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Articles of Clothing Having Connectable Devices and Methods for Making and Using the Devices

BEKLEIDUNGSARTIKEL MIT VERBINDBAREN VORRICHTUNGEN SOWIE VERFAHREN ZUR HERSTELLUNG UND VERWENDUNG DIESER VORRICHTUNGEN

VÊTEMENTS AYANT DES DISPOSITIFS POUVANT ÊTRE RELIÉS ET PROCÉDÉS DE FABRICATION ET D’UTILISATION DES DISPOSITIFS

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DESCRIPTION

TECHNICAL FIELD

[0001] The present invention relates to connecting articles by suction-based connectors, in particular, sets of articles of clothing such as socks, prior to washing, drying, and/or storing.

BACKGROUND

[0002] It is often useful to connect separate but associated articles of clothing, for example, socks, gloves, and mittens, just prior to storing or cleaning so that they can be easily dealt with. For example, after numerous separated pairs of different socks are washed in a washing machine and then dried, much time can be spent sorting the individual socks into matching pairs. Although sorting socks differing only in color is relatively easy, it becomes more time consuming in the case of a family having persons who wear socks differing only slightly in color, size or design. Persons in dormitories, in team sports, or military service having identical socks could reduce laundry expenses by being able to jointly wash and dry their combined loads of socks in one coin-operated washer and one coin-operated drier instead of separate machines if thereafter they could ensure being able to match their own socks versus others’ socks, especially if there is no discernible difference between them.

[0003] Connecting socks with, for example, a safety pin has the disadvantage of the pin coming open during washing or drying, subjecting the person grabbing a bunch of the socks to potentially being stuck by the open pin. Also, connecting with a pin or other means that are not intended to remain on the articles of clothing before and after storage or washing requires storing and finding the connecting means when storage and washing of the clothing are desired. Still further, a pin or similar connecting means takes significant time to put onto and take off of the articles of clothing. Connecting articles of clothing by attaching a snap to the articles has the disadvantage of requiring a male/female-type match to connect the clothing and has the disadvantage of requiring pulling on the clothing to release the snapping mechanism. Connecting articles of clothing by a Velcro-type mechanism has the disadvantage of requiring a male/female-type match to connect the clothing and further may harm or adversely affect other clothing in the cleaning process by attaching thereto if not fully engaged or covered during the cleaning process. A Velcro-type mechanism has the further disadvantage of requiring pulling on the clothing to release the attachment. A pairing system using snap fasteners is disclosed in document FR-A-2 722 062.

Therefore, a method and means for quickly, easily, and safely obtaining properly matched sock pairs or other particularly grouped articles of clothing would be useful.

SUMMARY OF THE INVENTION

[0005] One embodiment of the present invention includes a first sock, a second sock, a suction cup affixed to the first sock, and a suction-retentive member affixed to the second sock. The suction cup and the suction retentive member are configured to be joined to hold together the first and second socks. The suction-retentive member can have a substantially flat surface against which the suction cup can be forced. The suction-retentive member can be flexible and made of a polymeric material.

[0006] Alternatively, the suction cup can be a first suction cup and the suction-retentive member can be a second suction cup.

[0007] A suction cup can be substantially permanently affixed to the first sock and the suction-retentive member is substantially permanently affixed to the second sock. Likewise, it can be more removably affixed. At least one of the suction cup and the suction-retentive member include an adhesive material that affixes at least one of the suction cup and suction-retentive member to at least one of the first and second socks respectively.

[0008] Another embodiment of the invention is a method of making a pair of socks connectable. One step is providing a first sock and a second sock. Other steps are affixing a first suction-based component to the first sock and affixing a second suction-based component to the second sock. The first and second suction-based components are configured to be connected together with suction. The first and second suction-based components can comprise suction cups.

[0009] Alternatively, the first suction-based component can comprise a suction cup and the second suction-based component can have a substantially flat surface against which the suction cup can be forced to connect the first and second socks.

[0010] The affixing steps can involve substantially permanently affixing the first and second suction-based components to the first and second socks, respectively. Alternatively, the step can involve a more removable affixing of these components.

[0011] While multiple embodiments are disclosed, still other embodiments of the present invention will become apparent to those skilled in the art from the following detailed description, which shows and describes illustrative embodiments of the invention. Accordingly, the drawings and text are to be regarded as illustrative in nature and not restrictive.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1A is a perspective view of one embodiment of the present invention having an unconnected pair of socks with each sock having an affixed suction cup.

[0013] FIG. 1B is a perspective view of the embodiment of FIG. 1A with the socks connected by the suction
The present invention involves sets of articles of clothing, such as socks or stockings, that are connected using suction-based components that, when engaged, provide a suction-connection force. The most common sock design within the scope of the present invention is a sock having an open top end and a closed bottom end, but the present invention is not limited to that design or type of socks. Other designs or types of socks also within the scope of the present invention include, but not limited to, socks used by baseball or other sports players having a bottom end partially closed by a crossing piece or strap-like element, sometimes referred to as a stirrup sock, and a sock having both ends open, often worn between the ankle and knee to keep the calf muscle warm by persons exercising or practicing ballet or other dances.

The cup and base regions of suction cups 2a, 2b are not necessarily entirely integral and uniformly of the same material. In the embodiments shown herein, the cup and base regions of the affixed suction cups 2a, 2b are integral and of the same material, while in other embodiments (not shown), the cup and base regions of suction cups 2a, 2b can be of different material, substantially permanently bonded by suitable means, for example, by welding during molding the two regions separately, or after molding the two regions separately, for example, such as by heat-based welding, solvent-based welding, or adhesive. Generally suitable adhesives include vinyl-based, polymeric acrylate-based (e.g., PMMA), and epoxy-based adhesives.
0.75 inch, and may have a radius of curvature ranging from about 0.5 inch to about 1 inch, although other dimensions can be used. The base regions 5a, 5b are not limited to a specific geometry and may be generally or substantially circular, oval, square, or rectangular.

[0026] The suction force that connects the socks 1a, 1b is made by urging together with sufficient force the suction cups 2a, 2b such that fluid, usually air, between the cups 2a, 2b is forced out from between them, and such that one or both of the suction cups are elastically deformed and a fluid seal is formed between them. This creates a lower pressure environment between the suction cups 2a, 2b than that outside the suction cups, hence the suction force that connects the cups 2a, 2b and thereby the respective socks 1a, 1b. An established, connective suction force will be maintained as long as fluid (e.g., air, other gas, water, or other liquid) surrounding the region between the engaged cups 2a, 2b does not enter that region and equalize the pressure within the region to that outside the region. The connection provided by the cups 2a, 2b is intended to withstand the challenge of washing, drying, and storing the pair of socks 1 for the next use so that a step of matching up separated socks is eliminated (or at least reduced for a group of socks).

[0027] The suction cups 2a, 2b can be substantially permanently affixed to the socks. By this, it is meant that the affixation of the cups 2a, 2b is such that the cups 2a, 2b are intended to remain attached for the expected life of the socks or article of clothing, although the cups could be removed for example by cutting the sock fabric or by cutting off a significant portion of the cups leaving a smaller portion on the socks. That is, the cups 2a, 2b are intended to remain after repeated washing in soaps, detergents, bleaches, fabric softeners, and combinations thereof, at washing temperatures, such as up to about 180°F, and after repeated drying at drying temperatures, such as up to about 150°F, that is, for the normal life of the sock. Alternatively, the cups can be more removably affixed, that is, they can be removed without from the sock without any or substantial harm to the sock or the cup.

[0028] Base regions 5a, 5b of the cups 2a, 2b may be substantially permanently affixed to a sock or other article, for example, by heating and melting a portion of each base region 5a, 5b to flow into the sock fabric if base regions 5a, 5b are made of or include a thermoplastic material, or by a suitable adhesive between base regions 5a, 5b and into the sock fabric.

[0029] For cups that are made of a thermoplastic material, known heating/melting processes can be used to substantially permanently affix the cups 2a, 2b to the socks 1a, 1b by melting a portion of the base region 5a, 5b to the socks 1a, 1b. One such process is ultrasonic welding, in which the surface (not shown) of the base regions 5a, 5b can be, for example, rough or otherwise non-smooth and flat such that the ultrasonic energy melts that surface when pressed against the sock causing the melted thermoplastic material to cool and bond to the sock 1a, 1b. In addition or alternatively, a thermoplastic member such as a thin disk (not shown) can be placed on the inside of the sock, which can be melted through the sock to the base region 5a, 5b of the cups 2a, 2b to provide the cup-to-sock bond.

[0030] To adhesively affix the cups 2a, 2b to the socks 1a, 1b, the base regions 5a, 5b can be roughened or otherwise prepared or modified (e.g., primed) to enhance adhesion. Generally suitable adhesives are those that bond the selected cup material and sock material. Examples include polymeric acrylate-based (e.g., PMMA) and epoxy-based adhesives. Hot melt adhesives can be used as well, such as adhesives made of materials that are the same as or similar to the thermoplastic material of which the cup is made.

[0031] Suction cups 2a, 2b, engaged as in FIG. 1B, remain engaged throughout such washing and drying conditions, yet are readily separable by pinching on their sides or by pulling them apart. A pinchable release is preferred to a pulling release to minimize stress on the article’s fabric.

[0032] Rather than being substantially permanently affixed, the suction cups 2a, 2b can be removably affixed to the socks 1a, 1b, respectively. By referring to this embodiment as having removably affixed suction cups, it is meant that the affixation of the cups 2a, 2b is such that the suction cups 2a, 2b are intended to be removable from and replaceable onto the socks 1a, 1b as desired during the expected life of the socks or another article of clothing without damaging the cups or socks. Removable suction cups are readily reusable if one or both socks become unexpectedly damaged before the end of their normally useful life. Removable affixation of suction cups 2a, 2b can be accomplished by using suitable known mating fasteners (not shown) such as a post and a removable, engageable clasp similar to that used for pierced earrings such that the post transfixes the fabric from one side of the fabric and is secured by the clasp on the other side of the fabric; a threaded post and a matingly threaded retainer, for example, a male threaded post with a pointed end to facilitate transfixing through the fabric and female threaded retainer that matingly threads onto the threaded post; or a post that does not pierce the fabric but is at least partially surrounded by the fabric and a removable mating cap that affixes to the fabric-covered post after straight insertion or after insertion and rotation. Non-mating, removable affixation means include, but are not limited to, small, spring-biased clamps such as an alligator-type clip, a wire-like element securely affixed to a portion of the suction cup and that can be run through the sock fabric and secured to the suction cup, and other such means as are well known to those of ordinary skill in the art of fasteners. Though removable, suction cups 2a, 2b remain affixed to the socks 1a, 1b and to each other through washing and drying as described above until released by pinching or pulling apart the cups 2a, 2b.

[0033] FIGS. 2A and 2B show another embodiment of the present invention. FIG. 2A shows an unconnected,
FIGS. 2A and 2B, having two pairs of suction-based connectors that include suction cup 22a and suction-retentive element 23a on sock 21a and suction cup 22b and suction-retentive element 23b on sock 21b. That is, two suction-based connectors are used rather than one pair to connect the socks 21a, 21b. Though this embodiment is shown with a vertical arrangement of the cups 22a, 22b and retentive elements 23a, 23b and with relative positions of the suction cup 22a and retentive element 23a that is opposite the relative positions of suction cup 22b and retentive element 23b, the vertical positioning could be replaced with a horizontal, diagonal, or other positioning, and the relative positions could be the same rather than opposite as shown. Retentive elements 23a, 23b are substantially similar or equivalent to suction-retentive element 13. Still further, even more cup pairs or cup/retentive element pairs than are shown can be employed on a sock, or on one or more articles of a set.

FIG. 5 shows another embodiment of the present invention in which a suction cup 22 (or suction-retentive element, not shown) is positioned within a graphical design 34 on sock 31. For example, the graphical design 34 could be a decorative design, such as the polka dots as shown, a logo, a combination thereof, or other graphics. Similarly, graphics could be added to the cup 32 (not shown).

Though not shown, it is easily understood that the suction cups and suction retentive elements can be placed on different parts of a sock, such as nearer the open end so that either remain outside a shoe when one is put on by the wearer. Similarly, the suction cup and retentive element can be placed on the back, front, or side of the sock. If the pair of socks includes a right-footed and a left-footed sock, the suction cup and/or suction retentive element can be placed, for example, on the outer side of the right-footed and left-footed socks to avoid or reduce the rubbing together of the suction cups, of a suction cup with the suction-retentive element, or of these components with the wearer’s shoes or other items.

As set forth above, the suction cups and suction retentive elements provide means for connecting, joining, or holding together articles of clothing, using suction force. Similarly set forth above are means for affixing the cups to the socks, including thermoplastic materials, adhesives, clasps, and the like.

The suction cups, suction-retentive elements, or other suction-based connectors may be made as a set of a particular color, as having multiple colors, as having an identifiable design, shape, marking, or lettering, or a combination thereof. Different sets of connectors may have different colors, designs, shapes, markings, and lettering, or a combination thereof so that the sets and the articles they are affixed to are readily differentiable.

As noted, the present invention is useful for connecting socks. It is, however, useful for connecting mittens, gloves, and other articles of clothing. Another embodiment of the invention is a set of articles comprising a child’s coat and pair of gloves or mittens, wherein the coat has at least two affixed suction cups, for example,
each cup located near the end of each sleeve, and each
glove or mitten has a suction cup such that each suction
cup of the glove or mitten is connectively engaged to a
suction cup on the coat, and this set of connected articles
can be hung up at home or school to dry when the gloves
or mittens have become wet from playing in the snow,
reducing the likelihood of losing one or both gloves or
mittens. Similarly, matching sets of gloves, mittens, hats,
scarves, and jackets, such as fleece versions of these
articles, can be kept together with the present invention
for storage purposes or even for washing/drying purpos-
eses.

[0042] Another embodiment of the present invention
is a method for connecting articles of clothing including
socks, by suction-based components. One step of the
method is providing a first sock having a top open end,
and a first means for providing a suction-connective force. Another step is providing a sec-
ond sock having a top open end, a bottom closed end,
and a second means for providing a suction-connective
force. Another step is connecting the first and second
socks by sufficiently forcing together the first and second
means for providing the suction-connective force to pro-
duce a substantially secure but releasable suction-con-
nective force between said components. Structures de-
scribed above, including suction cups and suction-reten-
tive members, can be used with this method.

[0043] Various modifications and additions can be
made to the exemplary embodiments discussed without
departing from the scope of the present invention. For
example, while the embodiments described above refer
to particular sets, articles, structures, features, or steps,
the scope of this invention also includes embodiments
having different combinations of such articles, structures,
features, and steps and embodiments that do not include
all of the described sets, articles, structures, features,
and steps. Accordingly, the scope of the present inven-
tion is intended to embrace all such alternatives, modifi-
cations, and variations as fall within the scope of the
claims, together with all equivalents thereof.

Claims

1. A pair of articles of clothing, comprising:
   a first sock;
   a second sock, characterized in that,
   a suction cup is affixed to the first sock; and
   a suction-retentive member is affixed to the sec-
   ond sock;

   wherein the suction cup and the suction retentive
   member are configured to be joined to hold together
   the first and second socks.

2. The invention of claim 1 wherein the suction-reten-
tive member has a substantially flat surface against
   which the suction cup can be forced.

3. The invention of claim 1 wherein the suction-retentive member is flexible and made of a polymeric ma-
terial.

4. The invention of claim 1 wherein the suction cup is
   a first suction cup and the suction-retentive member is a second suction cup.

5. The invention of claim 1 wherein the suction cup is
   substantially permanently affixed to the first sock and
   the suction-retentive member is substantially perma-
   nently affixed to the second sock.

6. The invention of claim 5 wherein at least one of the
   suction cup and the suction-retentive member com-
   prises an adhesive material that affixes at least one
   of the suction cup and suction-retentive member to
   at least one of the first and second socks respective-
   ly.

7. A method of making a pair of socks connectable,
   comprising the steps of:

   providing a first sock and a second sock;
   affixing a first suction-based component to the
   first sock; and
   affixing a second suction-based component to
   the second sock;

   wherein the first and second suction-based compo-
   nents are configured to be connected together with
   suction.

8. The method of claim 7 wherein the first and second
   suction-based components comprise suction cups.

9. The method of claim 7 wherein the first suction-
   based component comprises a suction cup and
   wherein the second suction-based component has
   a substantially flat surface against which the suction
   cup can be forced to connect the first and second
   socks.

10. The method of claim 7 wherein the affixing steps
    comprising substantially permanently affixing the
    first and second suction-based components to the
    first and second socks, respectively.

Patentansprüche

1. Ein Paar von Bekleidungsstücken, bestehend von:
   einer ersten Socke;
   einer zweiten Socke, dadurch gekennzeich-
   net dass,
eine Saugbecher zu der ersten Socke befestigt ist; und ein Saugbechergegenstück zu der zweiten Socke befestigt ist; wobei der Saugbecher und das Saugbechergegenstück so beschaffen sind, dass sie mit einander verbunden werden können und dabei die erste und die zweite Socke zusammenhalten können.

2. Die Erfindung nach Anspruch 1 wobei das Saugbechergegenstück eine wesentlich flache Oberfläche hat gegen die der Saugbecher gedrückt werden kann.

3. Die Erfindung nach Anspruch 1 wobei das Saugbechergegenstück biegsam ist und von einem Polymerisat gemacht ist.

4. Die Erfindung nach Anspruch 1 wobei der Saugbecher ein erster Saugbecher ist und das Saugbechergegenstück ein zweiter Saugbecher ist.

5. Die Erfindung nach Anspruch 1 wobei der Saugbecher im wesentlichen permanent zur ersten Socke befestigt ist und das Saugbechergegenstück im wesentlichen permanent zur zweiten Socke befestigt ist.

6. Die Erfindung nach Anspruch 5 wobei mindestens entweder der Saugbecher oder das Saugbechergegenstück durch eine Klebeschicht zur einer der ersten oder zweiten Socken befestigt ist.

7. Eine Methode für die Verbindung eines Paar Socken, bestehend von den Schritten:

   Verschaffen einer ersten Socke und einer zweiten Socke; Befestigung einer ersten saug-basierten Komponente zur ersten Socke; und Befestigung einer zweiten saug-basierten Komponente zur zweiten Socke; wobei die erste und die zweite saugbasierten Komponenten so beschaffen sind, dass sie durch ansaugen miteinander verbunden werden können.

8. Eine Methode nach Anspruch 7 wobei die erste und zweite saug-basierten Komponenten Saugbecher sind.

9. Eine Methode nach Anspruch 7 wobei die erste saug-basierte Komponente ein Saugbecher ist und die zweite saug-basierte Komponente eine wesentlich flache Oberfläche hat gegen die der Saugbecher gedrückt werden kann um die erste und zweite Socke zu verbinden.

10. Eine Methode nach Anspruch 7 wobei der Befestigungsschritt ein Prozess ist wobei man wesentlich permanent die erste und zweite saug-basierte Komponente zur der entsprechenden ersten und zweiten Socke befestigt.

Revendications

1. Une paire d’articles vestimentaires, comprenant:

   une première chaussette; une deuxième chaussette; caractérisée en ce que, une ventouse est apposée sur la première chaussette; et un membre retentif d’aspiration est apposée sur la deuxième chaussette; ou la ventouse et le membre retentif d’aspiration sont configurés pour être joints de façon à tenir la première et la deuxième chaussette ensemble.

2. L’invention de la réclamation 1 ou le membre retentif d’aspiration a une surface essentiellement a plat contre laquelle la ventouse peut être appliquée.

3. L’invention de la réclamation 1 ou le membre retentif d’aspiration est flexible et fait dans un matériel polymère.

4. L’invention de la réclamation 1 ou la ventouse est une première ventouse et le membre retentif d’aspiration est une deuxième ventouse.

5. L’invention de la réclamation 1 ou la ventouse est essentiellement apposée de façon permanente à la première chaussette et le membre retentif d’aspiration est essentiellement apposé de façon permanente à la deuxième chaussette.

6. L’invention de la réclamation 5 ou au moins une des ventouses et du membre retentif d’aspiration comporte un matériau adhésif qui appose la ventouse ou le membre retentif d’aspiration à l’un ou l’autre de la première ou la deuxième chaussette respectivement.

7. Une méthode pour rendre une paire de chaussette raccordable, comprenant les étapes suivantes:

   la fourniture d’une première et d’une deuxième chaussette; l’apposition sur la première chaussette d’un premier élément base sur l’aspiration; et l’apposition sur la deuxième chaussette d’un deuxième
élément base sur l’aspiration;
ou le premier et le deuxième élément bases sur l’aspiration sont configurés pour être relier ensemble avec l’aspiration.

8. La méthode de la réclamation 7 ou le premier et le deuxième élément a base d’aspiration comprennent des ventouses.

9. La méthode de la réclamation 7 ou le premier élément a base d’aspiration comprend une ventouse et ou le deuxième élément a base d’aspiration a une surface essentiellement plate contre laquelle la ventouse peut être appliquée pour relier la première et la deuxième chaussette.

10. La méthode de la réclamation 7 ou les étapes d’approvisionnement comprennent essentiellement une apposition permanente du premier et du deuxième élément a base d’aspiration a la première et la deuxième chaussette respectivement.
REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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