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(54) Title: CLOTHES HANGER HAVING EXTENSION RODS

(57) Abstract: A clothes hanger may be configured with extension rods that are adapted to cause a lower portion of a garment hung on the hanger to be pulled tautly between the extension rods. The extension rods may be adapted to cooperate to impede wrinkling of a lower portion of the garment. The hanger may have a hook portion and a shoulder portion. The extension rods may be flexible and resilient, and may be coupled to the shoulder portion via respective torsion springs, or by a detent mechanism. The hanger may include a housing that contains the torsion springs or detent mechanism. At least one of the extension rods may be a telescoping rod. The rods may be hinged to the shoulder portion. The rods may be adapted to be folded up into the hanger to emulate the look of a conventional clothes hanger.

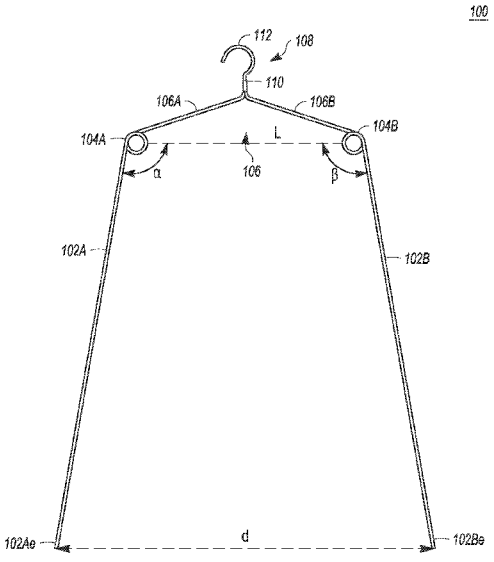

FIG. 1

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CLOTHES HANGER HAVING EXTENSION RODS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority from Provisional U.S. Patent Application No. 62/382,452, filed September 1, 2016.

[0002] This application is related to U.S. Design Patent Application No. [CREA_0001_D01], filed on even date herewith, entitled "Clothes Hanger," to U.S. Design Patent Application No. [CREA_0001_D02], filed on even date herewith, entitled "Clothes Hanger," and to U.S. Design Patent Application No. [CREA_0001_D03], filed on even date herewith, entitled "Clothes Hanger." The disclosure of each of the foregoing design patent applications is incorporated herein by reference.

BACKGROUND

[0003] A typical clothes hanger includes a hook portion, and a shoulder portion coupled to the hook portion. A garment, such as a shirt, blouse, sweater, jacket, coat, or other garment adapted to be worn over the shoulders of and around a human torso, may be placed onto the hanger such that the hook portion of the hanger extends through the neck of the garment, and the shoulders of the garment are supported by the shoulder portion of the hanger. With a conventional clothes hanger, the lower portion of the garment hangs freely. That is, a conventional clothes hanger does not support the lower portion of the garment.

[0004] When placed on a conventional clothes hanger, the unsupported lower portion of a garment may fold over on itself, especially when the garment is tightly pressed among other adjacent garments, say, in a closet, or packed in a suitcase, for example. Such folding may cause unsightly wrinkling in the lower portion of the garment, and may render the garment unwearable. The cost of dry cleaning or laundering and pressing such garments is wasted if the garment, though

clean, cannot be worn due to unsightly wrinkling. And, though wearing such a wrinkled garment may be embarrassing, it may often be necessary if, for example, an iron cannot be found.

[0005] It would be desirable, therefore, if there were available, an improved hanger that mitigates the tendency of the lower portion of a garment to fold over on itself, and thereby impedes wrinkling that results from such folding.

SUMMARY

[0006] As disclosed herein, a clothes hanger may include a shoulder portion having a first end portion and a second end portion disposed opposite the first end portion. A first extension rod may extend from the first end portion, and a second extension rod may extend from a second end portion. One or both of the extension rods may be flexible and resilient. The extension rods may be configured to flex inwardly relative to one another. The extension rods may be adapted to cause a lower portion of a garment hung on the shoulder portion of the clothes hanger to be pulled tautly between the extension rods. The extension rods may be adapted to cooperate to impede wrinkling of a lower portion of a garment hung on the shoulder portion of the clothes hanger.

[0007] The clothes hanger may have a hook portion, a shoulder portion coupled to the hook portion, a first extension rod extending from the shoulder portion, and a second extension rod extending from the shoulder portion. The hook portion may extend from the shoulder portion in a first direction, while each of the extension rods extends from the shoulder portion in a direction opposite the first direction.

[0008] The clothes hanger may include a hook, a neck portion extending from the hook, a first shoulder rod extending from the neck portion, a first torsion spring disposed at an end of the first shoulder rod, and a first extension rod extending from the first torsion spring. The hanger may also include a second shoulder rod extending from the neck portion, a second torsion spring disposed at an end of the second shoulder rod, and a second extension rod extending from the second torsion spring. The first torsion spring may be configured to produce a first tension on the first extension rod. The second torsion spring may be configured to produce a second tension on the second extension rod.

[0009] Each of the extension rods may extend at least two feet from its respective the torsion spring. Respective distal ends of the extension rods may be separated by about 30 inches. Each of the extension rods may form a respective angle of about 22 to 28 degrees with a line defined by the

torsion springs. The hanger may include a housing that contains the torsion springs. Each of the extension rods may be a telescoping rod. The telescoping rods may be hinged to the shoulder portion, such that the rods may be collapsed and folded into the shape of a conventional hanger.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 depicts an example of a clothes hanger having extension rods for providing lower support to a garment and a torsion spring for maintaining tension on the extension rods.

[0011] FIG. 2 depicts a portion of the clothes hanger depicted in FIG. 1, providing a detailed view of the torsion spring.

[0012] FIG. 3 depicts an example of a clothes hanger having extension rods for providing lower support to a garment, with the extension rods flexed inwardly toward each other.

[0013] FIG. 4 depicts a garment hung on an example clothes hanger having extension rods for providing lower support to the garment.

[0014] FIG. 5 depicts another example of a clothes hanger having extension rods for providing lower support to a garment, with a housing that contains a torsion spring for maintaining tension on the extension rods.

[0015] FIG. 6 depicts a portion of the clothes hanger depicted in FIG. 5, providing a detailed view of the torsion spring contained by the housing.

[0016] FIG. 7 depicts an example of a clothes hanger having extension rods for providing lower support to a garment and a detent mechanism for maintaining tension on the extension rods.

[0017] FIGs. 8A and 8B provide detailed views of a detent mechanism for adjusting tension on the extension rods.

[0018] FIG. 9 provides a detailed view of a portion of a telescoping extension rod.

[0019] FIG. 10 depicts a clothes hanger having telescoping extension rods for providing lower support to a garment, wherein the extension rods are folded into a conventional hanger configuration.

[0020] FIG. 11 depicts an example garment insert having side rods for providing lower support to a garment.

DETAILED DESCRIPTION

[0021] FIG. 1 depicts an example of a clothes hanger 100 having extension rods 102A, 102B for providing lower support to a garment (not shown in FIG. 1). The hanger 100 has one or more torsion springs, e.g., 104A, 104B for maintaining tension on the respective extension rods 102A, 102B. The hanger 100 may be formed from a single piece of wire. The wire may be made of a metal or a synthetic material, such as a plastic or polymer, for example, a carbon fiber polymer.

[0022] As shown, the hanger 100 may have a hook portion 108. The hook portion 108 may include a hook 112, which may be formed into a "C" shape. The hook 112 may be adapted to be selectively mounted on a dowel or other cylindrically shaped clothes rack, such as those conventionally disposed horizontally in closets. A neck portion 110 may extend from the hook portion 112, and couple the hook portion 108 to a shoulder portion 106. The shoulder portion 106 may include a first shoulder rod 106A extending from the neck portion 110. The shoulder portion 106 may include a second shoulder rod 106 B extending from the neck portion 110. The first shoulder rod 106A may extend from the neck portion 110 in a first direction (*e.g.*, leftward as shown in FIG. 1). The second shoulder rod 106 B may extend from the neck portion 110 in a second direction (*e.g.*, rightward as shown in FIG. 1). The second direction may be opposite the first direction.

[0023] One or more extension rods 102A, 102B may extend from the shoulder portion 106. As shown, the hook portion 108 may extend from the shoulder portion 106 in a first direction (*e.g.*, upward as shown in FIG. 1), while the each of the extension rods 102A, 102B extends from the shoulder portion 106 in a direction opposite the first direction (*e.g.*, downward as shown in FIG. 1). Each of the extension rods 102A, 102B may be flexible and resilient, such that the extension rods 102A, 102B may be flexed toward one another, and such that, after the rods 102A, 102B are released, they will return to their rest state.

[0024] Each rod 102A, 102B may be fashioned of a variety of materials such as plastics, carbon composites, metal, or wood. Each rod 102A, 102B may also be integrally formed with the hanger shoulder portion 106. Also, the entire rod 102A, 102B may be hollow, or solid at least in some portions or segments.

[0025] Each rod 102A, 102B may be relatively rigid; however each rod 102A, 102B may also be resilient, such that when the rod 102A, 102B is displaced from its rest position, the rod 102A, 102B tends to return forcefully back to its rest position. Also, each rod 102A, 102B may

bend or otherwise be deformed, again with a resilience tending to return the rod 102A, 102B forcefully back to its rest position.

[0026] The shoulder portion 106 of the hanger 100 may define a line, L, between the points from which the extension rods 102A, 102B extend from the shoulder portion 106. Each of the extension rods 102A, 102B may form a respective angle, α, β, of with the line, L, defined by the shoulder portion 106. The angles, α, β, may be in the range of about 10 to 40 degrees, about 20 to 30 degrees, or about 22 to 28 degrees. Each of the extension rods 102A, 102B may extend at least two feet from the shoulder portion 106. Respective distal ends 102Ae, 102Be of the extension rods 102A, 102B may be separated by a distance, d, of about 30 inches. The distance, d, by which the distal ends 102Ae, 102Be of the extension rods 102A, 102B may be separated may range from about two feet to about three feet. The distance, d, may be variable.

[0027] As shown in FIG. 1, the shoulder portion 106 of the hanger 100 may include one or more torsion springs 104A, 104B. A first torsion spring 104A may be disposed at an end of the first shoulder rod 106A. The first extension rod 102A may extend from the first torsion spring 104A. A second torsion spring 104B may be disposed at an end of the second shoulder rod 106B. The second extension rod 102B may extend from the second torsion spring 104B. The first torsion spring 104A may be configured to produce a first tension on the first extension rod 102A. The second torsion spring 104B may be configured to produce a second tension on the second extension rod 102B.

[0028] The torsion springs 104A, 104B may define a line, L. Each of the extension rods 102A, 102B may form a respective angle, α, β, with the line, L, defined by the torsion springs 104A, 104B. The angles, α, β, may be in the range of about 10 to 40 degrees, about 20 to 30 degrees, or about 22 to 28 degrees. Each of the extension rods 102A, 102B may extend at least two feet from its respective torsion spring 104A, 104B.

[0029] Each of the torsion springs 104A, 104B may be formed to have one or more loops. The torsion springs 104A, 104B depicted in FIG. 1 are depicted as single-loop torsion springs. FIG. 2 provides a detailed view of an example single-loop torsion spring 204. As shown, the torsion spring 204 may couple a first rod 206 to a second rod 202, such that the first rod 206 and the second rod 202 are at an angle, γ, relative to one another.

[0030] As shown in FIG. 3, the extension rods 102A, 102B may be configured to flex inwardly toward one another. Alternatively, one of the extension rods may be flexible while the other is non-flexible, such that the flexible rod may be flexed toward the non-flexible rod (or, in

seen another way, the rods may be flexed toward one another relatively). While flexed relatively toward one another, the extension rods 102A, 102B may be slipped through the neck portion of a garment (not shown in FIG. 3), such as a shirt, blouse, jacket, or coat, for example.

[0031] As shown in FIG. 4, the extension rods 102A, 102B may be slipped through the neck portion of a garment 40. If the garment 40 is a button-down garment, the garment 40 may be draped over the shoulder portion 106 of the hanger 100, and the lower portion 40L of the garment 40 may be buttoned around the extension rods 102A, 102B. Thus, the shoulder portion 40S of the garment 40 may be supported by the shoulder portion 106 of the hanger 100, while the hook portion 108 of the hanger 100 extends out from the neck portion 40N of the garment 40.

[0032] As shown, the shoulder portion 106 possesses bi-lateral symmetry, and includes a center section to which the hook portion 108 is mounted, and a pair of preferably sloped, depending slats 107A, 107B extending in generally opposing directions. Respective slots 109A, 109B are preferably disposed slightly inward from the distal ends of each slat 107A, 107B, on the upper surface thereof, the purpose of which is primarily to receive relatively thin shoulder straps of a blouse or similar garment. The slots 109A, 109B are optional. In the hanger depicted in FIG. 3, the hook portion 108 is preferably fashioned of metal and is preferably threadably secured into the shoulder portion 106, which is preferably fashioned of wood. It should be appreciated that the hook portion 108 and the shoulder portion 106 may be formed of a variety of different materials such as plastics, carbon composites, metal, and wood and that the hook portion 108 may be secured to the shoulder portion 106 by other means such as by gluing or nailing. Indeed, the hook portion 108 and the shoulder portion 106 may be integrally formed of the same material.

[0033] The extension rods 102A, 102B may be adapted to cause the lower portion 40L of a garment 40 hung on the shoulder portion of the clothes hanger to be pulled tautly between the extension rods 102A, 102B. One or both of the extension rods 102A, 102B may be flexible and resilient, such that when the garment 40 is hung on the hanger 100, the rods 102A, 102B effectively pull away from one another, and thereby pull apart the sides 40A, 40B of the lower portion 40L of the garment 40. Thus, the extension rods 102A, 102B may be adapted to cooperate with one another to impede wrinkling of a lower portion 40L of a garment 40 hung on the shoulder portion 106 of the clothes hanger 100.

[0034] Thus, when a garment 40 is placed on the hanger 100, the lower portion of each extension rod 102A, 102B is deformed in a slightly inward curve, and the lower portion of each rod

102A, 102B abuts an associated interior, lateral side 40A, 40B of the garment 40, whereby the resilience of the rods 102A, 102B causes each rod 102A, 102B to be forcibly pressed against the associated interior, lateral side 40A, 40B of the garment 40, whereby the garment 40 is pulled and stretched in a taut condition. As such, the hanger 100 helps both to prevent wrinkling of the garment 40 while the garment 40 is on the hanger 100, and to reduce any wrinkling that may already have been in the garment 40 before the garment 40 was placed on the hanger 100. Also, the hanger 100 helps maintain the garment 40 in a relatively planar condition that may be easily placed on and removed from a clothes rack and may be maintained in a suitcase or other garment bag, again in a condition that inhibits wrinkling.

[0035] The hanger 100 may include frictional elements to inhibit the apparel from moving upward along each rod 102A, 102B. As shown in FIG. 3, for example, each rod 102A, 102B may be provided with a pair of friction-generating members 30 spaced from the lower distal end 102Ae, 102Be of each rod 102A, 102B, and also spaced from the other member(s) 30 on the same rod. The members 30 may be made of cylindrical or bulbous pieces of soft rubber or soft foam secured to the associated rod 102A, 102B by adhesive or other securing means. Each member 30 may protrude laterally outward from the associated rod 102A, 102B so as to be in intimate contact with the interior surface of an article of apparel hanging on the hanger and thus to inhibit upward movement of the apparel, which helps maintain the apparel in an unwrinkled condition. Alternatively, or in addition, one or more portions of each rod 102A, 102B, or each entire rod 102A, 102B, may be coated with such a soft rubber, a soft foam, or other non-slip material to help inhibit upward movement of the apparel.

[0036] FIG. 5 depicts another example of a clothes hanger 120 having extension rods 102A, 102B for providing lower support to a garment (not shown in FIG. 5). As shown, the hanger 120 may include a housing 116. The housing 116 may be made of wood, or plastic, or the like. Thus, the hanger 120 may be configured more like a conventional wood or plastic hanger. Also, the hanger 120 depicted in FIG. 5 has a broader shoulder portion 106 than does the wire-frame hanger 100 depicted in FIG. 1. Such a broader shoulder portion 106 may provide more support for the shoulder portion of a garment hung on the hanger 120.

[0037] The housing 116 may contain one or more torsion springs 124A, 124B. The torsion springs 124A, 124B may be configured to maintain tension on the extension rods 102A, 102B. As

shown in FIG. 5, the torsion springs 124A, 124B may be multi-loop torsion springs. Alternatively, the torsion springs 124A, 124B could be single-loop torsion springs, such as those described above.

[0038] FIG. 6 depicts a portion of the clothes hanger 120 depicted in FIG. 5, providing a detailed view of the multi-loop torsion springs 124A, 124B contained by the housing 116. The housing 116 may be made in two opposing parts, which may be fused together over a wire frame, such as depicted in FIG. 1. Or the housing may be molded onto the wire frame. The housing 116 have a thickness, t_1, from front to back, and thickness, t_2, from top to bottom. The thickness, t_1, may be about 3/4" to one inch. The thickness, t_2, may be about 1-4 inches, depending on the hanger design. The housing may be about 18" wide from shoulder to shoulder. The width of the housing may range from 14-20 inches, or from one to two feet.

[0039] FIG. 7 depicts an example of a clothes hanger having extension rods for providing lower support to a garment and a hinge and detent mechanism for maintaining tension on the extension rods. The detent mechanism may be used instead of the torsion springs described above.

[0040] As shown in FIG. 7, the hanger 200 may include a pair of essentially identical extension rods 202A, 202B each depending and extending from the lower surface of the shoulder portion 206 of the hanger 200. An upper distal end of each rod 202A, 202B may be secured to an associated lower surface of each slat 206A, 206B, near the distal end thereof, and generally beneath an associated slot (not shown in FIG. 7). The upper distal end of each rod 202A, 202B may be secured to an associated slat 206A, 206B by drilling a corresponding shaped hole in the slat and then either by inserting the rod 202A, 202B into the hole in a press-fit manner, by gluing the end of the rod 202A, 202B into the hole, or by other suitable means. Alternatively, the shoulder portion 206 and the rods 202A, 202B may be integrally formed. Each rod 202A, 202B may have a length of about 2-4 feet. The rods 202A, 202B may be straight (or linear), but may be curved, serrated, or otherwise non-linear. The rods 202A, 202B may be splayed and diverge at an angle in the range of 10 to 40 degrees, and very preferably about 20 to 30 degrees, and most preferably about 22 to 28 degrees.

[0041] Using detent mechanisms 204A, 204B, the angles of diversion, α and β, can be selectively varied. FIGs. 8A and 8B provide detailed views of a detent mechanism 224 for adjusting tension on an extension rod 202. As shown, the detent mechanism 224 may include opposing clutch portions 224A, 224B and a button 226. When the button 226 is depressed, the opposing clutch portions 224A, 224B open relative to one another. An extension rod, such as described herein (not

shown in FIGs. 8A and 8B), may be engaged to one of the clutch portions 224A, 224B. For example, the rod may be received into a hole 228 in the clutch portion 224A. The rod may then be used to turn the clutch portion to which it is engaged. When the button 226 is released, the clutch portions 224A, 224B re-engage one another, holding the rod at the selected angle of diversion.

[0042] Each rod may be segmented or non-segmented. The rods 102A, 102B depicted in FIG. 1 are non-segmented. The rods 202A, 202B depicted in FIG. 7 are segmented. If the rods are segmented, segments of each rod may be configured to telescope with respect to adjacent rod segments, such that the effective length of a segmented, or telescoping, rod may be selectively changed.

[0043] FIG. 9 provides a detailed view of a portion of a telescoping extension rod. The telescoping position may be maintained through a friction-fit between surfaces of adjacent telescoping segments, or may be selectively maintained with a set screw passing threadably through the wall of the outer telescoping segment and adapted for selective, forceful engagement against the outer surface of the inner telescoping segment. As shown in FIG. 9, in a longitudinal cross-sectional view of a rod 202, each rod 202 may comprise a cylindrical upper section 202U that is hollow, and a cylindrical lower section 202L that may be either solid or hollow. The outer diameter of the lower section 202L may be very slightly smaller than the inner diameter of the upper section 202U such that the lower section 202L may slide longitudinally within the upper section 202U. The relative positions of the two sections 202U, 202L may be selectively fixed by a set screw 24 that extends threadably through the wall of the upper section 202U. By turning the set screw 24 in one rotational direction, the set screw 24 advances toward the periphery of the lower section 202L, eventually contacts the lower section 202L, and then forcefully compresses the lower section 202L against the opposing inner surface of the upper section 202U. Such compression causes the lower section 202L to be restrained from longitudinal movement relative to the upper section 202U. Turning the set screw 24 in the other rotational direction retracts the set screw 24 away from the lower section 202L.

[0044] FIG. 10 depicts a clothes hanger 200 having telescoping extension rods 202A, 202B for providing lower support to a garment, wherein the extension rods 202A, 202B are folded into a conventional hanger configuration. As shown, the several segments 202U, 202L of a telescoping rod can be nested within one another to shorten the rod length. The rod length can be shortened such that it can be folded into the hanger housing (by rotating the detent mechanism 204A, 204B). As such, the hanger 200 with the folded rods 202A, 202B can be configured to the form and

function of a conventional hanger, for storage, or use as a conventional hanger, where the lower portion of the garment hangs freely.

[0045] FIG. 11 depicts an example garment insert 300 having side rods 302A, 302B for providing lower support to a garment (not shown in FIG. 11). As shown, the insert 300 may have a first elongated side rod 302A, a second elongated side rod 302B, and a central rod 304 coupled to each of the side rods 302A, 302B. The side rods 302A, 302B may be rigid, or flexible and resilient, such as described above in connection with extension rods. The central rod 304 may be a torsion rod, which may be elongated or contracted by twisting an outer rod portion 304A relative to an inner rod portion 304B.

[0046] The garment insert 300 may be inserted into a garment such that the side rods 302A, 302B contact the sides of the lower portion of the garment. The central rod 304 may be elongated (or contracted) to the point where the side rods 302A, 302B effectively cause the lower portion of the garment to be pulled tautly between the side rods 302A, 302B. The garment insert 300 may be used alone, say, for packing garments in a suitcase or garment bag, or it may be used as an extension to a conventional hanger to form a structure that will work effectively as the hanger examples described above.

CLAIMS

What is claimed:

1. A clothes hanger, comprising:

a hook;

a neck portion extending from the hook;

a first shoulder rod extending from the neck portion;

a first torsion spring disposed at an end of the first shoulder rod; and

a first extension rod extending from the first torsion spring.

2. The clothes hanger of claim 1, further comprising:

a second shoulder rod extending from the neck portion;

a second torsion spring disposed at an end of the second shoulder rod; and

a second extension rod extending from the second torsion spring.

3. The clothes hanger of claim 2, wherein the first torsion spring is configured to produce a first tension on the first extension rod.

4. The clothes hanger of claim 3, wherein the second torsion spring is configured to produce a second tension on the second extension rod.

5. The clothes hanger of claim 4, wherein each of the extension rods is resilient.

6. The clothes hanger of claim 5, wherein each of the extension rods extends at least two feet from a respective one of the torsion springs.

7. The clothes hanger of claim 5, wherein respective distal ends of the extension rods are separated by at least 30 inches.

8. The clothes hanger of claim 5, wherein the first and second torsion springs define a line, and wherein each of the extension rods forms a respective angle of about 22 to 28 degrees with the line defined by the torsion springs.

9. A clothes hanger, comprising:

a hook portion;

a shoulder portion coupled to the hook portion;

a first extension rod extending from the shoulder portion; and

a second extension rod extending from the shoulder portion;

wherein at least one of the extension rods is flexible and resilient.

10. The clothes hanger of claim 9, wherein the hook portion extends from the shoulder portion in a first direction, and the each of the extension rods extends from the shoulder portion in a direction opposite the first direction.

11. The clothes hanger of claim 10, wherein the extension rods are adapted to cause a lower portion of a garment hung on the shoulder portion of the clothes hanger to be pulled tautly between the extension rods.

12. A clothes hanger, comprising:

a shoulder portion having a first end portion and a second end portion disposed opposite the first end portion;

a first extension rod extending from the first end portion of the shoulder portion; and

a second extension rod extending from a second end portion of the shoulder portion;

wherein at least one of the extension rods is flexible and resilient.

13. The clothes hanger of claim 12, wherein each of the extension rods is coupled to the shoulder portion via a respective torsion spring.

14. The clothes hanger of claim 13, further comprising a housing that contains the torsion springs.

15. The clothes hanger of claim 12, wherein each of the extension rods is a telescoping rod.

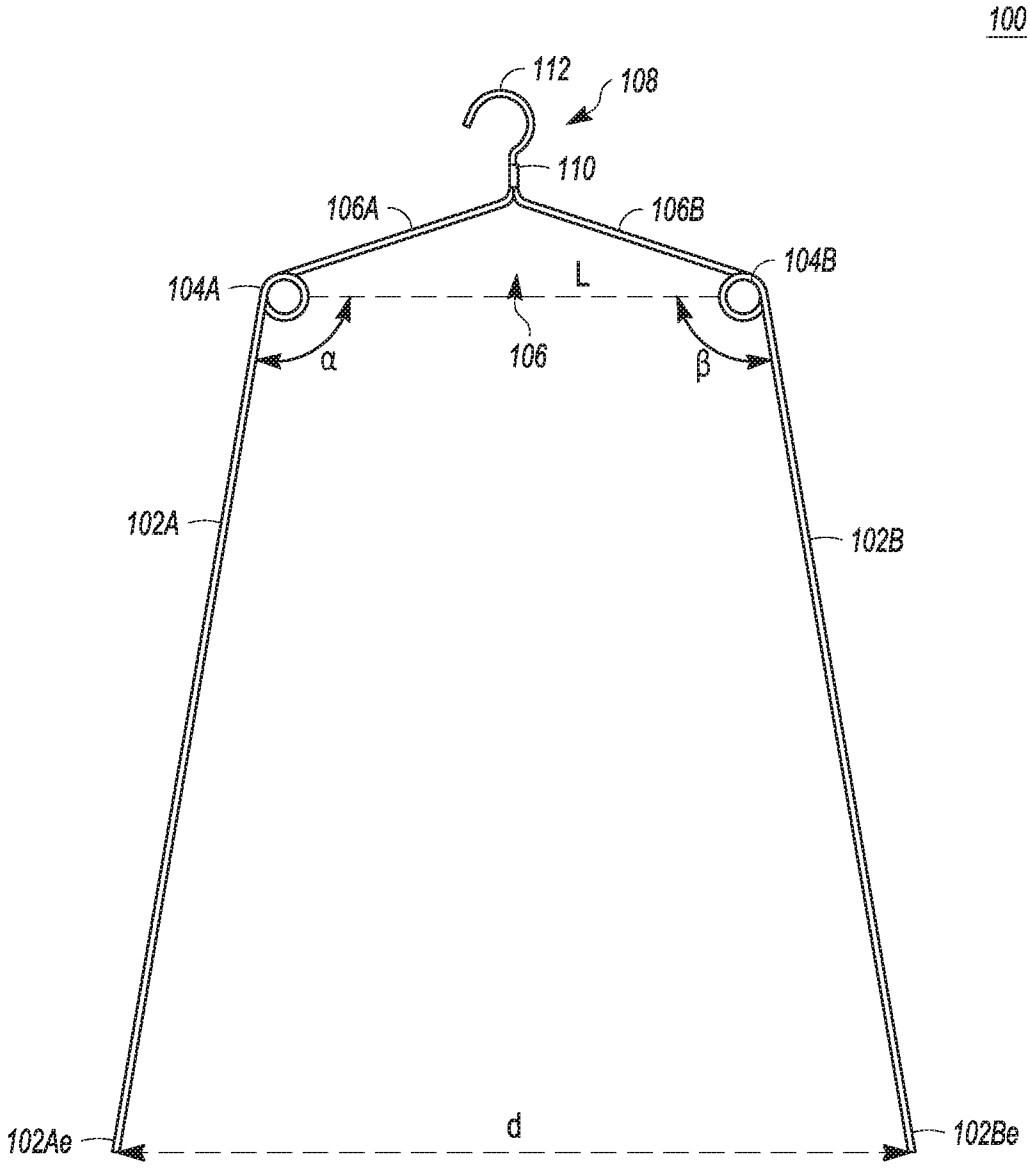
16. The clothes hanger of claim 15, wherein the telescoping rods are hinged to the shoulder portion.

17. The clothes hanger of claim 12, wherein each of the extension rods extends from the shoulder portion by at least two feet.

18. The clothes hanger of claim 12, wherein the extension rods are configured to flex inwardly relative to one another.

19. The clothes hanger of claim 18, wherein the extension rods are adapted to cause a lower portion of a garment hung on the shoulder portion of the clothes hanger to be pulled tautly between the extension rods.

20. The clothes hanger of claim 18, wherein the extension rods are adapted to cooperate to impede wrinkling of a lower portion of a garment hung on the shoulder portion of the clothes hanger.


100
112
108
110
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106B
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104B
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102A
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102Be

FIG. 1

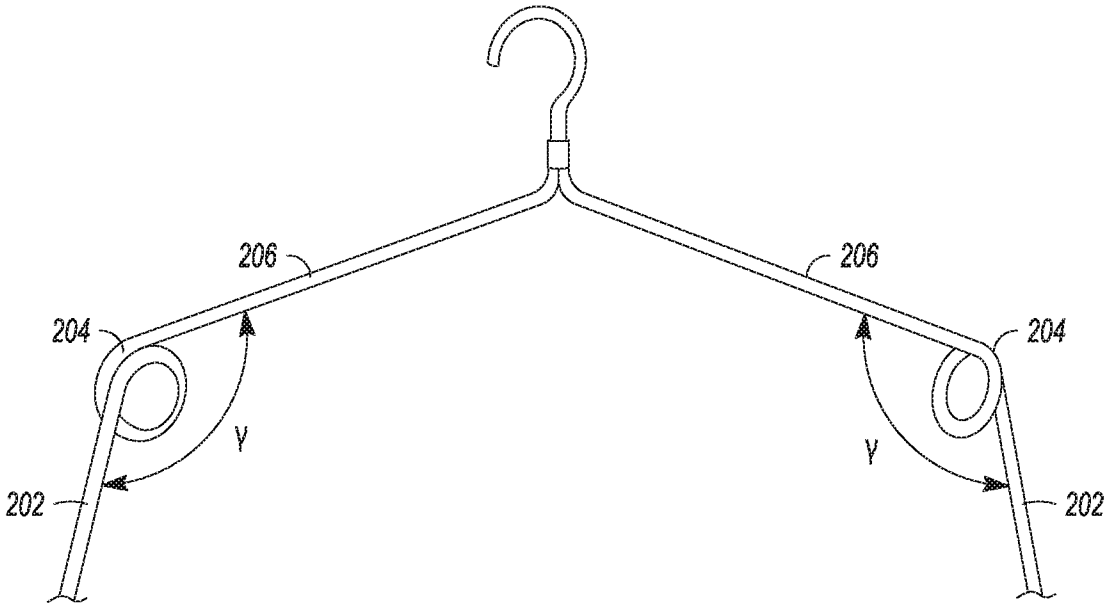

FIG. 2

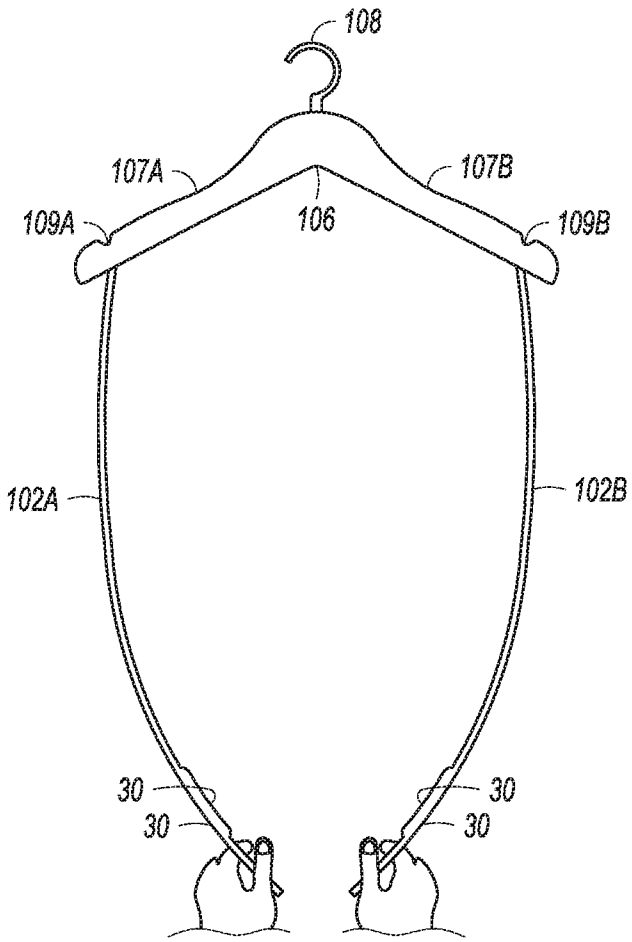

FIG. 3

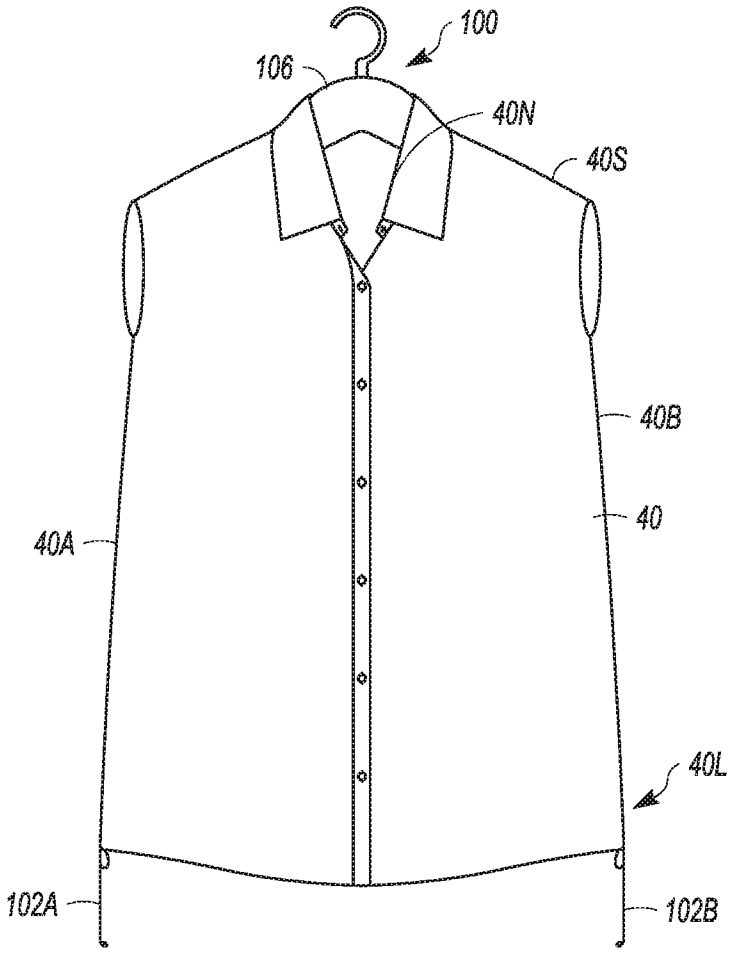

FIG. 4

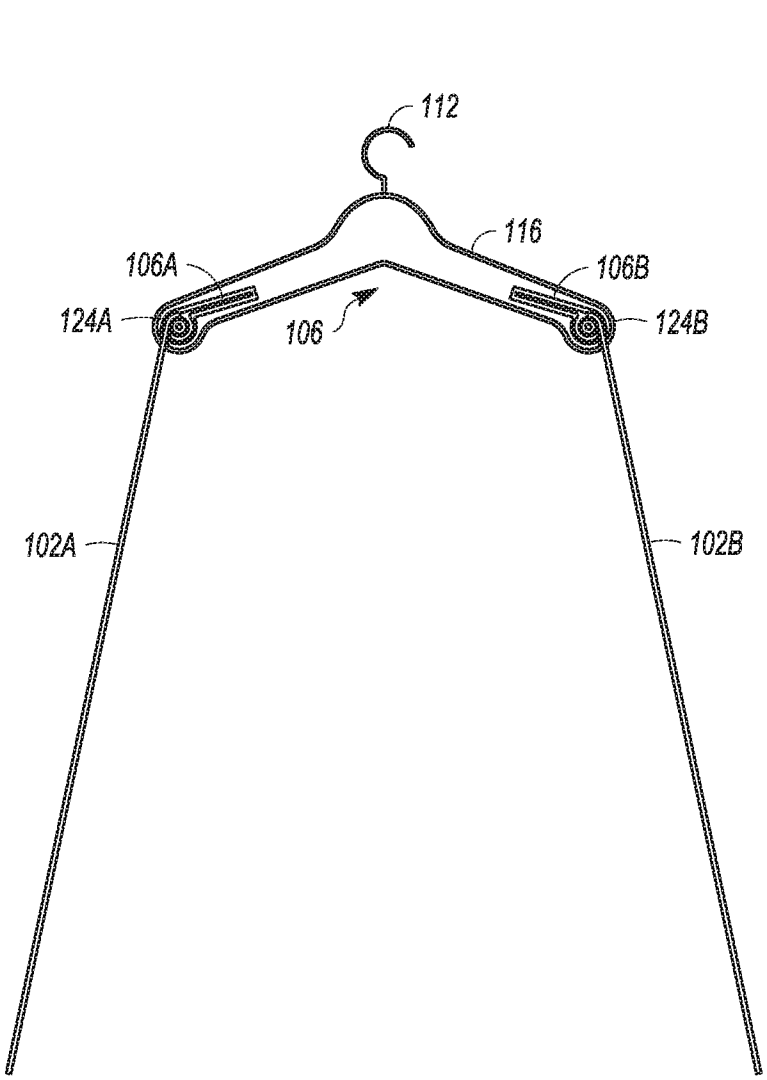

FIG. 5

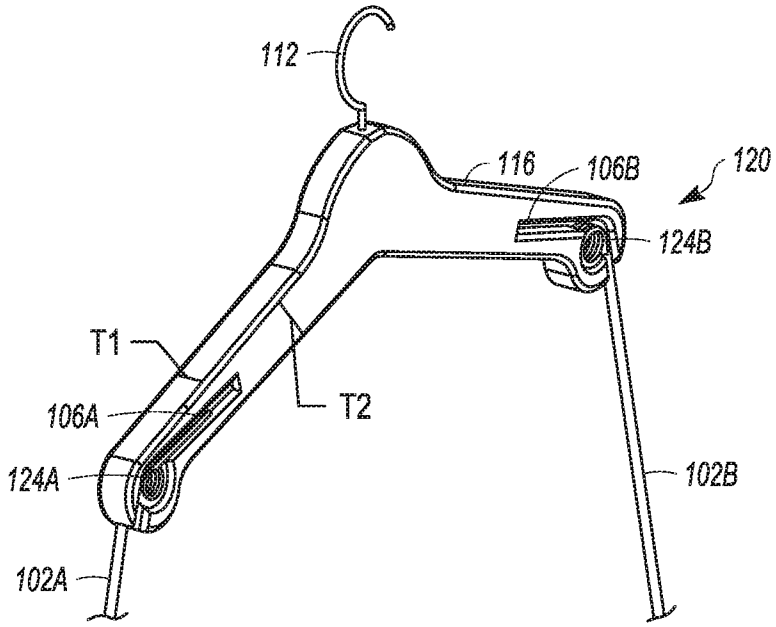

FIG. 6

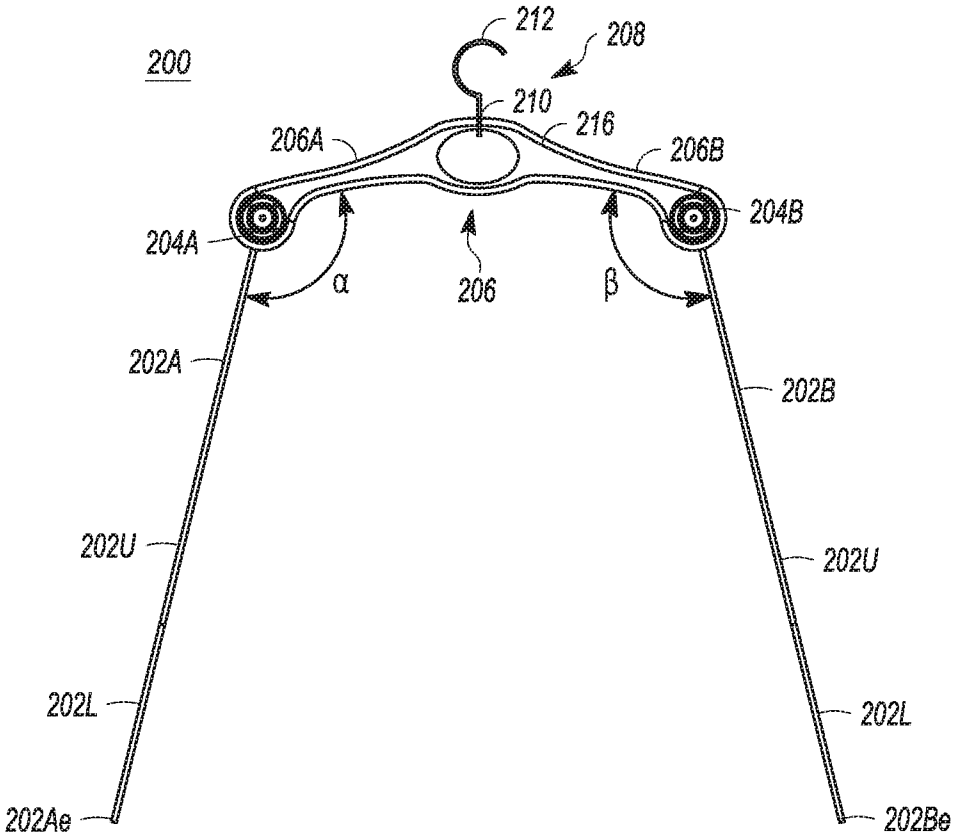
200
212
208
210
216
206A
206B
204A
204B
α
206
β
202A
202B
202U
202U
202L
202L
202Ae
202Be

FIG. 7

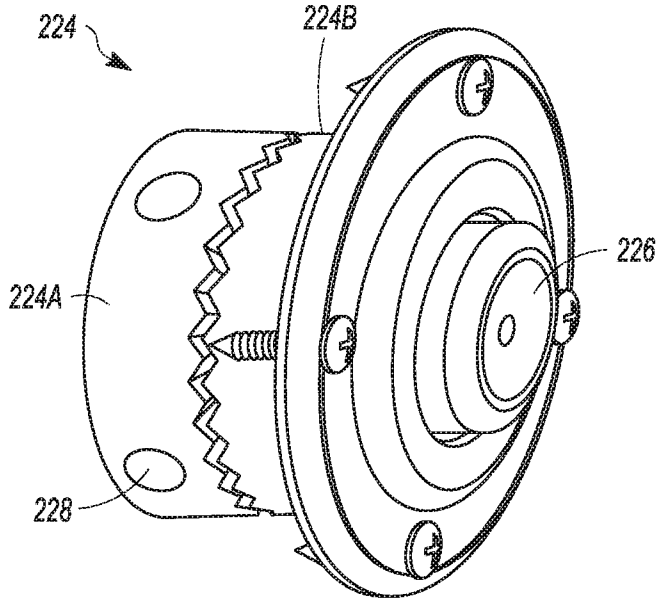

FIG. 8A

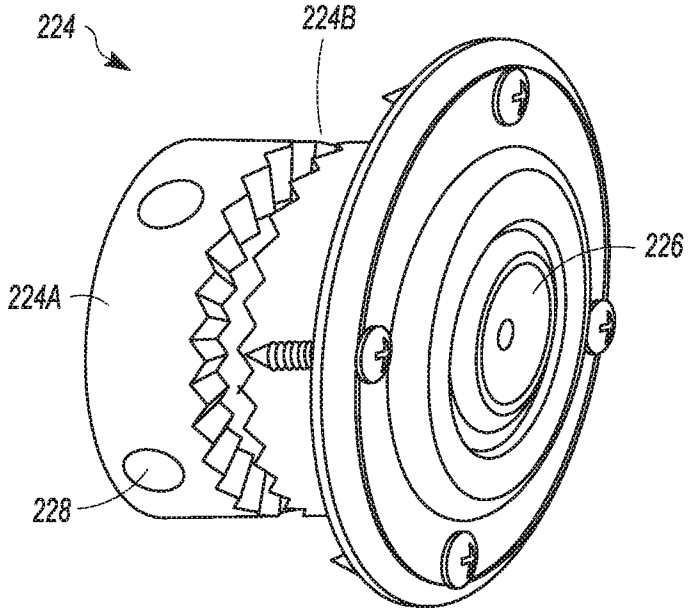

FIG. 8B

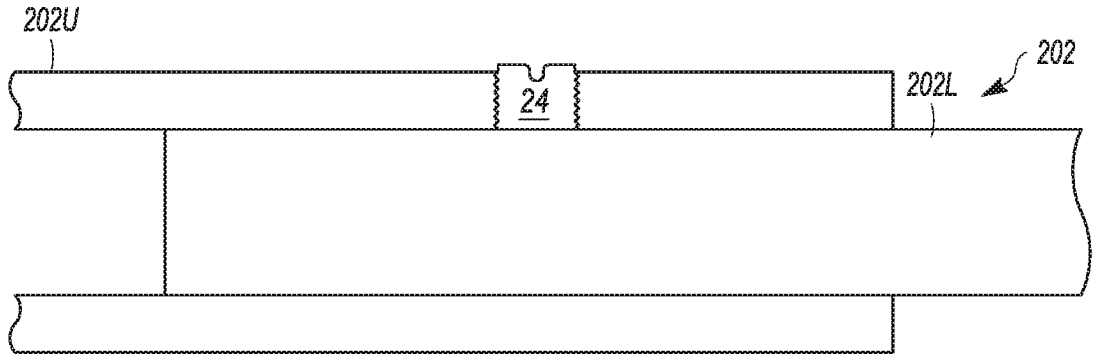

FIG. 9

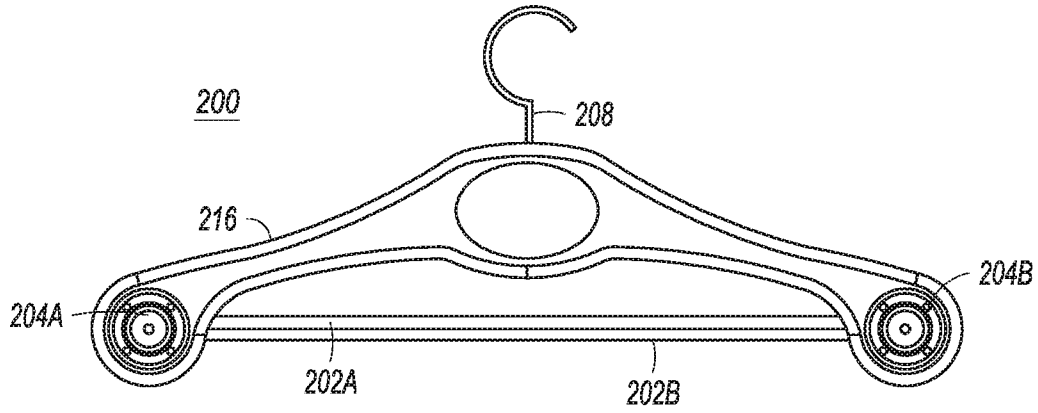

FIG. 10

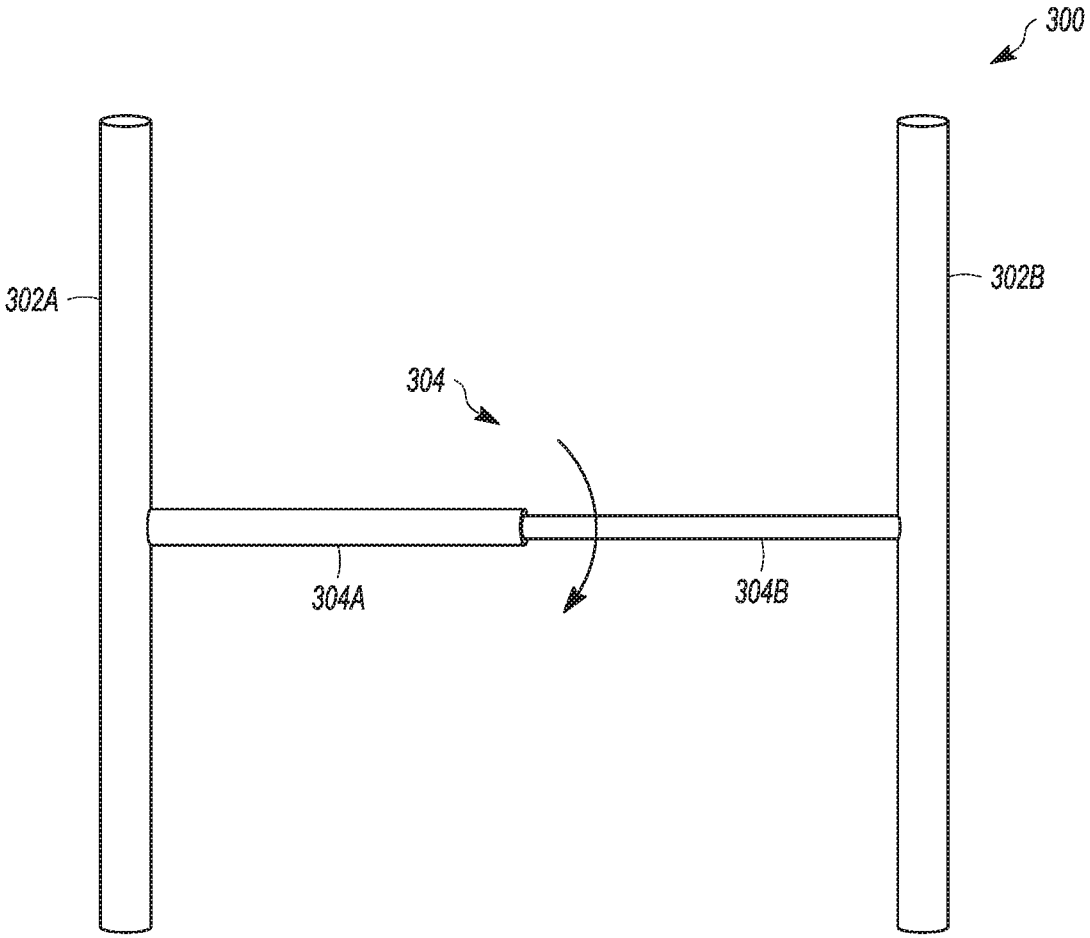

FIG. 11

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2017/049739

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
See extra sheet(s).

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-8

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2017/049739

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A47G 25/20; A47G 25/00; A47G 25/14; A47G 25/24; A47G 25/44 (2017.01)

CPC - A47G 25/20; A47G 25/44; A47G 25/441; A47G 25/442; A47G 25/447; A47G 2025/448 (2017.08)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

USPC - 223/85; 223/89; 223/92; 223/94 (keyword delimited)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3,401,854 A (DODULIK) 17 September 1968 (17.09.1968) entire document	1-8
A	CN 2734065 Y (HU) 19 October 2005 (19.10.2005) see machine translation	1-8
A	KR 20-0334735 Y1 (KIM) 28 November 2003 (28.11.2003) see machine translation	1-8
A	US 3,352,430 A (MCATEE) 14 November 1967 (14.11.1967) entire document	1-8

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 November 2017	22 DEC 2017
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450 Facsimile No. 571-273-8300	Authorized officer Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2017/049739

Continued from Box No. III Observations where unity of invention is lacking

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees need to be paid.

Group I, claims 1-8 are drawn to a clothes hanger comprising a neck portion.

Group II, claims 9-20 are drawn to a clothes hanger comprising a second extension rod.

The inventions listed in Groups I-II do not relate to a single general inventive concept under PCT Rule 13.1, because under PCT Rule 13.2 they lack the same or corresponding special technical features for the following reasons:

The special technical features of Group I, a clothes hanger comprising a neck portion extending from a hook, and a first torsion spring disposed at an end of a first shoulder rod, are not present in Group II; and, the special technical features of Group II, a clothes hanger comprising a second extension rod extending from a shoulder portion, wherein at least one of the extension rods is flexible and resilient, are not present in Group I.

Groups I and II share the technical features of a clothes hanger comprising a hook, a first shoulder portion, and a first extension rod. However, these shared technical features do not represent a contribution over the prior art. Specifically, US 3,352,430 A to McAtee teaches of a clothes hanger (hanger 10, Fig. 1; Title) comprising a hook (hook 14, Fig. 1), a first shoulder portion (section 26, Fig. 1), and a first extension rod (vertical support arm 21, Fig. 1).

Since none of the special technical features of the Groups I-II inventions are found in more than one of the inventions, unity is lacking.