



US 20160219954A1

(19) **United States**

(12) **Patent Application Publication**
Nakamura

(10) **Pub. No.: US 2016/0219954 A1**

(43) **Pub. Date: Aug. 4, 2016**

(54) **CURVED PLEATED PRODUCT AND METHOD FOR MANUFACTURING CURVED PLEATED PRODUCT**

A47H 23/04 (2006.01)

A41D 1/06 (2006.01)

A47H 23/08 (2006.01)

A41B 1/08 (2006.01)

A41D 1/22 (2006.01)

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(52) **U.S. Cl.**

CPC . *A41D 27/00* (2013.01); *A41B 1/08* (2013.01);

A41D 1/14 (2013.01); *A41D 1/22* (2013.01);

A41D 1/06 (2013.01); *A47H 23/08* (2013.01);

A47H 23/04 (2013.01)

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(21) Appl. No.: **14/917,536**

(22) PCT Filed: **Sep. 2, 2014**

(57) **ABSTRACT**

(86) PCT No.: **PCT/JP2014/073087**

§ 371 (c)(1),

(2) Date: **Mar. 8, 2016**

[Problem] To provide a curved pleated product and a method for manufacturing curved pleated products, which dramatically increase the degree of freedom in pleat design and are capable of providing pleats of multiple variations and which impart a novel value to products, such as pleated clothing that gives an elegant or “sexy” impression.

[Solution] The curved pleated product has curved pleats (2) formed by joining together multiple fabric pieces (21), in which the two side edges (A, B, a, b) are formed as long curves, at the respective left and right side edges (A, B, a, b) along the contours of the two side edges (A, B, a, b) and alternating ridge folds and valley folds along the contours of said joined side edges (A, B, a, b).

(30) **Foreign Application Priority Data**

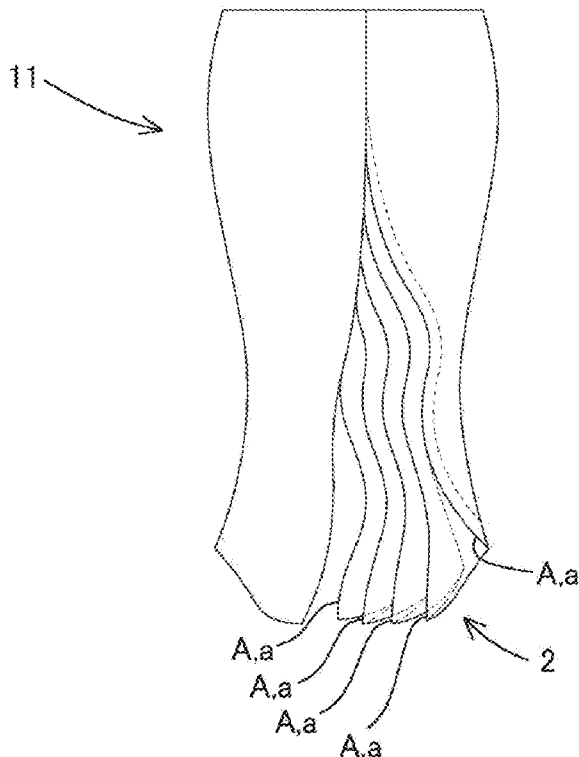
Sep. 11, 2013 (JP) 2013-188375

Publication Classification

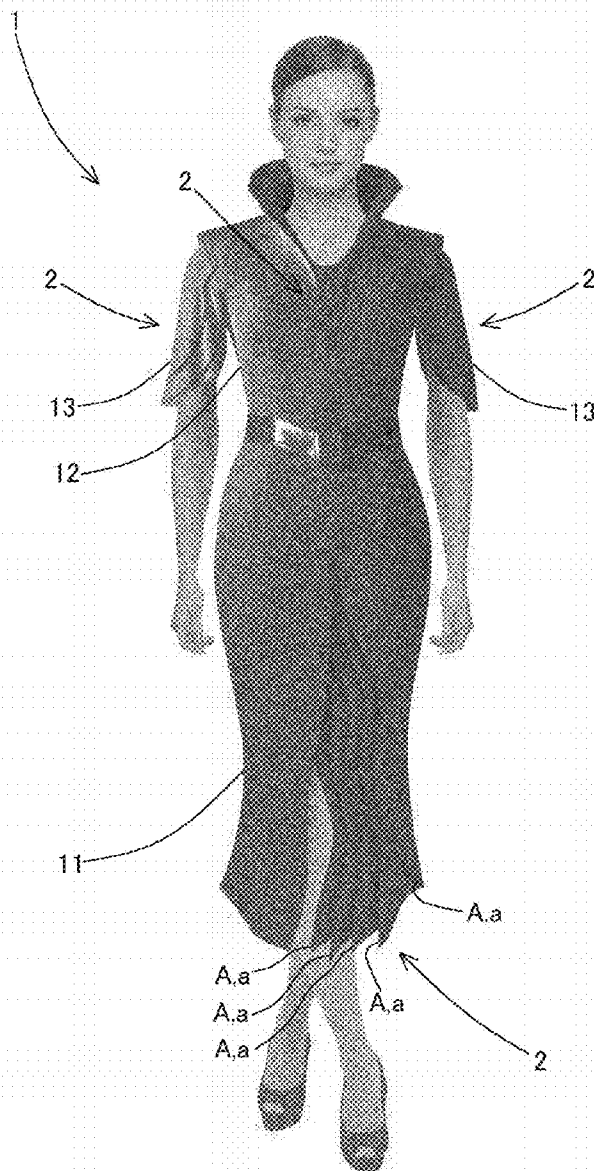
(51) **Int. Cl.**

A41D 27/00 (2006.01)

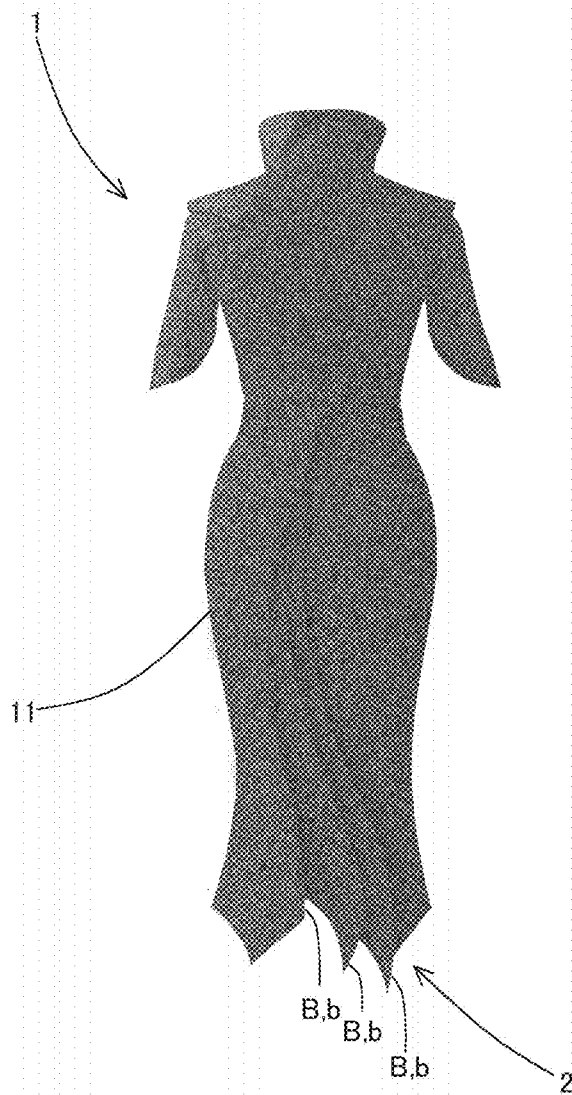
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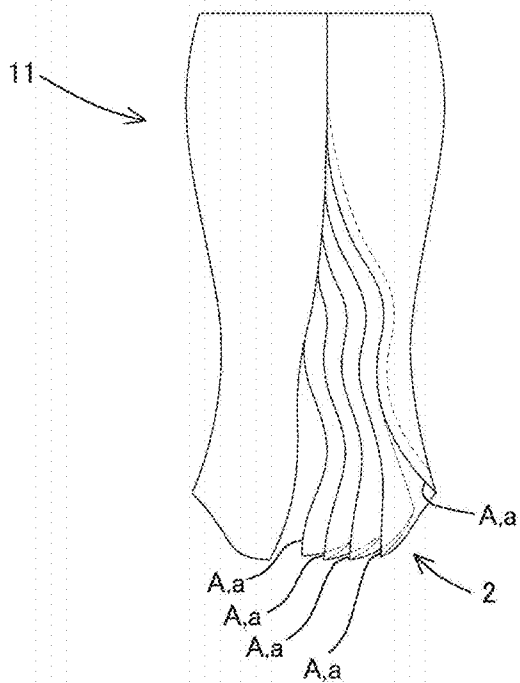
[FIG. 1]



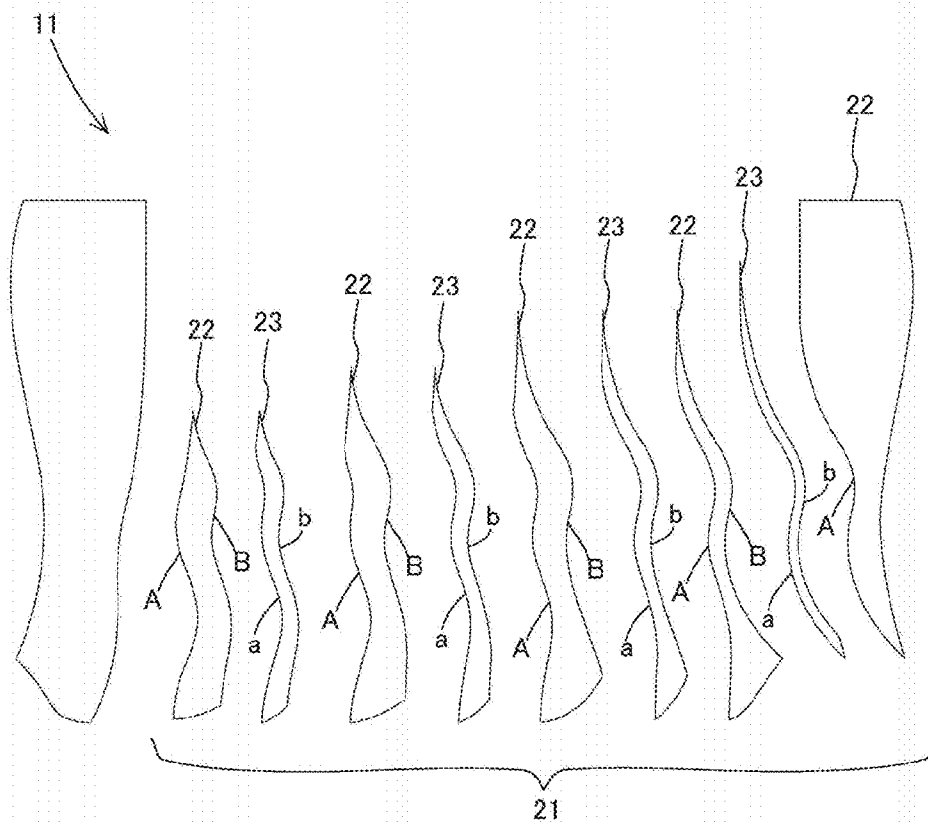
[FIG. 2]



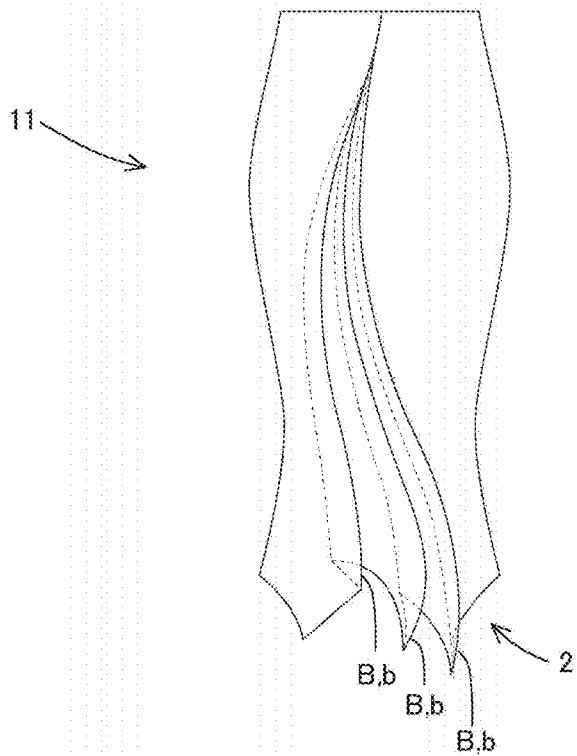
[FIG. 3]



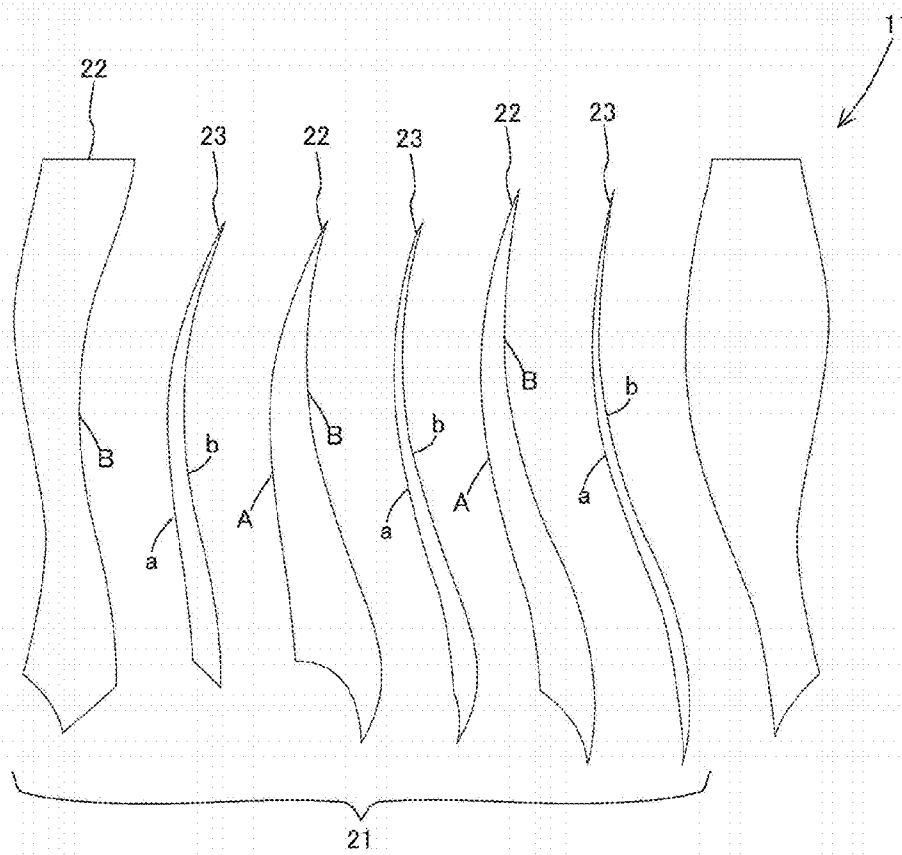
[FIG. 4]



[FIG. 5]

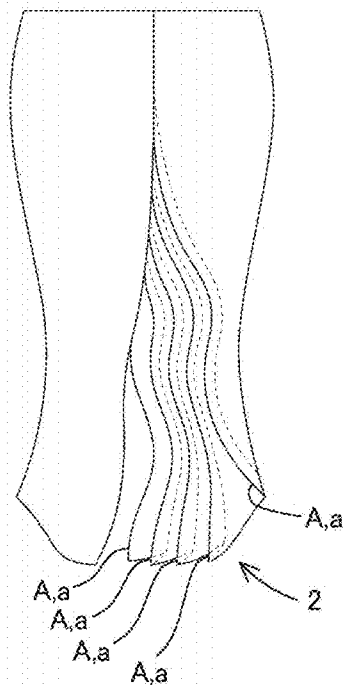


[FIG. 6]

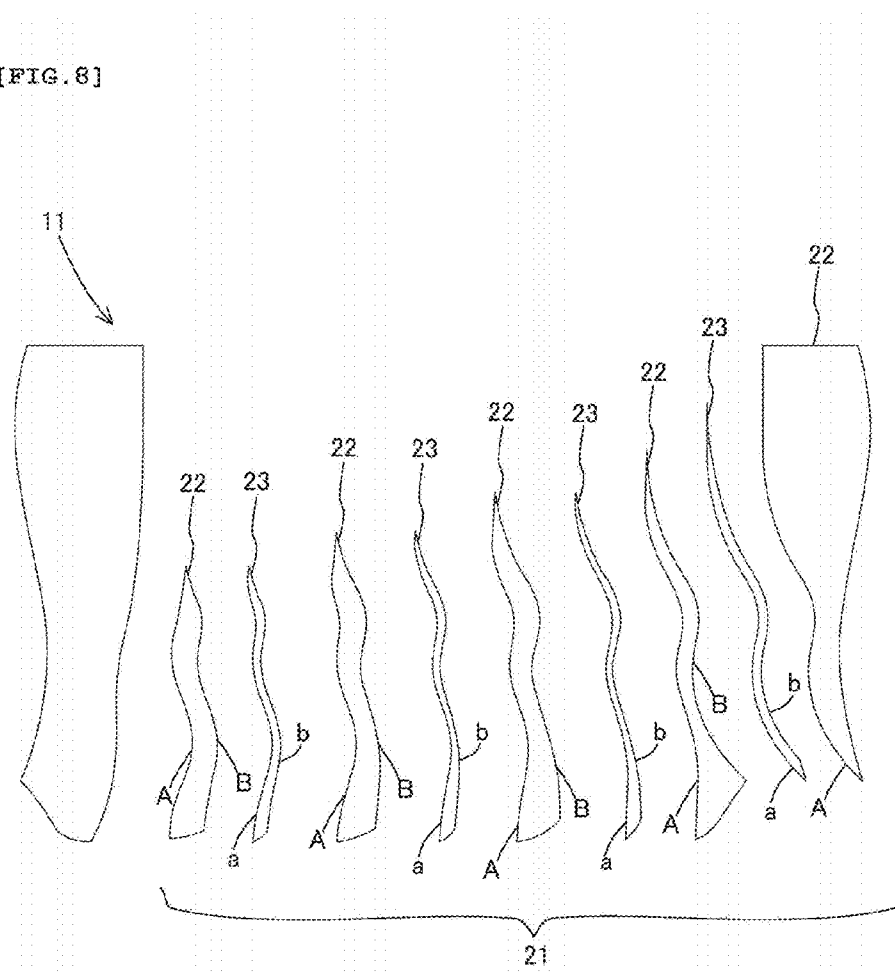


[FIG. 7]

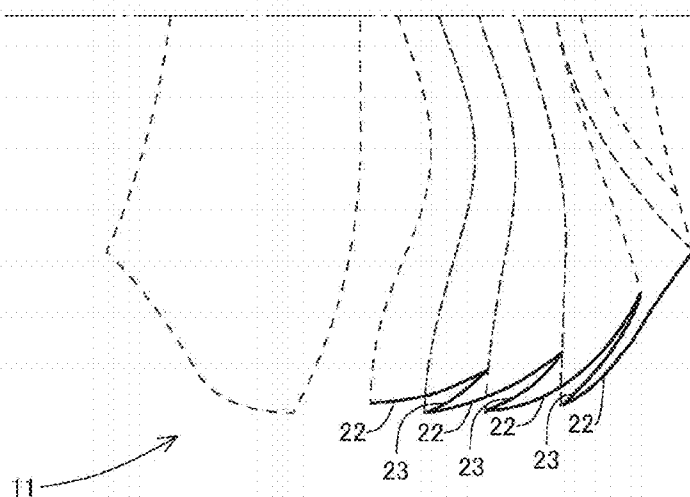
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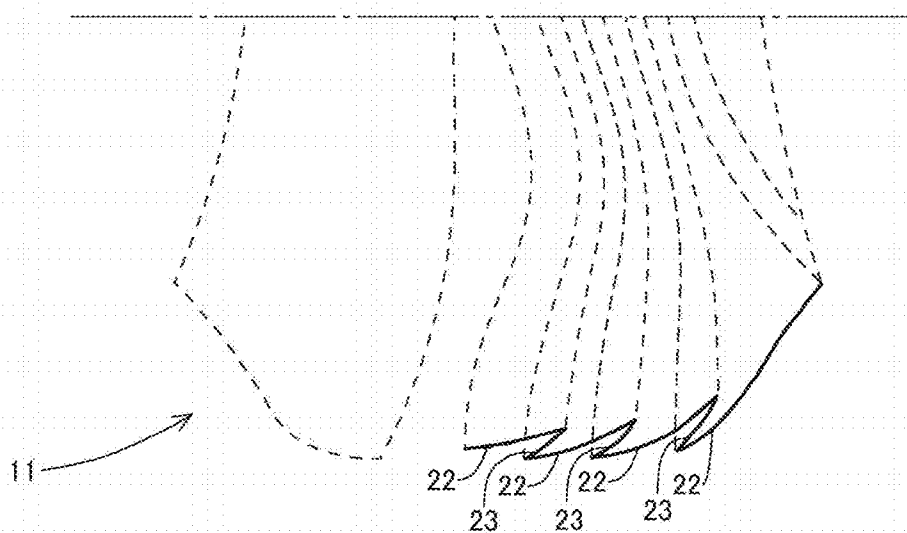
[FIG. 8]



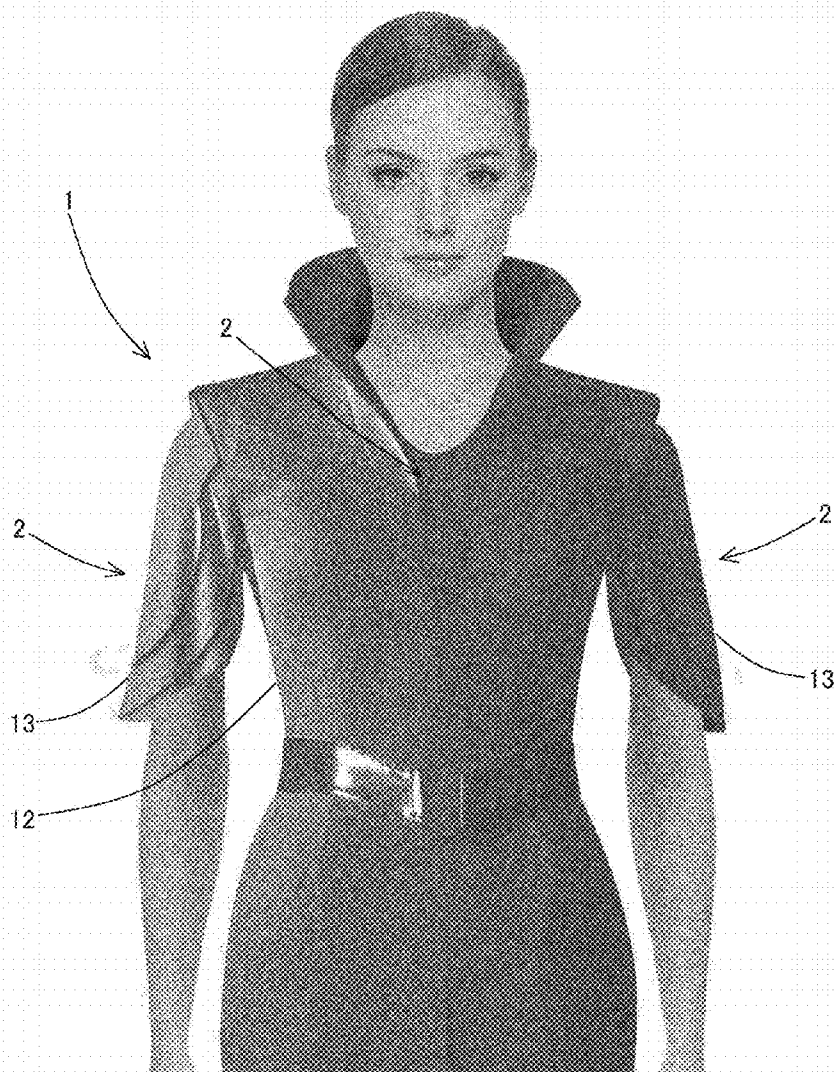
[FIG. 9]



[FIG. 10]



[FIG. 11]



CURVED PLEATED PRODUCT AND METHOD FOR MANUFACTURING CURVED PLEATED PRODUCT

TECHNICAL FIELD

[0001] The present invention relates to a curved pleated product having a curved pleat and a method for manufacturing the curved pleated product.

BACKGROUND ART

[0002] There are garments such as a skirt, a one-piece dress, a blouse, and slacks or fabric products such as curtains known in the art that have a gather called a pleat. The pleat is one of popular decoration because of its beautiful impression due to the shade or its wearing comfort due to the looseness in size.

[0003] Methods for forming a pleat in a product such as a garment that have been proposed so far include those of folding a cloth fabric like paper folding to form a wrinkle and sewing a folded over fabric.

[0004] For example, Japanese Patent No. 2504931 proposes a processing method for forming a pleat in which a semi-finished product after sewing is subjected to a pleating machine to be machine-pleated, the semi-finished product is then wrapped by a soft sheet having excellent breathability and heat-resistance, the soft sheet is twisted and bound up with string, and the semi-finished product is put into heat treatment equipment (Patent Literature 1). This processing method enables a variety of designs and easily provides high value added pleated products.

CITATION LIST

Patent Literature

[0005] Patent Literature 1: Japanese Patent No. 2504931

SUMMARY OF INVENTION

Technical Problem

[0006] Most pleats applied to conventional pleated products have linearly formed gathers and lack variation. On the other hand, a wrinkled pleat called a twist pleat can be formed by using the invention described in Patent Literature 1. The twist pleat, however, is formed by wrapping a semi-finished product that is machine-pleated or hand-pleated with a soft sheet, twisting the soft sheet, bound it up with string, and heat-treating the semi-finished product, so that the method provides the entire pleated product with wrinkled and disordered pleat. Such a pleat undesirably impairs a sense of luxury of the product, and also, is not an orderly pleat with neatness, elegance, nor gracefulness. In particular, the invention of Patent Literature 1 cannot manufacture, for example, a loosely waving curved pleat nor a tidily-aligned curved pleat.

[0007] In addition, the conventional pleated products are each formed from a single fabric, and thus, cannot have gathers each of which differs from the other in color, pattern, nor material. Accordingly, the conventional pleated products can only give a beautiful impression due to the shade, and are undesirably limited to monotonous designs.

[0008] The present invention has been made to solve such problems, and aims to provide a curved pleated product that has dramatically improved flexibility of pleat design and thus can be rolled out in a wide variety of variations and that can

have new value, like clothing provided with a pleat that gives a graceful or sensual impression, and also aims to provide a method for manufacturing the curved pleated product.

Solution to Problem

[0009] A curved pleated product according to the present invention has a curved pleat including a plurality of fabric pieces with longitudinally curved opposite side edge portions, the fabric pieces including a plurality of outer pleat pieces and a plurality of inner pleat pieces formed narrower than the outer pleat pieces, the curved pleat being formed by alternately arranging the outer pleat pieces and the inner pleat pieces, joining each adjacent fabric pieces along contours of opposing side edge portions, and alternately forming a mountain fold and a valley fold along the contours.

[0010] In an aspect of the present invention, the fabric pieces may include different colors, different patterns, different materials, or combinations thereof.

[0011] A method for manufacturing a curved pleated product according to the present invention includes cutting a plurality of outer pleat pieces and a plurality of inner pleat pieces out of a desired fabric, the outer pleat pieces each having longitudinally curved opposite side edge portions, the inner pleat pieces each having side edge portions that conform with the shapes of the side edge portions of the outer pleat pieces and being formed narrower than the outer pleat pieces, forming a curved pleat by alternately arranging the outer pleat pieces and the inner pleat pieces, joining each opposing side edge portions along contours of the opposing side edge portions, and alternately forming a mountain fold and a valley fold along the contour of each side edge portion, and attaching the curved pleat to a desired position of the product to manufacture the curved pleated product.

Advantageous Effects of Invention

[0012] The present invention dramatically enhances flexibility of pleat design to allow the pleat to be rolled out in a wide variety of variations, and can add new value to a pleated product, such as clothing provided with a pleat that gives a graceful or sensual impression.

BRIEF DESCRIPTION OF DRAWINGS

[0013] FIG. 1 is a computer graphic image showing a front view of a curved pleated garment, which is an embodiment of a curved pleated product according to the present invention.

[0014] FIG. 2 is a computer graphic image showing the back of the curved pleated garment of the embodiment.

[0015] FIG. 3 is a front view of a skirt section of the curved pleated garment of the embodiment.

[0016] FIG. 4 shows fabric pieces constituting curved pleat in FIG. 3.

[0017] FIG. 5 is a rear view of the skirt section of the curved pleated garment of the embodiment.

[0018] FIG. 6 shows fabric pieces constituting curved pleat in FIG. 5.

[0019] FIG. 7 is a front view of a skirt section of another embodiment of the curved pleated garment.

[0020] FIG. 8 shows fabric pieces constituting curved pleat in FIG. 7.

[0021] FIG. 9 is a partially enlarged front view of the skirt section of the embodiment where a lower edge is shown by a solid line and the other edges are shown by dashed lines.

[0022] FIG. 10 is a partially enlarged front view of the skirt section of the embodiment shown in FIG. 7 where a lower edge is shown by a solid line and the other edges are shown by dashed lines.

[0023] FIG. 11 is a computer graphic image showing the upper half of the curved pleated garment of the embodiment.

DESCRIPTION OF EMBODIMENTS

[0024] Hereinafter, an embodiment of an invention according to the present invention will be described using the drawings.

[0025] A curved pleated product 1 has a curved pleat structure, and is a garment such as a skirt, a one-piece dress, a blouse, a party dress, or slacks or a product such as curtains that is decorated with a curved pleat 2.

[0026] In the embodiment, a curved pleated garment 1 will be taken as an example curved pleated product 1, as shown in FIGS. 1 and 2. The curved pleated garment 1 is provided with curved pleats 2 at a front of a skirt section 11, and also, at a back of the skirt section 11, a chest section 12, and right and left sleeve sections 13. The configuration of the curved pleat 2 will be described mainly based on the curved pleat 2 provided at the front of the skirt section 11.

[0027] As shown in FIGS. 3 and 4, the curved pleat 2 in the embodiment is formed by joining a plurality of fabric pieces 21 each having longitudinally curved opposite side edge portions, at the right and left opposite side edge portions along the contours of the opposite side edge portions and then folding the fabric along the contours of the joined side edge portions, alternating between mountain folds and valley folds. That is, unlike a method for forming a pleat by making a fold like a wrinkle on a cloth fabric or by sewing a folded over cloth fabric, surfaces constituting the gathers of the curved pleat 2 are formed from fabric pieces 21 each cut into a different shape. These fabric pieces 21 are joined together by sewing, crimping using an adhesive, or other ways, thereby forming the curved pleat 2.

[0028] The fabric pieces 21 of the curved pleat 2 are made of a cloth fabric of cotton, silk, or other material, which can be used for garments, curtains, or other products, or made of a leather fabric including natural leather or synthetic leather, for example. The fabric is cut into a predetermined shape using a pattern, or the like, to have the opposite side edge portions formed in longitudinal curves, as shown in FIG. 4. The fabric pieces 21 of the embodiment include outer pleat pieces 22 that appear on the outer side of the curved pleat 2 and inner pleat pieces 23 that stay on the inner side of the curved pleat 2. The curved pleat 2 is formed by alternately arranging the outer pleat pieces 22 and the inner pleat pieces 23, and joining each opposing side edge portions, which are formed in the same contour.

[0029] The outer pleat pieces 22 are fabric pieces 21 each having longitudinally curved left side edge portion A and right side edge portion B. The contour of either right or left side edge portion A or B appears on the outer side of the finished garment to give a beautiful impression. In the embodiment, the contour of the left side edge portion A appears on the outer side, as shown in FIGS. 1, 3, and 4.

[0030] Similarly to the outer pleat pieces 22, the inner pleat pieces 23 are fabric pieces 21 each having longitudinally curved left side edge portion a and right side edge portion b that respectively conform with the shapes of the side edge portions A and B of each outer pleat piece 22. In the embodiment, the outer pleat pieces 22 and the inner pleat pieces 23

are formed such that the left side edge portions A of the outer pleat pieces 22 and the left side edge portions a of the inner pleat pieces 23 have the same contour, and also, the right side edge portions B of the outer pleat pieces 22 and the right side edge portions b of the inner pleat pieces 23 have the same contour, as shown in FIG. 4. In the embodiment, the right side edge portion B of the rightmost outer pleat piece 22 continues to the back side of the skirt section 11 and the outer pleat piece 22 forms the side silhouette of the skirt section 11. The left side edge portion A of the leftmost outer pleat piece 22 and the right side edge portion B of the rightmost outer pleat piece 22 may be formed in any shape.

[0031] In the embodiment, the inner pleat pieces 23 are formed to be narrower than the outer pleat pieces 22, as shown in FIG. 4. In this way, the inner pleat pieces 23 stay on the inner side of the finished curved pleat 2, and also, the outer pleat pieces 22 and the inner pleat pieces 23 are arranged such that the contours of the left side edge portions A and the left side edge portions a are aligned laterally parallel to each other, as shown in FIGS. 1 and 3. The inner pleat pieces 23 may be set to any width, and do not have to be narrower than the outer pleat pieces 22 and may be formed to have almost the same width with the outer pleat pieces 22.

[0032] In the embodiment, the curve shape appearing on the outer side of the curved pleat 2 in FIG. 3 is defined by the contours of the left side edge portions A and a of the outer pleat pieces 22 and the inner pleat pieces 23, but the curved shape is not limited to this and may be defined by the contours of the right side edge portions B and b as shown in FIGS. 5 and 6.

[0033] The width of the inner pleat piece 23 is determined to meet the needs of, for example, how high the curved pleat 2 rises or how softly it flutters. For example, wider inner pleat pieces 23 as shown in FIGS. 3 and 4 make deeper the valleys at the valley folds formed by each inner pleat piece 23 and the outer pleat piece 22 behind the inner pleat piece 23 as shown in FIG. 9, thereby allowing the gathers to rise higher. On the other hand, narrower inner pleat pieces 23 as shown in FIGS. 7 and 8 make shallower the valleys as shown in FIG. 10, thereby reducing the height of the rising gathers.

[0034] The fabric pieces 21 may include different colors, different patterns, different materials, or combinations thereof. For example, the color of the inner pleat pieces 23 may be different from that of the outer pleat pieces 22. In that case, the inner pleat pieces 23 are hidden inside when a wearer is standing still, while they appear when the wearer moves, providing an excellent accent in design. Also, a lace fabric may be used for some of the plurality of outer pleat pieces 22, achieving a gorgeous or fascinating design.

[0035] The curved pleat 2 is formed by joining the plurality of fabric pieces 21 described above. Now, a description will be made of a method for manufacturing the curved pleated product, including how the fabric pieces 21 are joined together, taking a garment as an example.

[0036] First, the longitudinally curved outer pleat pieces 22 and inner pleat pieces 23 are cut out of a desired fabric. In the embodiment, as shown in FIG. 4, the plurality of outer pleat pieces 22 and the plurality of inner pleat pieces 23 are cut out of the fabric. The outer pleat pieces 22 are cut out such that they each has longitudinally curved opposite side edge portions A and B. The inner pleat pieces 23 are cut out such that they each has side edge portions a and b that conform with the

shapes of the side edge portions A and B of the corresponding outer pleat pieces 22 and such that they are narrower than the outer pleat pieces 22.

[0037] Next, the outer pleat pieces 22 and the inner pleat pieces 23 having the side edge portions a and b that conform with the side edge portions A and B of the outer pleat pieces 22 are aligned alternately, and each opposing side edge portions are sewed together along their contours. In the embodiment, each right side edge portion B of the outer pleat pieces 22 and the corresponding right side edge portion b of the inner pleat pieces 23 are sewed together along their contours and each left side edge portion A of the outer pleat pieces 22 and the corresponding left side edge portion a of the inner pleat pieces 23 are sewed together along their contours, as shown in FIGS. 3 and 4. Thus, the fabric pieces 21 are tidily joined together along the contours of the opposite side edge portions.

[0038] The side edge portions A, B, a, and b of the fabric pieces 22 and 23 may be stitched together in any ways as long as they will not frayed, and the stitch type is appropriately selected from, running stitch, reverse stitch, overcast stitch, blind stitch, and other stitches. A core such as wire may be inserted along the contours in order to prevent the pleat from losing its curved contour. The fabric pieces 21 may be joined together by crimping using an adhesive, instead by sewing.

[0039] Next, the joined outer pleat pieces 22 and inner pleat pieces 23 are folded along the contours of the sewed side edge portions A, B, a, and b. Here, the joined fabric is folded to alternate between mountain folds and valley folds. Thus, the outer pleat pieces 22 are arranged on the outer side and the inner pleat pieces 23 are arranged on the inner side as shown in FIG. 1, thereby forming the curved pleat 2. In the embodiment, the folded fabric is pressed to put folds at the contours of the side edge portions A, B, a, and b.

[0040] The joined fabric may be folded such that the stitches are hidden on the inner side or appear on the outer side according to the design. The outer pleat pieces 22 and the inner pleat pieces 23 are sewed together and then the joined fabric is folded along the contours in the embodiment, while the fabric may be folded as needed every time an outer pleat piece 22 and an inner pleat piece 23 is sewed together along the contour.

[0041] Finally, the formed curved pleat 2 is sewed on the garment at a desired position to manufacture the curved pleated garment. In this way, the curved pleat 2 can be arranged on a garment freely at a desired position without any design constraints. For example, in the embodiment, a slit is formed at the front center of the skirt section 11, and the curved pleat 2 is sewed to the right of the slit, as shown in FIG. 1. Similarly, the curved pleated product 1 of the embodiment has curved pleats 2 sewed thereto at the back of the skirt section 11, the chest section 12, and the right and left sleeve sections 13, as shown in FIGS. 1 and 2. Thus, the curved pleat 2 can be attached to various portions.

[0042] Now, operation of each configuration in the curved pleated product 1 of the embodiment will be described.

[0043] In the curved pleat 2, the curved contours of the left side edge portions A of the outer pleat pieces 22 appear in a laterally aligned manner, as shown in FIGS. 1 and 3. Thus, the curved pleat 2 can give a beautiful impression due to the pleat design with the beautiful curves that cannot be achieved by conventional techniques, to those who look at the curved pleat 2. Such a curved pleat 2 has high design flexibility, thereby adding various beautiful impressions like a neat impression, a charming impression, or a graceful and sensual impression.

[0044] In addition, the height of the rising each gather of the pleat can be changed by increasing or decreasing the width of the inner pleat pieces 23 as shown in FIGS. 9 and 10. Accordingly, it is possible to adjust how much the pleat flutters or how high it rises to meet the needs. For example, wider inner pleat pieces 23 as shown in FIG. 9 allow the curved pleat 2 to easily flutter softly and slowly, and thus this tends to emphasize the gracefulness and makes the curved pleat 2 elegant. In contrast, narrower inner pleat pieces 23 as shown in FIG. 10 reduce the weight of the inner pleat pieces 23 to make the curved pleat 2 move easily, and thus the inner pleat pieces 23 tend to appear and disappear whenever the wearer moves.

[0045] The curved contours of the left side edge portions A in the outer pleat pieces 22 appearing on the outer side have a role to define the pleat design and the outer pleat pieces 22 may be designed to have any desired contour. As a result, a manufacturer can easily achieve a desired design image.

[0046] Also, while not shown in the figure, the outer pleat pieces 22 and the inner pleat pieces 23 may include different colors, different patterns, different materials, or combinations thereof, thereby improving the aesthetic effect of the curved pleat 2. For example, when a see-through material is used for one of the fabric pieces 21, the effect is that the curved pleat 2 looks as if it was provided with a slit. Alternatively, when a color of the outer pleat pieces 22 is different from that of the inner pleat pieces 23, the three-dimensionality of the curved pleat 2 is emphasized.

[0047] Further, as shown in FIGS. 1, 2, and 11, there are only few limits on the position to provide or the size of the curved pleat 2, which means the curved pleated product 1 itself has high flexibility. For example, the curved pleat 2 may be arranged spirally on a skirt portion of a wedding dress, making the dress gorgeous.

[0048] The above embodiment provides the following effects.

1. The shape, color, pattern, material, and the like of each fabric piece 21 may be selected freely, and thus this dramatically enhances the pleat design flexibility, allowing the curved pleat 2 to be rolled out in a wide variety of variations.
2. The arrangement position of the curved pleat 2 can be selected freely, and thus this makes the curved pleated product 1 highly flexible in kind, shape, and the like, allowing the curved pleated product 1 to be rolled out in a wide variety of variations.
3. The curved pleat 2 can add new value to the curved pleated product 1, including various beautiful impressions like a neat impression, a charming impression, or a graceful and sensual impression, and a sense of luxury.
4. It is possible to appropriately adjust how much each gather of the pleat flutters or how high it rises, by appropriately selecting the width of each fabric piece 21, and accordingly, the curved pleated product 1 can also be provided with functionality such as ease of mobility.

[0049] The curved pleated product according to the present invention and the method for manufacturing the same is not limited to the above embodiment, and can be changed as appropriate.

[0050] For example, the embodiment has been described taking a dress as an example curved pleated garment, while the curved pleated product 1 is not limited to a garment and can be applied to a variety of products, such as curtains. Also, in addition to the cloth fabric or the leather fabric, fabrics of other materials may be employed.

REFERENCE SIGNS LIST

- [0051] 1 Curved pleated product
 - [0052] 2 Curved pleat
 - [0053] 11 Skirt section
 - [0054] 12 Chest section
 - [0055] 13 Sleeve section
 - [0056] 21 Fabric piece
 - [0057] 22 Outer pleat piece
 - [0058] 23 Inner pleat piece
 - [0059] A Left side edge portion of outer pleat piece
 - [0060] B Right side edge portion of outer pleat piece
 - [0061] a Left side edge portion of inner pleat piece
 - [0062] b Right side edge portion of inner pleat piece
1. A curved pleated product having a curved pleat including a plurality of fabric pieces with longitudinally curved opposite side edge portions, the fabric pieces including a plurality of outer pleat pieces and a plurality of inner pleat pieces formed narrower than the outer pleat pieces, the curved pleat being formed by alternately arranging the outer pleat pieces and the inner pleat pieces, joining each adjacent fabric pieces along contours of opposing side edge portions, and alternately forming a mountain fold and a valley fold along the contours.

- 2. The curved pleated product according to claim 1, wherein the fabric pieces include different colors, different patterns, different materials, or combinations thereof.
- 3. A method for manufacturing a curved pleated product comprising:
 - cutting a plurality of outer pleat pieces and a plurality of inner pleat pieces out of a desired fabric, the outer pleat pieces each having longitudinally curved opposite side edge portions, the inner pleat pieces each having side edge portions that conform with the shapes of the side edge portions of the outer pleat pieces and being formed narrower than the outer pleat pieces;
 - forming a curved pleat by alternately arranging the outer pleat pieces and the inner pleat pieces, joining each opposing side edge portions along contours of the opposing side edge portions, and alternately forming a mountain fold and a valley fold along the contour of each side edge portion; and
 - attaching the curved pleat to a desired position of the product to manufacture the curved pleated product.

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