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(72) Inventors:  
• **MIZOBATA, Akira**  
**Ibaraki-shi, Osaka 567-0082 (JP)**  
• **FURUKAWA, Daisuke**  
**Ibaraki-shi, Osaka 567-0082 (JP)**

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(74) Representative: **Hasegawa, Kan**  
**Patentanwaltskanzlei Hasegawa**  
**Untere Hauptstraße 56**  
**85354 Freising (DE)**

(71) Applicant: **Zuiko Corporation**  
**Ibaraki-shi**  
**Osaka 5670082 (JP)**

(54) **GARMENT PRODUCTION METHOD**

(57) Provided is a method of manufacturing a garment that can be efficiently manufactured. A third sheet material and a fourth sheet material transported in a superimposed state are partially joined and cut in predetermined positions to form tubular sleeve members (30). The sleeve members are superimposed with a transported first sheet material (W1) for forming a front member (10). The transported first sheet material and a transported second sheet material (W2) are superimposed so that the sleeve members superimposed with the first sheet material are disposed between the first sheet material and the second sheet material. In a second formation process, the first sheet material and the second sheet material transported in the superimposed state are partially joined in conformity with the shape of the outer edge of a garment (1), and the first sheet material and the second sheet material transported in the superimposed state are partially cut in conformity with the shape of the outer edge of the garment (1). The garment that has been formed by the second formation process is separated from the first sheet material and the second sheet material.

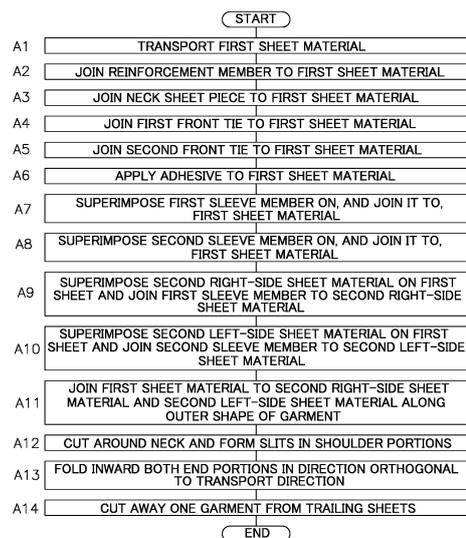


FIG. 10

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**Description****TECHNICAL FIELD**

[0001] The present invention relates to a garment manufacturing method.

**BACKGROUND ART**

[0002] Conventionally, as a method of manufacturing a garment such as a protective apparel cover or a surgical gown, a manufacturing method such as described in Patent Document 1 (Japanese Patent No. 6,762,991) has been known.

**CITATION LIST****Patent Literature**

[0003] Patent Document 1: Japanese Patent No. 6,762,991

**SUMMARY OF INVENTION****Technical Problem**

[0004] The garment disclosed in Patent Document 1 (Japanese Patent No. 6,762,991) is manufactured by curvilinearly sewing plural members such as a front panel, two rear panels, a collar, sleeves, and cuffs. For that reason, the method of manufacturing the garment disclosed in Patent Document 1 (Japanese Patent No. 6,762,991) is complicated and unsuitable for mass production.

[0005] It is an object of the present invention to provide a method of manufacturing a garment whose manufacturing method is relatively simple and which can be efficiently manufactured.

**Solution to Problem**

[0006] A method of manufacturing a garment of the present invention includes a first transport process, a second transport process, a first formation process, a first superimposition process, a second superimposition process, a second formation process, and a separation process. In the first transport process, a first sheet material for forming a first member that is one of a front body and a back body is transported. In the second transport process, a second sheet material for forming a second member that is the other of the front body and the back body is transported. In the first formation process, tubular sleeve members are formed by superimposing a transported third sheet material and a transported fourth sheet material, partially joining the third sheet material and the fourth sheet material transported in the superimposed state, and cutting them in predetermined positions. In the first superimposition process, the transported first sheet

material and the sleeve members are superimposed. In the second superimposition process, the transported first sheet material and the transported second sheet material are superimposed so that the sleeve members superimposed with the first sheet material are disposed between the first sheet material and the second sheet material. In the second formation process, the first sheet material and the second sheet material transported in the superimposed state are partially joined in conformity with the shape of the outer edge of the garment. Furthermore, in the second formation process, the first sheet material and the second sheet material transported in the superimposed state are partially cut in conformity with the shape of the outer edge of the garment. In the separation process, the garment that has been formed by the second formation process is separated from the first sheet material and the second sheet material.

**Advantageous Effects of Invention**

[0007] In the method of manufacturing the garment pertaining to the present invention, the garment can be manufactured by a relatively simple process, and the garment can be efficiently manufactured.

[0008] Furthermore, in the method of manufacturing the garment pertaining to the present invention, the sleeve members are disposed between the first sheet material for forming the first member and the second sheet material for forming the second member, so the sleeve members and the part that becomes the outer surface (front surface) of the front body can be covered by the back body. For that reason, in the method of manufacturing the garment pertaining to the present invention, a hygienically excellent garment, capable of reducing the occurrence of a situation where the sleeve members and the outer surface of the front body of the manufactured garment are touched by a person's hands for example and become contaminated, can be manufactured.

**BRIEF DESCRIPTION OF DRAWINGS****[0009]**

FIG. 1 is a schematic view, seen from the front, of a garment manufactured by the garment manufacturing method of the present invention in a state when the garment has been donned.

FIG. 2 is a schematic view, seen from the back, of the garment manufactured by the garment manufacturing method of the present invention in a state when the garment has been donned.

FIG. 3 is a schematic view of the garment manufactured by the garment manufacturing method of the present invention in a state before the garment is donned, seen from the side that is made to face outward (the side that does not oppose the person) when the wearer dons the garment.

FIG. 4 schematically depicts an example of proces-

sing performed on a first sheet material in the garment manufacturing method of the present invention.

FIG. 5 is a continuation of FIG. 4 and schematically depicts an example of processing performed on the first sheet material and on sleeve members and a second sheet material that merge with the first sheet material in the garment manufacturing method of the present invention.

FIG. 6 schematically depicts an example of processing to form the sleeve members from a third sheet material and a fourth sheet material in the garment manufacturing method of the present invention.

FIG. 7 schematic depicts an example of processing performed on the second sheet material in the garment manufacturing method of the present invention.

FIG. 8 is a drawing for describing an example of positions at which the first sheet material and the second sheet material are cut in a second formation process of the garment manufacturing method of the present invention.

FIG. 9 is a drawing for describing another example of positions at which the first sheet material and the second sheet material are cut in the second formation process of the method of manufacturing the garment of the present invention.

FIG. 10 is a flowchart schematically showing an example of a flow of the processing performed on the first sheet material and on the sleeve members and the second sheet material that merge with the first sheet material in FIG. 4 and FIG. 5.

FIG. 11 is a flowchart schematically showing an example of a flow of the processing to form the sleeve members from the third sheet material and the fourth sheet material in FIG. 6.

FIG. 12 is a flowchart schematically showing an example of a flow of the processing performed on the second sheet material in FIG. 7.

FIG. 13 is a drawing schematically depicting some of the main parts of a garment manufacturing system, and mainly depicts devices that perform processing on the first sheet material and devices that form the sleeve members.

FIG. 14 is a drawing schematically depicting some of the main parts of the garment manufacturing system, and mainly depicts devices that perform processing on the second sheet material.

FIG. 15 is a drawing schematically depicting some of the main parts of the garment manufacturing system, and mainly depicts devices that cause the second sheet material to merge with the first sheet material and the sleeve members to form the garment.

FIG. 16 is a schematic view of the garment pertaining to another example manufactured by the garment manufacturing method of the present invention in a state before the garment is donned, seen from the side that is made to face outward (the side that does

not oppose the person) when the wearer dons the garment.

FIG. 17 is a schematic view of a sleeve member formed by joining the third sheet material and the fourth sheet material and then cutting the joints in central parts thereof.

FIG. 18 schematically depicts an example of processing to form the sleeve members from the third sheet material and the fourth sheet material in the garment manufacturing method of example modification J.

## DESCRIPTION OF EMBODIMENTS

**[0010]** An embodiment of the garment manufacturing method pertaining to the present invention will be described below with reference to the drawings.

**[0011]** It will be noted that the embodiment described below is merely an example of the present invention and is not intended to limit the scope of the present invention. It will be understood by persons skilled in the art that many changes may be made to the following embodiment without departing from the spirit and scope of the present invention as set forth in the claims.

(1) Garment

(1-1) Overview

**[0012]** A garment 1 manufactured using the garment manufacturing method pertaining to the present invention will now be described with reference to FIG. 1 to FIG. 3. FIG. 1 is a schematic view, seen from the front, of the garment 1 in a state when the garment 1 has been donned by a wearer. FIG. 2 is a schematic view, seen from the back, of the garment 1 in a state when the garment 1 has been donned by the wearer. FIG. 3 is a schematic view of the garment 1 in a state before the garment 1 is donned, seen from the side that is made to face outward (the side that does not oppose the person) when the wearer dons the garment. In FIG. 3, depiction of members not directly visible except for a left rear member 20L and sleeve members 30 is omitted from the standpoint of drawing legibility.

**[0013]** It will be noted that FIG. 1 and FIG. 2 depict a state in which later-described ties for bringing the garment 1 into close contact with the body are not tied. Furthermore, FIG. 3 depicts a state in which not the garment at the point in time when a later-described garment manufacturing system 100 has finished manufacturing the garment 1 but the garment 1 that had been folded by the garment manufacturing system 100 to make the garment 1 compact has been unfolded in order to don the garment 1.

**[0014]** When describing hereinafter the garment 1 and members configuring the garment 1, terms such as "upper", "lower", "front (front side)", "rear (back side)", "right", and "left" may be used to indicate directions and orientations. Unless other specified, these expressions

mean "upper", "lower", "front", "rear", "right", and "left" in a state in which the garment 1 has been donned. Specifically, upper side of the garment 1 means the side corresponding to the head of the wearer in a state in which the garment 1 has been normally donned, front side of the garment 1 means the side corresponding to the chest (front side) of the wearer in a state in which the garment 1 has been normally donned, and right side of the garment 1 means the side corresponding to the right arm of the wearer in a state in which the garment 1 has been normally donned. The same also applies to other expressions.

**[0015]** Furthermore, when describing hereinafter the garment 1 or members configuring the garment 1, terms such as "outer surface" and "inner surface" may be used, and unless otherwise specified, these expressions mean "outer surface" and "inner surface" in a state in which the garment 1 has been donned. Specifically, inner surface means the surface on the side opposing the wearer in a state in which the garment 1 has been normally donned, and outer surface means the surface on the side not opposing the wearer in a state in which the garment 1 has been normally donned.

**[0016]** The garment 1 manufactured by the manufacturing method of the present invention can be utilized for example as a surgical gown or a protective cover used during work, though this is not intended to limit its applications. The garment 1 is for example a disposable garment that is discarded after use, though this is not intended to limit the number of times it is used. The garment 1 covers the upper half of the wearer's body and also the lower half of the wearer's body from the waist area to the vicinity of the ankles.

**[0017]** The garment 1 includes as main members a front member 10 (front body) that is an example of a first member, a rear member 20 (back body) that is an example of a second member, a first sleeve member 30R (right sleeve), and a second sleeve member 30L (left sleeve). It will be noted that the difference between the first sleeve member 30R and the second sleeve member 30L is which side they are disposed on relative to the members 10, 20 (which of the wearer's arms is inserted into them), and their shape and structure are the same. Hereinafter, when there is no particular need to distinguish between the first sleeve member 30R and the second sleeve member 30L, they may be called by the single name of sleeve members 30 without calling them by their separate names of first sleeve member 30R and second sleeve member 30L.

**[0018]** The first member 10, the rear member 20, and the sleeve members 30 configure the garment 1 as a result of the front member 10 and the sleeve members 30 being joined in predetermined places, the rear member 20 and the sleeve member 30 being joined in predetermined places, and the front member 10 and the rear member 20 being joined in predetermined places. The joining of the front member 10 and the sleeve members 30, the joining of the rear member 20 and the sleeve

members 30, and the joining of the front member 10 and the rear member 20 will be described later.

**[0019]** The material of the front member 10 and the rear member 20 is for example a film comprising a thermoplastic resin or a nonwoven fabric, though this is not intended to be limiting. For example, the material of the front member 10 and the rear member 20 may be a polyolefin resin such as polyethylene or polypropylene, polyethylene terephthalate, or nylon. Using such a raw material allows the front member 10 and the rear member 20 to be heat-welded. It will be noted that the front member 10 and the rear member 20 do not need to be manufactured using a single type of raw material and may be manufactured using a raw material comprising plural materials in which plural raw materials are laminated.

**[0020]** Furthermore, another member may be partially adhered to the front member 10 and the rear member 20 for the purpose of reinforcement and/or improving wearer comfort. Though this is not intended to be limiting, in the present embodiment, a reinforcement member 12 of a raw material different from that of the front member 10 is adhered to the inner surface of the front member 10 (see FIG. 1). The reinforcement member 12 is disposed in a region from the chest area to near a bottom 18 of the front member 10 across roughly the entire front member 10 in the left-right direction. Furthermore, a neck member 15a (nonwoven fabric) is adhered to the inner surface of the front member 10 around a neckline 14 on the front side of the garment 1 as in FIG. 1. Furthermore, in the present embodiment, a neck member 25a (nonwoven fabric) is adhered to the inner surface of the rear member 20 around a neckline 24 on the rear side of the garment 1 as in FIG. 1.

**[0021]** The front member 10, the rear member 20, and the sleeve members 30 will now be described in greater detail.

#### (1-2) Details of Each Member

##### (1-2-1) Front Member

**[0022]** The front member 10 is, as in FIG. 1, a substantially rectangular sheet-like member. However, in the upper portion of the front member 10, a substantially C-shaped neckline 14 is formed so as to be recessed downward for the wearer's head to pass through. It will be noted that the shape of the neckline 14 is optional; for example, the shape of the neckline 14 may be substantially V-shaped. Furthermore, shoulder parts 16 of the front member 10 that cover the wearer's shoulders include sloping portions 16a that extend obliquely downward from the neckline 14 side toward the sleeve member 30 sides as in FIG. 1 so as to fit the wearer's body. Furthermore, the shoulder parts 16 of the front member 10 include, as in FIG. 1, horizontal portions 16b that extend between the neckline 14 and the sloping portions 16a. Because the shoulder parts 16 have such a configuration, end portions 16c on the sleeve member 30 sides

of the shoulder parts 16 are disposed closer to the bottom of the garment 1 (the bottom 18 of the front member 10) than are end portions 16d on the neckline 14 sides of the shoulder parts 16.

**[0023]** A first front tie 11a and a second front tie 11b are attached as accessories to the outer surface of the front member 10 near the waist. In FIG. 1, the first front tie 11a and the second front tie 11b are depicted in front of the front member 10, but when the wearer has actually donned the garment 1 the first front tie 11a and the second front tie 11b are fastened on the back side of the wearer. By fastening the first front tie 11a and the second front tie 11b on the back side of the wearer, the garment 1 can be brought into close contact with the wearer's body in the vicinity of the wearer's waist.

#### (1-2-2) Rear Member

**[0024]** The rear member 20 includes a right rear member 20R and a left rear member 20L. The right rear member 20R and the left rear member 20L are each substantially rectangular sheet-like members. In the garment 1, the right rear member 20R and the left rear member 20L are disposed so as to overlap each other. Specifically, in the garment 1, the part of the right rear member 20R near the left end thereof is disposed so as to lie on top of the part of the left rear member 20L near the right end thereof. In FIG. 2, the part of the right rear member 20R near the left end thereof is disposed in back of the part of the left rear member 20L near the right end thereof, but the shape of the garment 1 is not limited to this kind of shape and may be modified in design so that the part of the left rear member 20L near the right end thereof is disposed in back of the part of the right rear member 20R near the left end thereof.

**[0025]** Hereinafter, rather than describing the shapes of each of the right rear member 20R and the left rear member 20L, the right rear member 20R and the left rear member 20L will be regarded as an integrated rear member 20 and its shape will be described.

**[0026]** The rear member 20 has the same outer shape as that of the front member 10. The rear member 20 is, as in FIG. 2, a substantially rectangular sheet-like member. However, in the upper portion of the rear member 20, a substantially C-shaped neckline 24 is formed so as to be recessed downward for the wearer's head to pass through. It will be noted that the shape of the neckline 24 is optional; for example, the shape of the neckline 24 may be substantially V-shaped. Furthermore, shoulder parts 26 of the rear member 20 that cover the wearer's shoulders include sloping portions 26a that extend obliquely downward from the neckline 24 side toward the sleeve member 30 sides as in FIG. 2 so as to fit the wearer's body. Furthermore, the shoulder parts 26 of the rear member 20 include, as in FIG. 2, horizontal portions 26b that extend between the neckline 24 and the sloping portions 26a. Because the shoulder parts 26 have such a configuration, end portions 26c on the sleeve member 30

sides of the shoulder parts 26 are disposed closer to the bottom of the garment 1 (a bottom 28 of the rear member 20) than are end portions 26d on the neckline 24 sides of the shoulder parts 26.

**[0027]** The front member 10 and the rear member 20 are joined at the following parts and integrated. The shoulder parts 26 of the rear member 20 are joined to the shoulder parts 16 of the front member 10. Furthermore, the right and left outer edges of the rear member 20 and the front member 10 are entirely joined to each other from the parts (underarm parts) where the front member 10 and the rear member 20 are joined to the lower end portions of the sleeve members 30 to the bottoms 18, 28 of the front member 10 and the rear member 20.

**[0028]** It will be noted that the neckline 24 of the rear member 20 and the neckline 14 of the front member 10 are not joined to each other because the wearer needs to put his/her head through them. Furthermore, the bottom 28 of the rear member 20 and the bottom 18 of the front member 10 are not joined to each other because the wearer needs to put his/her feet through them.

**[0029]** A first neck tie 22a and a second neck tie 22b are attached as accessories to the outer surface of the rear member 20 near the neckline 24. The first neck tie 22a is attached to the left rear member 20L, and the second neck tie 22b is attached to the right rear member 20R. When the wearer has donned the garment 1, the first neck tie 22a and the second neck tie 22b are fastened on the back side of the wearer. By fastening the first neck tie 22a and the second neck tie 22b on the back side of the wearer, the garment 1 can be brought into close contact with the wearer's body around the wearer's neck.

**[0030]** Furthermore, a waist outer tie 21a and a waist inner tie 21b are attached as accessories to the rear member 20 near the waist. The waist outer tie 21a is attached to the outer surface of the left rear member 20L. The waist inner tie 21b is attached to the inner surface of the right rear member 20R. When the wearer has actually donned the garment 1, the waist outer tie 21a and the waist inner tie 21b are fastened on the back side of the wearer. By fastening the waist outer tie 21a and the waist inner tie 21b on the back side of the wearer, the right rear member 20R and the left rear member 20L can be inhibited from becoming separated from each other.

**[0031]** Furthermore, a hook-and-loop fastener 22c (a hook portion) is provided as an accessory on the inner surface of the right rear member 20R that opposes the outer surface of the left rear member 20L. When the wearer has actually donned the garment 1, the hook-and-loop fastener 22c sticks to fibers (a loop portion) on the outer surface of the left rear member 20L and is used to bring the garment 1 into close contact with the wearer's body around the wearer's neck.

#### (1-2-3) Sleeve Members

**[0032]** The sleeve members 30 are parts through which the wearer of the garment 1 passes his/her arms.

**[0033]** The sleeve members 30 are cylindrical members. One end side of each sleeve member 30 is provided with a cuff 32 through which the wearer of the garment 1 puts his/her hands. The other end side of each sleeve member 30 is provided with an armhole 34 through which the wearer of the garment 1 inserts his/her arms.

**[0034]** The sleeve members 30 are joined to the front member 10 and the rear member 20 at the end portions thereof on the armhole 34 sides. Specifically, the outer edge of the end portion of the front surface of the first sleeve member 30R on the armhole 34 side is joined, along the entire length thereof in the up-down direction, to the right-side outer edge of the outer surface of the front member 10. Furthermore, the outer edge of the end portion of the rear surface of the first sleeve member 30R on the armhole 34 side is joined, along the entire length thereof in the up-down direction, to the right-side outer edge of the outer surface of the rear member 20 (the right rear member 20R). Furthermore, the outer edge of the end portion of the front surface of the second sleeve member 30L on the armhole 34 side is joined, along the entire length thereof in the up-down direction, to the left-side outer edge of the outer surface of the front member 10. Furthermore, the outer edge of the end portion of the rear surface of the second sleeve member 30L on the armhole 34 side is joined, along the entire length thereof in the up-down direction, to the left-side outer edge of the outer surface of the rear member 20 (the left rear member 20L).

**[0035]** In the sleeve members 30 of the present embodiment, the dimension of the openings of the cuffs 32 is formed smaller than the dimension of the openings of the armholes 34 of the sleeve members 30. By forming the cuffs 32 of the sleeve members 30 small (by reducing the dimension of the openings of the cuffs 32), it is unlikely that an excessive amount of the cuffs 32 of the sleeve members 30 will interfere with work. At the same time, by relatively increasing the dimension of the opening of the armholes 34 of the sleeve members 30, it is easy for the wearer of the garment 1 to freely move his/her arms.

**[0036]** It will be noted that elastic materials E are disposed in (attached to) the cuffs 32 of the sleeve members 30. The elastic materials E are, for example, sheet-like members with a high elasticity or rubber threads. The cuffs 32 are tightened by the elastic materials E in the cuffs 32 of the sleeve members 30, whereby the cuffs 32 are less likely to interfere with work and foreign matter is less likely to get inside the garment 1 through the cuffs 32.

### (1-3) Method of Donning Garment

**[0037]** The method of donning the garment 1 will now be described.

**[0038]** First, before describing the method of donning the garment 1, the shape of the garment 1 before being donned by the wearer will be described. It will be noted that the garment manufacturing system 100 that manufactures the garment 1 manufactures the garment 1 in a

folded state as described later to make the manufactured garment 1 compact. However, here, it is not the shape of the garment 1 in the folded state but the shape of the garment 1 after the garment 1 in the folded state manufactured by the garment manufacturing system 100 has been unfolded that is called the shape of the garment 1 before being donned by the wearer.

**[0039]** After the garment 1 has been donned, the outer surface of the front member 10 becomes disposed in front of the wearer and the outer surface of the rear member 20 becomes disposed in back of the wearer. Furthermore, after the garment 1 has been donned, the inner surface of the front member 10 opposes the front of the wearer and the inner surface of the rear member 20 opposes the back of the wearer.

**[0040]** By contrast, in the garment 1 before being donned by the wearer, the inner surface of the front member 10 (the surface that opposes the wearer after donning the garment 1) is disposed on the outside and the inner surface of the rear member 20 (the surface that opposes the wearer after donning the garment 1) is disposed on the outside. In other words, in the garment 1 before being donned by the wearer, the outer surface of the front member 10 (the surface that does not oppose the wearer after donning the garment 1) is disposed on the inside and the outer surface of the rear member 20 (the surface that does not oppose the wearer after donning the garment 1) is disposed on the inside. In short, in the garment 1 before being donned by the wearer, the surfaces that become disposed on the outside after the wearer dons the garment 1 are not exposed to the outside. Additionally, in the garment 1 before being donned by the wearer, the sleeve members 30 are disposed between the outer surface of the front member 10 and the outer surface of the rear member 20. It will be noted that the armholes 34 of the sleeve members 30 disposed between the front member 10 and the rear member 20 are open at the side surfaces of the garment 1. In other words, in the garment 1 before being donned by the wearer, the wearer is able to insert his/her arms into the armholes 34 of the sleeve members 30.

**[0041]** When the wearer dons the garment 1, the wearer brings the inner surface (the surface that opposes the wearer after donning the garment 1) of the front member 10 of the garment 1 having a shape such as in FIG. 3 into opposition with the front of the wearer. Then, the wearer inserts his/her right arm through the armhole 34 of the first sleeve member 30R and pushes his/her right wrist through the cuff 32 of the first sleeve member 30R. Furthermore, the wearer inserts his/her left arm through the armhole 34 of the second sleeve member 30L and pushes his/her left wrist through the cuff 32 of the second sleeve member 30L.

**[0042]** In this state, for example, an assistant assisting the wearer in donning the garment 1 covers the back of the wearer with the right rear member 20R and the left rear member 20L so that the inner surface of the rear member 20 (the inner surface of the right rear member

20R and the inner surface of the left rear member 20L) that had been disposed in front of the wearer opposes the back of the wearer. Then, the assistant sticks the hook-and-loop fastener 22c provided on the inner surface of the right rear member 20R to the fibers (loops) on the outer surface of the left rear member 20L. Moreover, the assistant fastens the first neck tie 22a and the second neck tie 22b on the back side of the wearer and fastens the waist outer tie 21a and the waist inner tie 21b on the back side of the wearer. Next, the assistant or the wearer fastens the first front tie 11a and the second front tie 11b on the back side of the wearer. In the manner described above, the wearer can don the garment 1.

## (2) Garment Manufacturing Method and Manufacturing System

**[0043]** An embodiment of the method of manufacturing the garment 1 of the present invention and an example of the garment manufacturing system 100 that manufactures the garment 1 using this manufacturing method will now be described with reference to FIG. 4 to FIG. 15.

**[0044]** FIG. 4 schematically depicts an example of processing performed on a first sheet material W1. FIG. 5 is a continuation of FIG. 4 and schematically depicts an example of processing performed on the first sheet material W1 and on the sleeve members 30 and a second sheet material W2 that merge with the first sheet material W1. FIG. 6 schematically depicts an example of processing to form the sleeve members 30 from a third sheet material W3 and a fourth sheet material W4. FIG. 7 schematic depicts an example of processing performed on the second sheet material W2.

**[0045]** It will be noted that in FIG. 4, FIG. 5, and FIG. 7 the dash-dotted lines representing the necklines and shoulder parts of the garment and the dash-dotted lines representing boundaries of regions of the sheet materials used to manufacture one garment 1 (dash-dotted lines depicted in a position corresponding to the bottom of the garment 1) are depicted from the standpoint of facilitating understanding, and it is not the case that perforations or the like are physically provided. Furthermore, the long dashed double-short dashed lines depicted on the sheet materials transported in FIG. 6 indicate that joining of the third sheet material and the fourth sheet material and cutting of the third sheet material and the fourth sheet material are performed in those positions in processes thereafter, and it is not the case that perforations or the like are physically provided. Furthermore, in FIG. 4 and FIG. 7 members not directly visible are indicated by dashed lines, while in FIG. 5 illustration of members not directly visible is omitted to keep the drawings from becoming complicated.

**[0046]** FIG. 8 is a drawing for describing an example of positions at which the first sheet material W1 and the second sheet material W2 are cut in a second formation process of the method of manufacturing the garment 1. FIG. 9 is a drawing for describing another example of

positions at which the first sheet material W1 and the second sheet material W2 transported in a superimposed state are cut in the second formation process of the method of manufacturing the garment 1.

**[0047]** FIG. 10 corresponds to FIG. 4 and FIG. 5 and is a flowchart schematically showing an example of a flow of the processing performed on the first sheet material W1 and on the sleeve members 30 and the second sheet material W2 that merge with the first sheet material W1. FIG. 11 corresponds to FIG. 6 and is a flowchart schematically showing an example of a flow of the processing to form the sleeve members 30 from the third sheet material W3 and the fourth sheet material W4. FIG. 12 corresponds to FIG. 7 and is a flowchart schematically showing an example of a flow of the processing performed on the second sheet material W2.

**[0048]** FIG. 13 is a drawing schematically depicting some of the main parts of the garment manufacturing system 100, and mainly depicts devices that perform processing on the first sheet material W1 and devices that form the sleeve members 30. FIG. 14 is a drawing schematically depicting some of the main parts of the garment manufacturing system 100, and mainly depicts devices that perform processing on the second sheet material W2. FIG. 15 is a drawing schematically depicting some of the main parts of the garment manufacturing system 100, and mainly depicts devices that cause the second sheet material W2 to merge with the first sheet material W1 and the sleeve members 30 to form the garment 1.

## (2-1) Materials used to Manufacture Front Member and Rear Member

**[0049]** In the manufacture of the garment 1, a first sheet material W1 for manufacturing the front member 10, a second sheet material W2 for manufacturing the rear member 20, and a third sheet material W3 and a fourth sheet material W4 for manufacturing the sleeve members 30 are used as main materials. It will be noted that materials used in addition to the first sheet material W1, the second sheet material W2, the third sheet material W3, and the fourth sheet material W4 will be described in the description of the method of manufacturing the garment 1.

**[0050]** The first sheet material W1 and the second sheet material W2 are for example thermoplastic resin sheets. The width of the first sheet material W1 (the length of the first sheet material W1 in a direction orthogonal to the transport direction thereof; see FIG. 4) is equal to a length L1 (see FIG. 1) of the right-left width of the front member 10 and the rear member 20 of the garment 1.

**[0051]** The third sheet material W3 and the fourth sheet material W4 are for example sheets in which a nonwoven fabric and a reinforcement material are laminated. The width of the third sheet material W3 and the fourth sheet material W4 (their length in a direction orthogonal to their

transport direction; see FIG. 6) is equal to a length L2 (see FIG. 2) of the right-left width of the sleeve members 30.

**[0052]** The first sheet material W1 and the second sheet material W2 are paid out from original sheet rolls (not shown in the drawings).

**[0053]** The third sheet material W3 is manufactured by superimposing and joining a sleeve sheet material W3nw (nonwoven fabric) paid out from an original sheet roll and a reinforcement sheet material W3r of reinforcement material paid out from an original sheet roll. The fourth sheet material W4 is manufactured by superimposing and joining a sleeve sheet material W4nw (nonwoven fabric) paid out from an original sheet roll and a reinforcement sheet material W4r of reinforcement material paid out from an original sheet roll.

## (2-2) Method of Manufacturing Garment

**[0054]** An example of the method of manufacturing the garment 1 of the present invention will now be described by describing the manufacture of the garment 1 by the garment manufacturing system 100.

**[0055]** The garment manufacturing system 100 includes, as devices that perform processing on the first sheet material W1 and on the sleeve members 30 and the second sheet material W2 that have merged with the first sheet material W1, mainly a first sheet material transporting device 110, a reinforcement member joining device 120, a sheet piece joining device 130, front tie joining devices 140, 150, an adhesive applying device 160, sleeve member superimposing devices 260, 270, second sheet material superimposing devices 410, 420, a body edge portion joining device 180, a body edge portion cutting device 190, a separating device 200, and a folding device 195 (see FIG. 13 and FIG. 15). The garment manufacturing system 100 includes, as devices that form the sleeve members 30, mainly a third sheet material forming and transporting device 210, a fourth sheet material forming and transporting device 220, elastic material joining devices 205, 215, a sleeve edge portion joining device 230, a sleeve edge portion cutting device 240, and position adjusting devices 245, 250 (see FIG. 13). Furthermore, the garment manufacturing system 100 includes, as devices that perform processing on the second sheet material W2, mainly a second sheet material transporting device 310, a sheet piece joining device 320, a slitting device 330, neck tie joining devices 340, 390, waist tie joining devices 350, 380, a hook-and-loop fastener joining device 360, and adhesive applying devices 370, 400 (see FIG. 14). The function of each device will be performed in conjunction with the description of the manufacturing method.

**[0056]** It will be noted that the flow of the manufacturing method described below is merely an example. For example, the order in which processes are implemented may be changed where not contradictory. Furthermore, for example, two or more processes may be executed simultaneously if there are no contradictions.

**[0057]** Furthermore, in the following description, expressions such as "B" is superimposed on "A" are sometimes used, but these expressions are not intended to limit positional relationships such that "B" is disposed on top of "A" and mean that "A" and "B" are in a superimposed state. In other words, the expression that "B" is superimposed on "A" shall also include, if there are no contradictions, an aspect where "A" is disposed on top of "B" and an aspect where "A" and "B" are arranged in the horizontal direction (are adjacent in the horizontal direction).

**[0058]** The first sheet material transporting device 110 (see FIG. 13) uses for example plural rollers to transport the first sheet material W1 paid out from an original sheet roll (not shown in the drawings) (step A1 in FIG. 10). The process of step A1 in FIG. 10 is an example of a first transport process of transporting the first sheet material W1 for forming the front member 10 that is one of a front body and a back body (here, the front body). It will be noted that although detailed description is omitted here, the first sheet material W1 may be a sheet material in which sheets are laminated in plural layers, and the manufacturing process of the garment 1 may include a process of manufacturing from plural sheets the first sheet material W1 in which plural layers are laminated.

**[0059]** The reinforcement member joining device 120 (see FIG. 13) joins to the first sheet material W1 transported by the first sheet material transporting device 110 the reinforcement member 12 which is cut out from a sheet material (not shown in the drawings) paid out from an original sheet roll (not shown in the drawings) (step A2 in FIG. 10). The joining method may be welding or adhesion and is selected as appropriate. The reinforcement member joining device 120 (see FIG. 13) joins the reinforcement member 12 to the transported first sheet material W1 so that the reinforcement member 12 is disposed in a predetermined position on the inner surface of the front member 10 in the manufactured garment 1. The shape of the reinforcement member 12 is determined as appropriate but is for example a rectangular shape.

**[0060]** The sheet piece joining device 130 (see FIG. 13) joins to the first sheet material W1 transported by the first sheet material transporting device 110 a neck sheet piece 15 which is cut out from a sheet material (not shown in the drawings) paid out from an original sheet roll (not shown in the drawings) (step A3 in FIG. 10). The joining method may be welding or adhesion using an adhesive and is selected as appropriate. It will be noted that the sheet piece joining device 130 joins the neck sheet piece 15 to the transported first sheet material W1 so that the neck member 15a (the member that remains on the front member 10 as a result of the neck sheet piece 15 being cut together with the first sheet material W1 in a downstream process) is disposed in a predetermined position around the neckline 14 on the inner surface of the front member 10 in the manufactured garment 1. The shape of the neck sheet piece 15 is decided as appropriate but is

for example a rectangular shape.

**[0061]** The front tie joining device 140 (see FIG. 13) joins to the first sheet material W1 transported by the first sheet material transporting device 110 the first front tie 11a which is obtained by superimposing a sheet material Wa1 and a sheet material Wa2 cut out from original sheet rolls (not shown in the drawings), folding the superimposed sheet materials one or more times in a direction orthogonal to the transport direction, joining them in a predetermined place, and then cutting them in a predetermined width in the transport direction (step A4 in FIG. 10). The front tie joining device 140 joins the first front tie 11a to the transported first sheet material W1 so that the first front tie 11a is disposed in a predetermined position on the front member 10 in the manufactured garment 1. The joining method may be welding or adhesion and is selected as appropriate.

**[0062]** The front tie joining device 150 (see FIG. 13), in the same manner as the front tie joining device 140, joins to the first sheet material W1 transported by the first sheet material transporting device 110 the second front tie 11b which is formed from a sheet material Wb1 and a sheet material Wb2 (step A5 in FIG. 10). The front tie joining device 150 joins the second front tie 11b to the transported first sheet material W1 so that the second front tie 11b is disposed in a predetermined position on the front member 10 in the manufactured garment 1. The joining method may be welding or adhesion and is selected as appropriate.

**[0063]** The adhesive applying device 160 (see FIG. 13) applies an adhesive to the outer surface of the first sheet material W1 (the surface that becomes the outer surface of the front member 10 when the garment 1 is completed) transported by the first sheet material transporting device 110, in positions thereof where the sleeve members 30 (the first sleeve member 30R and the second sleeve member 30L) are to be joined (step A6 in FIG. 10). Specifically, the adhesive applying device 160 applies an adhesive to the right-side edge portion of the outer surface of the first sheet material W1 in a position thereof that the first sleeve member 30R, which will be placed on the first sheet material W1 in a downstream process, will contact. Furthermore, the adhesive applying device 160 applies an adhesive to the left-side edge portion of the outer surface of the first sheet material W1 in a position thereof that the second sleeve member 30L, which will be placed on the first sheet material W1 in a downstream process, will contact. Though this is not intended to be limiting, the adhesive applied by the adhesive applying device 160 is a hot-melt adhesive.

**[0064]** Here, description of the processes performed on the first sheet material W1 will be temporarily interrupted so that the process of forming the sleeve members 30 may be described with reference to FIG. 6, FIG. 11, and FIG. 13.

**[0065]** The sleeve members 30 are mainly configured from the third sheet material W3 and the fourth sheet material W4.

**[0066]** The third sheet material forming and transporting device 210 (see FIG. 13) transports the third sheet material W3, which is manufactured by superimposing (see FIG. 6) and joining the sleeve sheet material W3nw of nonwoven fabric paid out from an original sheet roll (not shown in the drawings) and the reinforcement sheet material W3r of reinforcement material paid out from an original sheet roll (not shown in the drawings) (step B1 in FIG. 11). It will be noted that in FIG. 13 illustration of mechanisms that merge and join the sleeve sheet material W3nw and the reinforcement sheet material W3r is omitted.

**[0067]** The elastic material joining device 205 places, with respect to the transported third sheet material W3, the elastic materials E on, and joins them to, both end portions thereof in a direction orthogonal to the direction in which the third sheet material W3 is transported (step B2 in FIG. 11). The process of step B2 in FIG. 11 is an example of a placement process.

**[0068]** The fourth sheet material forming and transporting device 220 (see FIG. 13) transports the fourth sheet material W4, which is manufactured by superimposing and joining the sleeve sheet material W4nw of nonwoven fabric paid out from an original sheet roll (not shown in the drawings) and the reinforcement sheet material W4r of reinforcement material paid out from an original sheet roll (not shown in the drawings) (see FIG. 6) (step B3 in FIG. 11). It will be noted that in FIG. 13 illustration of mechanisms that merge and join the sleeve sheet material W4nw and the reinforcement sheet material W4r is omitted.

**[0069]** It will be noted that although for convenience of illustration here step B3 is described after step B1 and step B2, this does not mean that step B3 is executed after step B1 and step B2. Step B1 and step B2 are preferably executed in parallel with step B3 and later-described step B4.

**[0070]** The elastic material joining device 215 places, with respect to the transported fourth sheet material W4, the elastic materials E on, and joins them to, both end portions thereof in a direction orthogonal to the direction in which the fourth sheet material W4 is transported (step B4 in FIG. 11). The process of step B4 in FIG. 11 is an example of a placement process.

**[0071]** The third sheet material W3 after attachment of the elastic materials E and the fourth sheet material W4 after attachment of the elastic materials E are merged (step B5 in FIG. 11) and become superimposed. The third sheet material W3 and the fourth sheet material W4 in the superimposed state are transported in a first direction D1 (see FIG. 13).

**[0072]** The sleeve edge portion joining device 230 (see FIG. 13) partially joins the third sheet material W3 and the fourth sheet material W4 transported in the first direction D1 (see FIG. 6) in the superimposed state (step B6 in FIG. 11). Specifically, the sleeve edge portion joining device 230 joins, along directions intersecting the first direction D1 and across the entire width direction of the third sheet material W3 and the fourth sheet material W4, the third

sheet material W3 and the fourth sheet material W4 transported in the first direction D1 in the superimposed state (see the thick solid lines depicted above reference sign B6 in FIG. 6). More specifically, the sleeve edge portion joining device 230 joins, across the entire width direction of the third sheet material W3 and the fourth sheet material W4, the third sheet material W3 and the fourth sheet material W4 transported in the first direction D1 in a superimposed state so that, when seen from a direction perpendicular to the sheet surface of the third sheet material W3 and the fourth sheet material W4, one joint and a joint adjacent to this joint in the first direction D1 generally match the shapes of the upper edge and the lower edge in the outer shape of the sleeve member 30. Because the sleeve edge portion joining device 230 joins the third sheet material W3 and the fourth sheet material W4 in this way, when the third sheet material W3 and the fourth sheet material W4 transported in the first direction D1 in the superimposed state are seen from a direction perpendicular to the sheet surface of the third sheet material W3 and the fourth sheet material W4, a sleeve member 30 where the cuff 32 is disposed on one end side in a second direction D2 orthogonal to the first direction D1 and a sleeve member 30 where the cuff 32 is disposed on the other end side in the second direction D2 are alternately arranged (however, the sleeve members 30 are interconnected) (see FIG. 6).

**[0073]** The method by which the sleeve edge portion joining device 230 joins the third sheet material W3 and the fourth sheet material W4 may be heat welding or ultrasonic welding. The method by which the sleeve edge portion joining device 230 joins the third sheet material W3 and the fourth sheet material W4 may be adhesion using an adhesive.

**[0074]** The sleeve edge portion cutting device 240 (see FIG. 13) is disposed on the downstream side of the sleeve edge portion joining device 230 in the first direction D and cuts, along the direction in which the joints extend and in the central portions of the joints, each of the joints that were formed by the sleeve edge portion joining device 230 in the third sheet material W3 and the fourth sheet material W4 transported in the first direction D1 in the superimposed state (step B7). In other words, the sleeve edge portion cutting device 240 cuts apart the sleeve members 30 in the mutually interconnected state on the transported third sheet material W3 and the fourth sheet material W4 to form sleeve members 30 independent of other sleeve members 30.

**[0075]** Because the superimposing, joining, and cutting of the third sheet material W3 and the fourth sheet material W4 are performed in the above manner (because the processes of steps B5 to B7 serving as an example of a first formation process are performed), in the garment manufacturing system 100 the tubular first sleeve member 30R where the cuff 32 is disposed on one end side in the second direction D2 orthogonal to the first direction D1 and the tubular second sleeve member 30L where the cuff 32 is disposed on the other end side in the

second direction D2 are alternately formed from the third sheet material W3 and the fourth sheet material W4 transported in the first direction D1 in the superimposed state. In the present embodiment, the first sleeve member 30R is used as a right sleeve and the second sleeve member 30L is used as a left sleeve. In this way, by alternately forming the first sleeve member 30R and the second sleeve member 30L from the third sheet material W3 and the fourth sheet material W4 transported in the first direction D1 in the superimposed state, generation of leftover material can be inhibited even in the case of forming the sleeve members 30 where the openings on the cuff 32 sides are smaller than the openings on the armhole 34 sides (even in the case of forming the sleeve members 30 whose thickness is not uniform).

**[0076]** It will be noted that, in the sleeve members 30, the elastic materials E in the cuffs 32 are useful because they can tighten the cuffs 32. However, the elastic materials E on the armhole 34 sides are not particularly unnecessary, and it is preferred not to have them. Thus, for example, it is preferred that the method of manufacturing the garment 1 have a cutting process of cutting the elastic materials E that are attached to the parts of the sleeve members 30 that become the armholes 34 at the same time as, or before or after, the processes of step B6 and step B7. Though this is not intended to be limiting, in the cutting process, for example, the elastic materials E are cut by heat by applying heat to the parts of the sleeve members 30 that become the armholes 34.

**[0077]** The sleeve members 30 that have been formed as a result of the processes of steps B5 to B7 serving as an example of a first formation process being performed are transported by the position adjusting devices 245, 250 to the sleeve member superimposing devices 260, 270 that superimpose the sleeve members 30 on the first sheet material W1 (step B8). It will be noted that the position adjusting devices 245, 250 transport the first sleeve member 30R to the sleeve member superimposing device 260 and transport the second sleeve member 30L to the sleeve member superimposing device 270. This will be specifically described.

**[0078]** The position adjusting device 245 transports the sleeve members 30 to the position adjusting device 250 and hands over the sleeve members 30 to the position adjusting device 250. It will be noted that the position adjusting device 245 has the function of adjusting the distance between the adjacent sleeve members 30 in the transport direction of the sleeve members 30. For example, the position adjusting device 245 has a roller and plural retention members provided on the outer periphery of the roller along the circumferential direction thereof (not shown in the drawings). The retention members are members that receive and retain the formed sleeve members 30. When the position adjusting device 245 rotates the roller and thereby also rotates the retention members to transport the sleeve members 30, it changes the relative positions of the retention members relative to the roller in the circumferential direction of the roller to

thereby increase the distance between the adjacent sleeve members 30 in the transport direction of the sleeve members 30.

**[0079]** Of the sleeve members 30 received from the position adjusting device 245, the position adjusting device 250 transports the first sleeve member 30R to the sleeve member superimposing device 260 and transports the second sleeve member 30L to the sleeve member superimposing device 270. The position adjusting device 250 has the function of adjusting the distance between the adjacent sleeve members 30 at least in a direction (the width direction) orthogonal to the transport direction. For example, the position adjusting device 250 has a roller and plural retention members provided on the outer periphery of the roller along the circumferential direction thereof (not shown in the drawings). The retention members are members that receive and retain the formed sleeve members 30. When the position adjusting device 250 rotates the roller and thereby also rotates the retention members to transport the sleeve members 30, it changes the relative positions of the retention members relative to the roller along the direction of the rotational axis of the roller to thereby increase the distance between the adjacent sleeve members 30 in the transport direction of the sleeve members 30.

**[0080]** Because positional adjustment of the first sleeve member 30R and the second sleeve member 30L is performed by the position adjusting devices 245, 250 in this way, the first sleeve member 30R and the second sleeve member 30L become transported on mutually different transport paths during transport and are transported to respectively different places. Specifically, the first sleeve member 30R is transported to the sleeve member superimposing device 260, and the second sleeve member 30L is transported to the sleeve member superimposing device 270.

**[0081]** To return to description of the processing performed on the first sheet material W1. Here, reference is made mainly to FIG. 5, FIG. 10, and FIG. 13.

**[0082]** The sleeve member superimposing device 260 (see FIG. 13) superimposes the transported first sheet material W1 and the first sleeve member 30R (step A7 in FIG. 10). Step A7 in FIG. 10 is an example of a first superimposition process. The sleeve member superimposing device 260 superimposes the first sleeve member 30R on the transported first sheet material W1 so that the first sleeve member 30R is disposed in a predetermined position on the outer surface of the front member 10 in the manufactured garment 1.

**[0083]** It will be noted that when superimposing the first sheet material W1 and the first sleeve member 30R, the sleeve member superimposing device 260 applies heat to the part of the right-side edge portion of the first sheet material W1 where the adhesive applying device 160 applied the hot-melt adhesive. As a result, the first sheet material W1 and the first sleeve member 30R are joined. In other words, step A7 of FIG. 10 is also part of a joining process of joining the first sheet material W1 and the

sleeve members 30.

**[0084]** The sleeve member superimposing device 270 (see FIG. 13) superimposes the transported first sheet material W1 and the second sleeve member 30L (step A8 in FIG. 10). Step A8 of FIG. 10 is an example of a first superimposition process. The sleeve member superimposing device 260 superimposes the second sleeve member 30L on the transported first sheet material W1 so that the second sleeve member 30L is disposed in a predetermined position on the outer surface of the front member 10 in the manufactured garment 1.

**[0085]** It will be noted that when superimposing the first sheet material W1 and the second sleeve member 30L, the sleeve member superimposing device 260 applies heat to the part of the left-side edge portion of the first sheet material W1 where the adhesive applying device 160 applied the hot-melt adhesive. As a result, the first sheet material W1 and the second sleeve member 30L are joined. In other words, step A8 of FIG. 10 is also part of a joining process of joining the first sheet material W1 and the sleeve members 30.

**[0086]** Here, description of the processing performed on the first sheet material W1 will again be interrupted. The processing performed on the second sheet material W2 may be described with reference mainly to FIG. 7, FIG. 12, and FIG. 14.

**[0087]** The second sheet material transporting device 310 (see FIG. 14) uses for example plural rollers to transport the second sheet material W2 which is paid out from an original sheet roll (not shown in the drawings) (step C1 in FIG. 12). The process of step C1 in FIG. 12 is an example of a second transport process of transporting the second sheet material W2 for forming the rear member 20 that is the other of the front body and the back body (here, the back body). It will be noted that although detailed description is omitted here, the second sheet material W2 may be a sheet material in which sheets are laminated in plural layers, and the manufacturing process of the garment 1 may include a process of manufacturing from plural sheets the second sheet material W2 in which plural layers are laminated.

**[0088]** The sheet piece joining device 320 (see FIG. 13) joins to the second sheet material W2 transported by the second sheet material transporting device 310 a neck sheet piece 25 which is cut out from a sheet material (not shown in the drawings) paid out from an original sheet roll (not shown in the drawings) (step C2 in FIG. 12). The joining method may be welding or adhesion using an adhesive and is selected as appropriate. It will be noted that the sheet piece joining device 320 joins the neck sheet piece 25 to the transported second sheet material W2 so that the neck member 25a (the member that remains on the rear member 20 as a result of the neck sheet piece 25 being cut together with the second sheet material W2 in a downstream process) is disposed in a predetermined position around the neckline 24 on the inner surface of the rear member 20 in the manufactured garment 1. The shape of the neck sheet piece 25 is

decided as appropriate but is for example a rectangular shape.

**[0089]** The slitting device 330 (see FIG. 14) forms in the transported second sheet material W2 a slit in the transport direction of the second sheet material W2 in the middle part thereof in the width direction of the second sheet material W2 (the direction orthogonal to the transport direction of the second sheet material W2) (step C3 in FIG. 12). The process of step C3 in FIG. 12 is an example of a third formation process. The second sheet material W2 in which the slit has been formed by the slitting device 330 is divided into a second right-side sheet material W2a and a second left-side sheet material W2b and transported.

**[0090]** On the second right-side sheet material W2a is performed the following processing.

**[0091]** The neck tie joining device 340 joins the second neck tie 22b to the transported second right-side sheet material W2a (step C4 in FIG. 12). The neck tie joining device 340 joins the second neck tie 22b to the transported second right-side sheet material W2a so that the second neck tie 22b is disposed in a predetermined position on the outer surface of the rear member 20 in the manufactured garment 1. It will be noted that the neck tie joining device 340 is functionally the same as the front tie joining devices 140, 150, with only the joining position of the tie and the length of the tie that is joined being different. Here, detailed description of the neck tie joining device 340 is omitted to avoid redundant description.

**[0092]** The waist tie joining device 350 joins the waist inner tie 21b to the transported second right-side sheet material W2a (step C5 in FIG. 12). The waist tie joining device 350 joins the waist inner tie 21b to the transported second right-side sheet material W2a so that the waist inner tie 21b is disposed in a predetermined position on the inner surface of the rear member 20 in the manufactured garment 1. It will be noted that the waist tie joining device 350 is functionally the same as the front tie joining devices 140, 150, with only the joining position of the tie and the length of the tie that is joined being different. Here, detailed description of the neck tie joining device 340 is omitted to avoid redundant description.

**[0093]** The hook-and-loop fastener joining device 360 joins the hook-and-loop fastener 22c to the transported second right-side sheet material W2a (step C6 in FIG. 12). The hook-and-loop fastener joining device 360 joins the hook-and-loop fastener 22c to the transported second right-side sheet material W2a so that the hook-and-loop fastener 22c is disposed in a predetermined position on the inner surface of the rear member 20 in the manufactured garment 1.

**[0094]** The adhesive applying device 370 (see FIG. 14) applies an adhesive to the outer surface of the transported second right-side sheet material W2a (the surface that becomes the outer surface of the front member 10 when the garment 1 is completed) in a position thereof where the first sleeve member 30R will be joined (step C7 in FIG. 12). Specifically, the adhesive applying device

370 applies an adhesive to the right-side edge portion of the second right-side sheet material W2a in a position thereof that the first sleeve member 30R will contact in a downstream process. Though this is not intended to be limiting, the adhesive applied by the adhesive applying device 370 is a hot-melt adhesive.

**[0095]** Next, processing performed on the second left-side sheet material W2b will be described. It will be noted that although for convenience of illustration here step C8 to step C10 are described after step C4 to step C7, this does not mean that step C8 to step C10 are executed after step C4 to step C7. Step C4 to step C are preferably executed in parallel with step C8 to step C10.

**[0096]** The waist tie joining device 380 joins the waist outer tie 21a to the transported second left-side sheet material W2b (step C8 in FIG. 12). The waist tie joining device 380 joins the waist outer tie 21a to the transported second left-side sheet material W2b so the waist outer tie 21a is disposed in a predetermined position on the outer surface of the rear member 20 in the manufactured garment 1. It will be noted that the waist tie joining device 380 is functionally the same as the front tie joining devices 140, 150, with only the joining position of the tie and the length of the tie that is joined being different. Here, detailed description of the waist tie joining device 380 is omitted to avoid redundant description.

**[0097]** The neck tie joining device 390 joins the first neck tie 22a to the transported second left-side sheet material W2b (step C9 in FIG. 12). The neck tie joining device 390 joins the first neck tie 22a to the transported second left-side sheet material W2b so that the first neck tie 22a is disposed in a predetermined position on the outer surface of the rear member 20 in the manufactured garment 1. It will be noted that the neck tie joining device 390 is functionally the same as the front tie joining devices 140, 150, with only the joining position of the tie and the length of the tie that is joined being different. Here, detailed description of the neck tie joining device 390 is omitted to avoid redundant description.

**[0098]** The adhesive applying device 400 (see FIG. 14) applies an adhesive to the outer surface of the transported second left-side sheet material W2b (the surface that becomes the outer surface of the front member 10 when the garment 1 is completed) in a position thereof where the second sleeve member 30L will be joined (step C10 in FIG. 12). Specifically, the adhesive applying device 400 applies an adhesive to the left-side edge portion of the second left-side sheet material W2b in a position thereof that the second sleeve member 30L will contact in a downstream process. Though this is not intended to be limiting, the adhesive applied by the adhesive applying device 400 is a hot-melt adhesive.

**[0099]** To return to the description of processing performed on the first sheet material W1. Hereinafter, the processing performed on the first sheet material W1 will be described with reference mainly to FIG. 5, FIG. 10, and FIG. 15.

**[0100]** The second sheet material superimposing de-

vice 410 (see FIG. 15) superimposes the transported first sheet material W1 and the transported second right-side sheet material W2a (the second sheet material W2) so that the first sleeve member 30R superimposed with the first sheet material W1 is disposed between the first sheet material W1 and the second right-side sheet material W2a (step A9 in FIG. 10). Step A9 in FIG. 10 is an example of a second superimposition process.

**[0101]** It will be noted that when superimposing the first sheet material W1 and the second right-side sheet material W2a, the second sheet material superimposing device 410 applies heat to the part of the right-side edge portion of the second right-side sheet material W2a to which the adhesive applying device 370 applied the hot-melt adhesive. As a result, the second right-side sheet material W2a and the first sleeve member 30R are joined. In other words, step A9 of FIG. 10 is also part of a joining process of joining the second sheet material W2 (the second right-side sheet material W2a) and the sleeve members 30.

**[0102]** The second sheet material superimposing device 420 (see FIG. 15) superimposes the transported first sheet material W1 and the transported second left-side sheet material W2b (the second sheet material W2) so that the second sleeve member 30L superimposed with the first sheet material W1 is disposed between the first sheet material W1 and the second left-side sheet material W2b (step A10 in FIG. 10). Step A10 in FIG. 10 is an example of a second superimposition process.

**[0103]** It will be noted that when superimposing the first sheet material W1 and the second left-side sheet material W2b, the second sheet material superimposing device 420 applies heat to the part of the left-side edge portion of the second left-side sheet material W2b to which the adhesive applying device 400 applied the hot-melt adhesive. As a result, the second left-side sheet material W2b and the second sleeve member 30L are joined. In other words, step A10 in FIG. 10 is also part of a joining process of joining the second sheet material W2 (the second left-side sheet material W2b) and the sleeve members 30.

**[0104]** By going through the processes of step A9 and step A10, the first sheet material W1, the first sleeve member 30R, the second sleeve member 30L, and the second sheet material W2 become disposed in this order as schematically depicted in the enlarged area inside the long dashed double-short dashed line in FIG. 15. Furthermore, by going through the processes of step A9 and step A10, the first sleeve member 30R and the second sleeve member 30L become sandwiched between the outer surface of the first sheet material W1 (the surface that becomes the outer surface of the front member 10 when the garment 1 is completed) and the outer surface of the second sheet material W2 (the surface that becomes the outer surface of the rear member 20 when the garment 1 is completed).

**[0105]** The first sheet material W1 and the second sheet material W2 that have been superimposed through

the processes of step A9 and step A10 are transported further downstream.

**[0106]** It will be noted that in the garment manufacturing system 100 one garment 1 is formed from region Z of the first sheet material W1 and the second sheet material W2 transported in the superimposed state. Region Z is, as shown in FIG. 5, a region defined by line segment X1, line segment X2, and both edge portions of the first sheet material W1 and the second sheet material W2 in the direction orthogonal to the transport direction thereof. Line segment X1 and line segment X2 are straight lines extending in the width direction of the first sheet material W1 and the second sheet material W2, which is orthogonal to the lengthwise direction of the first sheet material W1 and the second sheet material W2. Line segment X1 and line segment X2 are disposed apart from each other by a length L3 (see FIG. 3) that is the total length of the garment 1.

**[0107]** The garment 1 is manufactured using most of the raw material in region Z of the first sheet material W1 and the second sheet material W2. What becomes left-over material out of the first sheet material W1 and the second sheet material W2 in region Z are just the part defined by line segment X1 and virtual line X3 depicted in the position that becomes the neckline of the garment 1 (the neckline 14 of the front member 10 and the neckline 24 of the rear member 20) when the garment 1 is finished and the parts defined by line segment X1 and virtual lines X4 depicted in positions that become the sloping portions of the shoulder parts of the garment 1 (the sloping portions 16a of the shoulder parts 16 of the front member 10 and the sloping portions 26a of the shoulder parts 26 of the rear member 20) when the garment 1 is finished. It will be noted that line segment X1 here is a line segment depicted in positions that become the horizontal portions of the shoulder parts of the garment 1 (the horizontal portions 16b of the shoulder parts 16 of the front member 10 and the horizontal portions 26b of the shoulder parts 26 of the rear member 20) when the garment 1 is finished. Furthermore, line segment X2 is a line segment depicted in a position that becomes the bottom of the garment 1 (the bottom 18 of the front member 10 and the bottom 28 of the rear member 20) when the garment 1 is finished.

**[0108]** In steps A11 and A12 described below, in order to form one garment 1 from region Z of the first sheet material W1 and the second sheet material W2 transported in the superimposed state, in region Z, the first sheet material W1 and the second sheet material W2a are partially joined in conformity with the shape of the outer edge of the garment 1, and the first sheet material W1 and the second sheet material W2b are partially joined in conformity with the shape of the outer edge of the garment 1. That is, the processes of steps A11 and A12 are an example of a second formation process.

**[0109]** In step A11, the body edge portion joining device 180, which is disposed on the downstream side of the second sheet material superimposing device 420 in the transport direction of the first sheet material W1 and

the second sheet material W2, partially joins the first sheet material W1 and the second sheet material W2.

**[0110]** Specifically, the body edge portion joining device 180 joins the first sheet material W1 and the second sheet material W2 at the parts of the garment 1 extending from the armpit parts to the bottom when the garment 1 is finished and the parts of the garment 1 that become the shoulder parts when the garment 1 is finished (the parts indicated by thick solid lines).

**[0111]** In other words, the body edge portion joining device 180 joins both edge portions, in the direction orthogonal to the transport direction of the first sheet material W1 and the second sheet material W2, of the first sheet material W1 and the second sheet material W2 where the first sheet material W1 and the second sheet material W2 are in direct contact. Moreover, the body edge portion joining device 180 joins the parts of the first sheet material W1 that become the shoulder parts 16 of the front member 10 when the garment 1 is finished to the parts of the second sheet material W2 that become the shoulder parts 26 of the rear member 20 when the garment 1 is finished.

**[0112]** The method by which the body edge portion joining device 180 joins the first sheet material W1 and the second sheet material W2 may be heat welding or ultrasonic welding. The method by which the body edge portion joining device 180 joins the first sheet material W1 and the second sheet material W2 may be adhesion using an adhesive.

**[0113]** In step A12, the body edge portion cutting device 190 cuts, in region Z of the first sheet material W1 and the second sheet material W2 transported in the superimposed state, the first sheet material W1 and the second sheet material W2 in conformity with the shapes (so as to correspond to the shapes) of the sloping portions of the shoulder parts (the sloping portions 16a of the shoulder parts 16 of the front member 10 and the sloping portions 26a of the shoulder parts 26 of the rear member 20) and the necklines (the neckline 14 of the front member 10 and the neckline 24 of the rear member 20) in the outer edge of the garment 1.

**[0114]** Describing this now in detail using the drawings, in step A12 the body edge portion cutting device 190 cuts the parts, indicated by thick lines in FIG. 9, that become the sloping portions 16a of the shoulder parts 16 of the front member 10 and the sloping portions 26a of the shoulder parts 26 of the rear member 20 when the garment 1 is finished. Furthermore, the body edge portion cutting device 190 cuts the parts, indicated by a thick line in FIG. 9, that become the neckline 14 of the front member 10 and the neckline 24 of the rear member 20 when the garment 1 is finished. Furthermore, the body edge portion cutting device 190 cuts the part of line segment 17, indicated by a thick line in FIG. 9, that interconnects one end of each of the neckline 14 of the front member 10 and the neckline 24 of the rear member 20 and the other end of each of the neckline 14 of the front member 10 and the neckline 24 of the rear member 20. It will be noted that the

leftover material generated at this time (the part defined by line segment 17 and the parts that become the neckline 14 of the front member 10 and the neckline 24 of the rear member 20 when the garment 1 is finished) is recovered by a leftover material recovery device not shown in the drawings.

**[0115]** The body edge portion cutting device 190 does not cut the parts, indicated by dashed lines in FIG. 9, that become the horizontal portions 16b of the shoulder parts 16 of the front member 10 and the horizontal portions 26b of the shoulder parts 26 of the rear member 20 when the garment 1 is finished. By not cutting the parts that become the horizontal portions 16b of the shoulder parts 16 of the front member 10 and the horizontal portions 26b of the shoulder parts 26 of the rear member 20 when the garment 1 is finished, even when the body edge portion cutting device 190 cuts the first sheet material W1 and the second sheet material W2, the first sheet material W1 and the second sheet material W2 on the downstream side of the places cut by the body edge portion cutting device 190 and the first sheet material W1 and the second sheet material W2 on the upstream side of the places cut by the body edge portion cutting device 190 remain interconnected. For that reason, by transporting the first sheet material W1 and the second sheet material W2 that are on the downstream side of the places cut by the body edge portion cutting device 190, the first sheet material W1 and the second sheet material W2 that are on the upstream side of the places cut by the body edge portion cutting device 190 can also be transported.

**[0116]** It will be noted that in step A12 the body edge portion cutting device 190 need not cut the part of line segment 17 as indicated by the dashed line in FIG. 10.

**[0117]** The first sheet material W1 and the second sheet material W2 on which processing has been performed by the body edge portion cutting device 190 are transported further downstream.

**[0118]** The folding device 195 (see FIG. 15) folds the first sheet material W1 and the second sheet material W2 transported in the superimposed state after processing has been performed thereon by the body edge portion cutting device 190, along a direction in which the first sheet material W1 and the second sheet material W2 are transported (a third direction D3, see FIG. 5), so that the both end portions of the first sheet material W1 and the second sheet material W2 in a direction orthogonal to the third direction are folded inward (step A13 of FIG. 10). As a result, the first sheet material W1 and the second sheet material W2 that are transported become reduced in width in the width direction orthogonal to the transport direction.

**[0119]** The first sheet material W1 and the second sheet material W2 that have been folded by the folding device 195 are transported further downstream, and the separating device 200 disposed on the downstream side of the folding device 195 cuts apart an amount of the first sheet material W1 and the second sheet material W2 equivalent to one garment 1 (in other words, the part of

region Z used to manufacture the garment 1) from the first sheet material W1 and the second sheet material W2 transported in the superimposed state (step A14 in FIG. 10). In other words, the separating device 200 separates from the first sheet material W1 and the second sheet material W2 the garment 1 that has been formed by the second formation process (step A11 and step A12). The process of step A14 is an example of a separation process, and by going through the process of step A14, one garment 1 is cut apart from the first sheet material W1 and the second sheet material W2 and becomes independent of the first sheet material W1 and the second sheet material W2. It will be noted that leftover material generated at this time is recovered by a leftover material recovery device not shown in the drawings.

**[0120]** To make the garment 1 more compact after step A14, the garment manufacturing system 100 may have a folding device that further folds the garment 1. Here, detailed description thereof is omitted.

### (3) Characteristics

**[0121]** Characteristics of the method of manufacturing the garment 1 of the above embodiment are described below.

#### **[0122]** (3-1)

The method of manufacturing the garment 1 of the above embodiment includes a first transport process (step A1), a second transport process (step C1), a first formation process (steps B5, B6, B7), a first superimposition process (steps A7, A8), a second superimposition process (steps A9, A10), a second formation process (steps A11, A12), and a separation process (step A14). In the first transport process, the first sheet material W1 for forming the front member 10 (front body) serving as an example of a first member is transported. In the second transport process, the second sheet material W2 for forming the rear member 20 (back body) serving as an example of a second member is transported. In the first formation process, the tubular sleeve members 30 are formed by superimposing the transported third sheet material W3 and the transported fourth sheet material W4, partially joining the third sheet material W3 and the fourth sheet material W4 transported in the superimposed state, and cutting them in predetermined positions. In the first superimposition process, the transported first sheet material W1 and the sleeve members 30 are superimposed. In the second superimposition process, the transported first sheet material W1 and the transported second sheet material W2 are superimposed so that the sleeve members 30 superimposed with the first sheet material W1 are disposed between the first sheet material W1 and the second sheet material W2. Particularly in the above embodiment, in the second superimposition process, the transported first sheet material W1 and the transported second right-side sheet material W2a are superimposed so that the first sleeve member 30R superimposed with the first sheet material W1 is disposed be-

tween the first sheet material W1 and the second right-side sheet material W2a. Furthermore, in the above embodiment, in the second superimposition process, the transported first sheet material W1 and the transported second left-side sheet material W2b are superimposed so that the second sleeve member 30L superimposed with the first sheet material W1 is disposed between the first sheet material W1 and the second left-side sheet material W2b. In the second formation process, the first sheet material W1 and the second sheet material W2 transported in a superimposed state are partially joined in conformity with the shape of the outer edge of the garment 1. Furthermore, in the second formation process, the first sheet material W1 and the second sheet material W2 transported in a superimposed state are partially cut in conformity with the shape of the outer edge of the garment 1. In the separation process, the garment that has been formed by the second formation process is separated from the first sheet material W1 and the second sheet material W2.

**[0123]** In the method of manufacturing the garment 1 of the above embodiment, the garment 1 can be manufactured by a relatively simple process, and the garment 1 can be efficiently manufactured.

**[0124]** Furthermore, in the method of manufacturing the garment 1 of the above embodiment, the sleeve members 30 are disposed between the first sheet material W1 for forming the front member 10 and the second sheet material W2 for forming the rear member 20, so the sleeve members 30 and the part that becomes the outer surface of the front member 10 can be covered by the rear member 20. As a result, in the method of manufacturing the garment 1 of the above embodiment, a hygienically excellent garment, capable of reducing the occurrence of a situation where the sleeve members 30 and the outer surface of the front member 10 of the manufactured garment 1 are touched by a person's hands for example and become contaminated, and can be manufactured.

**[0125]** Moreover, in the method of manufacturing the garment 1 of the above embodiment, since the inner surface side of the rear member 20 is exposed to the outside in the garment 1 before being donned, a hygienically excellent garment, capable of reducing the occurrence of a situation where the outer surface of the rear member 20 is touched by a person's hands for example and becomes contaminated before the garment 1 is donned, can be manufactured.

#### **[0126]** (3-2)

The method of manufacturing the garment 1 pertaining to the above embodiment includes a third formation process (step C3). In the third formation process, a slit is formed in the second sheet material W2 along the direction in which the second sheet material is transported.

**[0127]** In the method of manufacturing the garment 1 pertaining to the above embodiment, before the garment 1 is donned, contamination of the sleeve members 30 and the part that becomes the outer surface of the front member 10 (the front body) can be inhibited by the rear

member 20 (the back body), and when the garment 1 is donned, the rear member 20 can be easily disposed on the back side of the wearer's body. In short, in the method of manufacturing the garment 1 pertaining to the above embodiment, the garment 1 that is hygienically excellent and easy to don can be manufactured.

**[0128]** (3-3)

In the garment 1 manufactured by the method of manufacturing the garment 1 pertaining to the above embodiment, the dimension of the openings of the cuffs 32 of the sleeve members 30 is smaller than the dimension of the openings of the armholes 34 of the sleeve members 30. Additionally, in the process of forming the sleeve members, the first sleeve member 30R and the second sleeve member 30L are alternately formed from the third sheet material W3 and the fourth sheet material W4 transported in the first direction D1 in a superimposed state. The first sleeve member 30R is a sleeve member 30 where the cuff 32 is disposed on one end side, in the second direction D2 orthogonal to the first direction D1, of the third sheet material W3 and the fourth sheet material W4 transported in the first direction D1 in a superimposed state. The second sleeve member 30L is a sleeve member 30 where the cuff 32 is disposed on the other end side (the opposite side of the first sleeve member 30R), in the second direction D2 orthogonal to the first direction D1, of the third sheet material W3 and the fourth sheet material W4 transported in the first direction D1 in a superimposed state.

**[0129]** In the sleeve members 30 of the garment 1 manufactured by the method of manufacturing the garment 1 pertaining to the above embodiment, the dimension of the openings of the cuffs 32 is small and the dimension of the openings of the armholes 34 is large. For that reason, in the garment manufactured by this manufacturing method, it is easy for the wearer to move his/her arms when the wearer is donning the garment and less likely for the cuffs 32 to interfere with work.

**[0130]** It will be noted that in the first sleeve member 30R, the cuff 32 which requires less sheet material is disposed on one end (called a first end portion) in the second direction D2, and the armhole 34 which requires more sheet material is disposed on the other end (called a second end portion) in the second direction D2, of the third sheet material W3 and the fourth sheet material W4 transported in a superimposed state. In the second sleeve member 30L, the cuff 32 which requires less sheet material is disposed on the second end portion in the second direction D2, and the armhole 34 which requires more sheet material is disposed on the first end portion in the second direction D2, of the third sheet material W3 and the fourth sheet material W4 transported in a superimposed state. For that reason, using the above mentioned method of manufacturing the garment 1 can reduce the amount of raw material needed to manufacture the sleeve members 30 compared with a case where just sleeve members 30 corresponding to the first sleeve member 30R or the second sleeve member 30L are

continuously manufactured from the third sheet material W3 and the fourth sheet material W4.

**[0131]** (3-4)

The method of manufacturing the garment 1 of the above embodiment includes a first placement process (step B2) and a second placement process (step B4). In the first placement process, the elastic materials E are placed, with respect to the transported third sheet material W3, on both end portions thereof in a direction orthogonal to the direction in which the third sheet material W3 is transported. In the second placement process, the elastic materials E are placed, with respect to the transported fourth sheet material W4, on both end portions thereof in a direction orthogonal to the direction in which the fourth sheet material W4 is transported.

**[0132]** In this method of manufacturing the garment 1, the elastic materials E are placed, with respect to each of the third sheet material W3 and the fourth sheet material W4, on both end portions thereof in directions orthogonal to the transport directions of the third sheet material W3 and the fourth sheet material W4, so the elastic materials E can be provided in the cuffs 32 of the sleeve members 30. For that reason, in the garment 1 manufactured by this manufacturing method, the cuffs 32 can be tightened by the elastic materials E, making it less likely for the cuffs 32 to interfere with work and, furthermore, less likely for foreign matter to get inside the garment 1 through the cuffs 32.

**[0133]** (3-5)

In the method of manufacturing the garment 1 of the above embodiment, the elastic materials E are placed on both the parts of the sleeve members 30 that become the cuffs 32 and the parts of the sleeve members 30 that become the armholes 34. The method of manufacturing the garment 1 includes a cutting process of cutting the elastic materials E that are attached to the parts of the sleeve members 30 that become the armholes 34.

**[0134]** In a case where the elastic materials E are present in the armhole 34 parts of the sleeve members 30, there is a concern that during the manufacture of the garment 1 wrinkles will form in the sheet materials W3, W4 that form the sleeve members 30 and the first sheet material W1 or the second sheet material W2 to which the sleeve members 30 become attached, so that the garment 1 will be unable to be neatly manufactured. Furthermore, if the elastic materials E are present in the armhole 34 parts of the sleeve members 30, there is a concern that they will interfere with the donning of the garment 1.

**[0135]** To address this, in this method of manufacturing the garment 1, the elastic materials E that are attached to the armhole 34 parts of the sleeve members 30 are cut, so the occurrence of situations where the elastic materials E interfere with the manufacture of the garment 1 or interfere with the donning of the garment 1 can be reduced.

**[0136]** (3-6)

The method of manufacturing the garment 1 of the above embodiment includes a joining process (steps A7, A8, A9, A10). The joining process is performed before joining

the first sheet material W1 and the second sheet material W2. In the joining process, the first sheet material W1 and the sleeve members 30 are joined, and the second sheet material W2 and the sleeve members 30 are joined.

**[0137]** In this method of manufacturing the garment 1, misalignment of the sleeve members 30 relative to the first sheet material W1 and the second sheet material W2 in the manufacturing process can be inhibited.

**[0138]** (3-7)

In the method of manufacturing the garment 1 of the above embodiment, the end portions (16c, 26c) of the shoulder parts (the shoulder part 16 of the front member 10 and the shoulder part 26 of the rear member 20) of the garment 1 on the sides of the sleeve member 30 of the garment 1 are disposed closer to the bottom of the garment 1 (the bottom 18 of the front member 10 and the bottom 28 of the rear member 20) than are the end portions (16d, 26d) of the shoulder parts of the garment 1 on the sides of the neckline (the neckline 14 of the front member 10 and the neckline 24 of the rear member 20) of the garment 1. In the second formation process, the first sheet material W1 and the second sheet material W2 are cut in conformity with the shapes of at least parts of the shoulder parts (the sloping portion 16a of the shoulder part 16 of the front member 10 and the sloping portion 26a of the shoulder part 26 of the rear member 20) of the outer edge of the garment 1.

**[0139]** The garment 1 manufactured by this manufacturing method has a shape where the shoulder parts become lower from the neckline side toward the sleeve portions. For that reason, the garment 1 manufactured by this manufacturing method easily fits the body.

**[0140]** (3-8)

The method of manufacturing the garment 1 of the above embodiment includes a folding process (step A13). The folding process is executed after the second formation process (steps A11, A12) and before the separation process (step A14) on the first sheet material W1 and the second sheet material W2 transported in the third direction D3 in the superimposed state. In the folding process, both end portions of the first sheet material W1 and the second sheet material W2 in a direction orthogonal to the third direction D3 are folded inward along the third direction D3.

**[0141]** In this method of manufacturing the garment 1, the garment 1 that is manufactured can be made compact.

#### (4) Example Modifications

**[0142]** Example modifications of the above embodiment will be described below. It will be noted that the following example modifications may be combined as appropriate to the extent that they are not mutually contradictory.

#### (4-1) Example Modification A

**[0143]** The positions and numbers of the ties and the hook-and-loop fastener for fastening provided on the front member 10 and the rear member 20 are examples and can be changed as appropriate. Furthermore, the ties and the hook-and-loop fastener for fastening may be omitted as appropriate.

#### (4-2) Example Modification B

**[0144]** In the process of step C3 of the above embodiment, a slit is formed in the second sheet material W2 along the direction in which the second sheet material W2 is transported.

**[0145]** However, the present invention is not limited thereto, and in the process of step C3 a perforation may be formed instead of a slit in the second sheet material W2 along the direction in which the second sheet material W2 is transported. It will be noted that in this case the second sheet material W2 is not separated. For that reason, the processes of steps C4 to C10 of FIG. 12 become performed on one sheet material (the second sheet material W2). Furthermore, in this case, rather than the second right-side sheet material W2a and the second left-side sheet material W2b being superimposed on the first sheet material W1 in two processes as in step A9 and step A10 of FIG. 10, the second sheet material W2 becomes superimposed on the first sheet material W1 in one process. Furthermore, the garment 1 manufactured in this case does not have a configuration where the right rear member 20R and the left rear member 20L overlap as in the above embodiment. When donning the garment 1 (see FIG. 16) in which a perforation 23 is formed instead of a slit, for example an assistant assisting the wearer in donning the garment 1 tears the perforation 23 part and then disposes the rear member 20 on the back side of the wearer.

**[0146]** Furthermore, the process of step C3 may be omitted. In this case, when donning the garment 1, for example an assistant assisting the wearer in donning the garment 1 cuts the rear member 20 in a predetermined place along the up-down direction (e.g., cuts the rear member 20 along a cut line drawn on the rear member 20) and disposes the rear member 20 on the back side of the wearer.

#### (4-3) Example Modification C

**[0147]** In the above embodiment, the first sheet material W1 and the sleeve members 30 are superimposed and then the first sheet material W1 and the second sheet material W2 are superimposed. However, the present invention is not limited thereto, and the second sheet material W2 and the sleeve members 30 may be superimposed and then the second sheet material W2 and the first sheet material W1 may be superimposed.

## (4-4) Example Modification D

**[0148]** In the garment 1 manufactured by the manufacturing method of the above embodiment, the dimension of the openings of the cuffs 32 of the sleeve members 30 is smaller than the dimension of the openings of the armholes 34 of the sleeve members 30. However, the present invention is not limited thereto, and the dimension of the openings of the cuffs 32 of the sleeve members 30 may be identical to the dimension of the openings of the armholes 34 of the sleeve members 30. In other words, the thickness of the sleeve members 30 may be uniform.

## (4-5) Example Modification E

**[0149]** In the manufacturing method of the above embodiment, the sleeve member 30 that becomes the right sleeve and the sleeve member 30 that becomes the left sleeve are manufactured from the third sheet material W3 and the fourth sheet material W4. However, the present invention is not limited thereto, and the sleeve member 30 that becomes the right sleeve may be manufactured from a pair of sheet materials, and the sleeve member 30 that becomes the left sleeve may be manufactured from a pair of sheet materials different from those of the sleeve member 30 that becomes the right sleeve. In other words, the sleeve member 30 that becomes the right sleeve and the sleeve member 30 that becomes the left sleeve may be manufactured by respectively different devices. However, in this case, a manufacturing device for the right sleeve and a manufacturing device for the left sleeve each become needed, which has the potential to lead to an increase in the cost of the garment manufacturing system.

## (4-6) Example Modification F

**[0150]** In the manufacturing method of the above embodiment, the joining of the first sheet material W1 and the sleeve members 30 and the joining of the second sheet material W2 and the sleeve members 30 are completed in steps A7, A8, A9, and A10.

**[0151]** However, the present invention is not limited thereto, and in steps A7, A8, A9, and A10, tentative fixing of the first sheet material W1 and the sleeve members 30 and tentative fixing of the second sheet material W2 and the sleeve members 30 may be performed. Then, when the joining of the first sheet material W1 and the second sheet material W2 is performed in step A11, the joining of the first sheet material W1 and the sleeve members 30 and the joining of the second sheet material W2 and the sleeve members 30 may be performed. It will be noted that even in a case where heat welding or ultrasonic welding is selected as the joining means, by adjusting the output, the first sheet material W1 and the second sheet material W2 can be joined to the sleeve members 30 while keeping the third sheet material W3 and the

fourth sheet material W4 from being welded together.

## (4-7) Example Modification G

5 **[0152]** The method of manufacturing the garment 1 described in the above embodiment is merely an example of the present invention and can be changed as appropriate.

10 **[0153]** For example, although in the above embodiment the elastic materials E are attached to the third sheet material W3 and the fourth sheet material W4, this process may be omitted.

15 **[0154]** Furthermore, for example, although in the above embodiment the garment 1 is separated from the first sheet material W1 and the second sheet material W2 after the folding device 195 folds the garment 1, conversely the garment 1 may be folded after the garment 1 is separated from the first sheet material W1 and the second sheet material W2.

## (4-8) Example Modification H

20 **[0155]** Although the shoulder parts 16, 26 of the garment 1 described in the above embodiment have the sloping portions 16a, 26a, they are not limited thereto. The shoulder parts 16, 26 may be entirely configured by the horizontal portions 16b, 26b.

## (4-9) Example Modification I

30 **[0156]** In the method of manufacturing the garment of the above embodiment, the sleeve member 30 where the cuff 32 is disposed on one end side in the second direction D2 orthogonal to the first direction D1 and the sleeve member 30 where the cuff 32 is disposed on the other end side in the second direction D2 are alternately formed by cutting the third sheet material W3 and the fourth sheet material W4 transported in the first direction D1 (just by joining and cutting both sheets).

40 **[0157]** However, the method of manufacturing the garment of the present disclosure is not limited to this kind of aspect. For example, in the method of manufacturing the garment of the present disclosure, the third sheet material W3 and the fourth sheet material W4 transported in the first direction D1 may be cut (both sheets may be joined and cut) to form just sleeve members 30 where the cuff 32 is disposed on one end side in the second direction D2 orthogonal to the first direction D1. Then, after the sleeve members 30 are formed, the sleeve members 30 may be transported while changing the attitudes of the sleeve members 30 so that a sleeve member 30 where the cuff 32 is disposed on one end side in the direction orthogonal to the transport direction and a sleeve member 30 where the cuff 32 is disposed on the other end side in the direction orthogonal to the transport direction are alternately arranged in the transport direction.

50 **[0158]** With this kind of configuration, as a result, both the sleeve member used as the right sleeve and the

sleeve member 30 used as the left sleeve can be manufactured from the third sheet material W3 and the fourth sheet material W4.

(4-10) Example Modification J

**[0159]** In the manufacturing method of the above embodiment, the sleeve edge portion cutting device 240 cuts, along the direction in which the joints extend and in the central portions of the joints, each of the joints in the third sheet material W3 and the fourth sheet material W4 formed by the sleeve edge portion joining device 230. At the point in time when this process ends, joints J (the hatched parts) between the third sheet material W3 and the fourth sheet material W4 project outward of the sleeve members 30 as in FIG. 17.

**[0160]** If the garment 1 is manufactured with the joints J between the third sheet material W3 and the fourth sheet material W4 in the sleeve members 30 projecting outward (if the garment 1 is manufactured such that the joints J are disposed on the outside when the garment 1 is donned), the potential for phenomena such as for example the joints J getting caught on or contacting a patient's organs during surgery to occur, such that the joints J end up inadvertently injuring the patient's organs, is conceivable. Furthermore, there is the concern that such a garment 1 may also deteriorates the appearance.

**[0161]** From such a standpoint, the method of manufacturing the garment 1 may include a reversal process. The reversal process is a process executed before superimposing the sleeve members 30 that have been formed by the first formation process with the first sheet material in the first superimposition process. The reversal process is a process of reversing the sleeve members 30 so that the surfaces of the sleeve members 30 that are disposed on the outside during the first formation process are disposed on the inside.

**[0162]** The reversal process specifically for example is a process of gripping the sides of the cuff 32 of the sleeve members that have been formed by the first formation process and whose first faces F1 (the sides where the joints J are exposed) face outward as in FIG. 17, and moving the cuffs 32 through the openings formed between the third sheet material W3 and the fourth sheet material W4 on the sides of the armhole 34 to dispose the first faces F1 inside the tubular sleeve members 30.

**[0163]** An example of a process of forming the sleeve members 30 including the reversal process will be described with reference to FIG. 18. It will be noted that, here, a case where the third sheet material W3 and the fourth sheet material W4 transported in the first direction D1 are joined and cut to form just the sleeve members 30 where the cuffs 32 are disposed on one end side in the second direction D2 as in example modification I will be taken as an example and described.

**[0164]** The process (the processes of step B1 to step B6 depicted in FIG. 18) of forming the sleeve members 30 described here is the same as the process of forming the

sleeve members 30 of the above embodiment except that step B2 and step B4 are partially different. Therefore, regarding the processes of step B1 to step B6, just the differences will be described here.

5 **[0165]** Here, since only the sleeve members 30 where the cuffs 32 are disposed on one end side in the second direction D2 are formed by joining and cutting the third sheet material W3 and the fourth sheet material W4, it is not necessary to dispose the elastic materials E on both ends in the second direction D2 in step B2 and step B4, and the elastic materials E need only be disposed on the side in the second direction D2 where the cuffs 32 are disposed. It will be noted that in the manufacturing flow of FIG. 18, the process of cutting the elastic materials E on the armhole 34 side is also unnecessary because the elastic materials E are not disposed on the armhole 34 side.

10 **[0166]** In step B7a, as in the above embodiment, the sleeve edge portion cutting device 240 cuts, along the direction in which the joints extend and in the central portions of the joints, each of the joints formed by the sleeve edge portion joining device 230 in the third sheet material W3 and the fourth sheet material W4 transported in the first direction D1 in the superimposed state. However, preferably, the sleeve edge portion cutting device 240 does not entirely cut the third sheet material W3 and the fourth sheet material W4 in the second direction D2. With this configuration, at the point in time when step B7a ends, the sleeve member 30 formed through the configuration of step B7a is connected to the sleeve members 30 adjacent thereto in the first direction D1 on the armhole 34 side in the second direction D2 (see FIG. 18).

15 **[0167]** Next, at the position indicated by reference sign R1 in FIG. 18, the sleeve members 30 are reversed by a reversing device (a blowing machine, a suction machine, a robot arm, etc.). The reversal method is as described above.

20 **[0168]** Thereafter, at the position indicated by reference sign B7b in FIG. 18, the sleeve members 30 adjacent to each other in the first direction D1 are cut apart by a cutting device so that the sleeve members 30 become mutually independent.

25 **[0169]** After the end of step B7b, the sleeve members 30 are transported to the next process by the position adjusting devices 245, 250 in the same manner as in step B8 of the above embodiment (step B8a). However, in the flow shown in FIG. 18, just the sleeve members 30 where the cuffs 32 are disposed on one end side in the second direction D2 are formed by joining and cutting the third sheet material W3 and the fourth sheet material W4 (by going through the processes of step B6 and step B7a). For that reason, in step B8a, the position adjusting devices 245, 250 together perform processes to change the attitudes in which the sleeve members 30 are transported so that a sleeve member 30 where the cuff 32 is disposed on one end side in the direction orthogonal to the transport direction and a sleeve member 30 where the cuff 32 is disposed on the other end side in the direction ortho-

gonal to the transport direction are alternately arranged along the transport direction of the sleeve members 30 as described in example modification I.

**[0170]** It will be noted that the process of forming the sleeve members 30 described with reference to FIG. 18 is merely an example and may be changed as appropriate.

**[0171]** For example, the reversal process R1 may be performed after the sleeve members 30 have become mutually independent members.

**[0172]** Furthermore, the reversal process R1 may also be applied to the case described in the above embodiment of alternately forming a sleeve member 30 where the cuff 32 is disposed on one end side in the second direction D2 orthogonal to the first direction D1 and a sleeve member 30 where the cuff 32 is disposed on the other end side in the second direction D2 by cutting the third sheet material W3 and the fourth sheet material W4 transported in the first direction D1 (just by joining and cutting both sheets).

<Addendum>

**[0173]** Finally, the technical ideas that can be grasped from the above embodiment and other examples (example modifications) is appended below.

**[0174]** A method of manufacturing a garment pertaining to a first aspect of the present invention includes a first transport process, a second transport process, a first formation process, a first superimposition process, a second superimposition process, a second formation process, and a separation process. In the first transport process, a first sheet material for forming a first member is transported. In the second transport process, a second sheet material for forming a second member is transported. The first member is one of a front body and a back body, and the second member is the other of the front body and the back body. In the first formation process, tubular sleeve members are formed by superimposing a transported third sheet material and a transported fourth sheet material, partially joining the third sheet material and the fourth sheet material transported in the superimposed state, and cutting them in predetermined positions. In the first superimposition process, the transported first sheet material and the sleeve members are superimposed. In the second superimposition process, the transported first sheet material and the transported second sheet material are superimposed so that the sleeve members superimposed with the first sheet material are disposed between the first sheet material and the second sheet material. In the second formation process, the first sheet material and the second sheet material transported in the superimposed state are partially joined in conformity with the shape of the outer edge of the garment. Furthermore, in the second formation process, the first sheet material and the second sheet material transported in the superimposed state are partially cut in conformity with the shape of the outer edge of the garment. In the separation process, the garment that has

been formed by the second formation process is separated from the first sheet material and the second sheet material.

**[0175]** In the method of manufacturing the garment of the first aspect, the garment can be manufactured by a relatively simple process, and the garment can be efficiently manufactured.

**[0176]** Furthermore, in the method of manufacturing the garment pertaining to the first aspect, the sleeve members are disposed between the first sheet material for forming the first member and the second sheet material for forming the second member, so the sleeve members and the part that becomes the outer surface (front surface) of the front body can be covered by the back body. As a result, in the method of manufacturing the garment pertaining to the first aspect, a hygienically excellent garment, capable of reducing the occurrence of a situation where the sleeve members and the outer surface of the front body of the manufactured garment are touched by a person's hands for example and become contaminated, can be manufactured.

**[0177]** A garment manufacturing method pertaining to a second aspect of the present invention is the garment manufacturing method of the first aspect, further including a third formation process. In the third formation process, a slit or perforation is formed in the first sheet material along the direction in which the first sheet material is transported. Alternatively, in the third formation process, a slit or perforation is formed in the second sheet material along the direction in which the second sheet material is transported.

**[0178]** In the method of manufacturing the garment pertaining to the second aspect, a slit or perforation can be formed in the member that becomes the back body. As a result, before the garment is donned, contamination of the sleeve members and the part that becomes the outer surface of the front body can be inhibited by the back body, and when the garment is donned, the back body can be easily disposed on the back side of the wearer's body. In short, in the method of manufacturing the garment pertaining to the second aspect, a garment that is hygienically excellent and easy to don can be manufactured.

**[0179]** A garment manufacturing method pertaining to a third aspect of the present invention is the garment manufacturing method of the first aspect or the second aspect, wherein in the garment manufactured by the manufacturing method, the dimension of openings of cuffs of the sleeve members is smaller than the dimension of openings of armholes of the sleeve members. In the process of forming the sleeve members, a first sleeve member and a second sleeve member are alternately formed from the third sheet material and the fourth sheet material transported in a first direction in the superimposed state. The first sleeve member is a sleeve member where the cuff is disposed on one end side, in a second direction orthogonal to the first direction, of the third sheet material and the fourth sheet material transported in the

first direction in the superimposed state. The second sleeve member is a sleeve member where the cuff is disposed on the other end side (the opposite side of the first sleeve members), in the second direction orthogonal to the first direction, of the third sheet material and the fourth sheet material transported in the first direction in the superimposed state.

**[0180]** In the sleeve members of the garment manufactured by the method of manufacturing the garment pertaining to the third aspect, the dimension of the openings of the cuffs is small and the dimension of the openings of the armholes is large, so in the method of manufacturing the garment pertaining to the third aspect, a garment in which it is easy for the wearer to move his/her arms when the wearer is donning the garment and less likely for the cuffs to interfere with work can be manufactured.

**[0181]** It will be noted that in the first sleeve member, the cuff which requires less sheet material is disposed on one end (called a first end portion) in the second direction of the third sheet material and the fourth sheet material transported in a superimposed state, and the armhole which requires more sheet material is disposed on the other end (called a second end portion) in the second direction of the third sheet material and the fourth sheet material transported in a superimposed state. In the second sleeve member, the cuff which requires less sheet material is disposed on the second end portion in the second direction of the third sheet material and the fourth sheet material transported in a superimposed state, and the armhole which requires more sheet material is disposed on the first end portion in the second direction of the third sheet material and the fourth sheet material transported in a superimposed state. For that reason, using the method of manufacturing the garment pertaining to the third aspect can reduce the generation of leftover material in the manufacture of the sleeve members compared with a case where just sleeve members corresponding to the first sleeve member or the second sleeve member are continuously manufactured from the third sheet material and the fourth sheet material.

**[0182]** A garment manufacturing method pertaining to a fourth aspect of the present invention is the garment manufacturing method of the third aspect, further including a first placement process and a second placement process. In the first placement process, elastic materials are placed, with respect to the transported third sheet material, on both end portions thereof in a direction orthogonal to the direction in which the third sheet material is transported. In the second placement process, elastic materials are placed, with respect to the transported fourth sheet material, on both end portions thereof in a direction orthogonal to the direction in which the fourth sheet material is transported.

**[0183]** In the garment manufacturing method pertaining to the fourth aspect, the elastic materials are placed, with respect to each of the third sheet and the fourth sheet, on both end portions thereof in directions ortho-

gonal to the transport directions of the third sheet and the fourth sheet, so the elastic materials can be provided in the cuffs of the sleeve members. For that reason, in the garment manufactured by the garment manufacturing method of the fourth aspect, the cuffs can be tightened by the elastic materials, making it less likely for the cuffs to interfere with work and, furthermore, less likely for foreign matter to get inside the garment through the cuffs.

**[0184]** A garment manufacturing method pertaining to a fifth aspect of the present invention is the garment manufacturing method of the fourth aspect, wherein the elastic materials are placed on both the parts of the sleeve members that become the cuffs and the parts of the sleeve members that become the armholes. The garment manufacturing method further includes a cutting process of cutting the elastic materials that are attached to the parts of the sleeve members that become the armholes.

**[0185]** In a case where the elastic materials are present in the armhole parts of the sleeve members, there is a concern that during the manufacture of the garment wrinkles will form in the sheets that form the sleeve members and the first sheet material or the second sheet material to which the sleeve members become attached, so that the garment will be unable to be neatly manufactured. Furthermore, if the elastic materials are present in the armhole parts of the sleeve members, there is a concern that they will interfere with the donning of the garment.

**[0186]** To address this, in the method of manufacturing the garment pertaining to the fifth aspect, the elastic materials that are attached to the armhole parts of the sleeve members are cut, so the occurrence of situations where the elastic materials interfere with the manufacture of the garment or interfere with the donning of the garment can be reduced.

**[0187]** A garment manufacturing method pertaining to a sixth aspect of the present invention is the garment manufacturing method of any of the first aspect to the fifth aspect, further including a joining process. The joining process is performed before joining the first sheet material and the second sheet material. In the joining process, the first sheet material and the sleeve members are joined, and the second sheet material and the sleeve members are joined.

**[0188]** In the garment manufacturing method pertaining to the sixth aspect, misalignment of the sleeve members relative to the first sheet material and the second sheet material in the manufacturing process can be inhibited.

**[0189]** A garment manufacturing method pertaining to a seventh aspect of the present invention is the garment manufacturing method of any of the first aspect to the sixth aspect, wherein end portions of shoulder parts of the garment on the sleeve member sides of the garment are disposed closer to a bottom of the garment than are end portions of the shoulder parts of the garment on a neckline side of the garment. In the second formation process,

the first sheet material and the second sheet material are cut in conformity with the shapes of at least parts of the shoulder parts on the outer edge of the garment.

[0190] The shoulder parts of the garment manufactured by the manufacturing method pertaining to the seventh aspect have a shape where they become lower from the neckline side toward the sleeve portions. For that reason, the garment manufactured by the manufacturing method pertaining to the seventh aspect easily fits the body.

[0191] A garment manufacturing method pertaining to an eighth aspect of the present invention is the garment manufacturing method of any of the first aspect to the seventh aspect, further including a folding process. The folding process is executed after the second formation process and before the separation process on the first sheet material and the second sheet material transported in a third direction in the superimposed state. In the folding process, both end portions of the first sheet material and the second sheet material in a direction orthogonal to the third direction are folded inward along the third direction.

[0192] In the method of manufacturing the garment pertaining to the eighth aspect, the garment that is manufactured can be made compact.

[0193] A garment manufacturing method pertaining to a ninth aspect of the present invention is the garment manufacturing method of any of the first aspect to the eighth aspect, further including a reversal process. The reversal process is executed before superimposing the sleeve members that have been formed by the first formation process with the first sheet material in the first superimposition process. In the reversal process, the sleeve members are reversed so that the surfaces of the sleeve members that are disposed on the outside during the first formation process are disposed on the inside.

[0194] In the method of manufacturing the garment pertaining to the ninth aspect, the joints between the third sheet material and the fourth sheet material in the sleeve members can be disposed inside the sleeve members, so the occurrence of a situation where the joints in the sleeve members project outward and interfere with the work of the wearer of the garment can be reduced. Furthermore, in the method of manufacturing the garment pertaining to the ninth aspect, the joints between the third sheet material and the fourth sheet material in the sleeve members can be disposed inside the sleeve members, so the appearance of the garment that is manufactured is good.

## REFERENCE SIGNS LIST

### [0195]

1	Garment
10	Front Member (First Member)
14	Neckline

16	Shoulder Parts
16a	Sloping Portions
16b	Horizontal Portions
20	Rear Member (Second Member)
5 23	Perforation
24	Neckline
26	Shoulder Parts
26a	Sloping Portions
26b	Horizontal Portions
10 30	Sleeve Members
30R	First Sleeve Member
30L	Second Sleeve Member
32	Cuffs
34	Armholes
15 E	Elastic Materials
W1	First Sheet Material
W2	Second Sheet Material
W3	Third Sheet Material
W4	Fourth Sheet Material
20	

## Claims

1. A method of manufacturing a garment comprising:

- 25 a first transport process of transporting a first sheet material for forming a first member that is one of a front body and a back body;
- a second transport process of transporting a second sheet material for forming a second member that is the other of the front body and the back body;
- 30 a first formation process of forming tubular sleeve members by superimposing a transported third sheet material and a transported fourth sheet material, partially joining the third sheet material and the fourth sheet material transported in the superimposed state, and cutting them in predetermined positions,
- 35 a first superimposition process of superimposing the transported first sheet material and the sleeve members;
- a second superimposition process of superimposing the transported first sheet material and the transported second sheet material so that the sleeve members superimposed with the first sheet material are disposed between the first sheet material and the second sheet material;
- 40 a second formation process of partially joining, in conformity with the shape of the outer edge of the garment, the first sheet material and the second sheet material transported in the superimposed state and partially cutting, in conformity with the shape of the outer edge of the garment, the first sheet material and the second sheet material being transported in the superimposed state; and
- 45 a separation process of separating from the first sheet material and the second sheet material
- 50
- 55

- the garment that has been formed by the second formation process.
2. The garment manufacturing method of claim 1, further comprising  
a third formation process of forming a slit or perforation in the first sheet material along the direction in which the first sheet material is transported or forming a slit or perforation in the second sheet material along the direction in which the second sheet material is transported.
3. The garment manufacturing method of claim 1 or 2, wherein  
the dimension of openings of cuffs of the sleeve members is smaller than the dimension of openings of armholes of the sleeve members, and in the first formation process, from the third sheet material and the fourth sheet material transported in a first direction in the superimposed state are alternately formed a first sleeve member where the cuff is disposed on one end side in a second direction orthogonal to the first direction and a second sleeve member where the cuff is disposed on the other end side in the second direction.
4. The garment manufacturing method of claim 3, further comprising  
a first placement process of placing, with respect to the transported third sheet material, elastic materials on both end portions thereof in a direction orthogonal to the direction in which the third sheet material is transported, and  
a second placement process of placing, with respect to the transported fourth sheet material, elastic materials on both end portions thereof in a direction orthogonal to the direction in which the fourth sheet material is transported.
5. The garment manufacturing method of claim 4, wherein  
the elastic materials are placed on both the parts of the sleeve members that become the cuffs and the parts of the sleeve members that become the armholes, and  
the garment manufacturing method further comprises a cutting process of cutting the elastic materials that are attached to the parts of the sleeve members that become the armholes.
6. The garment manufacturing method of any one of claims 1 to 5, further comprising  
a joining process of joining the first sheet material and the sleeve members and joining the second
- sheet material and the sleeve members before joining the first sheet material and the second sheet material.
7. The garment manufacturing method of any one of claims 1 to 6, wherein  
end portions of shoulder parts of the garment on the sleeve member sides are disposed closer to a bottom of the garment than are end portions of the shoulder parts of the garment on a neckline side of the garment, and  
in the second formation process, the first sheet material and the second sheet material are cut in conformity with the shapes of at least parts of the shoulder parts on the outer edge of the garment.
8. The garment manufacturing method of any one of claims 1 to 7, further comprising  
a folding process, executed after the second formation process and before the separation process on the first sheet material and the second sheet material transported in a third direction in the superimposed state,  
in the folding process, the first sheet material and the second sheet material being folded along the third direction so that both end portions of the first sheet material and the second sheet material in a direction orthogonal to the third direction being folded inward.
9. The garment manufacturing method of any one of claims 1 to 8, further comprising  
a reversal process, executed before superimposing the sleeve members that have been formed by the first formation process with the first sheet material in the first superimposition process,  
in the reversal process, the sleeve members being reversed to thereby dispose on the inside the surfaces of the sleeve members being disposed on the outside during the first formation process.

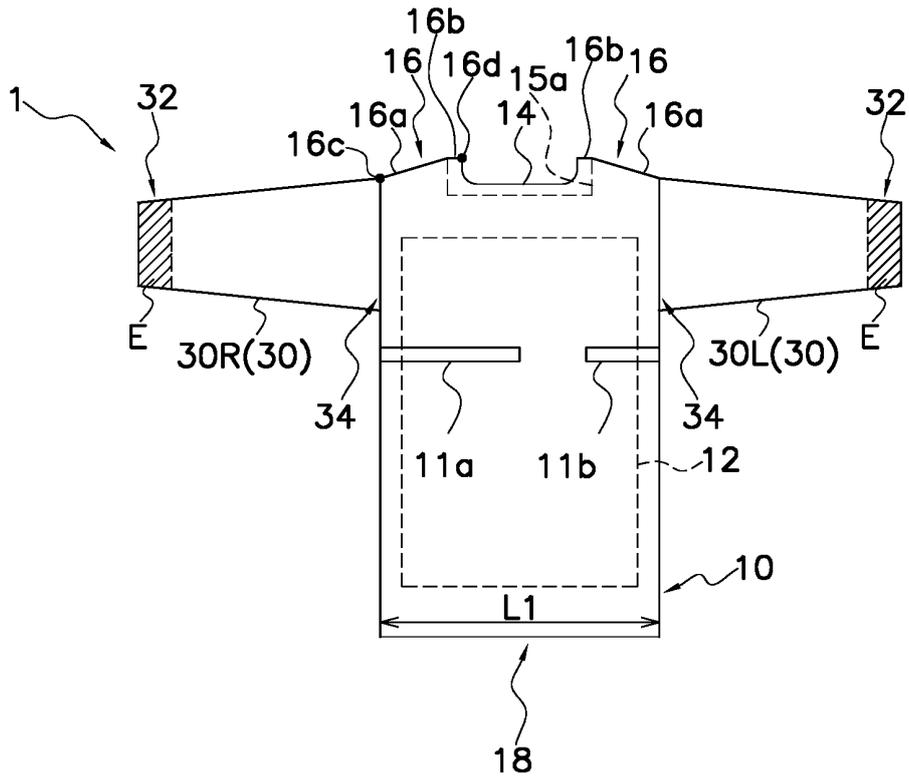


FIG. 1

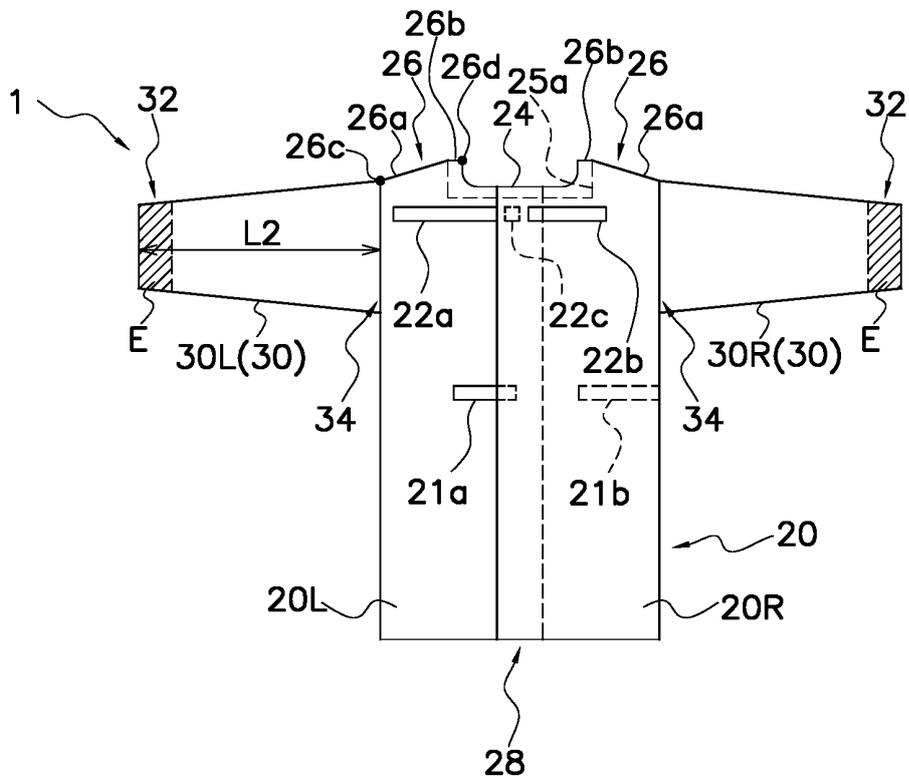


FIG. 2

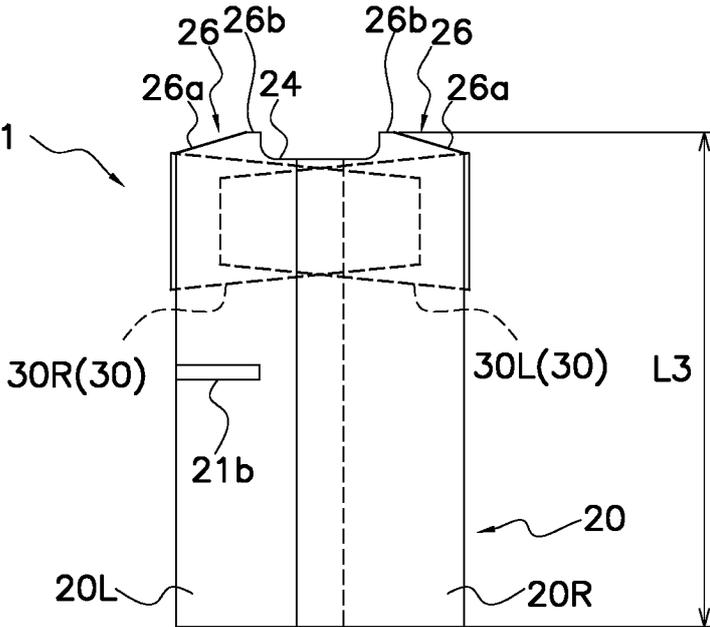


FIG. 3

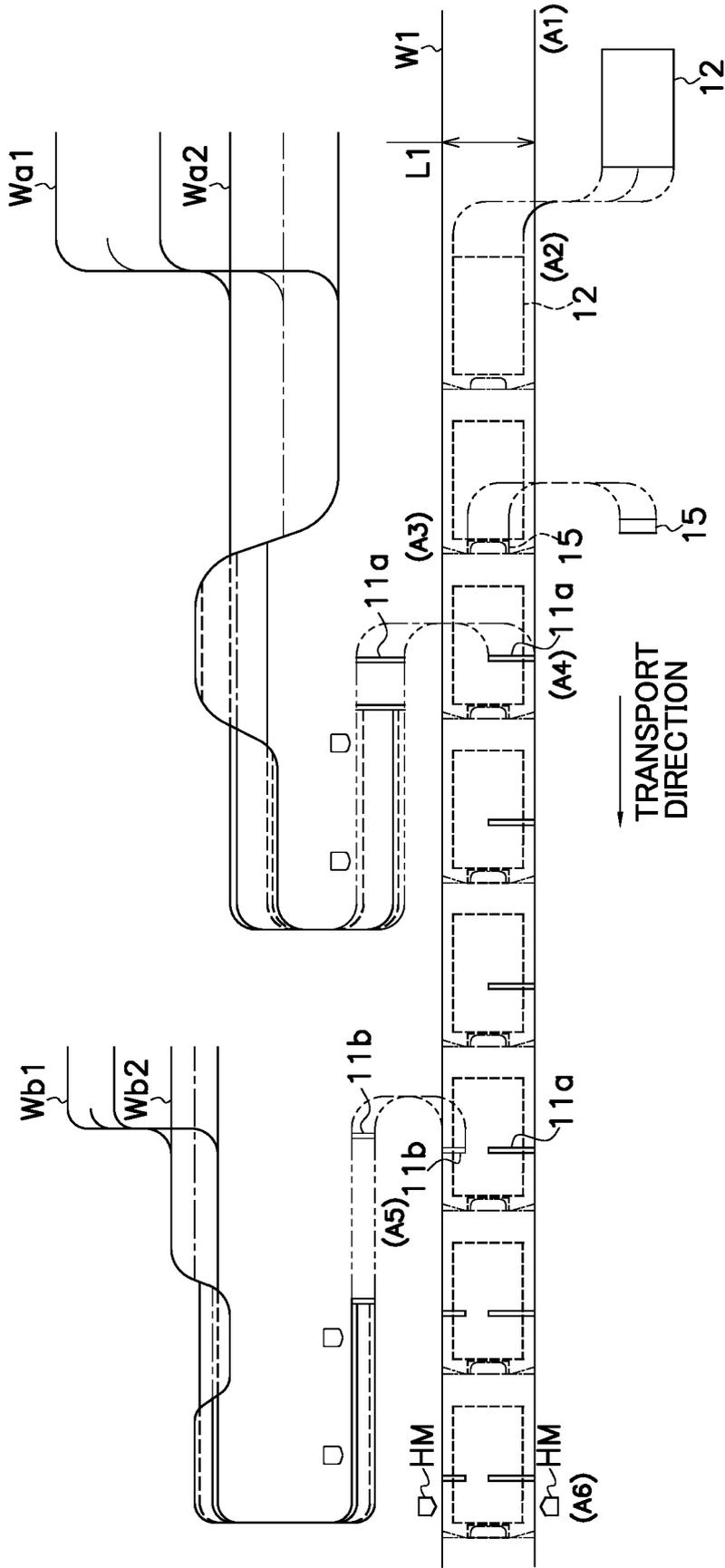


FIG. 4

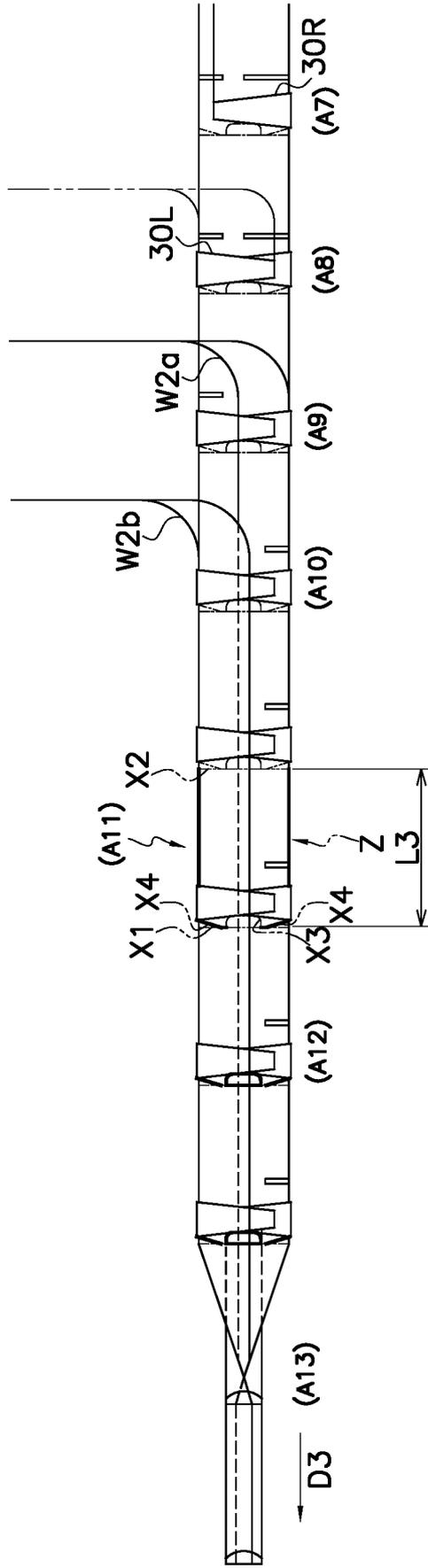


FIG. 5

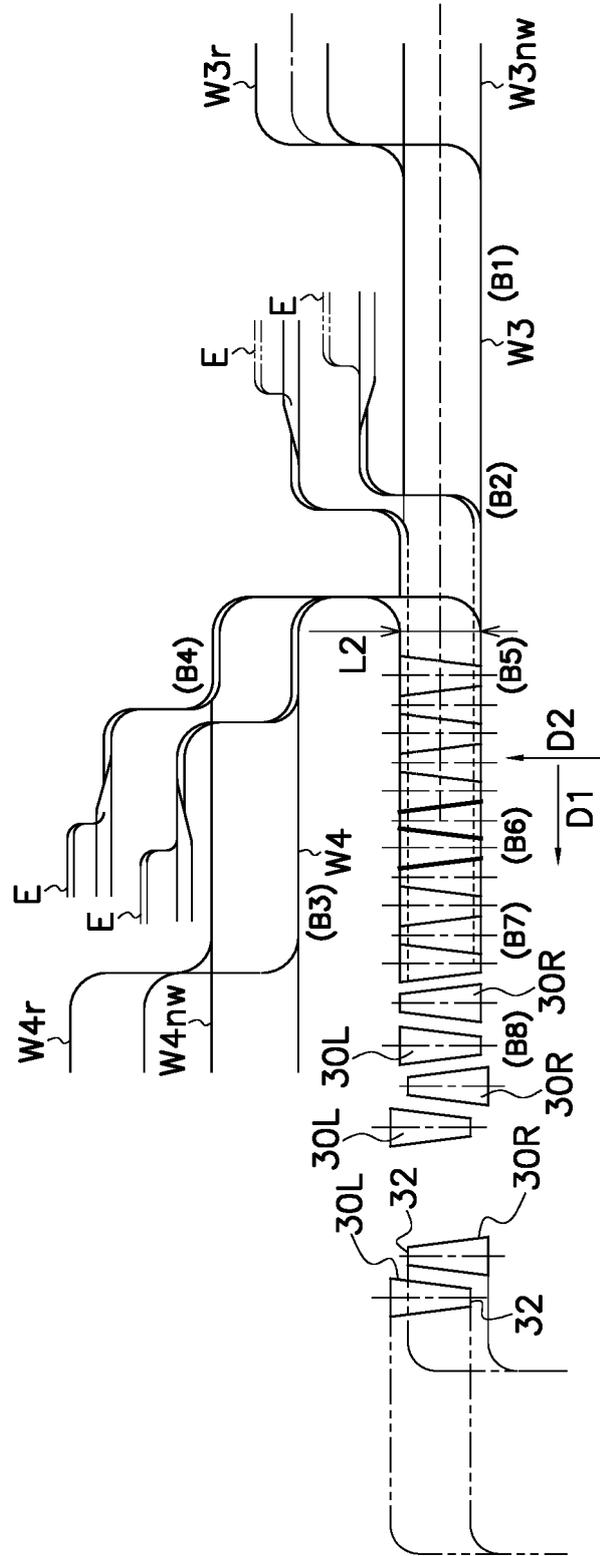


FIG. 6

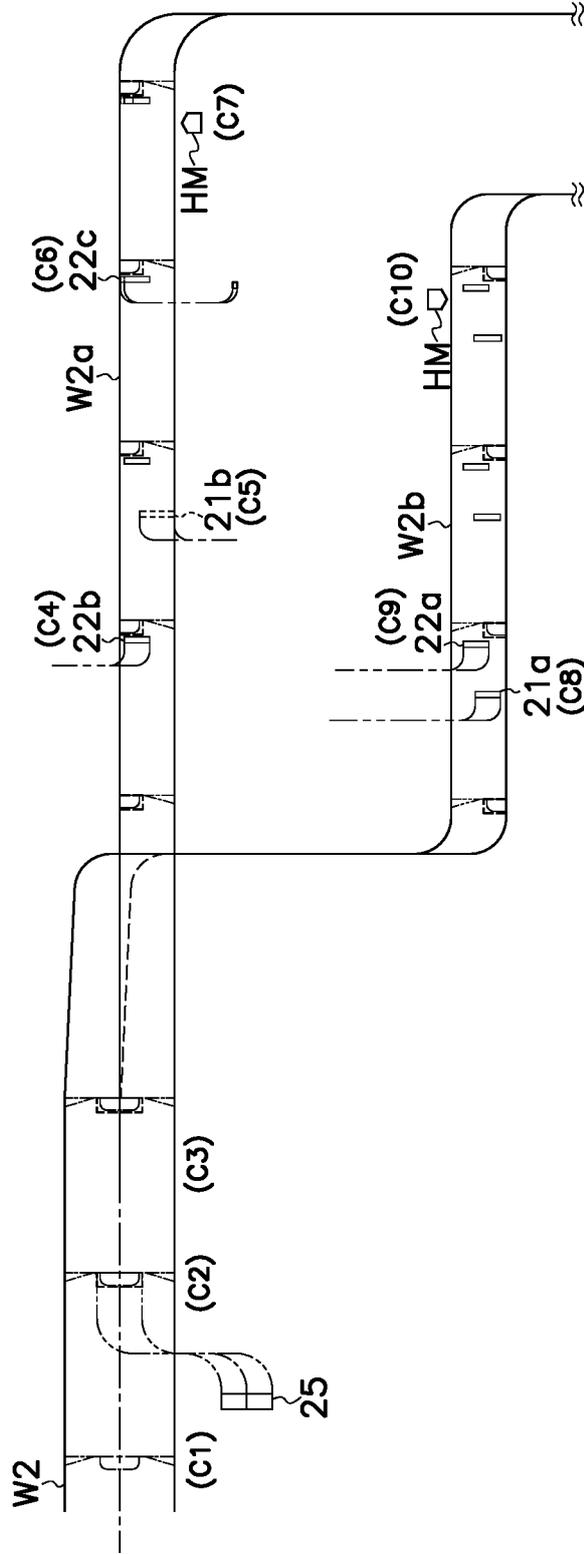


FIG. 7

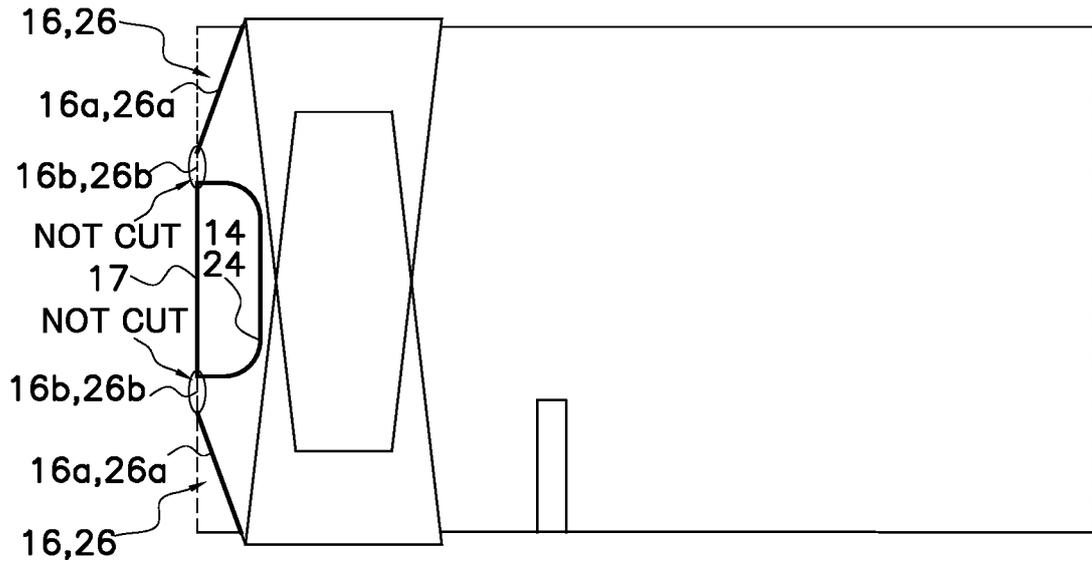


FIG. 8

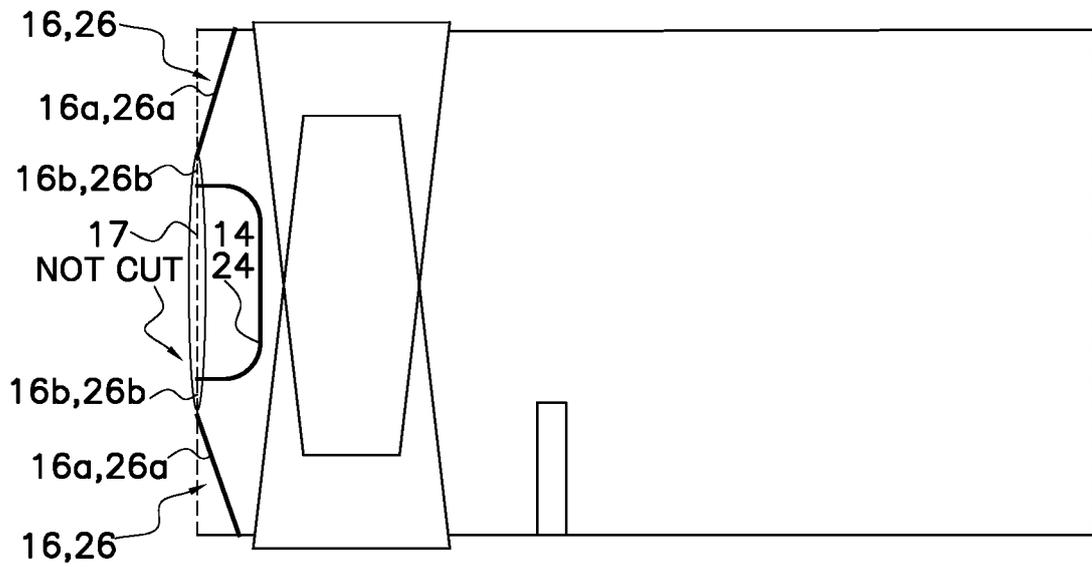


FIG. 9

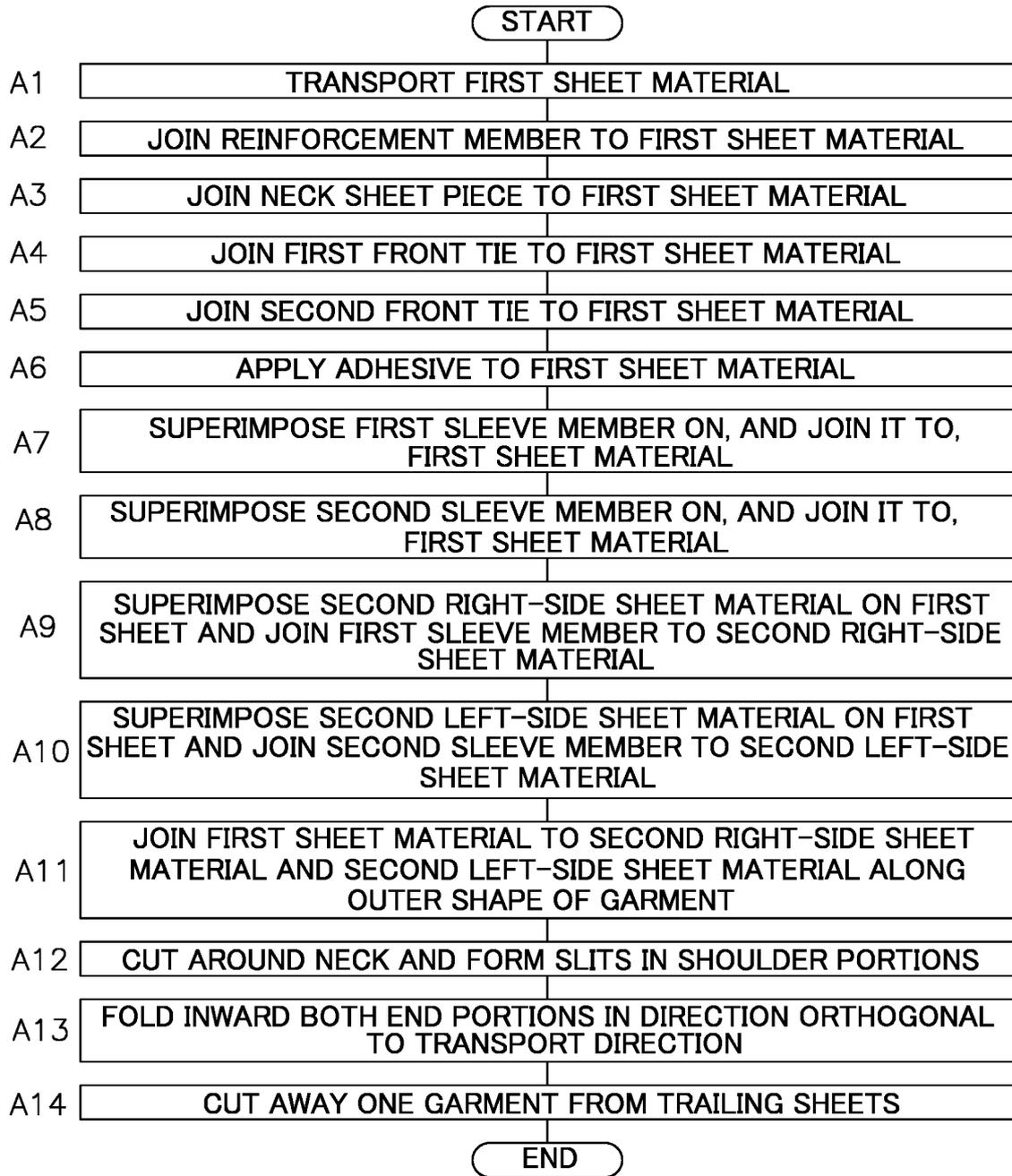
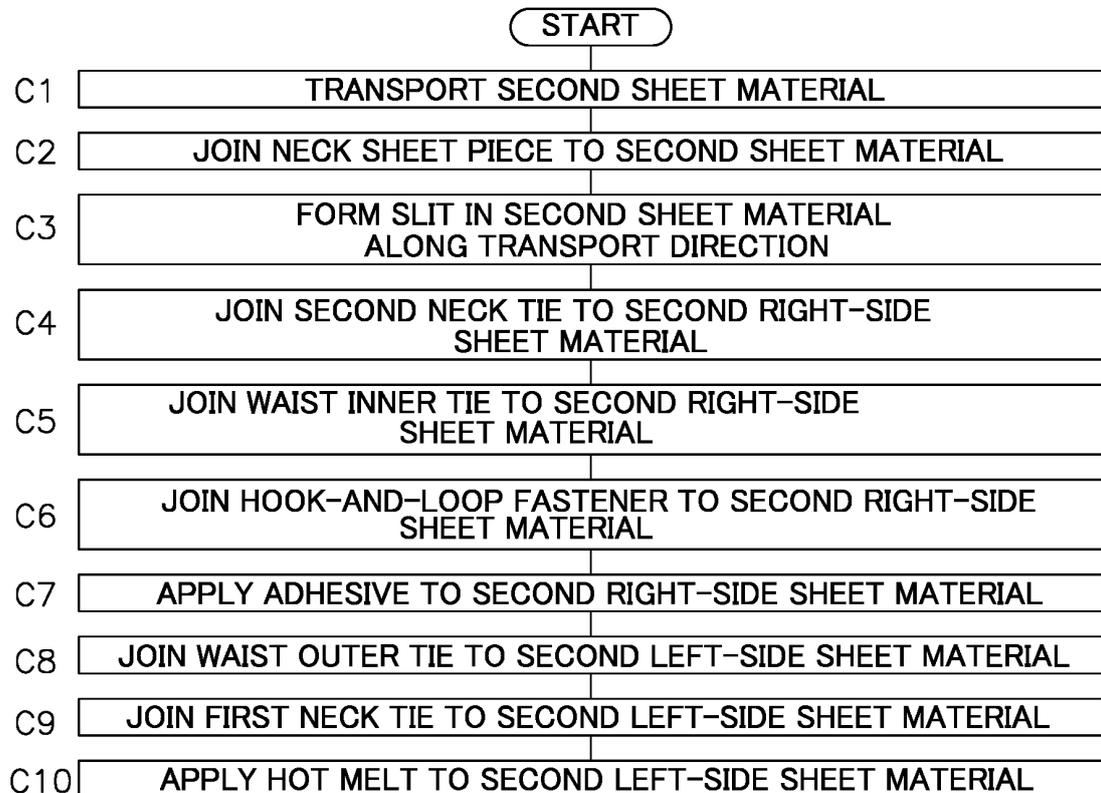
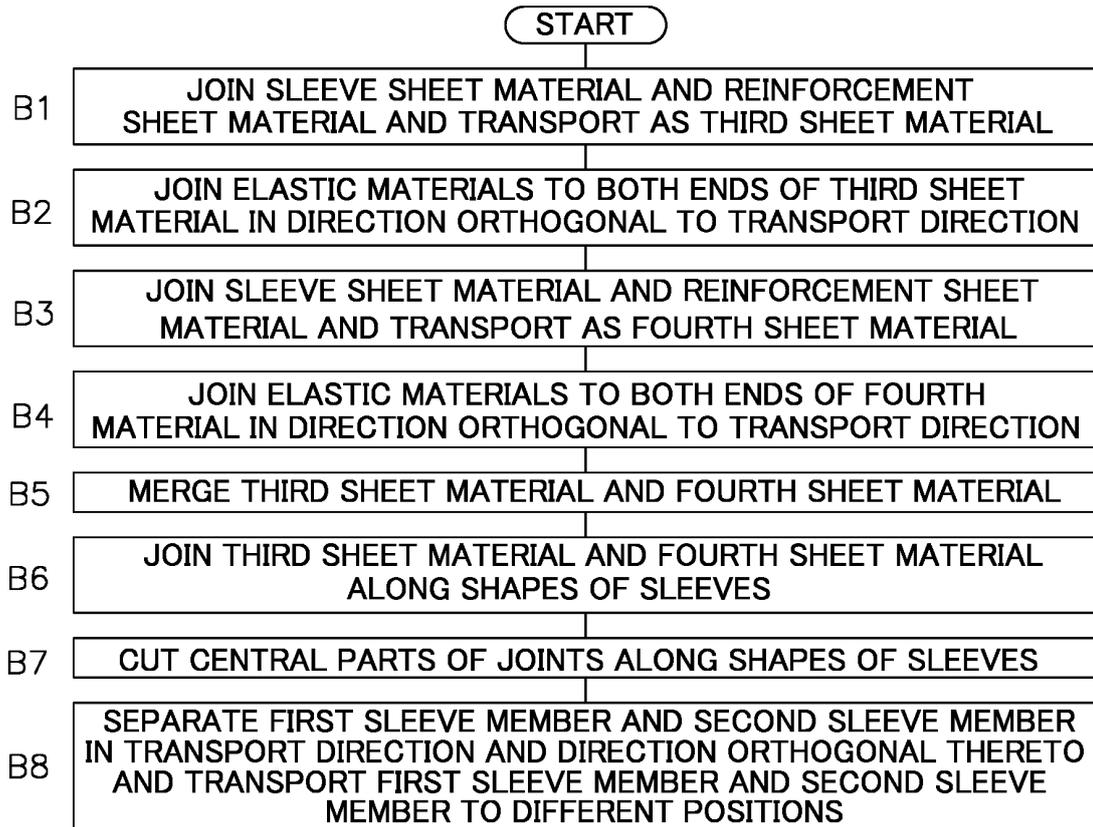


FIG. 10



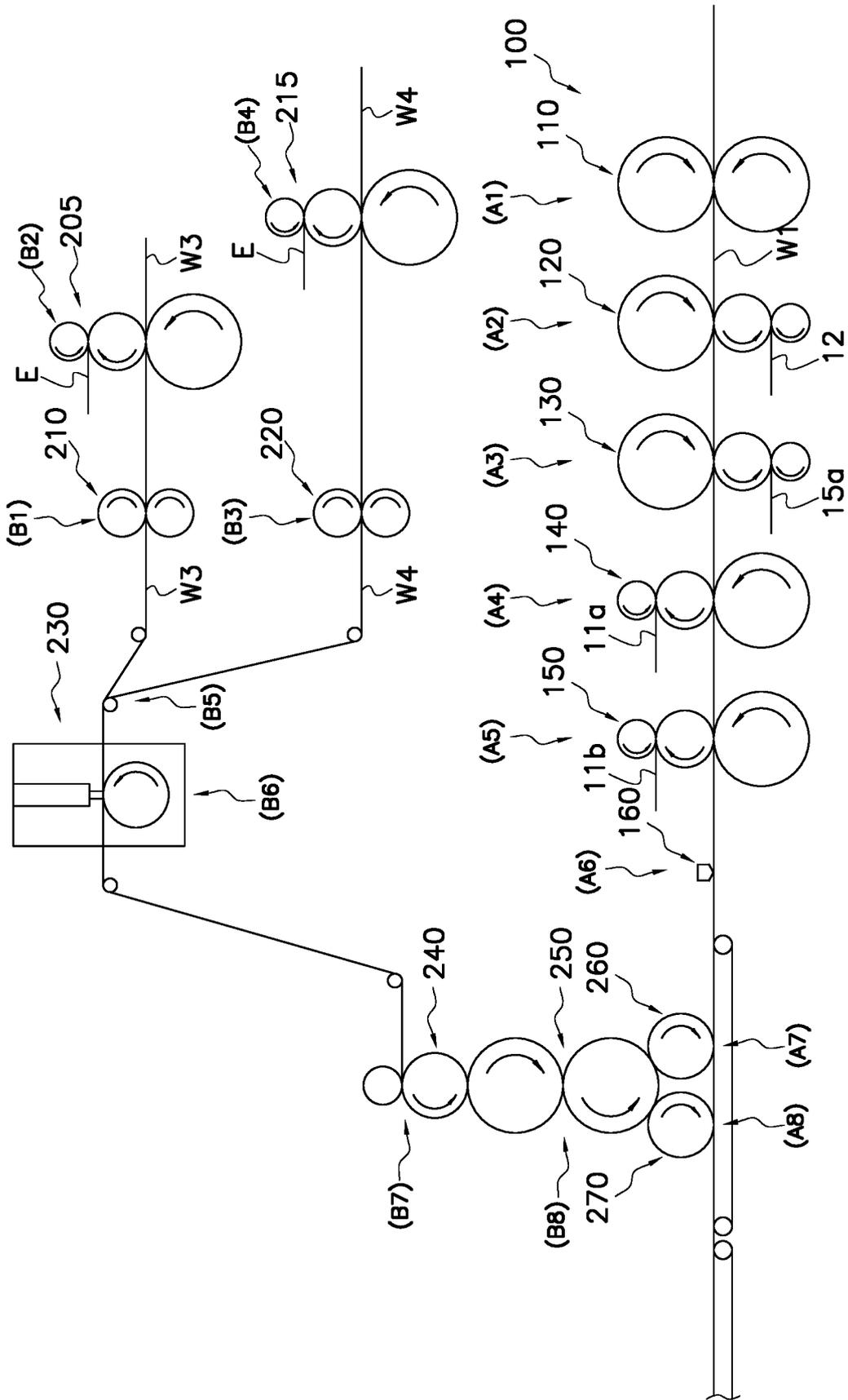


FIG. 13

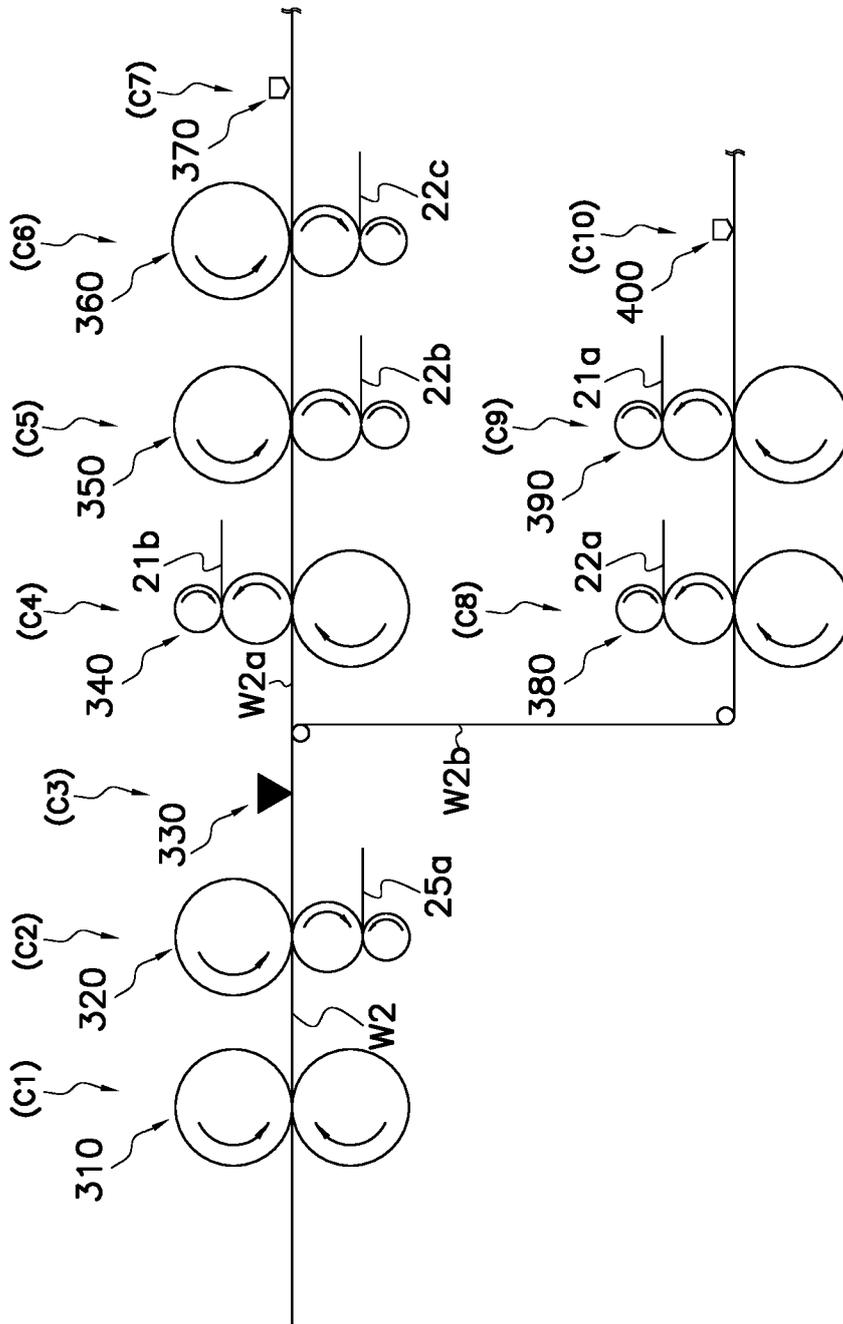


FIG. 14

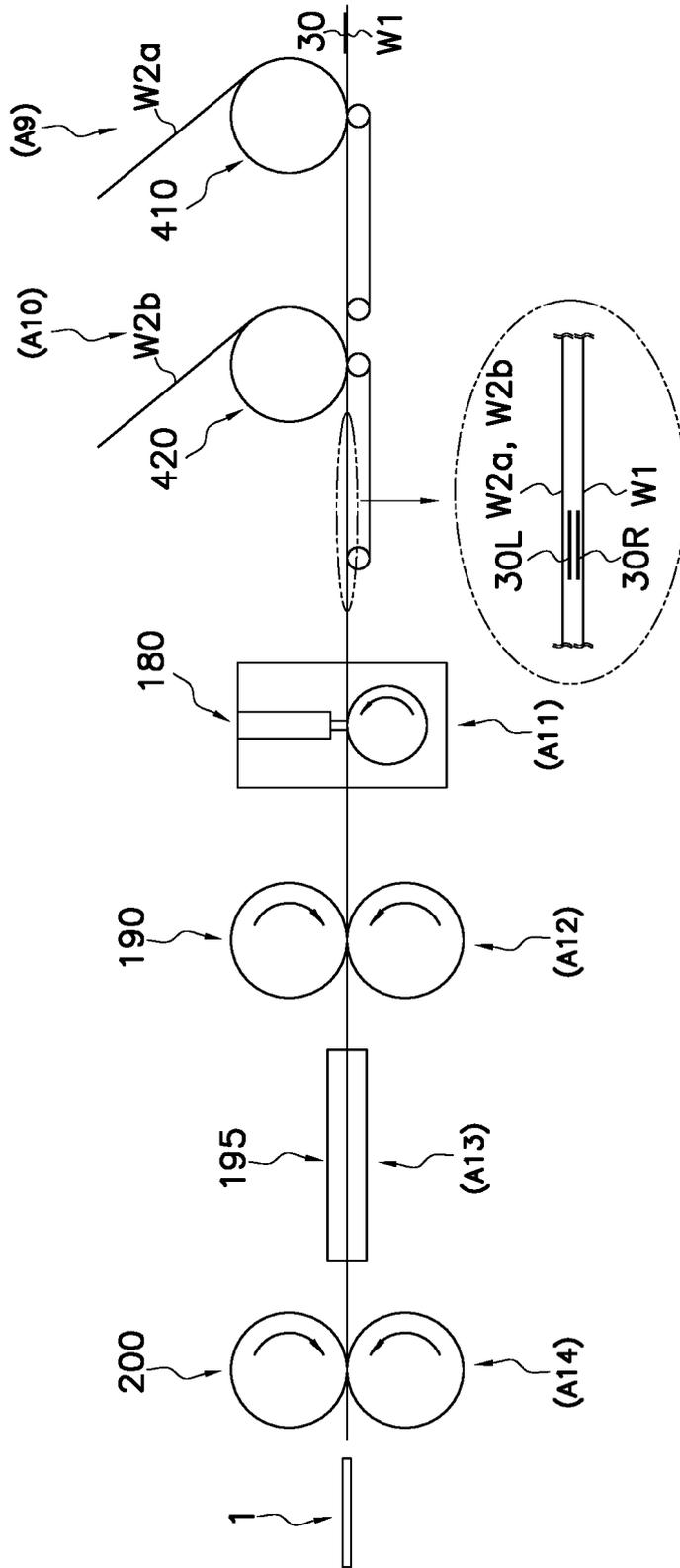


FIG. 15

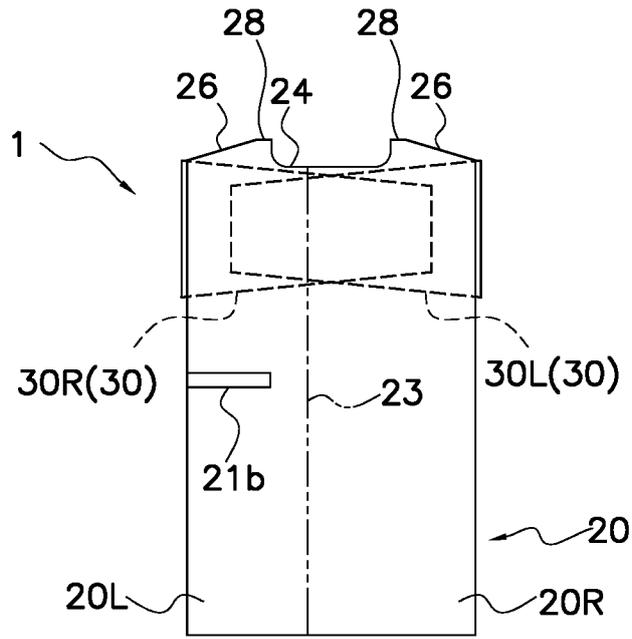


FIG. 16

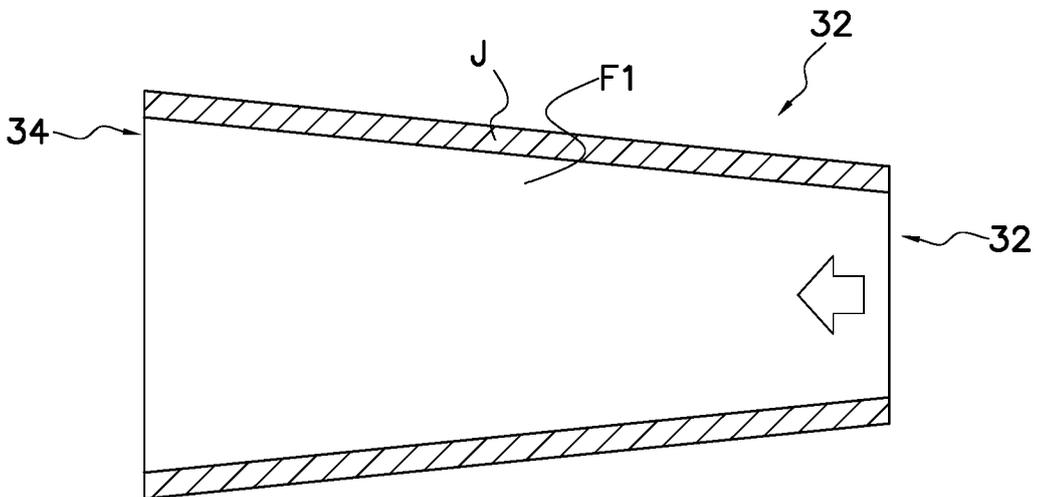


FIG. 17

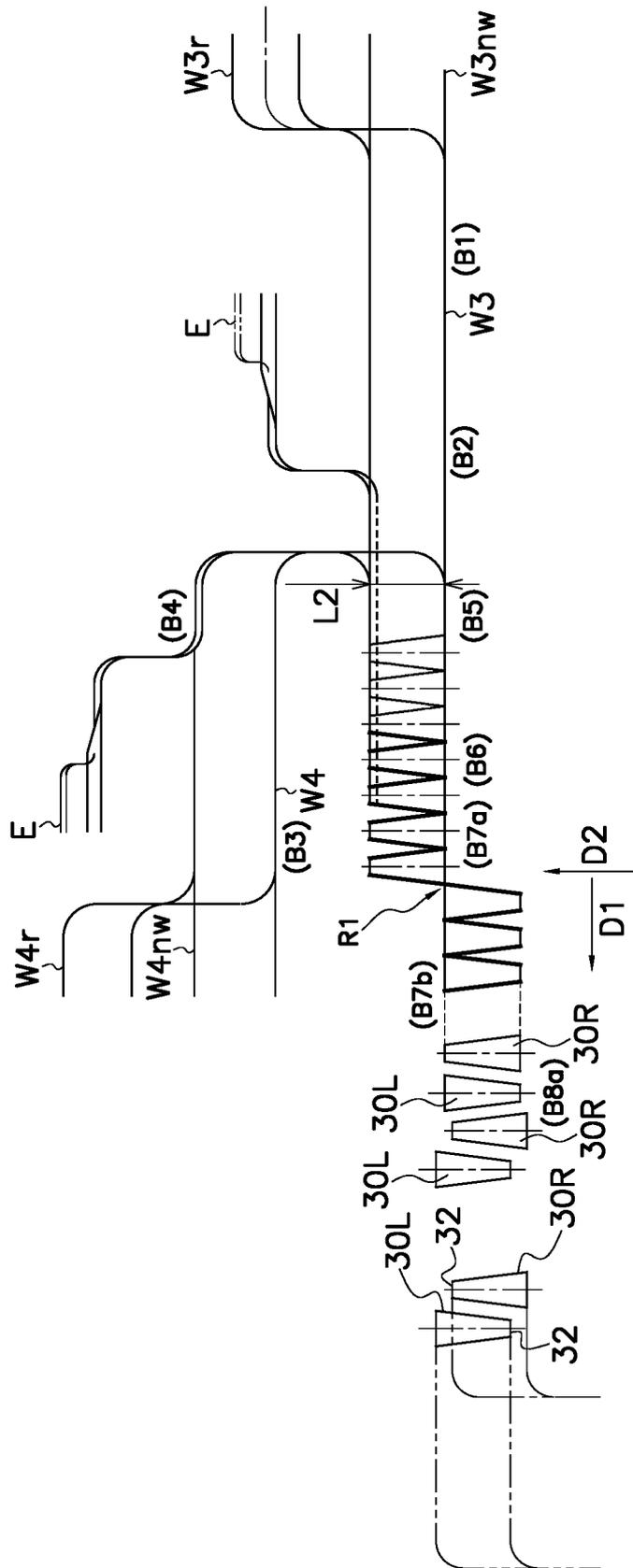


FIG. 18

INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/JP2023/010346**

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**A. CLASSIFICATION OF SUBJECT MATTER**  
*A41D 13/12*(2006.01)i; *A41H 42/00*(2006.01)i; *A41H 43/04*(2006.01)i  
 FI: A41H42/00; A41D13/12 109; A41H43/04 B  
 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)  
 A41D13/12; A41H42/00; A41H43/04  
 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
 Published examined utility model applications of Japan 1922-1996  
 Published unexamined utility model applications of Japan 1971-2023  
 Registered utility model specifications of Japan 1996-2023  
 Published registered utility model applications of Japan 1994-2023  
 Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2000-170011 A (UNI CHARM CORP.) 20 June 2000 (2000-06-20) paragraphs [0006]-[0051], fig. 1-4	1-9
Y	CN 110897234 A (DONGGUAN KYD AUTOMATION EQUIPMENT CO., LTD.) 24 March 2020 (2020-03-24) paragraphs [0003]-[0136]	1-9
Y	US 2018/0035731 A1 (CURT G. JOA, INC.) 08 February 2018 (2018-02-08) paragraphs [0004]-[0087], fig. 1-13	1-9

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

\* Special categories of cited documents:  
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 "P" document published prior to the international filing date but later than the priority date claimed  
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Date of the actual completion of the international search: **22 May 2023**  
 Date of mailing of the international search report: **30 May 2023**

Name and mailing address of the ISA/JP: **Japan Patent Office (ISA/JP)  
 3-4-3 Kasumigaseki, Chiyoda-ku, Tokyo 100-8915  
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 Authorized officer:  
 Telephone No.:

**INTERNATIONAL SEARCH REPORT**  
**Information on patent family members**

International application No. <b>PCT/JP2023/010346</b>
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Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
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CN 110897234 A	24 March 2020	(Family: none)	
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US 2018/0035731 A1	08 February 2018	WO 2018/031578 A1	
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**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- JP 6762991 B [0002] [0003] [0004]