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(54) Improvements in or relating to garment manufacture.

(57) The invention relates to textile garments, in particular the manufacture of men's briefs having a concealed gusset.

The apparatus described comprised first and second means for supporting respectively a back panel (12) and a front panel (14) of the briefs, the front panel comprising a portion having a double thickness of material in at least a marginal region (18, 20) thereof. The marginal portions of the front panel are to be seamed to corresponding marginal portions (16) of the back panel to complete said gusset. A ply separation arrangement (36, 38) is adapted to separate the plies of the double thickness of material and to turn one ply in a first reverse direction so that its edge is in register with the edge of the supported back ply on one side ply thereof and to turn the second ply in a second reverse direction so that the edge of the second ply is in register with said edge of the back ply at its opposite side. Further means are also provided for seaming together marginal portions adjacent the three edges (16, 18, 20), and for everting the seamed gusset so formed so as to conceal the stitched seam.

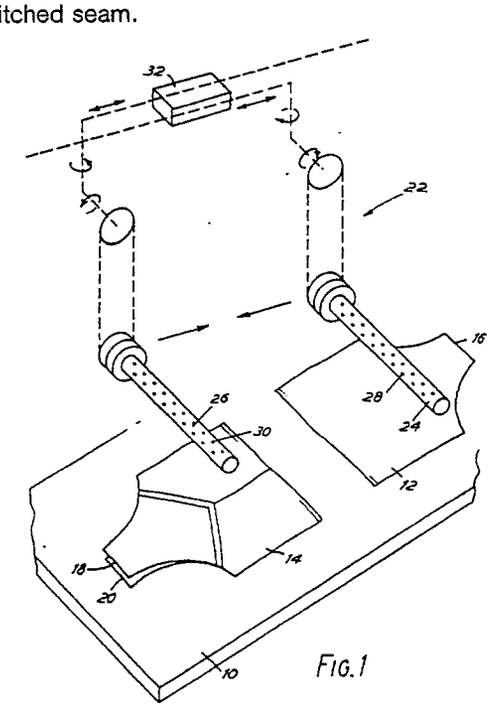

FIG.1

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Improvements in or relating to garment manufacture

The invention is concerned with improvements in or relating to textile garments and in particular to the manufacture of briefs having a concealed gusset.

The invention provides apparatus for use in the manufacture of briefs having a concealed gusset the apparatus comprising first and second means for supporting respectively a back panel and a front panel of said briefs, said front panel comprising a portion having a double thickness of material in at least a marginal region thereof, the marginal portions of which front panel are to be seamed to corresponding marginal portions of the back panel to complete said gusset, a ply separation arrangement adapted to separate the plies of the double thickness of material and to turn one ply in a first reverse direction so that its edge is in register with the edge of the supported back ply on one side thereof and to turn the second ply in a second reverse direction so that the edge of the second ply is in register with said edge of the back ply at its opposite side, means being provided for seaming together marginal portions of the two plies and the panel adjacent the edges, and for everting the seamed gusset so formed so as to conceal the seam thereof.

Advantageously, the means for supporting the back panel and the front panel may comprise a pair of rollers each of which is adapted to engage waist marginal portions of one of said panels and to rotate so as to fold or roll the appropriate panel until the free edges are drawn near to the rollers, and plate means upon which the panels are laid with the edge of the back panel adjacent the seaming means and the edges of the front panel facing ply separation means, said ply separating arrangement comprising a pair of separation rollers each adapted to engage one of said plies to separate them and to deflect them in opposed directions.

Conveniently, the separated plies may be received each on one of two receiving members, a first member of which is capable of turning the associated ply outwardly in a direction away from the second ply of the front panel and to turn the ply back on itself in a first reverse direction, said second member being capable of turning the second ply in a direction away from the first ply and to turn the second ply back on itself in a second reverse direction, so that the edges of each ply are in register with the edge of the back panel.

In an example of apparatus according to the invention, the means for everting the seamed gusset comprise turning means adapted to move two rollers of the first and second support means respectively from a first position in which they lie side by side in a substantially parallel manner in a plane passing through both said rollers to a second position in which they have turned in that plane by an obtuse angle at least approaching 180°.

Preferably the separation rollers of said ply separation means thereof may be perforated so as permit suction applied to the interior to bring about engagement of the material of the briefs by the rollers and the members.

There will now be described an example of apparatus according to the invention. It will be understood that the description, which is to be read with reference to the drawings, is given by way of example only and not by way of limitation.

In the drawings:

Figure 1 is a diagrammatic representation of means for supporting the panels of the garment;

Figure 2 is a perspective view of ply separation means of the apparatus;

Figure 3 is a schematic cross-section through rollers of the supporting means positioned adjacent the ply separation means; means;

Figure 4 is a cross-sectional view on line IV-IV of Figure 2;

Figure 5 is a similar view to Figure 4 at a later stage in manufacture; and

Figure 6 illustrates the operative action of the means for everting the gusset.

Referring to the drawings, Figure 1 shows a form of apparatus according to the present invention for seaming a front panel to a back panel of a pair of men's briefs to form a concealed gusset seam.

The apparatus has a support table 10 on which a back panel 12 and front panel 14 of the briefs are positioned. These panels are positioned with the waist portions adjacent and parallel to one another and marginal portions 16 of the back panel, and marginal portions 18, 20 of the double thickness front panel facing opposite end edges of the table. The apparatus also has support means 20 for the front and back plies, which are to be seamed together to form the gusset.

The support means 22 comprises two parallel, rotatable rollers 24, 26 each of which is hollow and has a number of suction holes 28, 30 in its surface, the holes being spaced along the length of the roller. The rollers are positioned in a horizontal attitude over the support table 10 and, as well as being rotatable (arrows A), can also be pivoted about a substantially vertical axis (arrows B) which passes through the rotational axis of the roller at a point outside the roller and away from the table 10. The rollers can also be moved towards and away

(arrow C) from one another by suitable means 32. Although the rollers illustrated are rigid, it may be arranged that the rollers are comprised of segments pivotally hinged to one another to assist in the everting step described later in this specification.

In use, the back and front panels 12, 14 are positioned as mentioned above and as shown in Figure 1. The rollers are then brought together and each is 2 mm above the support table 10 over and adjacent the waistband edge of a respective one of the back and front panels. Roller 24 is positioned over the back panel while roller 26 is positioned over the front panel. Since the fabric is approximately 1 mm thick, the positioning of the rollers gives approximatley 1 mm clearance.

Suction is then applied through the rollers and the suction holes 28, 30 to lift the fabric edge to the roller. The roller is then rotated for approximately two seconds to ensure that sufficient material is wound onto the roller before the latter is raised. The back panel roller 24 is rotated anticlockwise and the front panel roller 26 is rotated clockwise as seen in Figure 1. Each roller rotates at about 60 r.p.m. and thus during the aforementioned two seconds each roller rotates approximately two revolutions. The rollers can then be raised without risk of the weight of the material breaking the suction holding the material to the rollers, and transferred to a position above a plate means 34 of a ply separating device illustrated in Figure 2.

The ply separating arrangement comprises two co-operating devices, a separating device indicated at 36 and a ply turning device indicated at 38.

The separating device comprises two rollers 40, 42 arranged one above the other, which are perforated with suction holes and act as gripping means when in operation. As may be seen in Figure 4, the roller 40 is driven in a clockwise direction and the roller 42 in an anti-clockwise direction by means of motors 44, 46 respectively.

Each roller 40, 42 is provided with a deflector blade 48, 50 and the whole separation device is mounted on a movable frame 52.

The ply turning device 38 comprises in addition to the plate means 34, two vacuum plate members having suction holes 54, the upper plate member 56 extending downwards at an oblique angle of approximatley 45° from the vicinity of the roller 40 and the lower plate member 58 extending vertically at a position below that of the lower roller 42. Motors 60, 62 operate to pivot the plate members 56 and 58 in a manner to be described below.

In operation, once the double ply front panel has been positioned on the plate means 34, the upper ply 12 is fed towards the suction roller 40 and the lower ply 14 towards the roller 42. The deflector blades 50, 52 respectively, prevent the plies from curling around the rollers and cause them instead to peel away from the rollers so that the ply 18 travels across the upper face of plate 56 and the ply 20 falls vertically adjacent the plate 58. Suction is then applied to the holes 54 so that the plates act to grip the plies in position thereagainst.

The ply separating arrangement is then removed from a co-operating position with respect to the turning device.

Motors 60 and 62 are then actuated to cause the plates 56 and 58 respectivley to pivot in the directions shown by arrows A and B in Figure 4 so that they move towards the positions shown in Figure 5. Thus the ply 18 is turned away from the ply 20 in a first, reverse, direction so that its edge projects beyond the plate 34 to the right as shown in that Figure. Ply 20 is turned in a second, reverse, direction so that its edge similarly projects.

Since the roller 24 has already placed the panel 12 with its edge 16 projecting over the plate 34, said three edges are now in register as shown in Figure 5 and the marginal portions may be seamed at S by means of a sewing head of a sewing machine (not shown).

The panels 12 and 14 are thus still rolled about the rollers 24 and 26 and are trapped within the turned portions adjacent the seam S. The next step therefore is to raise the rollers once again and cause them to pivot towards one another about their respective vertical axes through an obtuse angle in a plane passing through their longitudinal axes. This turns the garment portion inside out so that the panels 12 and 14 may be unrolled and released ready for the next stage in the manufacture of the briefs.

Claims

1. Apparatus for use in the manufacture of briefs having a concealed gusset the apparatus comprising first and second means for supporting respectively a back panel and a front panel of said briefs, said front panel comprising a portion having a double thickness of material in at least a marginal region thereof, the marginal portions of which front panel are to be seamed to corresponding marginal portions of the back panel to complete said gusset, a ply separation arrangement adapted to separate the plies of the double thickness of material and to turn one ply in a first reverse direction so that its edge is in register with the edge of the supported back ply on one sided thereof and so turn the second ply in a second reverse direction so that the edge of the second ply is in register with said edge of the back ply at its opposite side, means being provided for seaming together marginal por-

tions of the two plies and the panel adjacent the edges, and for everting the seamed gusset so formed so as to conceal the seam thereof.

2. Apparatus as claimed in claim 1 wherein the means for supporting the back panel and the front panel comprises a pair of rollers each of which is adapted to engage waist marginal portions of one of said panels and to rotate so as to fold or roll the appropriate panel until the free edges are drawn near to the rollers, and plate means upon which the panel are laid with the edge of the back panel adjacent the seaming means and the edges of the front panel facing ply separation means, said ply separating arrangement comprising a pair of separation rollers each adapted to engage one of said plies to separate them and to deflect them in opposed directions.

3. Apparatus as claimed in claim 2, wherein there are provided two receiving members adapted to receive separated plies, a first member of which is capable of turning the associated ply outwardly in a direction away from the second ply of the front panel and to turn the ply back on itself in a first reverse direction, said second member being capable of turning the second ply in a direction away from the first ply and to turn the second ply back on itself in a second reverse direction, so that the edges of each ply are in register with the edge of the back panel.

4. Apparatus as claimed in claim 3 wherein the receiving members comprise two hollow plate members each having section holes therein each plate being associated with one of said pair of separation rollers and extending at an oblique angle with respect to one another, deflector means being arranged to deflect plies from the ply separation device onto said respective plates.

5. Apparatus as claimed in claim 4, wherein there is provision for relative movement between said plates and the ply separation device so that the plates are removed away from the region of the ply separated plies therefrom prior to the plates partaking of their first and second reverse direction movements respectivley.

6. Apparatus as claimed in any one of the preceding claims, wherein the means for everting the seamed gusset comprise turning means adapted to move two rollers of the first and second support means respectively from a first position in which they lie side by side in a substantially parallel manner in a plane passing through both said rollers to a second position in which they have turned in that plane by an obtuse angle at least approaching 180°.

7. Apparatus as claimed in any one of claims 2 to 6, wherein the pair of separation rollers of said ply separation means are hollow, and provided with suction holes so as to permit suction applied to the roller interior to bring about engagement of the roller with the material of the ply.

8. Apparatus as claimed in either one of claims 4 and 5, wherein the plates are hollow and provided with suction holes so as to permit suction applied to the plate interior to engage the respective plies.

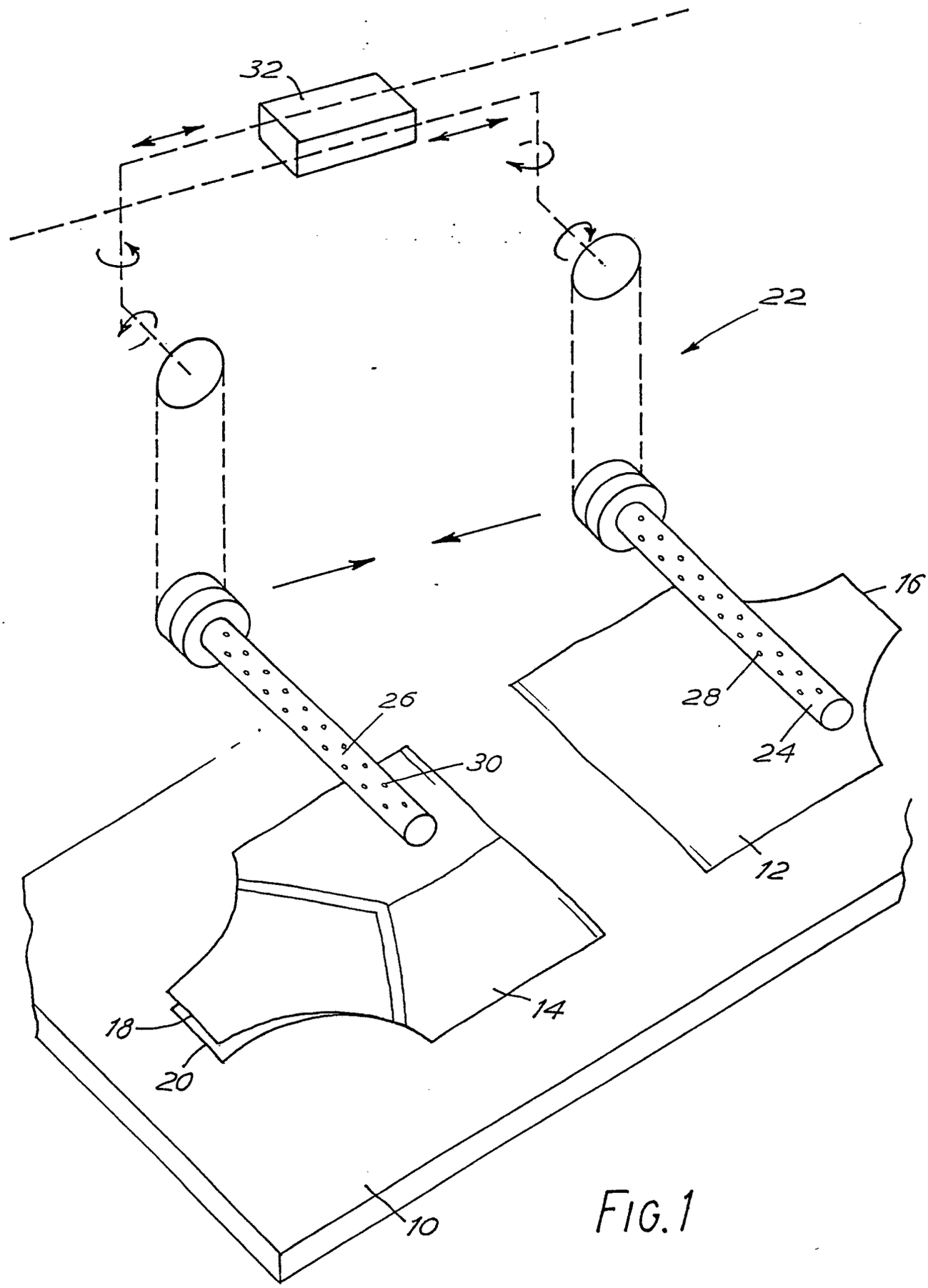
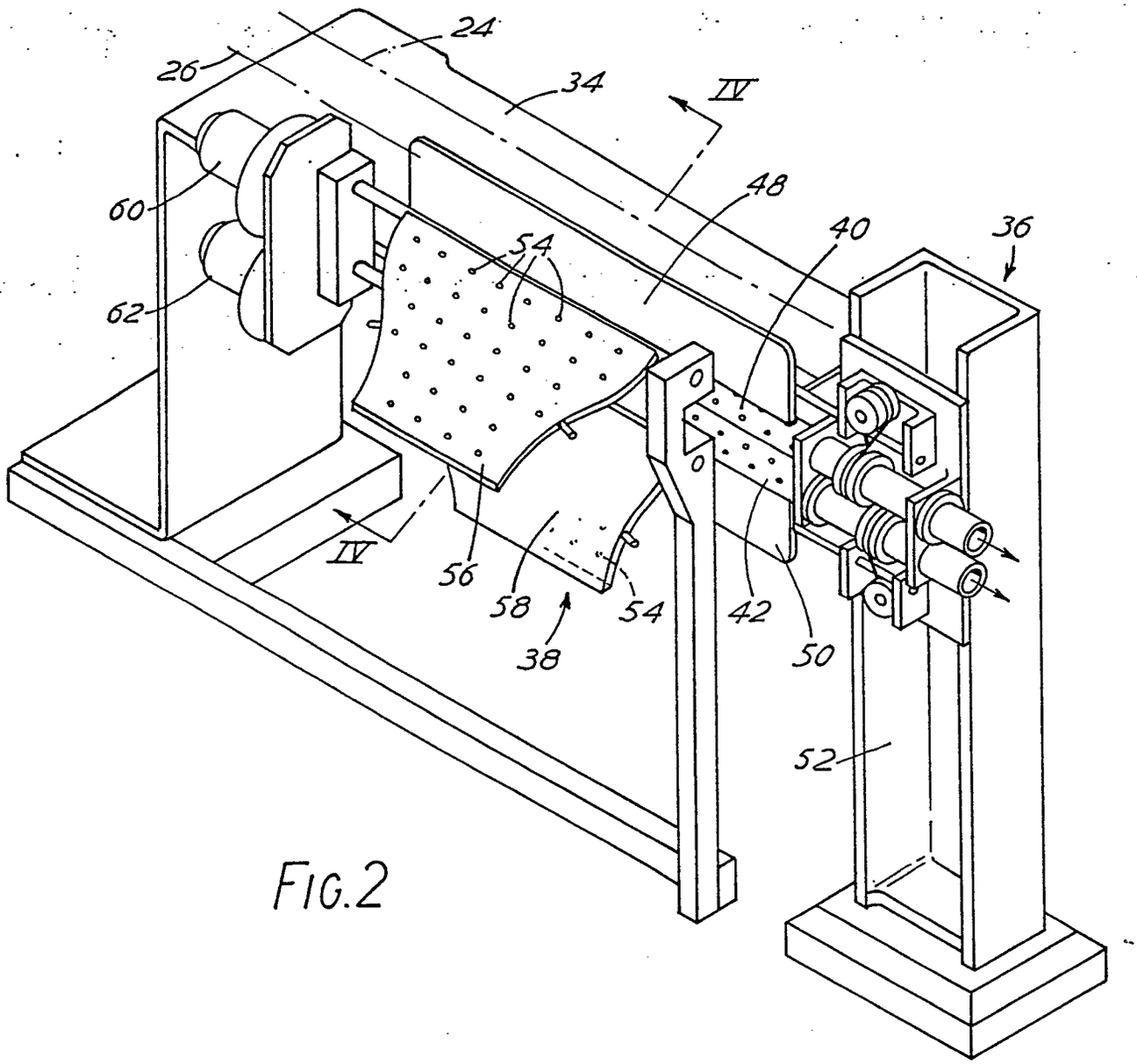


FIG. 1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IV
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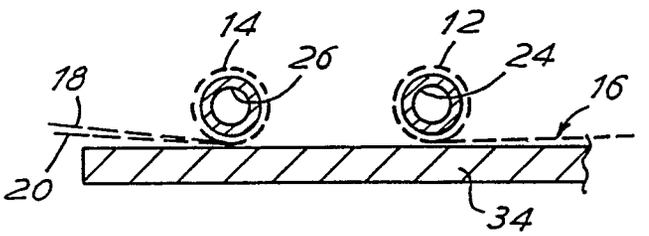
52

FIG.2


14
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34

FIG.3

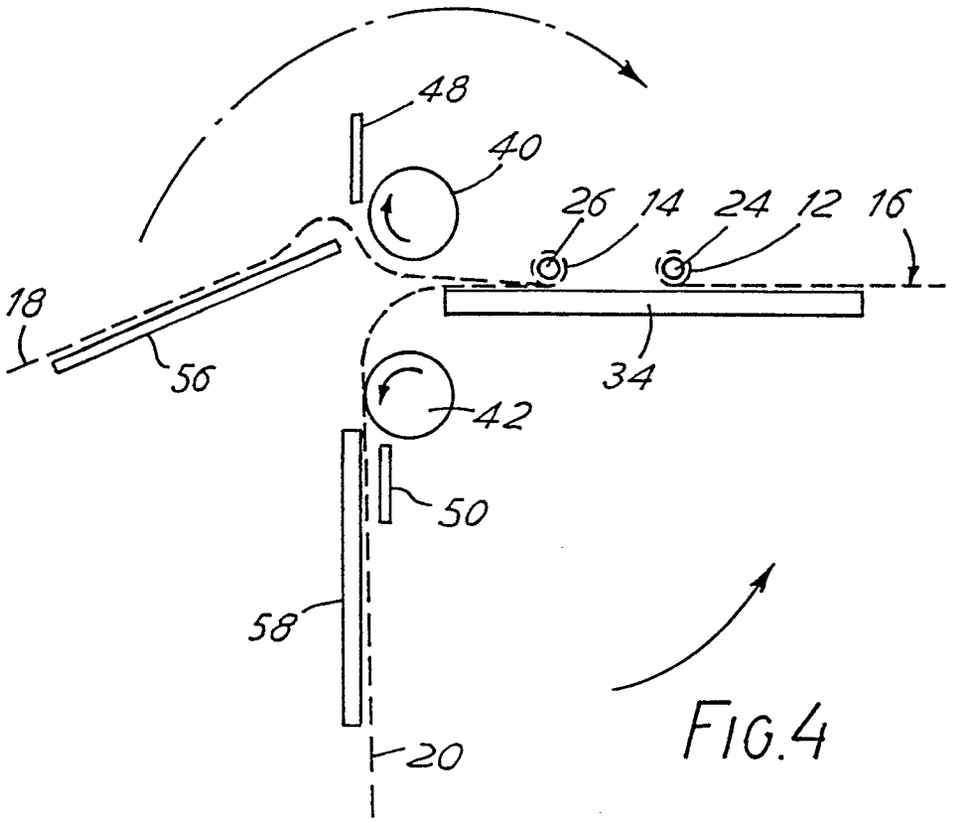

FIG.4

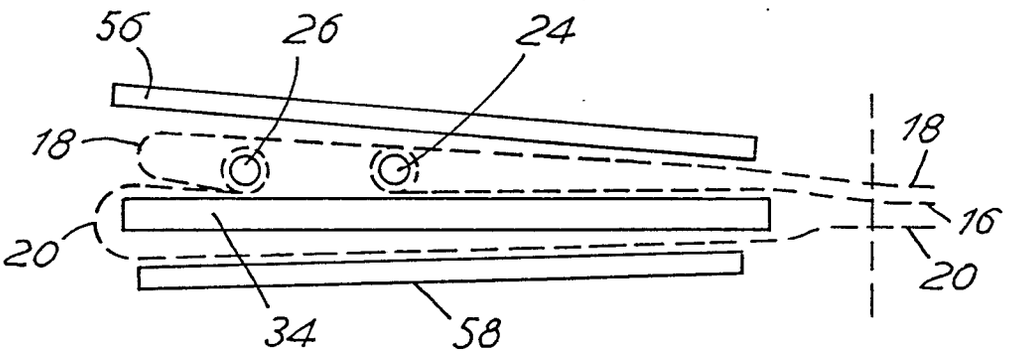

FIG.5

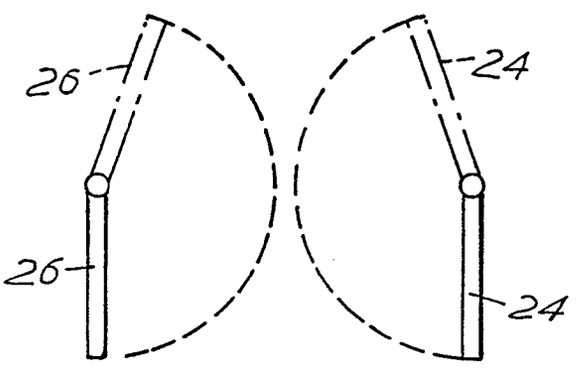

FIG 6

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EUROPEAN SEARCH REPORT

Application Number

EP 88 30 1461

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	US-A-3 765 672 (CONNER/STAHL URBAN) * Column 15, line 9 - column 16, line 42; figures 17-20, point 257 *	1	D 05 B 33/00 A 41 H 43/02
A	US-A-3 588 087 (IVANHOE) * Columns 3-4; figures 3,4,8 *	1	
A	FR-A-2 471 343 (VALTON) * Page 4 *	1	
A	US-A-3 191 557 (MOORE) * Column 3, line 54 - column 4, line 33; figure 10 *	1	
A	US-A-3 099 970 (HITE/VANITY FAIR) * Whole document *	1	
A	US-A-2 188 301 (NAFTALI/AMF) * Whole document *	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

D 05 B
A 41 H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	27-12-1988	VUILLEMIN L.F.

CATEGORY OF CITED DOCUMENTS

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