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(54) **STRUCTURE PROVIDED WITH  
CONCEALED MODULES FOR PREVENTING  
SEPARATION OF SOCKS**

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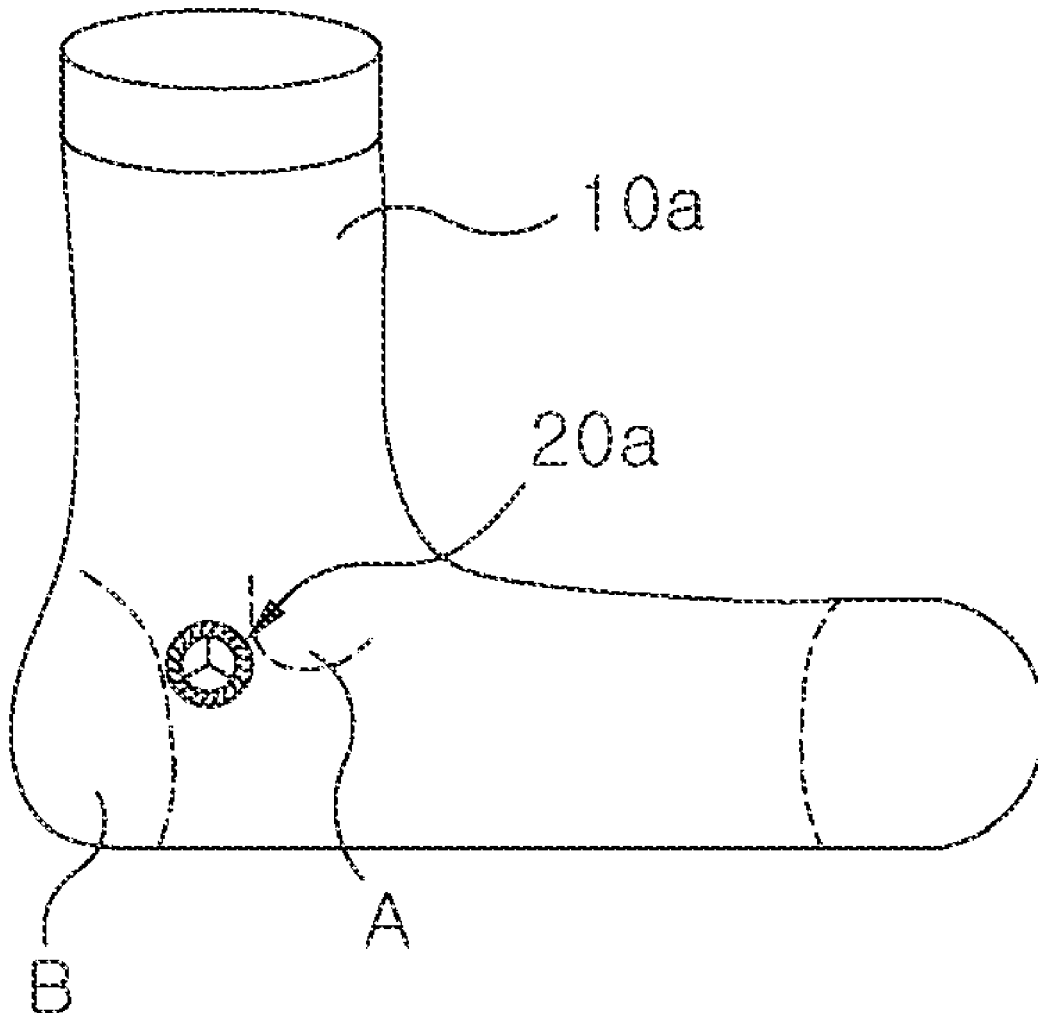
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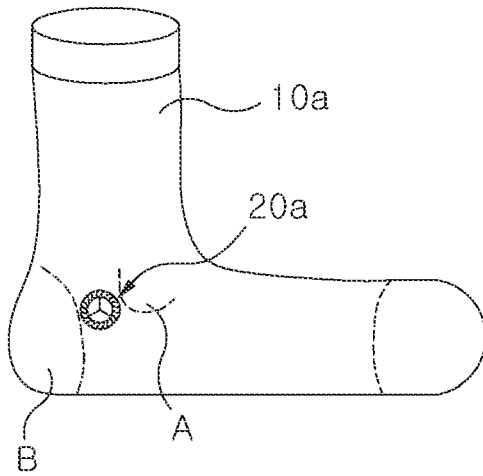
(57) **ABSTRACT**

A structure includes female and male snap buttons supported so as to be covered by left and right concealed modules fixed to one side of two socks, respectively. Thus, when the socks are not being worn, the female and male snap buttons can be exposed an opening operation of the concealed modules to correspondingly couple the two socks to each other so that the two socks form a pair when washed, dried, and stored. When the socks are being worn, the female and male snap buttons can be covered so as not to be exposed to the outside by a closing operation of the concealed modules. Thus, it is possible to prevent protrusions of the female and male snap buttons from contacting skin and clothing on the opposite ankle.

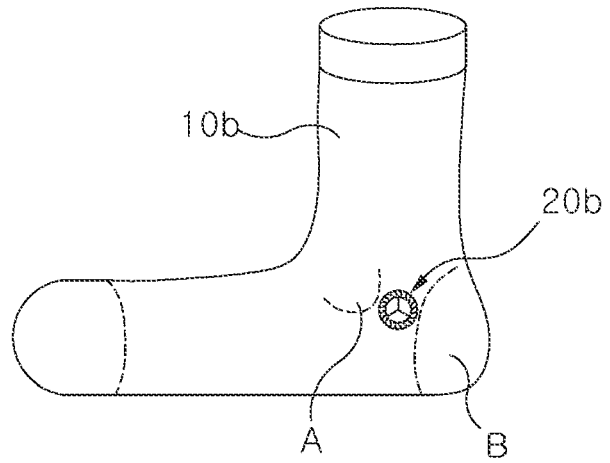
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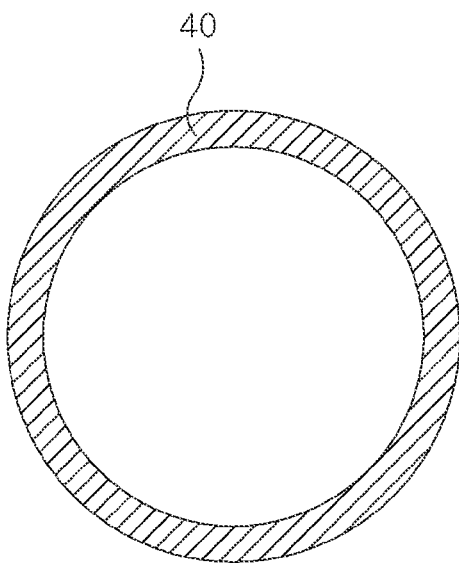




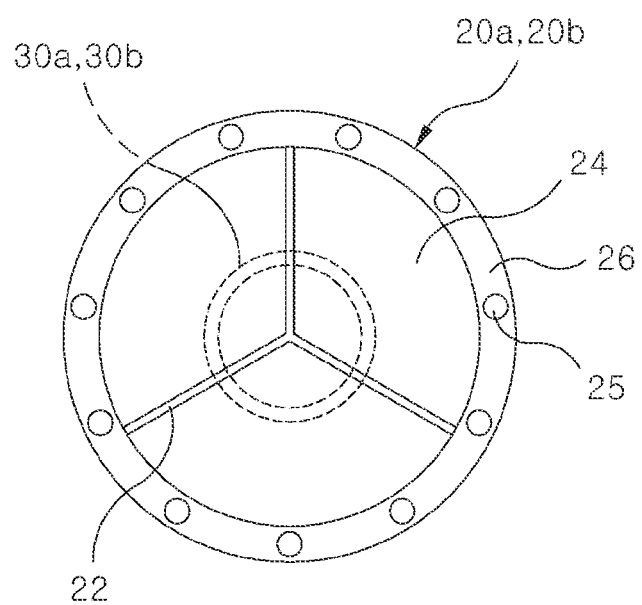
**FIG. 1A**



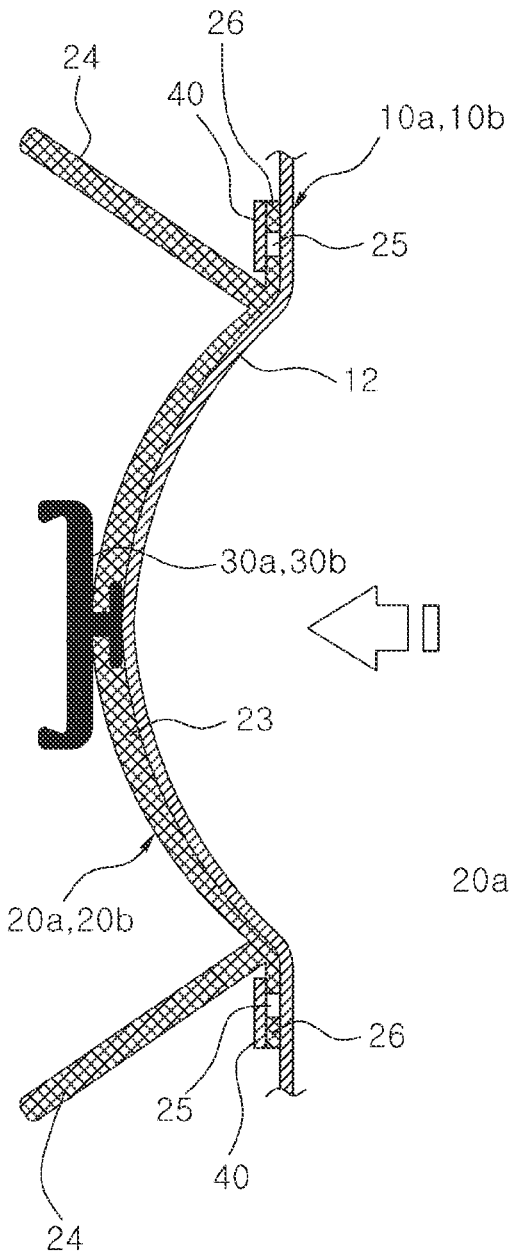
**FIG. 1B**



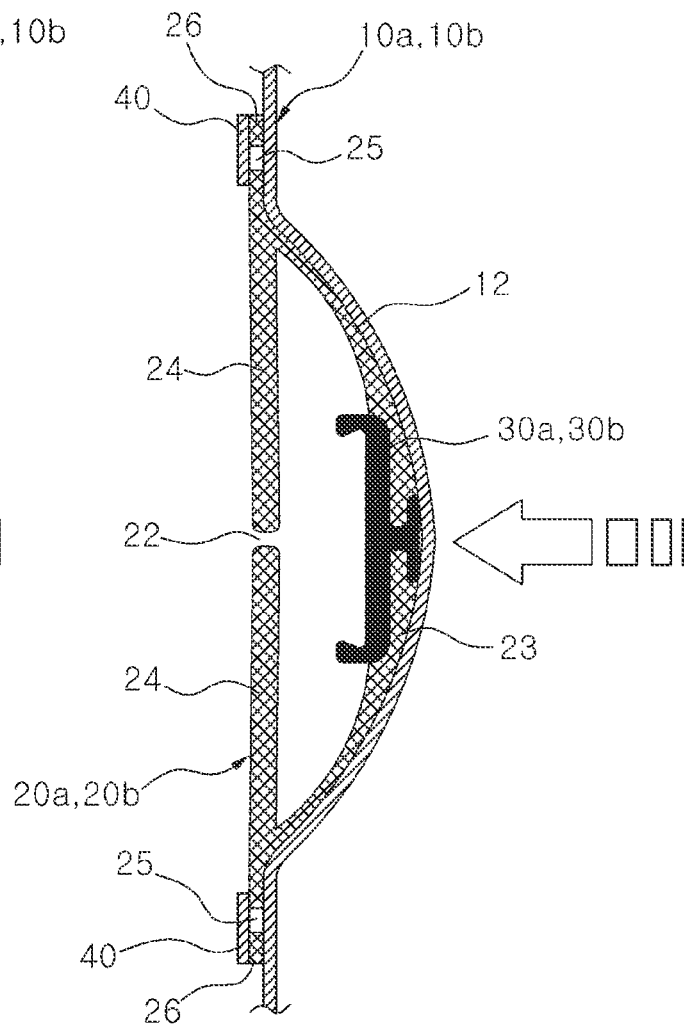
**FIG. 2A**



**FIG. 2B**



**FIG. 3A**



**FIG. 3B**



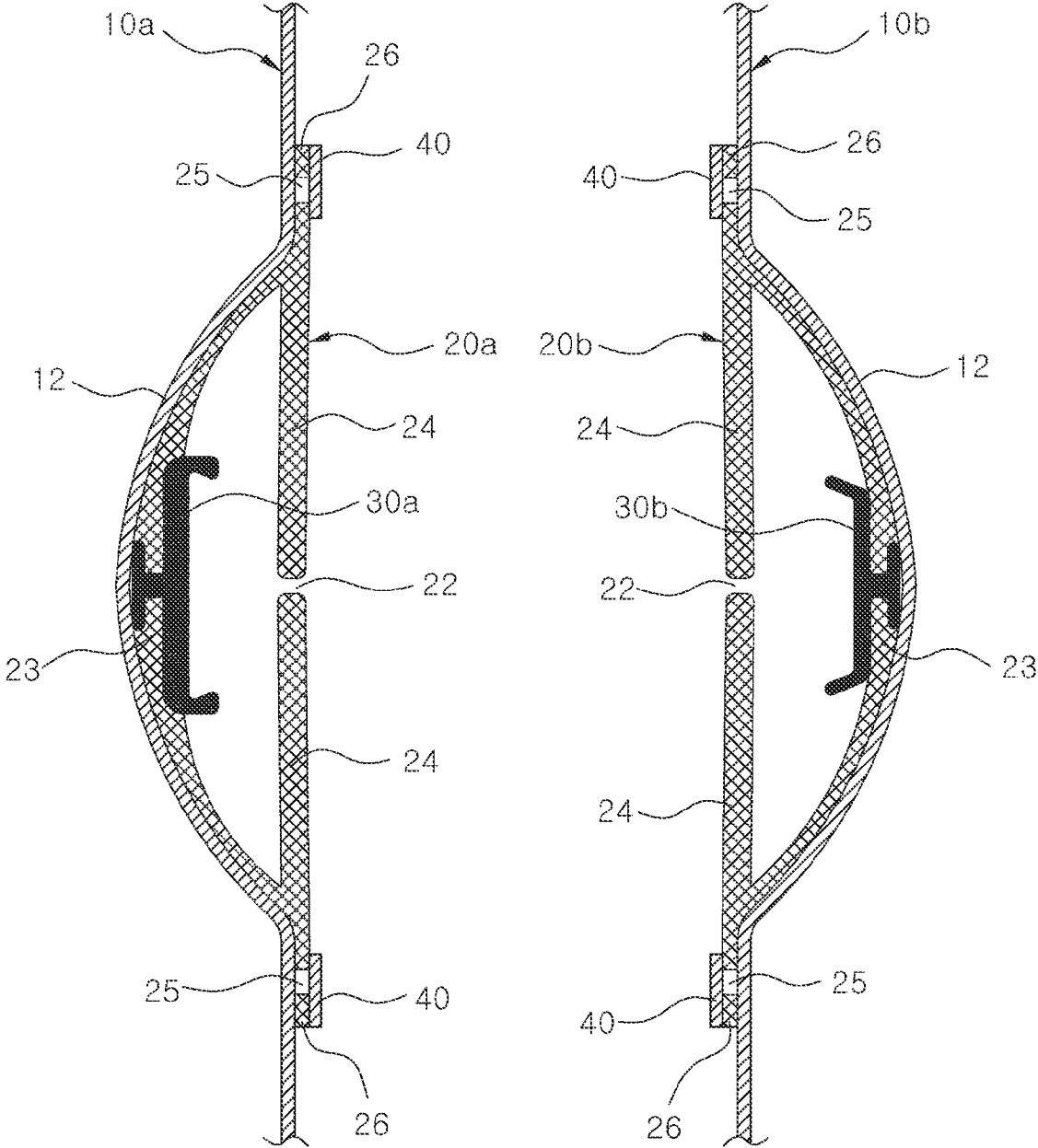


FIG. 5A

FIG. 5B

## STRUCTURE PROVIDED WITH CONCEALED MODULES FOR PREVENTING SEPARATION OF SOCKS

### CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a national phase entry under 35 U.S.C. § 371 of International Patent Application PCT/KR2022/000799, filed Jan. 17, 2022, designating the United States of America and published as International Patent Publication WO 2022/169132 A1 on Aug. 11, 2022, which claims the benefit under Article 8 of the Patent Cooperation Treaty of Korean Patent Application Serial No. 20-2021-0000367, filed Feb. 4, 2021 and Korean Patent Application Serial No. 10-2021-0034597, filed Mar. 16, 2021.

### TECHNICAL FIELD

[0002] The disclosure relates to a structure provided with concealed modules for preventing separation of socks, and more particularly to a structure provided with concealed modules for preventing separation of socks to reveal or conceal female and male snap fasteners attached to one side of each of two socks so that a pair of socks can be coupled to or separated from each other.

### BACKGROUND

[0003] In general, two socks are paired, and both of them are used at the same time due to the structure of a human body.

[0004] Such socks are usually changed every day, and the number of socks to wash is very large in a household with multiple people living together. The large number of socks are likely to get tangled, and it is difficult to pair the socks among the tangled socks. Therefore, it is necessary to compare and match the socks one by one.

[0005] Further, it is very difficult to distinguish between old and new socks having the same design and color, and thus the socks may be mixed and mismatched. In addition, it is also cumbersome to pair and fold the washed socks several times even when the washed socks are stored.

[0006] Accordingly, there has conventionally been proposed Korean Utility Model No. 20-0234599 titled "SOCKS WITH COUPLER," in which opposite couplers are respectively attached to ankle portions of two socks, and the couplers are formed by a snap fastener or a Velcro tape.

[0007] However, the snap fasteners of the conventional couplers respectively attached to the ankle portions of the two socks and facing each other are provided in the form of female and male snap fasteners that always protrude outwards from the ankle portion of the two socks, and therefore T-shaped protrusions formed in the female and male snap fasteners may touch the skin of an opposite ankle to cause abrasions or touch clothing to cause lint while wearing the socks, thereby causing problems of remarkably lowering the marketability such as damaging the aesthetics of the socks.

### BRIEF SUMMARY

[0008] The disclosure is conceived to solve the problems of the related art, and an aspect of the disclosure is to provide a structure provided with concealed modules for preventing separation of socks, in which T-shaped protrusions formed in female and male snap fasteners are prevented from

touching skin or clothing and the aesthetics and marketability of the socks are enhanced.

[0009] According to an embodiment of the disclosure, a structure provided with concealed modules for preventing separation of socks, includes: left and right concealment modules respectively attached to sides of two socks and formed with entrances opened or closed at sides; and female and male snap fasteners respectively attached to centers of the left and right concealment modules, revealed upon opening the entrances of the left and right concealment modules, and engaged with each other to pair the two socks.

[0010] According to an alternative embodiment, a pair of pockets may be formed to be concavely recessed or convexly protrude having a semilunar shape to attach the left and right concealment modules at the sides of the two socks.

[0011] According to an alternative embodiment, the pair of pockets may be formed in a region between an ankle bone corresponding portion and a heel corresponding portion on the sides of the two socks.

[0012] According to an alternative embodiment, the left and right concealment modules may include a silicone material.

[0013] According to an alternative embodiment, the left and right concealment modules may be attached to positions corresponding to the areas of the pair of pockets by an attachment band.

[0014] According to an alternative embodiment, the left and right concealment modules may include meniscus-shaped caps that support the female and male snap fasteners respectively attached to centers thereof and facing outwards, are respectively inserted in the pair of pockets from the outsides of the two socks; thin-film covers that extend inwards from surface edges of the caps and interlock with transformation of the caps to reveal or conceal the female and male snap fasteners supported on the caps; and rims that extend outwards from edges where the caps and the covers meet and are formed with multiple through holes so as to be contacted to the surface of the edges of sock surfaces (or outer sides) forming boundaries with the pair of pockets.

[0015] According to an alternative embodiment, the cap may be formed having a cross-sectional thickness decreasing from the center toward the edge to be easily transformed by a pressing force to have an inwardly concave or outwardly convex shape.

[0016] According to an alternative embodiment, the cover may be formed extending from the edge of the cap and having a certain thickness and is divided into multiple equal parts to open or close the entrance.

[0017] According to an alternative embodiment, the multiple through holes may be formed at regular intervals along a circumferential direction of the rim.

[0018] According to an alternative embodiment, the attachment band may include an adhesive applied to a rear surface thereof to be adhered corresponding to an area of the rim and partially adhered to the edge of the sock surface (or outer side) forming a boundary with the pair of pockets through the multiple through holes.

[0019] In a structure according to the disclosure, female and male snap fasteners are supported to be covered with left and right concealment modules respectively attached to one sides of two socks, so that the female and male snap fasteners can be revealed and engaged by opening the concealment modules to pair the two socks during washing, drying, and storing in the case of not wearing the socks, and

the female and male snap fasteners can be concealed and covered by closing the concealment modules made of a silicone material to prevent T-shaped protrusions formed in female and male snap fasteners from touching skin or clothing of an opposite ankle with each other, in particular, to prevent the T-shaped protrusions formed in the female and male snap fasteners from touching the skin and causing abrasions or touching the clothing and causing lint in the case of wearing the socks, thereby having advantages of improving the marketability by preventing damage to the aesthetics of the socks.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0020] FIGS. 1A and 1B illustrate a structure provided with concealed modules for preventing separation of socks according to the disclosure attached to each of two socks.

[0021] FIGS. 2A and 2B are front views of a structure provided with concealed modules for preventing separation of socks according to the disclosure.

[0022] FIGS. 3A and 3B are longitudinal section views showing operations of a structure provided with concealed modules for preventing separation of socks according to the disclosure.

[0023] FIG. 4 is a longitudinal section view showing that two socks are coupled by a structure provided with concealed modules for preventing separation of socks according to the disclosure.

[0024] FIGS. 5A and 5B are longitudinal section views showing a concealed state of two separated socks in a structure provided with concealed modules for preventing separation of socks according to the disclosure.

#### DETAILED DESCRIPTION

[0025] Below, embodiments of the disclosure will be described with reference to the accompanying drawings, FIGS. 1 to 5, for full understanding of the disclosure. The embodiments of the disclosure may be modified in various ways, and should not be construed as limiting the scope of the disclosure. Accordingly, the shape and the like of elements in the accompanying drawings may be exaggerated to emphasize the clarity of description. It should be noted that like numerals refer to like elements throughout the accompanying drawings. The detailed descriptions about publicly known functions and configurations that would unnecessarily obscure the subject matters of the disclosure are omitted.

[0026] FIGS. 1A and 1B illustrate that a structure provided with concealed modules for preventing separation of socks according to the disclosure is attached to each of two socks, FIGS. 2A and 2B are front views of a structure provided with concealed modules for preventing separation of socks according to the disclosure, FIGS. 3A and 3B are longitudinal section views showing operations of structure provided with concealed modules for preventing separation of socks according to the disclosure, FIG. 4 is a longitudinal section view showing that two socks are coupled by a structure provided with concealed modules for preventing separation of socks according to the disclosure, and FIGS. 5A and 5B are longitudinal section views showing a concealed state of two separated socks in a structure provided with concealed modules for preventing separation of socks according to the disclosure.

[0027] Referring to FIGS. 1 to 5, a structure provided with concealed modules for preventing separation of socks

according to the disclosure includes left and right concealment modules 20a and 20b respectively attached to sides of two socks 10a and 10b and formed with entrances 22 opened or closed at the sides; and female and male snap fasteners 30a and 30b respectively attached to the centers of the left and right concealment modules 20a and 20b, revealed when the entrances 22 of the left and right concealment modules 20a and 20b are opened, and engaged with each other so that the two socks 10a and 10b can be paired.

[0028] In other words, a pair of pockets 12 are formed at the sides of the two socks 10a and 10b to be concavely recessed or convexly protrude having a semilunar shape so that the left and right concealment modules 20a and 20b can be attached to the surfaces (or outer sides) of the socks. The pair of pockets 12 are formed in a region between an ankle bone corresponding portion A and a heel corresponding portion B on sides of the two socks 10a and 10b during a sock knitting process, respectively, thereby minimizing the protrusion of the bulky left and right concealment modules 20a and 20b from the surfaces (or outer sides) of the socks.

[0029] The left and right concealment modules 20a and 20b are disposed corresponding to the areas of pockets 12, and injection-molded with a silicone material to be attached to the sock surface (or outer side) by an annular attachment band 40.

[0030] In other words, the left and right concealment modules 20a and 20b include meniscus-shaped caps 23 that support the female and male snap fasteners 30a and 30b respectively attached to the centers thereof and facing outwards, are respectively inserted in the pair of pockets 12 from the outsides of the two socks 10a and 10b and transformed to have an inwardly concave or outwardly convex shape; thin-film covers 24 that extend inwards from the surface edges of the caps 23 and interlock with the transformation of the caps 23 to reveal or conceal the female and male snap fasteners 30a and 30b supported on the caps 23; and rims 26 that extend outwards from the edges where the caps 23 and the covers 24 meet and are formed with multiple through holes 25 so as to be contacted to the surface of the edges of the sock surfaces (or outer sides) forming boundaries with the pair of pockets 12.

[0031] In this case, the cap 23 is formed having a cross-sectional thickness decreasing from the center toward the edge so as to be easily transformed by a pressing force to have the inwardly concave or outwardly convex shape.

[0032] The cover 24 is formed extending from the edge of the cap 23 and having a certain thickness and is divided into three or multiple equal parts to open or close the entrance 22.

[0033] The multiple through holes 25 are formed at regular intervals along a circumferential direction of the rim 26, and are shaped like circles.

[0034] The rim 26 is shaped like a circular band corresponding to the area of the attachment band 40.

[0035] The attachment band 40 has an adhesive applied to the rear surface thereof to be adhered corresponding to the area of the rim 26 and partially adhered to the edge of the sock surface (or outer side) forming the boundary with the pockets 12 through the multiple through holes 25 so that the left and right concealment modules 20a and 20b can be attached to the pair of pockets 12 of the two socks 10a and 10b.

[0036] With this configuration according to the disclosure, in order to pair the two socks 10a and 10b by the left concealment module 20a or the right concealment module

**20b**, each of which is attached to the pocket **12** formed between the ankle bone corresponding portion A and the heel corresponding portion B of each of the two socks **10a** and **10b** as shown in FIGS. 1A and 1B, the rear of the cap **23** of the left concealment module **20a** or the right concealment module **20b** is first pressed in the direction of the arrow from the state shown in FIG. 3B, and thus the cover **24** integrally formed on the edge of the cap **23** is radially spread while the meniscus cap **23** is transformed having an outwardly convex shape as shown in FIG. 3A, thereby opening the entrance **22** and at the same time revealing the female snap fastener **30a** or the male snap fastener **30b** supported at the center of the cap **23** as moved forward a certain distance according to the transformation of the cap **23**.

[0037] In this state, the two socks **10a** and **10b** are moved close to each other in corresponding shape and at the same time the female snap fastener **30a** and the male snap fastener **30b** are engaged with each other as shown in FIG. 4, thereby connecting the two socks **10a** and **10b** as a single pair. Therefore, the two socks **10a** and **10b** are not separated during washing, drying and storing, thereby having advantages of avoiding the hassle and inconvenience of matching and searching for the two socks **10a** and **10b**.

[0038] On the other hand, in order to separate and wear the two socks **10a** and **10b**, the cap **23** of the left concealment module **20a** or the right concealment module **20b** is pressed inwards and transformed to have an inwardly concave shape from the state shown in FIG. 3A to the state shown in FIG. 3B, and thus the cover **24** integrally formed on the edge of the cap **23** is folded toward the center of the cap **23** according to the transformation of the cap **23**, thereby closing the entrance **22** and concealing the female snap fastener **30a** or the male snap fastener **30b** supported at the center of the cap **23**.

[0039] In other words, when the entrances **22** of the left concealment module **20a** and the right concealment module **20b** attached to the pockets **12** of the two socks **10a** and **10b** are closed as shown in FIGS. 5A and 5B, the female and male snap fasteners **30a** and **30b** are respectively covered with and concealed by the covers **24** of the left and right concealment modules **20a** and **20b**, thereby having advantages of preventing abrasions that may occur in the skin of an opposite ankle, lint that may occur in clothing, and the like caused by contact with T-shaped protrusions formed in the female and male snap fasteners **30a** and **30b**.

[0040] Further, the left and right concealment modules **20a** and **20b** are injection-molded with the silicone material inserted in and attached to the meniscus-shaped pockets **12** formed in the regions between the ankle bone corresponding portion A and the heel corresponding portion B at the height where an ankle bone of a human body protrudes, thereby having advantages of minimizing the bulkiness due to the installation area of the left and right concealment modules **20a** and **20b** and soft causing no irritation and no incompatibility with skin due to the softness and composition of the silicone material.

[0041] Meanwhile, the disclosure is not limited to the foregoing embodiments but may be modified and altered without departing from the scope of the disclosure, and the technical ideas subjected to such modification and alteration should also be considered to fall within the scope of the accompanying claims.

#### DESCRIPTION OF REFERENCE NUMERALS

[0042]	<b>10a, 10b</b> : two socks
[0043]	<b>12</b> : pocket
[0044]	<b>20a, 20b</b> : left and right concealment modules
[0045]	<b>22</b> : entrance
[0046]	<b>23</b> : cap
[0047]	<b>24</b> : cover
[0048]	<b>25</b> : multiple through holes
[0049]	<b>26</b> : rim
[0050]	<b>30a, 30b</b> : female and male snap fasteners
[0051]	<b>40</b> : attachment band
[0052]	A: ankle bone corresponding portion
[0053]	B: heel corresponding portion

1. A structure provided with concealed modules for preventing separation of socks, comprising:

left and right concealment modules respectively attached to sides of two socks and having entrances opened or closed at sides; and

female and male snap fasteners respectively attached to centers of the left and right concealment modules, revealed upon opening the entrances of the left and right concealment modules, and engaged with each other to pair the two socks.

2. The structure of claim 1, further comprising a pair of concavely recessed or convexly protruding pockets having a semilunar shape to attach the left and right concealment modules at the sides of the two socks.

3. The structure of claim 2, wherein the pair of pockets are formed in a region between an ankle bone corresponding portion and a heel corresponding portion on the sides of the two socks.

4. The structure of claim 1, wherein the left and right concealment modules comprise a silicone material.

5. The structure of claim 2, wherein the left and right concealment modules are attached to positions corresponding to areas of the pair of pockets by an attachment band.

6. The structure of claim 5, wherein the left and right concealment modules comprise:

meniscus-shaped caps supporting the female and male snap fasteners respectively attached to centers of the female and male snap fasteners and facing outwards, the meniscus-shaped caps respectively inserted in the pair of pockets from the outsides of the two socks;

thin-film covers extending inwards from surface edges of the caps and interlocking with the caps, transformation of the caps revealing or concealing the female and male snap fasteners supported on the caps; and

rims extending outwards from edges where the caps and the covers meet the rims having multiple through holes so as to be able contact with the surfaces of the socks through the multiple through holes.

7. The structure of claim 6, wherein the cap has a cross-sectional thickness decreasing from the center toward the edge so as to enable transformation of the cap by a pressing force to have an inwardly concave or outwardly convex shape.

8. The structure of claim 6, wherein the cover extends from the edge of the cap and has a thickness, the cover divided into multiple equal parts to open or close the entrance.

9. The structure of claim 6, wherein the multiple through holes are located at regular intervals along a circumference of the rim.



**10.** The structure of claim **6**, wherein the attachment band comprises an adhesive applied to a rear surface thereof to be adhered to an area of the rim and partially adhered to the surfaces of the socks through the multiple through holes.

**11.** A pair of socks, comprising:

a first sock;

a second sock; and

a first fastener attached to a surface of the first sock; and a second fastener attached to a surface of the second sock;

wherein, the first fastener and the second fastener are configured to releasably attach to one another; and

wherein each of the first fastener and the second fastener respective comprises:

a deformable concealment module having a pocket therein, the pocket being openable and closeable responsive to manual deformation of the concealment module; and

a fastening member attached to the concealment module within the pocket, the fastening member being revealed upon opening the pocket, the fastening member being hidden upon closing the pocket.

**12.** The pair of socks of claim **11**, wherein the deformable concealment member has a concave shape in a closed configuration of the deformable concealment module, and a convex shape in an open configuration of the deformable concealment module.

**13.** The pair of socks of claim **12**, wherein the pair of pockets are formed in a region between an ankle bone corresponding portion and a heel corresponding portion on the sides of the two socks.

**14.** The pair of socks of claim **11**, wherein the concealment module comprises silicone.

**15.** The pair of socks of claim **12**, wherein each of the first fastener and the second fastener comprises an attachment band extending around a peripheral edge of the deformable concealment module.

**16.** The pair of socks of claim **15**, wherein the deformable concealment module comprises:

a cap;

a cover extending inwards from a peripheral edge of the cap so as to define the pocket between the cap and the thin cover, deformation of the cap causing movement of the thin cover to reveal or conceal the fastening member within the pocket; and

a rim extending outwards from the peripheral edge of the cap, the rim having multiple through holes extending through the rim to enable contact with the surfaces of the socks through the multiple through holes.

**17.** The pair of socks of claim **16**, wherein the cap has a cross-sectional thickness decreasing from the center toward the peripheral edge of the cap so as to enable manual deformation of the cap by a pressing force to cause the cap to have an inwardly concave shape or an outwardly convex shape.

**18.** The pair of socks of claim **16**, wherein the cover includes multiple divided parts.

**19.** The pair of socks of claim **16**, wherein the multiple through holes are located at regular intervals along the rim.

**20.** The pair of socks of claim **16**, wherein the attachment band comprises an adhesive applied to a surface thereof, the adhesive securing the attachment band to the rim at an interface between the rim and the attachment band, the adhesive securing the respective fastener to the respective sock at an interface between the attachment band and the respective sock within the multiple through holes in the rim.

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