23 made of a low-stretch fabric and portions 21, 24a, 24b, 25 made of a stretch fabric.

[0021] In the context of the invention, a stretch fabric is one that is capable of being stretched significantly along at least one bias. The fabric can thus deform elastically with high elongation when one exerts a low tensile force. The force needed to obtain a predetermined deformation is low. Thus, the modulus of elasticity of the fabric is low.

[0022] This property, that is to say, stretchability, can be obtained in several ways. It can be obtained by selecting a fabric incorporating a material having good stretchability properties, such as spandex (elastane) or Lycra®. It can be obtained via the manufacturing of the fiber used to make the fabric. It can also be obtained by manufacturing the fabric using a suitable technique, such as weaving or knitting (e.g., by allowing air through the mesh). It can also be obtained through a combination of several techniques and/or choices of materials.

[0023] The stretch fabric does not necessarily have the same characteristics, depending upon whether it is biased along a direction parallel to the weft of the fabric or along a direction parallel to the warp of the fabric.

[0024] By way of example, a stretch fabric can be characterized by a tensile force of less than 15 N to obtain a deformation of 15% when it is biased along a "warp" direction, and by a tensile force of less than 10 N or, in a particular embodi-

ment less than 8 N, to obtain a deformation of 15% when it is biased along a “weft” direction.

[0025] Conversely, a low-stretch fabric is more rigid. The force for obtaining a predetermined deformation is more substantial than for a stretch fabric. It has a higher modulus of elasticity.

[0026] By way of example, a low-stretch fabric can be characterized by a tensile force of 90 to 100 N to obtain a deformation of 15% when it is biased along a “warp” direction, and by a tensile force of 60 to 70 N to obtain a deformation of 15% when it is biased along a “weft” direction.

[0027] An example of low-stretch fabric is standard polyester.

[0028] The use of low-stretch fabrics makes it possible to reduce the cost and weight of the garment. Indeed, cheaper and lighter low-stretch fabrics are more readily available than stretch fabrics. Therefore, the combination of stretch and low-stretch fabrics to make the outer shorts optimizes weight and cost.

[0029] The inner shorts 10 comprise a waistband 11 and two legs 12.

[0030] Each leg 12 is comprised of a substantially tubular portion 13 made of stretch fabric in a semi-cylindrical shape and a connecting band 14 covering the crotch area. The connecting band 14 can be made of a stretch fabric or, conversely, a non-stretch fabric.

[0031] The outer shorts 20 also comprise a waistband 21 and two substantially tubular portions each forming a leg 22. Each leg 22 includes a plurality of extensible or inextensible portions. In the example shown, the portions forming each leg 22 are arranged so that a main portion 23, comprised of a non-stretch fabric, is connected on each side 23a, 23b to the edge of an extensible interface band 24a, 24b. Each extensible interface band 24a, 24b is connected, on the opposite edge, to the connecting band 14. Thus, each extensible interface band 24a, 24b forms an interface zone between the main portion 23 and the connecting band 14, that is to say, the inner shorts 10.

[0032] As a result, the garment includes, in the area of each thigh, a first tubular envelope formed by the leg 12 and a second tubular envelope formed by the leg 22, the connecting band 14 being common to both envelopes. The second tubular envelope surrounds the first tubular envelope, except in the area of the connecting band, where the two envelopes merge.

[0033] As a result, the inner shorts 10 and the outer shorts 20 actually have a common portion, namely, the connecting band 14 located in the area of the crotch.

[0034] Thus, friction, which generates noise and wear, is avoided between the two legs of the more loosely fitting outer shorts 20 during use.

[0035] To improve the ease of movement for the athlete, extensible interface bands 24a, 24b are positioned between the main portion 23 of the outer shorts 20 and the leg 12 of the inner shorts 10. These interface bands 24a, 24b provide flexibility to the garment by making it possible to increase the relative displacement of the leg 22 in relation to the leg 12. The movement of the inner shorts is thus dissociated or isolated from the outer shorts due to this buffer zone comprised of these extensible interface bands 24a, 24b.

[0036] The extensible interface bands 24a, 24b, in a particular embodiment, have an area markedly smaller than the inextensible main portion 23, as it makes it possible to optimize the weight and cost of the leg 22.

[0037] The embodiment shown includes two interface bands 24a, 24b, each band being arranged on a respective one

of the two sides of the connecting band. This solution completely isolates the outer shorts 20 from the inner shorts 10. Alternatively, the garment may include only one interface band. In this case, the outer shorts are only partially isolated.

[0038] The interface bands are designed to be extensible along at least one bias.

[0039] The interface bands can be extensible along a longitudinal direction L, i.e., along a direction parallel to the axis of the dressed member of the body. This direction is represented by the vector L in FIG. 1. When an athlete runs, his/her thighs move in a vertical plane, which results in a relative movement between the two shorts along the longitudinal direction L. In order not to hinder these movements of large amplitude, the relatively rigid outer shorts should not block the inner shorts along this longitudinal direction L. The elasticity of the interface bands along this longitudinal direction L makes it possible to avoid this blocking, and thereby improves the comfort of the athlete, especially during a race.

[0040] The interface bands 24a, 24b can be extensible along a transverse direction T, i.e., along a peripheral direction in relation to the dressed member of the body. This direction is represented by the vector T in FIG. 1. The flexibility along this direction is particularly important for lateral movements of the athlete, such as sideways jumps or flexibility exercises, for example. Here again, the relatively rigid outer shorts should not block the inner shorts along this transverse direction T. The elasticity of the interface bands along this transverse direction T makes it possible to avoid this blocking, and thereby improves the comfort of the athlete when performing certain lateral movements.

[0041] Advantageously, the interface bands are extensible along any bias. Thus, they are extensible along the longitudinal direction L and along the transverse direction T. This homogeneity, or uniformity, provides comfort, regardless of the movements of the athlete.

[0042] Similarly, the interface bands can have different characteristics of extension depending upon the bias. In the previous example, the band can be oriented so that the weft of the fabric is parallel to the longitudinal direction L, and the warp of the fabric is parallel to the transverse direction T, the fabric then being more stretchable longitudinally. One might wish to reverse the orientation of the fabric so that the weft of the fabric is parallel to the transverse direction T. This depends on the desired stretchability properties.

[0043] The elasticity of the interface bands 24a and 24b can be characterized in relation to the elasticity of the main portion 23 of the leg 22. The modulus of elasticity of the interface bands 24a and 24b is at least four times greater than the modulus of elasticity of the main portion 23.

[0044] According to the illustrated embodiment, the interface bands are made with a breathable fabric. This breathable fabric is characterized by the presence of an aerated mesh or a perforated/honeycomb fabric forming openings capable of allowing air between the two shorts 10 and 20. This breathable fabric thus enables aeration or ventilation of the zone spacing the two shorts apart.

[0045] To improve this ventilation, the main portion 23 of the outer shorts 20 also includes portions 25 made of breathable fabric. Thus, these portions 25, coupled with the interface bands 24a, 24b, provide better air circulation between the two shorts of the garment.

[0046] In the example shown in FIG. 1, the inner shorts 10 extend beyond the outer shorts 20; this provides a mixed

visual aspect. Moreover, this representation more clearly shows the arrangement between the two shorts.

[0047] Alternatively, the inner shorts have the same length as, or are shorter than, the outer shorts. This design ensures an appearance which is that of the loosely fitting shorts **20**, because the snugly fitting inner shorts **10** remain hidden by the outer shorts.

[0048] In a particular embodiment, the legs **12** of the inner shorts are not longer than, and can even be shorter than, the legs of the outer shorts so as to hide any visual impression of a snug fit.

[0049] Connecting the two shorts together is particularly important in this context, in order to prevent a relative slip of the legs during the practice of a sport and to maintain the visual appearance of the loosely fitting shorts.

[0050] The waistbands **11**, **21** of the respective shorts **10**, **20** can be independent. In this case, the shorts are only connected together at the crotch, so as to ensure better adaptation to movements, the outer shorts thereby not hampering the movements of the inner shorts.

[0051] Alternatively, the waistbands **11**, **21** are connected in the area of the belt of the garment. This connection can be permanent, such as by means of a seam **30**, such as a stitched seam, or the connection can be removable, such as by means of buttons or snap fasteners.

[0052] It is then advantageous that the waistband **21** be an extensible interface band, surrounding the waist of the wearer for reasons similar to those described above. The interface band **21** provides flexibility to the garment by isolating the relatively rigid main portion **23** of the legs **22** in relation to the waistband **11**.

[0053] The extensible interface band **21** can also be made of a breathable fabric to increase ventilation inside the garment. The breathable fabric portion can only partially cover the waist of the athlete.

[0054] The connecting band **14** of the crotch can have a substantially rectangular shape, or a triangular shape, for example, depending upon to the cut of one or both shorts **10**, **20**.

[0055] Similarly, the term “band” as used herein also encompasses a panel or piece having a large width, or which are wider, i.e., transverse to the wearer’s torso, than they are long, i.e., along the length of the torso. The dimensions of the bands may be related to the dimensions of the garment. For example, shorts have a greater width to length ratio than pants.

[0056] The connecting band **14** can be provided in the form of a piece that is distinct from the inner shorts **10**, as shown in FIG. 2, or, on the contrary, can be integral or unitary with each leg **12**, as shown in FIG. 3, the latter then being obtained for example by knitting. This is particularly the case when the connecting band **14** is made of a stretch fabric.

[0057] According to the alternative embodiment of FIG. 2, a seam **15a**, such as a stitched seam, associates an edge of the portion **13**, an edge **14a** of the attached connecting band **14**, and an edge of the interface band **24a**. Similarly, a seam **15b**, such as a stitched seam, associates the other edge of the portion **13**, an edge **14b** of the attached connecting band **14**, and an edge of the interface band **24b**.

[0058] According to the alternative embodiment of FIG. 3, a seam **15a**, such as a stitched seam, associates an edge of the interface band **24a** directly with the portion **13** forming the leg **12**. Similarly, a seam **15b**, such as a stitched seam, associates an edge of the interface band **24b** directly with the

portion **13**. In this case, the visible portion of the leg **12** demarcated by the two seams **15a**, **15b** forms the connecting band **14**.

[0059] In the case in which each band **14** is comprised of a distinct piece, it can be either in the same fabric as the associated leg **12**, or in a different fabric, including a non-stretch fabric. As the case may, the fabric can also be a breathable fabric, such as a breathable mesh, or a perforated fabric for better ventilation.

[0060] FIG. 4 shows pants **101**, for which similar or identical elements are designated by the same reference numerals increased by **100**. Each of the two legs of the pants **101** extends at least below a respective knee area of a wearer. The invention encompasses an article of clothing in which the legs extend along any desired length of the legs of the wearer.

[0061] In this case, the pants **101** also comprise inner pants **110**, provided with a waistband **111** and legs **112**, and outer pants **120**, provided with a waistband **121** and legs **122**. These legs **122** include a main portion **123** made of non-stretch or very low-stretch fabric and two extensible interface bands **124b** connecting the main portion **123** to a connecting band **114** common to both pants **110** and **120**. The connecting band is located in the area of the crotch.

[0062] In this example, both pants **110**, **120** are connected by detachable connecting mechanisms **130**, such as buttons or snap fasteners.

[0063] The variations shown and described with respect to FIGS. 2 and 3, are applicable to the embodiment of FIG. 4, as well as to that of FIG. 1.

[0064] The present invention is not limited to the particular embodiments described hereinabove by way of non-limiting examples, but encompasses all embodiments that are similar or equivalent and/or seek to solve the same problems.

[0065] In particular, the invention could be transposed to other types of garments, such as articles covering the upper body, for example, jackets, sweaters, etc. Such garments are described in the aforementioned French Patent Application Publication No. 2 853 498 and corresponding U.S. Pat. No. 7,849,522.

[0066] The invention disclosed herein by way of exemplary embodiments suitably may be practiced in the absence of any element or structure which is not specifically disclosed herein.

1. An article of clothing comprising:
 - a snugly fitting inner portion comprising at least one connecting band extending along at least one member of the body;
 - a more loosely fitting outer portion partially covering the inner portion, the outer portion being connected to the connecting band;
 - the outer portion comprising at least one interface band extensible along at least one direction, an edge of the at least one interface band being connected to the connecting band.
2. An article of clothing according to claim 1, wherein: the interface band is structured and arranged to be extensible along a longitudinal direction.
3. An article of clothing according to claim 1, wherein: the interface band is structured and arranged to be extensible along a transverse direction.
4. An article of clothing according to claim 1, wherein: the outer portion comprises two extensible interface bands arranged on respective sides of the connecting band.

5. An article of clothing according to claim 1, wherein: the outer portion comprises an inextensible main portion.
6. An article of clothing according to claim 1, wherein: the outer portion comprises at least one portion made of a breathable fabric.
7. An article of clothing according to claim 1, wherein: the at least one extensible interface band is made of a breathable fabric.
8. An article of clothing according to claim 1, wherein: the connecting band is located in a friction zone of the article of clothing.

9. An article of clothing according to claim 1, wherein: the connecting band is a piece of the article of clothing distinct from other portions of the inner portion.
10. An article of clothing according to claim 1, wherein: the article of clothing is an article comprising two legs; the connecting band is located along a crotch area of each of the two legs.
11. An article of clothing according to claim 10, wherein: the article of clothing comprises shorts.
12. An article of clothing according to claim 10, wherein: the article of clothing comprises pants, each of the two legs of the pants extending below a respective knee area of a wearer.

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