ALL NON-METALLIC SUSPENDER CLIP DEVICE

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ABSTRACT

Clip-type fasteners for suspenders, particularly for pants (trousers, slacks, etc.) as well as suspenders with clip-type fasteners. The fasteners have a secure locking mechanism and have all of its components made of non-metallic materials, such as plastic, graphite, or composite materials. Preferably, the fasteners also have slots or rings for attachment to, and adjustment of, suspender straps. The suspender straps preferably have a plurality of tiny loop members along one entire side of the straps. Pieces of hook-type material are positioned on the straps in order to allow the length and fit of the suspender straps to be easily adjusted.
ALL NON-METALLIC SUSPENDER CLIP DEVICE

CROSS-REFERENCE TO RELATED APPLICATIONS


TECHNICAL FIELD

[0002] The present invention relates to clips for attaching suspenders to pants and the like, and more particularly to clips which are free of metallic components.

BACKGROUND

[0003] Suspenders have been used by persons for decades. Suspenders have been utilized to hold up pants (trousers, slacks, etc.), socks, and other items of clothing.

[0004] Suspenders can be used by persons as a fashion statement, by persons who have enlarged waist areas, or by persons who simply prefer not to wear belts (for comfort or otherwise). Typically, pants suspenders have two straps that fit over the shoulders of the wearer and are attached at their free ends by buttons or clips to other clothing. The two straps can also be connected together at the back of the wearer, such that only a single strap continues from the connection spot to the waist area of the wearer’s pants.

[0005] Due to difficulties in attachment and detachment of the suspender ends to the inside of the waistline of the pants, clips have become more popular to fasten or connect the suspender-ends to the pants. In this regard, clip-type fasteners are found in U.S. Design Patents D614,946 and D619,495.

[0006] In the past, most suspender clips have been made from metallic components, although some plastic clips have also been utilized. The known plastic clips, however, still include one or more metallic components, such as pivot pins, attachment rings, spring members and the like.

[0007] One of the problems with known clips today, whether they are totally metallic or only partially metallic, is that they can cause injury to wearers if they are worn during x-rays or MRI procedures. The metallic clips can hide or cause distortion with the results of the procedure, or can heat up to very high temperatures potentially causing burns or scarring.

[0008] Moreover, suspender clips with significant metallic components can cause a concern or inconvenience at security stations at airports, sporting events, conventions and the like. This can cause delays for wearers who have to take off their shoes or other garments, as well as the suspenders in order to pass through the scanners at security stations. Other delays could be caused by persons who elect to be “patted down” or “wanded” instead of passing through the scanner devices—or if they are subjected to additional security steps after passing through a scanner.

SUMMARY OF THE INVENTION

[0009] A clip-type fastener for suspenders for pants and other garments, as well as suspenders with clip-type fasteners. The fasteners have mechanisms for securely attaching a suspender strap to a garment. That mechanism can be an over-the-center type securing mechanism with either a friction-type locking mechanism and/or a plunger-type pin. All components of the clip-type fasteners are made from a non-metallic material, such as a hard plastic material, a composite, or a carbon-type material. The hinge and pivot mechanisms also are made from a durable non-metallic material, such as hard plastic, graphite, a composite material, or a carbon-based material.

[0010] The clip-type fasteners can be secured to the suspender-straps by sewing or another secure manner. The clip-type fasteners also can include a ring member which is used for attaching a suspender strap to the fasteners. The ring members also are made from non-metallic materials. The strap can be passed through the ring member and be securely attached to itself, or connected with an adjustment device, such as a non-metallic buckle or hook-and-loop type fasteners.

[0011] Preferably, the strap members have loop-type attachment members along at least a portion of the strap members or along the entire length of at least one side. Piece(s) of hook-type material are attached where desired to connect with the loop-type members.

[0012] Further objects, features and benefits of the invention are set forth below in the following description of the invention when viewed in combination with the drawings and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIG. 1 schematically depicts typical suspender devices as worn by a wearer.

[0014] FIGS. 2 and 3 depict an embodiment of the invention.

[0015] FIG. 4 depicts another embodiment of the invention.

[0016] FIGS. 5 and 6 depict another embodiment of the invention.

[0017] FIGS. 7-13 illustrate another embodiment of the invention.

[0018] FIGS. 14-17 illustrate still another embodiment of the invention.

[0019] FIGS. 18-20 illustrate a further embodiment of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0020] The present invention relates to suspenders with clip-type fasteners, or the clip-type fasteners by themselves that are used primarily for attaching suspenders to pants and other garments. It is to be understood that the clip-type fasteners disclosed herein are not to be limited solely to use on suspenders, but also can be used for many other purposes. For purposes of illustrating and discussing the invention, the clip-type fasteners will be disclosed with the preferred use of attaching suspenders to pants.

[0021] In this regard, the term “pants” is used as a term and includes trousers, slacks, shorts, Bermudas, skirts, and other items worn by wearers and typically covering a portion of the lower half of the wearer’s body. Also, the term “clip-like” is used as a generic term to mean any fastener that has two or more components or parts that fit over a garment or the like and are “snapped” or otherwise held together in a manner that securely holds the fastener onto the garment or other material.
In addition, the term “garment” is also not limiting and can refer to any material on which the clip-type fastener is secured.

A preferred use of the invention is shown in FIG. 1 and referred to by the numeral 10. The person 12 (or “wearer”) is wearing a set of representative suspenders 15. The suspenders 15 depicted in FIG. 1 are only one of many types and sets of suspenders on which the present invention could be utilized.

In FIG. 1, the suspenders 15 have two straps 16 and 17, each of which has a portion 20 positioned on the front of the wearer and a portion 22 positioned on the back of the wearer. These two straps are also connected on the back—whether by typical with many suspenders—at 25. The connection 25 could be made in any manner, such as by sewing.

The free ends of each of the strap members have a clip-type fasteners 30 thereon. The fasteners 30 are typically the same for all the ends of the straps, but they could be different types of fasteners if desired at different ends.

In FIG. 1, four fasteners 30 are shown. It is clear with many types of suspenders that only two or three fasteners are utilized. For example, suspenders which are attached to the sides or hips of the wearer typically only utilize two fasteners. Also, in some sets of suspenders, only a single strap member is utilized at the back of the wear position between the connection 25 and the pants. These suspenders only utilize three fastener members.

Two representative embodiments of clip-type fasteners utilized in accordance with the invention are shown in FIGS. 2-3 and FIGS. 5-6, respectively. In FIGS. 2-3, the fastener 30A is an over-center clip-type fastener with a base member 32 and a hinged or pivot lever member 34. The lever member is pivotted to the base member by pivot pin member 36 which extends through openings 38 in the two side flange members of the base member 32 and through opening or channel member in lever member 34.

When actuated to grip a garment in the direction shown by arrow “X,” the locking portion 35 meshes with mating locking portions 33 on base portion 32 which tightly grips and holds the garment between the two locking portions. The rotation of the lever member around the pivot pin 36 provides a cam action which tightly locks the garment in place.

Fastener 30A also includes a slotted flange member 50. This facilitates connecting the end of the suspend strap to the fastener. The end of the strap can be passed through the slot 52 in the ring member and then be attached back to itself, such as sewing, or with an adjustment mechanism, such as Velcro® hook-and-loop type material.

All of the components for the fastener 30A are made from a non-metallic material. This includes the base member 32, the lever member 34 and the pivot pin member 36. A preferred material for each of the components is a plastic material such as hard plastic. Other preferred materials include graphite and composition materials, such as glass filled nylon.

Composite materials are typically engineered materials made from two or more constituent materials with significantly different physical or chemical properties. When combined, the composite materials produce a material with characteristics different from the individual components. The individual components remain separate and distinct within the finished structure or compound. Composite materials are in use today for many different structures, such as boat hulls, race car bodies, shower stalls, bathtubs, and storage tanks.

Composite materials also can include materials such as carbon fiber reinforced polymers, aerospace components and ceramic composites.

Many commercial composites use a polymer matrix material often called a resin solution. There are many different polymers available depending upon the starting raw ingredients. There are several broad categories, each with numerous variations. The most common are known as polyester, vinyl ester, epoxy, phenolic, polyimide, polyamide, polypropylene, PEEK, and others. The reinforcement materials are often fibers, but also commonly are ground minerals.

For strength and durability, the pin members 36 are made from a graphite material or a hard plastic material.

Plastic materials are well known and comprise a wide range of synthetic or semi-synthetic organic solids that are moldable. Plastics typically are organic polymers of high molecular mass, but often contain other substances. The vast majority of these polymers are based on chains of carbon atoms alone or with other elements such as oxygen, sulfur and/or oxygen.

Either thermoplastic materials or thermosetting polymers can be used as the materials for the clip components. Representative materials include polyethylene, polypropylene, polystyrene, polyvinyl chloride (PVC), and polytetrafluoroethylene (PTFE), although the invention should not be limited just to use of these plastic materials.

The various clip components can be made from different materials, although the use of hard plastic materials are preferred, particularly for the pivot pin member 36 and the plunging pin member 76. Preferably, the gripping member 74 disclosed in FIGS. 5 and 6, is made from a softer plastic material that can grip and hold the plunging pin member 76 once it is inserted through a fabric material and the end of the pin member is inserted in the hole in the gripping member. The gripping member 74 can also be made of a hard elastomorphic material in order to firmly hold the plunging pin member in place and hold the clip-type fastener in its closed position.

Representative hard plastic materials that can be utilized include high-density polyethylene (HDPE), polyvinyl chloride (PVC), polypropylene (PP), acrylonitrile butadiene styrene (ABS), polycarbonate (PC) and ABS. Many of the special purpose plastics could also be utilized, depending on cost availability.

The precise size and shape of the clip-type fastener 30A and its components are not critical so long as one component (e.g., a lever member) has an over-center or cam action in order to be locked in place with the other component (e.g., a base member).

The pivot pin member 36 can be assembled in place holding together the other two component members 32 and 34 in any desired manner, such as by a force fit procedure. In an alternate embodiment, tiny bearing members (not shown), such as small cylinders or rings made of silicon or a similar material can be positioned in the openings 38.

In another embodiment as shown in FIG. 4, the lever member 34 can be formed with a pair of post members 60 and 62. This eliminates one long pin member such as 36. During assembly, the post members 60 and 62 are positioned in the openings 61 in the side flange members 40 and 42 in the base member. The lever member 34 is actuated in the same manner...
The length of the post members 60 and 62 is dependent on the resiliency of the side flange members 40 and 42 which have to be forced away from each other in order to assemble the lever member 34 in place and allow the post members 60 and 62 to fit in the openings 61.

In the embodiment shown in FIGS. 5 and 6, the clip-type fastener 30B has a greater number of components than the embodiment shown in FIGS. 3 and 4. It includes a base member 70, a lever member 72, a gripping member 74 with a plunging pin member 76 and a pin reception member 78 on the base member. The lever member 72 has a flange member 75 on which the gripper member 74 is positioned. The lever member 72 causes the flange member 75 to rotate toward the base member. As the lever member rotates as indicated by arrow “Y”, the lever member forces the flange member 75 towards the base member 70. This plunges the pin member 76 through the fabric or garment placed over the base portion and into the pin reception member 78. This action is similar to the over-center cam action of the lever member as shown in FIGS. 3 and 4 and discussed above.

When the lever member is forced to its closed position as shown in FIG. 5, the pin member is seated in the reception member and any garment positioned between them is securely held in place.

Similar to the embodiment discussed above, all of the components of the clip-type fastener 30B are made from a non-metallic material.

As shown in FIGS. 7 and 8, each of the strap members have a sufficient length to extend from the waistline at the rear of the wearer to the waistline at the front of the wearer. Each of the straps also has an additional amount which is used to adjust the suspenders for different sizes and shapes of wearers. These additional amounts are indicated by the reference numerals 114A and 116A in the drawings, as well as by “L” in FIG. 8.

The strap members 114 and 116 are attached together at 118 where they overlap in the back of the wearer 100. They can be connected together by any mechanism or method which attaches them together, such as by being glued or sewn together, or with releasable Velcro® hook and loop-type fasteners.

Fastener members 120 are used to connect the strap members to the pants or trousers worn by the wearer. The fasteners 120 are non-metallic clip-type fastener members, such as those described above with reference to FIG. 2-3, 4 or 5-6.

As to the portion of the suspenders which are to be positioned at the back of the wearer, the fastener members 120 can be securely affixed to the ends of the strap members. This is shown, for example, in FIG. 9 where the end 116B of the strap member 116 is positioned through the ring member 122 and securely attached, such as by stitches 124 made by sewing, on the strap member. Preferably, both of the “rear” or “back” ends of the strap members 114 and 116 are connected to their respective fastener members in the same way.

The portion 116A of the strap member 116 is adapted to be secured at any position along the strap member that the wearer desires. This makes the suspenders essentially infinitely adjustable. For this purpose, the strap members are made of a material with a plurality of small loop members 130 on at least one surface. This is shown in FIGS. 9-11. Additionally, a piece of Velcro®-type hook material 132 is glued, sewn or otherwise securely affixed to the end portion 116A of the strap member 116 as shown in FIGS. 10, 12 and 13. The piece of material 132 has a plurality of small hook members extending therefrom.

When the strap portion 116A is passed through the ring member 122 and pressed up against another portion of the strap member 116, some of the hook members on material 132 mate with some of the loop members 130 and secure the two items together. This movement is shown by arrow 140 in FIG. 13.

Although any type of material with hook members thereon can be used as material 132, preferably the material is one-half of a Velcro®-type fastening system.

Since the loop members 130 are present all along one of the surfaces of the strap members 114 and 116, the suspenders in accordance with the present invention are infinitely adjustable. This allows the suspenders to be easily adjusted to fit any body size or shape. It also allows a wearer to quickly and easily adjust the suspenders at any time for any reason, such as to make them more comfortable on certain days. This also allows the wearer to be able to unfasten the suspenders without undoing the front fasteners.

Although the above description relates specifically to strap member 116, it is to be understood that the same structure and members are to be used for strap member 114 and any other strap members in any other suspender configuration incorporating the present invention.

Preferably, the loop members 130 are provided only on one side of the strap members and this is the side which is worn adjacent the body of the person. (This also is what is shown in the drawings.) The other side of the strap members, that is the outer side, preferably has a smoother and harder surface. This allows outer garments to side easily over the strap members without catching or sticking. Of course, it is also possible that the strap members can have the same loop-type surfaces on both sides, or the suspenders could be worn with the loop side out.

The material used for the strap members 114 and 116 also can be stretchable or elastic. This would provide additional comfort and adjustability to the wearer.

Other embodiments of the invention are shown in FIGS. 14-17 and in FIGS. 18-20. In all of these embodiments, the strap material, fasteners and adjustment system are preferably the same as, or similar to, those set forth above. FIGS. 14-17 depict an embodiment of the invention known as “hip-style” suspenders. Suspenders of this type are called “Hip-Clip Suspenders” and sold by Hold-Up Suspender Company in Southfield, Mich.

FIG. 14 depicts the front view of one such embodiment 150 as worn by a person 152, while FIG. 15 is a side view and FIG. 16 is a back view. FIG. 17 is an enlarged view of a portion 154 of the figure shown in FIG. 15. As indicated, only two fasteners are needed in “hip-style” suspenders with the fasteners positioned and adapted to be connected to the waistband 166 of the wearer’s pants at the hips of the wearer.

The suspenders 150 have a pair of strap members 160 and 162. The strap members are attached together where they cross-over each other on the back or rear of the wearer. The strap members can be connected at that area in any way, such as by sewing or gluing, or by releasable Velcro®-type hook and loop fasteners. The latter attachment system is shown in FIG. 16 and referred to by the reference numeral 200. One or more pieces 201 of hook-type material are secured to one of the straps.
The strap members 160 and 162 are also attached to each other at a position on the sides of the wearer and adjacent the waistband 166 of the wearer’s pants or trousers. This is shown for one side in FIG. 15. The attachment mechanism on the other side of the wearer is the same. As shown in FIG. 17, the end 168 of strap member 162 is securely attached to strap member 160, while the end portion 170 of strap member 160 is passed through slot 172 of fastener 174 and releasably attached to itself. This is the adjustment system or mechanism for the suspenders and is substantially the same as the adjustment mechanism for the sets of suspenders described above.

As with the suspender embodiments disclosed above, one surface of each of the strap members has a plurality of small loop members positioned substantially along the entire length of the strap member. A piece of hook-type Velcro material 180 is secured to the end portion 170 of the strap member in order to mate with and be releasably fastened to the loop members.

The opposite sides of the strap members preferably have a hard or smooth surface, but also could have loop members thereon. Each of the strap members could also be made of a stretchable material, such as an elastic material.

The hip-style suspenders provide a more comfortable style of suspenders to some wearers than the more common “two-strap” pant suspenders. Also, since the hip-style suspenders are designed to be worn under an outer shirt of the wearer, the hip-style suspenders provide for slightly easier removal for restroom visits.

Embodiments of a shirt-and-sock type suspender 210 are shown in FIGS. 18-20. A preferred embodiment has a “Y”-type shape with two arm-type strap members adapted to be fastened to the wearers’s shirt and an elongated strap member adapted to be fastened to the wearer’s sock. A pair of shirt-and-sock type suspenders are worn by the wearer in order to keep both socks tight and prevent them from falling, and at the same time keeping both sides of the wearer’s shirt neat and inside the wearer’s pants.

The embodiment shown in FIGS. 18-20 has three strap members 202, 204 and 206 secured together at the “V” of the “Y”-shaped suspender. The strap members all preferably are made of an elastic or stretchable-type material with a plurality of loop members on one side. The outer ends of each of the three strap members have fasteners 220 attached thereon for securely holding in place either a skirt or a sock. At least the outer end of the elongated strap member has a hook-type Velcro® material attached thereto and is adjustable. The outer ends of the two arm-type strap members are preferably fixedly secured to their fastener members, but they also can have hook-type materials attached to them so they also can be adjustable.

As shown in the embodiment illustrated in FIG. 18-20, the suspender 210 has a pair of arm-type strap members 202 and 204 attached to an elongated strap member 206. The three strap members are secured together in a “Y”-shaped configuration and are adapted to be worn by a wearer in the manner shown in FIG. 18. The length of the suspender 210 is sufficient to extend from about the waist of the wear to the lower calf or ankle of the wearer in order to be attached at the upper end to the wearer’s shirt 212 and at the other end to the wearer’s sock 214. With a pair of suspenders 210, the wearer can maintain his shirt looking neat and always tucked in his/her pants, and at the same time, keep his/her socks tight and prevent them from falling.

In this regard, it should be understood that the invention is not to be limited to suspenders having the precise structure and configuration as shown in the drawings. The invention can be utilized with other sizes, shapes and strap configurations of suspenders which fulfill the same objective and purpose.

Fastener members 220 are used to connect the strap members to the shirt or socks worn by the wearer. Preferably, the fasteners 220 are the same as the non-metallic plastic clip-type fastener members 30 as discussed above.

Preferably, the three fastener members 220 on each suspender 210 are the same, but each could also be different from one another. As shown, each fastener has a slot 222 which allows the strap members to slide through them.

The end portion 207 of the elongated strap member 206 is adapted to be secured at any position along the strap member that the wearer desires. This makes the suspender 210 infinitely adjustable to fit and extend between the wearer’s shirt and socks. The strap member 206 preferably is made of material with a plurality of small loop members on at least one surface as discussed above. Additionally, a piece of Velcro®-type hook material 232 is glued, sewn or otherwise securely affixed to the end portion 207 of the suspender 206. The piece of material 232 has a plurality of small hook members extending therefrom in order to be detachably fastened to loop members on the strap.

When the strap portion 207 is passed through the ring member 222 and pressed up against another portion of the strap member 206, some of the hook members on material 232 mate with some of the loop members 208 and secure the two items together. This is the same as the pant-type suspenders described above.

Although any type of material with hook members thereon can be used as material 232, preferably the material is one-half of a Velcro®-type fastening system.

Since the loop members 230 are present all along one of the surfaces of the strap 206, the suspender is infinitely adjustable. This allows the suspenders to be easily adjusted to fit any body size or shape. It also allows a wearer to quickly and easily adjust the suspenders at any time for any reason, such as to make them more comfortable on certain days.

Although the above description relates specifically to strap member 206, it is to be understood that the same structure and members can be used for strap members 202 and 204 and any other strap members in any other suspender configuration in accordance with one embodiment of the invention. The end portions of the strap members 202 and 204 are fixedly secured to the fasteners 220, in the manner shown in FIG. 20 and described above with respect to FIG. 9.

The material used for the strap members 202, 204 and 206 also preferably is stretchable or elastic. This provides additional comfort and adjustability to the wearer.

With the present invention, metallic or plastic buckles that are in use today in many suspenders for adjustment of the straps on the wearers are eliminated. This eliminates the possibility of unsightly bumps or bulges under the outer garment, whether it be a shirt or a pair of form-fitting pants. By having the fasteners made only of non-metallic components, the suspenders then can be worn during medical procedures and through security scanners, such as airports.

Although the invention has been described with respect to preferred embodiments, it is to be also understood that it is not to be so limited since changes and modifications
can be made therein which are within the full scope of this invention as detailed by the following claims.

What is claimed is:

1. Suspenders for wearing over the shoulders of a person for attachment to the waistband of the person's pants, the suspenders comprising:
   a first strap member and second strap member, each strap member having a first end and a second end and a first surface and a second surface.
   said first strap surface of each of said first and second members having a plurality of loop members extending substantially over said first surface and said second surface of each of said first and second strap members being smooth substantially over said second surface.
   fastener members positioned adjacent said first ends of each of said first and second strap members;
   said first ends of each of said first and second strap members being adjustable to adjust the length of said first and second strap members;
   a hook-type member secured on said first surfaces of each of said first and second strap members adjacent said fastener members;
   said hook-type member having a plurality of hook members thereon;
   said fastener members having a clip-type mechanism for securing the strap members to the wearer's pants;
   said fastener members having a plurality of components, each of the components being made of a non-metallic material;
   wherein said hook-type members on each of said first and second strap members can be selectively secured to said loop members at any position along said first surfaces.

2. Suspenders for being attached to one or more garments worn by a person, said suspenders comprising:
   a first strap member and second strap member, each strap member having a first end and a second end and a first surface and a second surface.
   said first strap surface of each of said first and second members having a plurality of loop members extending substantially over said first surface and said second surface of each of said first and second strap members being smooth substantially over said second surface.
   fastener members positioned adjacent said first ends of each of said first and second strap members;
   said first ends of each of said first and second strap members being adjustable to adjust the length of said first and second strap members;
   a hook-type member secured on said first surfaces of each of said first and second strap members adjacent said fastener members;
   said hook-type member having a plurality of hook members thereon;
   said fastener members having a clip-type mechanism for securing the strap members to the wearer's pants;
   said fastener members having a plurality of components, each of the components being made of a non-metallic material;
   wherein said hook-type members on each of said first and second strap members can be selectively secured to said loop members at any position along said first surfaces.

3. A fastener member for securing ends of suspender straps to a garment comprising:
   a non-metallic base member;
   a non-metallic over-center cam action lever member pivotally attached to said base member;
   a non-metallic pivot pin member for pivotally attaching said lever member to said base member.

4. The fastener member as described in claim 3 wherein said base member and lever member are made from a non-metallic material selected from the group comprising plastic, graphite, or a composition material.

5. The fastener member as described in claim 4 wherein said non-metallic pivot pin member is made from a material selected from the group comprising hard plastic, graphite, or composition materials.

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