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(54) **PRODUCTION OF DISPOSABLE GARMENTS**

(57) The present invention relates to method for manufacturing disposable upper body garments having sleeves and a front portion. The method comprises feeding a main film in a longitudinal direction and forming an assembly comprising a first sleeve film and a second sleeve film arranged on an upper surface of the main film. The method further comprises, for a first one of the garments, welding the first sleeve film to the main film along an outline defining the sleeves of said first one of

the garments, and for a second one of the garments, welding the second sleeve film to the main film along an outline defining the sleeves of said second one of the garments. After the welding steps, the method comprises punching through the assembly to define a neck opening of the first one and the second one of the garments; and punching through the assembly along an outline of the first one and the second one of the garments.

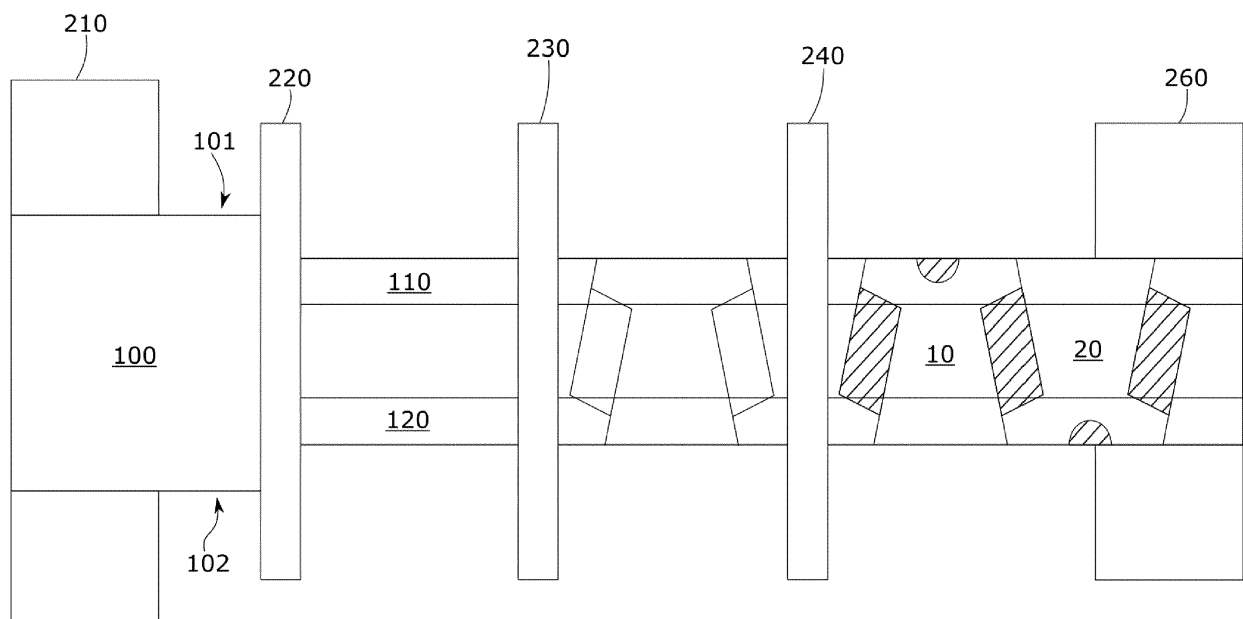


Fig. 4

## Description

### TECHNICAL FIELD

**[0001]** The present invention generally relates to the field of garments, and in particular to the manufacturing of disposable garments.

### BACKGROUND

**[0002]** Protective garments, such as disposable gowns for medical staff and patients, may be produced from a sheet of a flexible material, such as e.g. a plastic film, that is cut into parts and joined into the desired design. A drawback with this technology is however that the manufacturing process generally involves a large number of complex processing steps, which often requires manual intervention and handling.

**[0003]** With an ever-increasing demand for disposable protective garments there is a need for improved technologies that allow for a more efficient manufacturing and reduced manufacturing costs.

### SUMMARY

**[0004]** It would be advantageous to achieve a technology overcoming, or at least alleviating the above-mentioned drawback. In particular, it would be desirable to provide an improved and more cost-effective method for manufacturing disposable garments.

**[0005]** To better address this concern, a method, a garment and a system having the features defined in the independent claims are provided. Preferable embodiments are defined in the dependent claims.

**[0006]** Hence, according to a first aspect, there is provided a method for manufacturing disposable upper body garments having sleeves and a front portion. According to the method, a first sleeve film and a second sleeve film are provided on a respective edge portion of a main film, wherein the edge portions are separated by a centre line extending in a longitudinal direction. The method comprises joining the sleeve films to the main film along at least part of an outline defining the sleeves of the garments, and defining at least part of the remaining outline of the garments by punching through the films.

**[0007]** Specifically, the method may comprise feeding the main film in a longitudinal direction, wherein the first and second edge portions of the film are arranged transversely opposing each other on a respective side of the centre line. An assembly may be formed comprising the first sleeve film and the second sleeve film arranged on the upper surface of the main film, wherein the first sleeve film is arranged on the first edge portion of the main film and the second sleeve film is arranged on the second edge portion of the main film. For a first one of the garments, the first sleeve film may be welded to the main film along at least part of an outline defining the sleeves of the first one of the garments. For a second one of the

garments, the second sleeve film may be welded to the main film along at least part of an outline defining the sleeves of the second one of the garments. Further, the method may comprise a step of punching through the assembly to define a neck opening of the garments, and punching through the assembly along an outline of the first one and the second one of the garments.

**[0008]** According to a second aspect, a disposable upper body garment manufactured by the method according to the first aspect is provided.

**[0009]** According to a third aspect, a system for manufacturing of disposable upper body garments according to the first and second aspects is provided.

**[0010]** The present inventive concept is based on the realisation that by arranging the first and second sleeve films on the edge portions of the main film, and using the sleeve films to form the sleeves of the resulting garment, the manufacturing of the garment can be more efficient. Several advantages may be associated with the present aspect. Firstly, the sleeve films allow for the front portion of the garment to be provided with sleeves in a relatively easy and efficient way. The sleeves may be formed by joining the sleeve films and the main film along lines defining the armpit to arm seams of the garment and, optionally, the shoulder to arm seams, and punching the films at the arm opening so as to define the outline of the sleeves. This can be done "on the fly" as the film assembly is feed forward in the longitudinal direction. Secondly, the size of the sleeves can easily be determined by varying the width of the sleeve films, wherein a wider sleeve film allows for a wider sleeve and vice versa. Thus, the design of the sleeves can be varied by modifying the width of the sleeve films, the position of the welds joining the films, and the cuts or perforations defining the outline of the sleeves. Thirdly, the garments can be manufactured in a roll-to-roll process, which advantageously allows for increased productivity and reduced waste, especially compared to processes requiring individual and manual handling of the garments.

**[0011]** In the present specification, the term "disposable" may refer to a garment intended to be thrown away after use. This may also be referred to as one-use or expendable and should generally be understood as a garment that is not intended to be re-used multiple times.

**[0012]** The term "upper body garment" generally refers to an item of clothing suitable for the upper part of the body, in particular the trunk and the arms. The garment may also be referred to as a gown or an apron, such as a sleeved apron (with long or short sleeves). Preferably, the garment is a protective garment, such as a medical garment providing a barrier between patient and professional.

**[0013]** By "film" may be understood a material in the form of a thin and flexible sheet, preferably stored and supplied on a roll. The film may for example be formed of plastic or paper, or another material worked in a manner analogous to plastic. Preferably, the film is formed of polyethylene or polylactic acid. The first sleeve film, the

second sleeve film and the main film may be formed of the same material or of different materials.

**[0014]** The main film, or lower film in the assembly may generally be referred to as having a length extension in the longitudinal direction, i.e., the feeding direction during the manufacturing, and a width in a lateral direction, i.e., a direction orthogonal to the longitudinal direction. Similarly, the first and second sleeve films may have a length extension in the longitudinal direction and a width in the lateral direction. Preferably, each of the first and second sleeve films may have a width that is smaller than half the width of the main film. In other words, the first and second sleeve films may be separated by a distance when arranged on the main film, such that a centre region of the main film is not covered by any of the first and second sleeve films.

**[0015]** The layers of the assembly, i.e., the first/second sleeve film and the main film, may be selectively joined together in certain regions or along certain lines so as to form the sleeves of the garment. The joining may for example be achieved by applying pressure or heat. In some examples, the films may be joined by welding or gluing. Welding may be advantageous in that no additional components, such as e.g. glue, may be required. Instead, the joint may be formed by heating the material of the films to the point of melting.

**[0016]** By "punching" is generally meant the process of piercing a hole through the assembly. Thus, the punching may result in for example a perforation, i.e., a row of holes punched in the assembly so that a part can be torn off more easily, or a cut-out where a part of the assembly is removed in its entirety.

**[0017]** By "sleeve" is generally meant the part of the garment that wholly or partly covers a person's arm. Preferably, the sleeve is configured to wholly enclose or encircle a part of the arm, but not necessarily the entire length of the arm. By "front portion" is generally understood the part of the garment that is intended to wholly or partly cover the front of the wearer's body, i.e., to be arranged anterior to the body. However, the front portion may be suitable to be worn posterior to the body as well, depending on the desired use. The present aspect allows for garments to be produced, which may be open either in the back or in the front. By "neck opening" is generally referred to an opening intended to receive the head of the user during use.

**[0018]** According to an embodiment, the first and second sleeve films may be formed of the main film. The sleeve films may for example be cut out from the main film in a prior step and arranged on the upper surface of the main film to form the assembly.

**[0019]** Alternatively, the first and second sleeve films may be formed by folding the main film onto its upper surface. This may be achieved by folding a first longitudinal edge and a second longitudinal edge of the main film towards a centre of the main film, wherein the longitudinal edges are transversely opposed to each other. Forming the assembly by folding the edges of the main

film is advantageous in that the number of components involved in the manufacturing process may be reduced. In other words, there is no need for handling the sleeve films as separate components. Instead, the sleeve films may be provided by adding a folding step to the process rather than adding separate films. A further advantage is that the fold line may serve as a joint between the sleeve films and the main film, thereby reducing the welding. With this, it may suffice to weld together the sleeve films and the main film along the underarm seam, i.e., the seam running from the armpit to the arm opening of the sleeve.

**[0020]** Hence, the method may comprise welding the first/second sleeve film to the main film to form the underarm seam, whereas the first/second sleeve film is already joined to the main film along shoulder to arm seam. The sleeve opening and the front portion of the garment may then be defined by perforating or cutting the assembly.

**[0021]** Should the first/second sleeve films not be formed by folding the main film but provided as separate films arranged on the main film, the films may also be joined together along an upper arm seam, i.e., the shoulder to sleeve opening seam.

**[0022]** According to an embodiment, the first one and the second one of the garments may be arranged adjacent to each other in the longitudinal direction. Preferably, the opening of the sleeve of a first one of the garments is arranged next to the front portion of a second one of the garments such that both the arm opening and the front portion can be defined by a single, common cut or perforated line. With this arrangement the waste may be reduced.

**[0023]** The inventive concept allows for a continuous, on-the-fly production of garments that are arranged in an alternating pattern in the assembly. With every second garment having the sleeves formed from the first sleeve film and the intermediate garments having the sleeves formed from the second sleeve film, an alternating, compact and relatively surface-effective layout can be obtained, allowing for reduced waste of material.

**[0024]** According to an embodiment, the remaining material between consecutive garments may be cut out and removed from the assembly. The remaining assembly may thus comprise only garments arranged side by side in an alternating manner, wherein the sleeve opening of a first garment is attached to the side of the body of a neighbouring garment. Removing the remaining material between the garments may reduce the waste at the user's end and allow for the array of garments to be rolled up and stored in a roll having a reduced weight.

**[0025]** Alternatively, the garments may be separated from each. This allows for the garments to be arranged in a stack rather than on a roll.

**[0026]** In an embodiment, the assembly comprising a plurality of garments may be re-reeled into a roll. Optionally, the assembly may be folded along the longitudinal direction prior to being formed into a roll. The resulting

product may thus be protective gowns on roll, which facilitates handling and transport and allows for an improved user experience.

**[0027]** It is noted that embodiments of the invention relate to all possible combination of features recited in the claims. Further, it will be appreciated that the various embodiments described for the manufacturing method according to the first aspect are all combinable with embodiments of the product and system as defined in the second and third aspects.

#### BRIEF DESCRIPTION OF DRAWINGS

**[0028]** These and other aspects will now be described in more detail with reference to the appended drawing showing embodiments, in which:

Figure 1 shows a top view of an assembly comprising a main film and two sleeve films according to an embodiment.

Figure 2 shows a top view of an assembly comprising a main film and two sleeve films, in which the outlines of two disposable upper body garments have been defined according to an embodiment.

Figure 3 is a schematic side view of a system for manufacturing disposable upper body garments according to an embodiment.

Figure 4 is a schematic side view of a system for manufacturing disposable upper body garments according to an embodiment.

Figure 5 is a flow chart illustrating a method for manufacturing disposable upper body garments according to an embodiment.

**[0029]** All the figures are schematic, not necessarily to scale, and generally only show parts which are necessary in order to elucidate the embodiments, wherein other parts may be omitted or merely suggested. Like reference numerals refer to like elements throughout the description.

#### DETAILED DESCRIPTION

**[0030]** The present aspects will now be described more fully hereinafter with reference to the accompanying drawing, in which currently preferred embodiment are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided for thoroughness and completeness, and to fully convey the scope of the present aspects to the skilled person.

**[0031]** A main film 100 and a first and second sleeve film 110, 120 according to an embodiment will be described with reference to figure 1. The main film 100, which for example may be a plastic film of polyethylene or polylactic acid, may be feed in a longitudinal direction F during the manufacturing of disposable upper body garments

according to the inventive concept. The longitudinal direction F may also be referred to as a feeding direction. The feeding of the main film 100 may for example form part of a roll-to-roll processing, in which the main film 100 may be provided from a roll and be re-reeled to create an output roll after processing.

**[0032]** The main film 100 may comprise two transversely opposing edge portions 101, 102, or longitudinal portions 101, 102, that have a length extension in the longitudinal direction F and are separated by a centre line C extending along the longitudinal direction F. Further, the main film 100 has an upper surface and an opposing lower surface, facing away from the upper surface.

**[0033]** As indicated in the present figure, a first sleeve film 110 and, preferably, a second sleeve film 120 may be arranged on the upper surface of the main film 100. The sleeve films 110, 120 may have a similar configuration as the main film 100, with the difference that the sleeve films 110, 120 may have a width that is smaller than the width of the main film 100 (as seen in a direction orthogonal to the longitudinal direction F). In the present example, each of the sleeve films 110, 120 may have a width that is less than half the width of the main film 100 such that they, when arranged side by side on the main film 100, do not cover the full width of the main film 100. The first sleeve film 110 may be arranged on or above the first edge portion 101 and the second sleeve film 120 may be arranged on or above the second edge portion 102. As shown in figure 1, the sleeve films 110, 120 may be arranged to cover the respective edge portions 101, 102 all the way out to the longitudinal edges of the main film 100.

**[0034]** The sleeve films 110, 120 may be formed of the same type of material as the main film 100, i.e. for example polyethylene or polylactic acid. In the present example, the sleeve films 110, 120 are formed from the main film 100 by folding the longitudinal edges of the main film 100 onto the upper surface of the main film 100. Thus, the longitudinal edges indicated in figure 1 may represent the fold line at which the main film 100 has been folded onto itself.

**[0035]** Figure 2 shows the assembly of figure 1 after definition of a first and a second disposable upper body garment 10, 20. According to the present embodiment, the first and second garment 10, 20 have been defined beside each other in the feeding direction, and turned upside-down relative to each other such that the sleeves 11 of the first garment 10 are formed from the first sleeve film 110 and the sleeves 12 of the second garment 20 are formed from the second sleeve film 120. The first and second garments 10, 20 are arranged adjacent to each other such that an arm opening of the first garment 10 abuts the front portion 22 of the second garment 20.

**[0036]** In case the sleeve films 110, 120 are formed by a folded portion of the main film 100, it may suffice to join the sleeve films 110, 120 to the main film 100 along a portion of the outline 13, 23 defining the underarm seam.

Due to the folding, the sleeve film 110, 120 is already joined to the main film 100 along the shoulder to arm seam. However, should the sleeve film 110, 120 be provided as a separate item, i.e., not be formed from a folded part of the main film 100, it may be necessary to weld the sleeve film 110, 120 to the main film 100 along the shoulder to arm seam as well.

**[0037]** According to the embodiment illustrated in figure 2, the first garment 10 may be defined by welding the first sleeve film 110 to the main film 100 along the portion of the outline 13 corresponding to the underarm seams of the sleeves 11, whereas the second garment 20 may be defined by welding the second sleeve film 120 to the main film 100 along the portion of the outline 23 corresponding to the underarm seams of the sleeves 21. In a further processing step, the assembly may be punched along the remaining part of the sleeve outline corresponding to the arm openings 18, 28 of the sleeves 11, 21 and along the outline 16, 26 corresponding to the sides of the front portions 12, 22. The punching may in this example result in the remaining portion of the assembly that is arranged between neighbouring garments 10, 20 being cut out and removed, and the portion 18, 28 of the outline separating the arm openings from the neighbouring garment being perforated to allow the garments to be separated later, for example by a user. As a result, the assembly may comprise a sequence of alternately arranged garments 10, 20 that are attached to each other by perforations at the arm openings 18, 28. The sleeve film that is not used to form the sleeves of a garment, i.e., the second sleeve film 120 of the first garment 10 and the first sleeve film 110 of the second garment 20, may be unfolded during use to form part of the front portion 12, 22 of the garment.

**[0038]** The neck openings 14, 24 may be formed by cutting out a corresponding portion of the assembly. It is appreciated that the neck opening 14, 24 in an alternative example may be defined by perforating the assembly along an outline of the neck opening 14, 24 so as to allow for the material of the neck opening 14, 24 to be removed at a later stage, for example by a user.

**[0039]** Figure 3 is a schematic side view of a system for manufacturing a disposable upper body garment according to an exemplifying embodiment. The manufacturing process and the resulting garments may be similarly configured as the embodiments discussed above in connection with figures 1 and 2. The system 200 may comprise a feeding mechanism 210 for feeding the main film 100, or lower film 100, in the longitudinal, feeding direction F (indicated by an arrow in figure 3). The main film 100 may for example be provided from a roll by means of the feeding mechanism 210. The feeding mechanism 210 may further be configured to provide the first sleeve film 110 and the second sleeve film 120, which in the present embodiment and like the main film 100 may be provided from a roll.

**[0040]** The sleeve films 110, 120 may be arranged on the upper surface of the main film 100 by means of a

downstream assembling mechanism 220. The assembling mechanism 220 may for example comprise a guiding means for aligning the first sleeve film 110 with the first transversely opposing edge 101 of the main film 100 and the second sleeve film 120 with the second transversely opposing edge 102 of the main 100. The resulting assembly may be similar to the structure shown in figure 1.

**[0041]** The system 200 may further comprise a welding tool 230 configured to provide the welds 13, 23 defining the sleeves 11, 21 of the garments 10, 20. The welding tool 230 may for example comprise a rotating cylinder selectively applying heat to regions of the passing assembly, the regions extending along an outline of the sleeves 11, 12 corresponding to e.g. the underarm seam and the shoulder to arm seam.

**[0042]** The assembly may also pass through a cutting tool 240 for cutting out the neck openings 14, 24. The cutting tool 240 may for example comprise a rotating cylinder configured to punch out portions of the assembly that define the neck openings 14, 24. Additionally, the cutting tool 240 may be further configured to cut out also the regions of the assembly arranged between two neighbouring garments 10, 20. Thus, the result as the assembly passes through the cutting tool 240 may be a plurality of garments 10, 20 that are joined to each other at the interface between the arm openings and the lower parts of the front portions 12, 22.

**[0043]** A punching tool 250 may be added to the system 200 so as to provide a perforated outline defining the arm openings 18, 28 of the sleeves 11, 21. The punching tool 250 may be similarly configured as the cutting tool 240, and hence comprise a rotating cylinder for cutting through the assembly as it passes by.

**[0044]** It should be noted that the above cutting tool 240 and punching tool 250 may be provided as two structurally distinct devices along the processing line, or as an integrated tool capable of defining both the neck openings 14, 24 as well as the outline of the garments 10, 20. Thus, the cutting tool 240 and the punching tool 250 may refer to a single tool, such as a punching tool, for cutting out the neck openings 14, 24 as well as the remaining portions between the garments 10, 20. Further, such a tool may also be configured to either perforate the assembly along the arm opening 18, 28 or to cut through the assembly so as to separate the garments 10, 20 from each other.

**[0045]** The resulting product may then be fed to a finishing mechanism 260 at which it for example may be folded along the centre line and re-reeled into an output roll.

**[0046]** Figure 4 shows a top view of a system 200 according to an embodiment, which may be similarly configured as the system illustrated in connection with figure 3. Thus, the system may comprise a feeding mechanism 210 for feeding the main film 100 along the longitudinal direction of the film, an assembly mechanism 220 for arranging the sleeve films 110, 120 on the respective

edge portions 101, 102 of the main film 100, a welding tool 230 for joining the sleeve films 110, 120 to the main film 100 to define the sleeves 13, 23, and a punching or cutting tool 240 for defining the neck openings 14, 24 and at least part of the remaining outline of the garments 10, 20. The punching tool 240 may for example be configured to cut out the neck portions 14, 24 and the portions between the garments 10, 20 (indicated by the cross-hatched regions in figure 4). Finally, the assembly may be stored on a roll by means of a finishing mechanism 260.

**[0047]** A difference to the embodiment discussed above in connection with figure 1 may be that the first and second sleeve films 110, 120 according to the present embodiment may be formed by folding the edges 101, 102 of the main film 100 onto the upper surface of the main film 100. This may be performed by the assembly mechanism 220, which thus may be a folding mechanism 220 providing an assembly similar to the one illustrated in connection with figure 1. After the folding of the main film 100, an assembly is formed, in which the first and second sleeve film 110, 120 cover the edge portions of the main film 100 and are separated from each other along a centre line extending along the longitudinal direction of the main film 100. As a consequence, the sleeve films 110, 120 are already joined to the main film 100 along the upper seam, i.e., the shoulder to arm seam by the fold and it may therefore suffice if the welding tool 230 applies a joining weld to the underarm seam, i.e., the armpit to arm seam.

**[0048]** Figure 5 is a flow chart illustrating a method for manufacturing disposable upper body garments having sleeves and a front portion similar to the garments described with reference to figures 1 to 4. The method may comprise feeding 1 a main film in a longitudinal direction, forming 2 an assembly comprising a first sleeve film and a second sleeve film arranged on an upper surface of the main film, and more particular such that the first sleeve film is arranged on a first longitudinal edge portion of the main film and the second sleeve film is arranged on a second edge portion of the main film. This may for example be performed by folding the longitudinal edges of the main film onto its upper surface. Further, the method may comprise welding 3 the first sleeve film to the main film along an outline defining the sleeves of a first one of the garments, and welding 4 the second sleeve film to the main film along an outline defining the sleeves of the second one of the garments, cutting out 5 a neck opening of the first one and the second one of the garments, and punching through 6 the assembly along an outline of the first one and the second one of the garments. In some examples, the method may comprise removing 7 a remaining portion of the assembly arranged between the first and second ones of the garments. In an optional step, the assembly may be folded 8 along the longitudinal direction before it is rolled 9 into an output roll.

**[0049]** The person skilled in the art realises that the

present invention by no means is limited to the preferred embodiments described above. For example, the welding and punching may be performed in different order, in which the outline of the garments for example is defined by perforating or punching the assembly prior to the welding of the seams, or in a same processing step. Further, the outline may in addition to welding of the sleeves be defined by perforations only, by cutting only, or a combination of both. Additionally, variations to the disclosed embodiments can be understood and effected by those skilled in the art in practising the claimed invention, from a study of the drawings, the disclosure, and the appended claims. In the claims, the word "comprising" does not exclude other elements or steps, and the indefinite article "a" or "an" does not exclude a plurality. The mere fact that certain measures are recited in mutually different dependent claims does not indicate that a combination of these measures cannot be used to advantage. Any reference signs in the claims should not be construed as limiting the scope.

## Claims

1. A method for manufacturing disposable upper body garments (10, 20) having sleeves (11, 21) and a front portion (12, 22), comprising:
  - feeding (1) a main film (100) in a longitudinal direction (F), the film having a first and a second transversely opposing edge portion (101, 102) separated by a centre line (L) extending in the longitudinal direction;
  - forming (2) an assembly comprising a first sleeve film (110) and a second sleeve film (120) arranged on an upper surface of the main film, the first sleeve film being arranged on the first edge portion and the second sleeve film being arranged on the second edge portion;
  - for a first one of the garments, welding (3) the first sleeve film to the main film along an outline (13) defining the sleeves of said first one of the garments,
  - for a second one of the garments, welding (4) the second sleeve film to the main film along an outline (23) defining the sleeves of said second one of the garments;
  - punching through (5) the assembly to define a neck opening (14, 24) of the first one and the second one of the garments; and
  - punching through (6) the assembly along an outline (16, 26) of the first one and the second one of the garments.
2. The method according to claim 1, wherein the first sleeve film and the second sleeve film are formed of the main film.

3. The method according to claim 2, wherein:

providing the first sleeve film comprises folding a first longitudinal edge of the main film onto the upper surface; and  
providing the second sleeve film comprises folding a second longitudinal edge of the main film onto the upper surface.

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4. The method according to claim 3, comprising:

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welding the first/second sleeve film to the main film to form an underarm seam;  
punching through the first/second sleeve film and the main film to define the sleeve opening and the front portion.

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5. The method according to claim 1, comprising:

welding the first/second sleeve films to the main film to form an underarm seam and a shoulder to arm seam;  
punching through the first/second sleeve film and the main film to define the sleeve opening and the front portion.

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6. The method according to any of the preceding claims, wherein the first one and the second one of the garments are arranged adjacent to each other along the longitudinal direction.

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7. The method according to any of the preceding claims, further comprising removing (7) a remaining portion of the assembly arranged between the first and second ones of the garments.

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8. The method according to any of the preceding claims, further comprising separating the first and second ones of the garments from each other.

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9. The method according to any of claims 1 to 7, further comprising:

folding (8) the assembly along the longitudinal direction; and  
rolling (9) the folded assembly into a roll.

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10. A disposable upper body garment manufactured by the method according to any of claims 1 to 9.

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11. A system (200) for manufacturing of disposable upper body garments having sleeves and a front portion, comprising:

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a feeding mechanism (210) for feeding a main film in a longitudinal direction, the film having a first and a second transversely opposing edge

portion separated by a centre line extending in the longitudinal direction;

an assembling mechanism (220) configured to arrange a first sleeve film and a second sleeve film on an upper surface of the main film, such that the first sleeve film is arranged on the first edge portion and the second sleeve film is arranged on the second edge portion;

a welding tool (230) configured to weld the first sleeve film to the main film along an outline defining the sleeves of a first one of the garments and to weld the second sleeve film to the main film along an outline defining the sleeves of a second one of the garments;

a cutting tool (240) configured to cut out a neck opening of the first one and the second one of the garments; and

a punching tool (250) configured to punch through the assembly along an outline of the first one and the second one of the garments.

12. The system according to claim 11, wherein the welding tool comprises a rotatable cylinder.

13. The system according to claim 11 or 12, wherein the assembling mechanism is configured to fold a first and a second longitudinal edge of the main film onto the upper surface of the main film.

14. The system according to any of claims 11 to 13, further comprising a finishing mechanism (260) for folding and rolling the assembly.

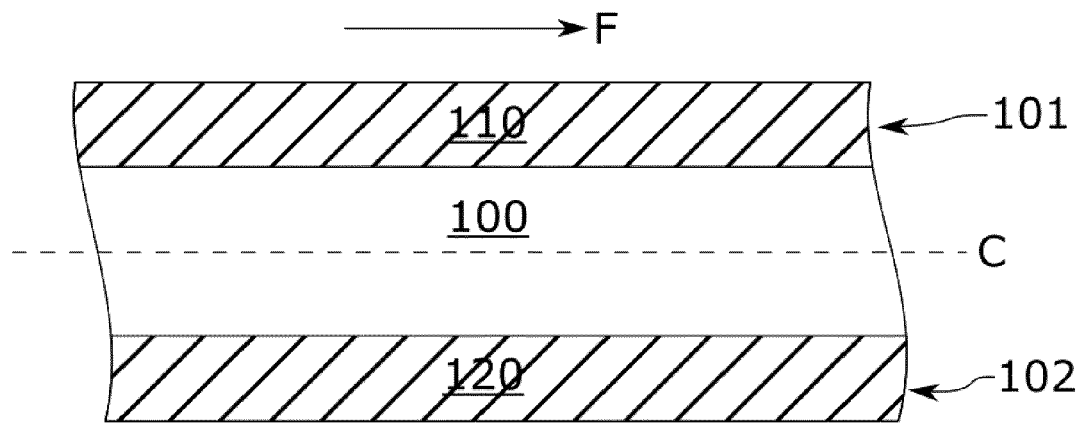


Fig. 1

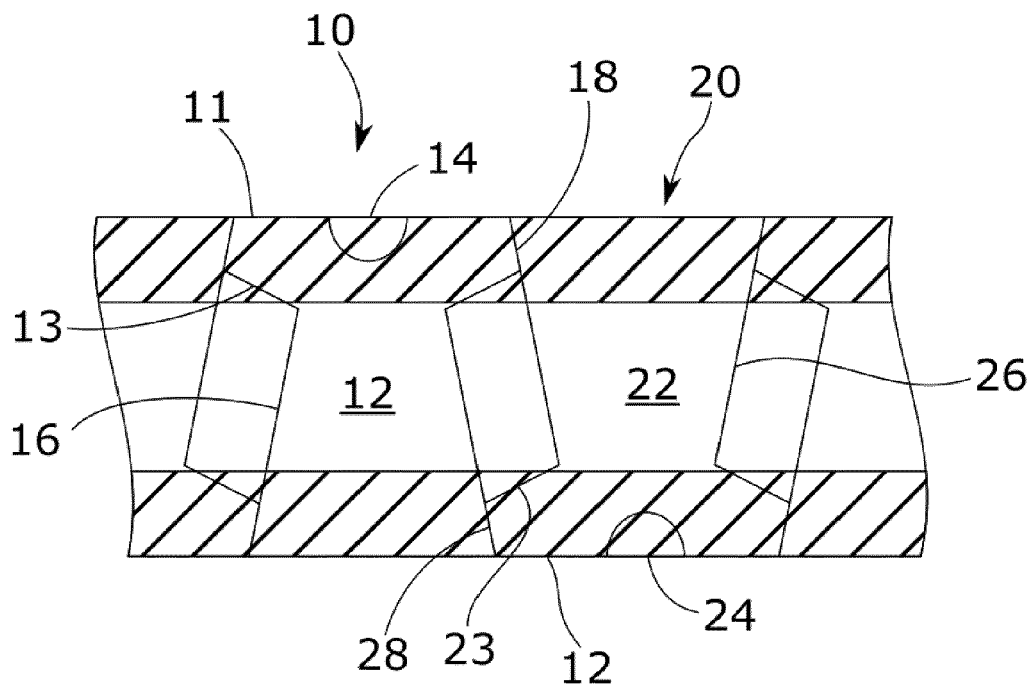


Fig. 2

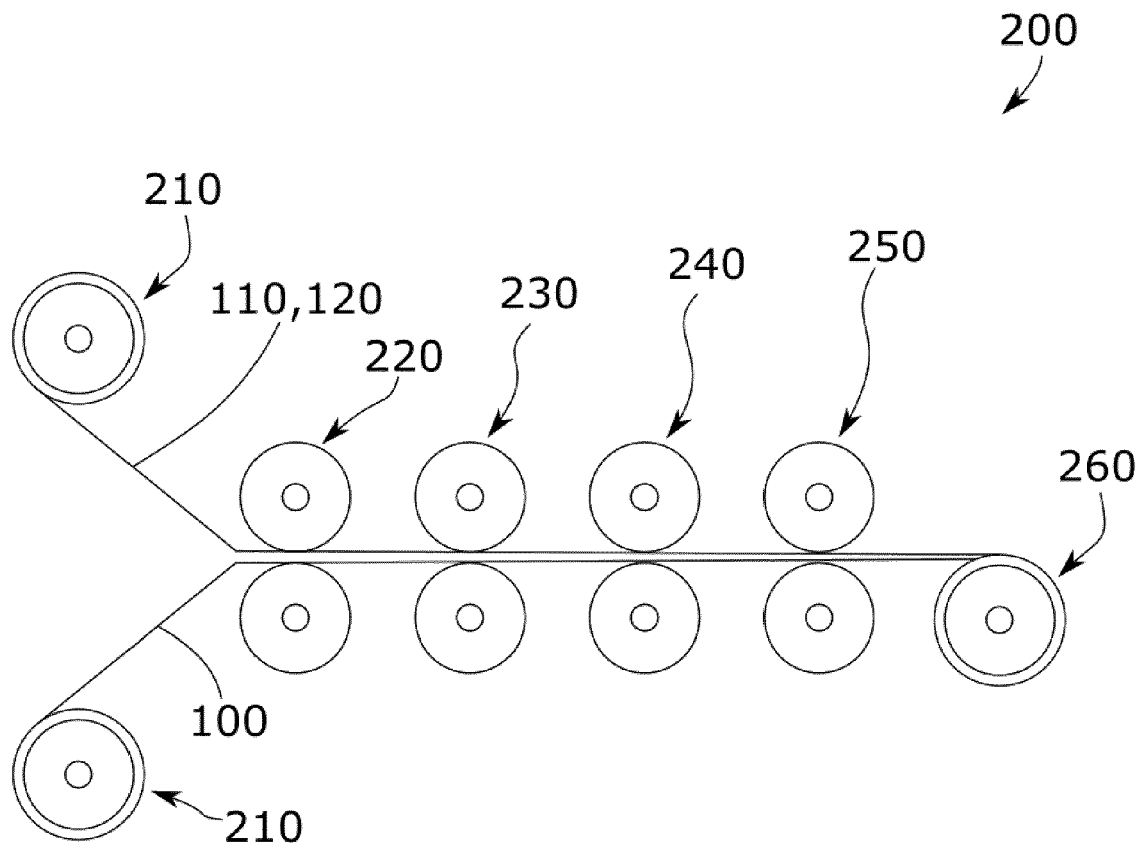


Fig. 3

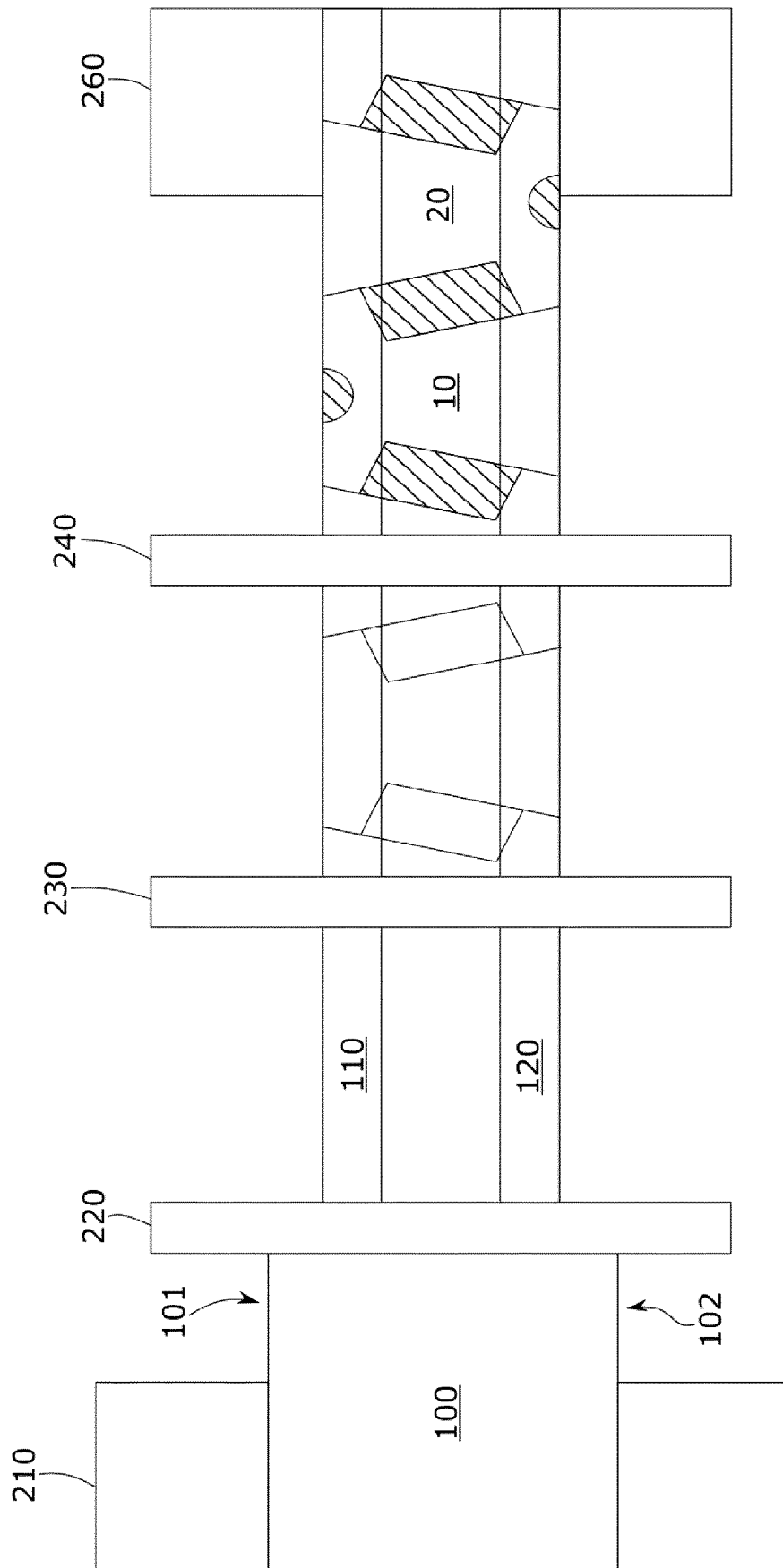


Fig. 4

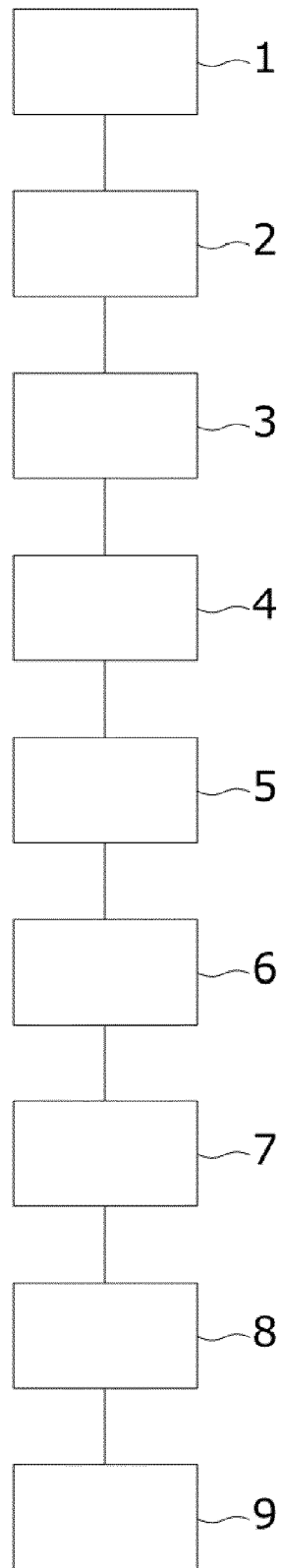


Fig. 5



## EUROPEAN SEARCH REPORT

 Application Number  
 EP 20 20 0137

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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