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(54) Multi-adjustable closure for clothing

(57) An adjustable fastener includes a male part and a female part, both of which are made of soft pliable, sewable plastic. The female fastener part has three spaced apart openings. Each opening has a broad portion and a narrow portion. The male fastener part has a base with an upstanding riser with a flange at the end of the riser. The flange is dimensioned to fit into the broad portion of each opening in the female fastener part and the riser is dimensioned to fit snugly into the narrow portion of each opening in the female fastener part. The narrow portion of each opening in the female fastener part is rectilinear in shape and the riser is also rectilinear in section. Thus, when the riser is in the narrow portion of an opening in the female fastener part, rotation of the male fastener part relative to the female fastener part is prevented. The back side of the male fastener part is provided with parallel grooves which enhance gripping when releasing the fastener. Both of the fastener parts have a pair of parallel flanges at one end between which a back end is inserted and secured to the fastener part. The fastener parts are preferably attached to the garment back so that the openings in the female fastener part face the back of the wearer and the riser and flange on the male fastener part face away from the back of the wearer. The back of the female fastener part is preferable covered with fabric and/or bears a trademark or a design.

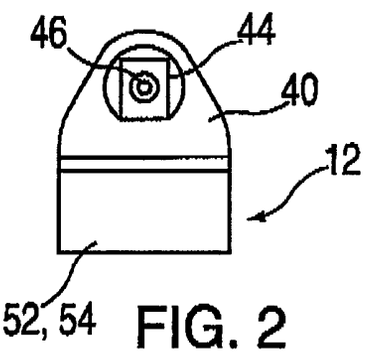

FIG. 2

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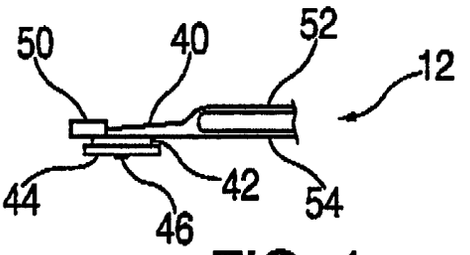
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FIG. 4

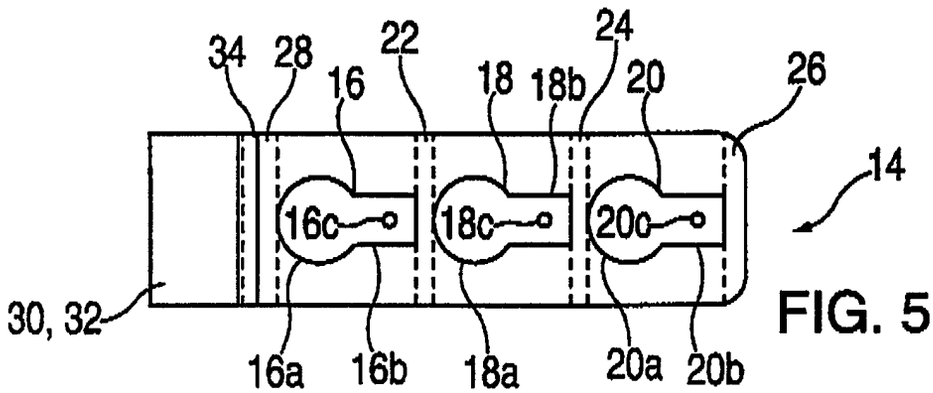

34
28
16
22
18
18b
24
20
26
14
16c
18c
20c
30, 32
16a
16b
18a
20a
20b

FIG. 5

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The invention relates to fasteners for clothing. More particularly, the invention relates to an adjustable fastener for a brassier or similar garment.

2. State of the Art

[0002] Many articles of clothing are provided with adjustable fasteners. In particular, brassieres are typically provided with an adjustable fastener for connecting right and left center backs of the garment. These fasteners usually include one or more hooks and multiple eyelets spaced apart from each other so that the snugness of the garment eye can be adjusted by mating the hook(s) with the appropriate eyelet(s).

[0003] The known brassier fasteners have several disadvantages. First, being located at the back of the garment, they are difficult to manipulate. Second, the hooks and eyelets are typically made of metal and feel uncomfortable pressing against the back of the wearer. Third, the hook is typically free to rotate in the eyelet and allow the bra back to hike up into an uncomfortable configuration. Fourth, the fastener is typically thicker than the eyes to which it is attached and is visible through outerwear as a bump.

[0004] Many attempts have been made to provide a brassier fastener which is easy to operate, comfortable to the wearer and less visible. While these fasteners may solve some of the problems described above, they typically do not solve all of the problems and often introduce new problems. For example, in attempting to overcome the problems described above, many brassier fasteners sacrifice stability for comfort. This permits the fastener from accidentally detaching. Also, some fasteners which attempt to solve the problem of visibility have actually increased the difficulty in operation of the fastener.

SUMMARY OF THE INVENTION

[0005] It is therefore an object of the invention to provide an adjustable fastener for clothing, in particular brassieres.

[0006] It is also an object of the invention to provide an adjustable fastener which is easy to operate.

[0007] It is another object of the invention to provide an adjustable fastener which is soft and comfortable.

[0008] It is still another object of the invention to provide an adjustable fastener which is stable when fastened.

[0009] It is yet another object of the invention to provide an adjustable fastener which is concealed when fastened.

[0010] In accord with these objects which will be discussed in detail below, the adjustable fastener of the present invention includes a male part and a female part, both of which are made of soft pliable, sewable plastic. The female fastener part has three spaced apart openings. Each opening has a broad portion and a narrow portion. The male fastener part has a base with an upstanding riser with a flange at the end of the riser. The flange is dimensioned to fit into the broad portion of each opening in the female fastener part and the riser is dimensioned to fit snugly into the narrow portion of each opening in the female fastener part. The narrow portion of each opening in the female fastener part is rectilinear in shape and the riser is also rectilinear in section. Thus, when the riser is in the narrow portion of an opening in the female fastener part, rotation of the male fastener part relative to the female fastener part is prevented. The back side of the male fastener part is provided with parallel grooves which enhance gripping when releasing the fastener. Both of the fastener parts have a pair of parallel flanges at one end between which the garment back end is inserted and secured to the fastener part. The fastener parts are preferably attached to the garment's center backs so that the openings in the female fastener part face the back of the wearer and the riser and flange on the male fastener part face away from the back of the wearer. The back of the female fastener part is preferable covered with fabric and/or bears a trademark or a design.

[0011] According to one embodiment of the invention, the flange on the male fastener part is substantially circular and has a centrally located nub rising from its surface. The broad portion of each opening in the female fastener part is substantially circular and the narrow portion of each opening in the female fastener part has a nub-receiving well. This structure adds stability to the fastener, preventing accidental unfastening.

[0012] According to another embodiment of the invention, the flange on the male fastener part is substantially elliptical. The broad portion of each opening in the female fastener part is substantially elliptical and a pair of ears extend between the broad portion and the narrow portion of each opening in the female fastener part. This structure also adds stability to the fastener, preventing accidental unfastening.

[0013] According to one method of manufacture, both parts are injection molded and are fastened to brassier center backs by sewing. According to another method of manufacture, the male fastener part is injection molded, but the female fastener part is made from a laminate structure which includes two outer layers and two inner layers. The outer layers are made of a soft fabric material and the inner layers are made of soft plastic. One of the plastic layers has the openings as described and the other plastic layer has thick portions which surround the openings in the other plastic layer to create a space for receiving the male fastener part. According to a presently preferred embodiment, the plastic spacer is made by embossing a plastic sheet and the outer fabric layers

are made from a single layer which is folded. All of the parts preferably have rounded edges and corners to prevent poking, snagging, and skin irritation.

[0014] Additional objects and advantages of the invention will become apparent to those skilled in the art upon reference to the detailed description taken in conjunction with the provided figures.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015]

Figure 1 is a plan view of the non-engaging side of a male fastener part according to a first embodiment of the invention;

Figure 2 is a plan view of the engaging side of the male fastener of Figure 1;

Figure 3 is an end elevation view of the male fastener of Figures 1 and 2;

Figure 4 is a side elevation view of the male fastener of Figures 1-3;

Figure 5 is a plan view of the engaging side of a female fastener part according to the first embodiment of the invention;

Figure 6 is a side elevation view of the female fastener part of Figure 5;

Figure 7 is a transparent side elevation view of the male and female fastener parts engaged;

Figure 8 is a plan view of the non-engaging side of a male fastener part according to a second embodiment of the invention;

Figure 9 is a plan view of the engaging side of the male fastener of Figure 8;

Figure 10 is an end elevation view of the male fastener of Figures 8 and 9;

Figure 11 is a side elevation view of the male fastener of Figures 8-10;

Figure 12 is a plan view of the engaging side of a female fastener part according to the second embodiment of the invention;

Figure 13 is an enlarged view of the circled portion of Figure 12;

Figure 14 is an exploded view of the component parts of a female fastener part according to a preferred embodiment;

Figure 15 is a plan view of the preferred outer laminate layers;

Figure 16 is a side elevation view of a preferred spacer layer;

Figure 17 is a plan view of the preferred spacer layers

Figure 18 is a plan view of the non-engaging side of the preferred female fastener part;

Figure 19 is a side elevation view of the preferred female fastener part; and

Figure 20 is a plan view of the engaging side of the preferred female fastener part.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0016] Referring now to Figures 1 through 7, an adjustable fastener 10 of the present invention includes a male part 12 and a female part 14, both of which are made of soft pliable, sewable plastic. As seen best in Figure 5, the female fastener part 14 has three spaced apart openings 16, 18, 20. Each opening 16, 18, 20 has a broad portion 16a, 18a, 20a and a narrow portion 16b, 18b, 20b. Opening 16 is separated from opening 18 by a flexible rib 22 and opening 20 is separated from opening 18 by a flexible rib 24. The narrow portion 20b of opening 20 terminates at rib 26 and the broad portion 16a of opening 16 terminates at rib 28. A pair of parallel flanges 30, 32 extend from the rib 28 as seen best in Figure 6. At least one of the flanges 30, 32 has a live hinge 34. According to this embodiment, the broad portion 16a, 18a, 20a of each opening 16, 18, 20 is substantially circular. The narrow portion 16b, 18b, 20b of each opening 16, 18, 20 is substantially rectilinear and the narrow portion of each opening has a nub-receiving well 16c, 18c, 20c.

[0017] Referring now to Figures 1-4, the male fastener part has a base 40 with an upstanding riser 42 with a flange 44 at the end of the riser 42. The flange 42 is substantially circular and is dimensioned to fit into the broad portion of each opening in the female fastener part and the riser 42 is substantially rectilinear in section, as seen best in phantom line in Figure 2, and is dimensioned to fit snugly into the narrow portion of each opening in the female fastener part. The flange 44 is provided with a centrally located nub 46 rising from its surface. The back side of the male fastener part 12 is provided with parallel grooves 48 and a finger stop 50 which enhance gripping when releasing the fastener. The male fastener part 12 is also provided with a pair of parallel flanges 52, 54, seen best in Figure 4.

[0018] The fastener parts 12, 14 are attached to garment center backs (not shown) by inserting ends of the

center backs between the flanges 30, 32, 52, 54, and stitching the center backs to the flanges. Preferably, the fastener is attached to the garment back so that the openings in the female fastener part face the back of the wearer and the riser and flange on the male fastener part face away from the back of the wearer. The back non-engaging surface 56 of the female fastener part 14 is preferable covered with fabric and/or bears a trademark or a design.

[0019] As shown in Figure 7, when the male and female fastener parts are engaged, the nub 46 resides in the nub receiving well 20c (or 16c or 18c) impeding lateral movement of the male part. The rectilinear riser 44 resides in the rectilinear narrow portion 20b (or 16b or 18b) preventing rotation of the parts relative to each other. The flange 44 prevents the male part from exiting the narrow portion orthogonally. According to this embodiment of the invention, both of the fastener parts are unitary members made by injection molding.

[0020] Turning now to Figures 8-13, a second embodiment of a fastener according to the invention is similar the first embodiment with similar reference numerals (increased by 100) referring to similar parts.

[0021] The fastener includes a male part 112 and a female part 114, both of which are made of soft pliable, sewable plastic. As seen best in Figure 12, the female fastener part 114 has three spaced apart openings 116, 118, 120. Each opening 116, 118, 120 has a broad portion 116a, 118a, 120a and a narrow portion 116b, 118b, 120b. According to this embodiment, the broad portion 116a, 118a, 120a of each opening 116, 118, 120 is substantially elliptical. The narrow portion 116b, 118b, 120b of each opening 116, 118, 120 is substantially rectilinear and a pair of ears 116c, 116d, 118c, 118d, 120c, 120d extend between the broad and narrow portions.

[0022] Referring now to Figures 8-11, the male fastener part 112 has a base 140 with an upstanding riser 142 with a flange 144 at the end of the riser 142. The flange 142 is substantially elliptical and is dimensioned to fit into the broad portion of each opening in the female fastener part and the riser 142 is substantially rectilinear in section, as seen best in phantom line in Figure 9, and is dimensioned to fit snugly into the narrow portion of each opening in the female fastener part. The back side of the male fastener part 112 is provided with parallel grooves 148 and a finger stop 150 which enhance gripping when releasing the fastener. The male fastener part 112 is also provided with a pair of parallel flanges 152, 154, seen best in Figure 11.

[0023] Turning now to Figure 14, the female fastener part 114 is preferably formed as a laminate structure which includes two outer layers 114a, 114d and two inner layers 114b, 114c. The outer layers 114a, 114d are made of a soft fabric material and the inner layers 114b, 114c are made of soft plastic. One of the plastic layers 114b has the openings as described and the other plastic layer 114c has thick portions which surround the openings in the other plastic layer to create a space for receiving the male fastener part. As shown in Figure 14, the plastic "spacer layer" 114c has four rectilinear through bores.

[0024] As shown in Figure 15, the outer layers (114a, 114d in Figure 14) are preferable formed as a single fabric layer 214a, 214d folded at fold line 214e. As shown in Figures 16 and 17, the plastic spacer 214c (114c in Figure 14) is made by embossing a plastic sheet with raised bumps which surround the openings in the layer 114b in Figure 14. The assembled female member 214 is shown in Figures 18-20.

[0025] There have been described and illustrated herein several embodiments of a fastener for clothing, in particular a brassier. While particular embodiments of the invention have been described, it is not intended that the invention be limited thereto, as it is intended that the invention be as broad in scope as the art will allow and that the specification be read likewise. It will therefore be appreciated by those skilled in the art that yet other modifications could be made to the provided invention without deviating from its spirit and scope as so claimed.

Claims

1. An adjustable fastener for an article of clothing, said fastener comprising:

a) a male part having a base, a riser extending from said base, and a flange extending from the riser;

b) a female part having a plurality of spaced apart openings, each opening having a broad portion and a narrow portion, wherein

each of said narrow portions is substantially rectilinear in shape, and

said riser is substantially rectilinear in section and dimensioned to fit snugly in each of said narrow portions.

2. An adjustable fastener as claimed in claim 1, wherein:

each of said broad portions is substantially circular in shape, and

said flange is substantially circular.

3. An adjustable fastener as claimed in claim 2, wherein:

said flange has a centrally located nub extending from its surface, and

each of said narrow portions has a nub-receiving well.

4. An adjustable fastener as claimed in claim 3, wherein:

each of said mail and female parts having a pair of substantially parallel flanges extending from an end thereof.

5. An adjustable fastener as claimed in claim 4, wherein:

at least one of said substantially parallel flanges has a live hinge.

6. An adjustable fastener as claimed in claim 5, wherein:

each of said plurality of openings is separated from an adjacent one of said plurality of openings by a flexible rib.

7. An adjustable fastener as claimed in claim 6, wherein:

said male part has a plurality of parallel groves on a side thereof opposite said riser and said flange.

8. An adjustable fastener for an article of clothing, said fastener comprising:

a) a male part having a base, a riser extending from said base, and a flange extending from the riser; and
b) a female part having a plurality of spaced apart openings, each opening having a broad portion and a narrow portion, with a pair of ears extending between said broad portion and said narrow portion.

9. An adjustable fastener according to claim 8, wherein:

each of said narrow portions is substantially rectilinear in shape, and
said riser is substantially rectilinear in section and dimensioned to fit snugly in each of said narrow portions.

10. An adjustable fastener as claimed in claim 9, wherein:

each of said broad portions is substantially elliptical in shape, and
said flange is substantially elliptical.

11. An adjustable fastener as claimed in claim 2, wherein:

said female part is made from a laminate of four layers, two outer layers of which are soft fabric and two inner layers of which are flexible plastic.

12. An adjustable fastener as claimed in claim 11, wherein:

one of said inner layers is and embossed sheet of plastic.

13. An adjustable fastener as claimed in claim 12, wherein:

said male part has a plurality of parallel groves on a side thereof opposite said riser and said flange.

14. An adjustable fastener for an article of clothing, said fastener comprising:

a) a male part having a base, a riser extending from said base, and a flange extending from the riser;
b) a female part having a plurality of spaced apart openings, each opening having a broad portion and a narrow portion, wherein
said flange has a centrally located nub extending from its surface, and
each of said narrow portions has a nub-receiving well.

15. An adjustable fastener as claimed in claim 14, wherein:

each of said broad portions is substantially circular in shape, and
said flange is substantially circular.

16. An adjustable fastener as claimed in claim 15, wherein:

each of said narrow portions is substantially rectilinear in shape, and
said riser is substantially rectilinear in section and dimensioned to fit snugly in each of said narrow portions.

17. An adjustable fastener as claimed in claim 16, wherein:

each of said mail and female parts having a pair of substantially parallel flanges extending from an end thereof.

18. An adjustable fastener as claimed in claim 17, wherein:

at least one of said substantially parallel flanges has a live hinge.

19. An adjustable fastener as claimed in claim 18, wherein:

each of said plurality of openings is separated from an adjacent one of said plurality of openings by a flexible rib.

20. An adjustable fastener as claimed in claim 19, wherein:

said male part has a plurality of parallel groves on a side thereof opposite said riser and said flange.

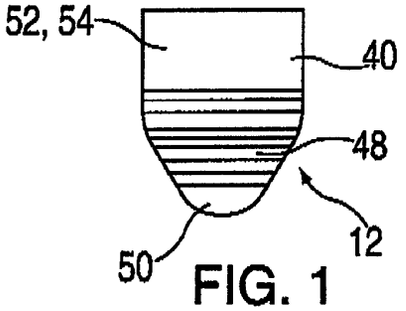


FIG. 1

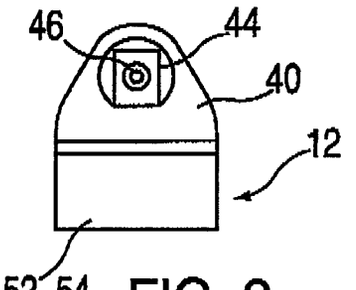


FIG. 2

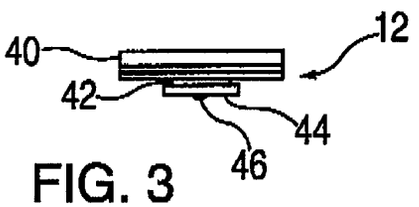


FIG. 3

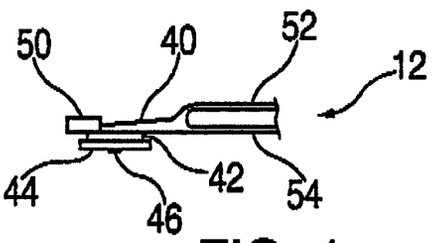


FIG. 4

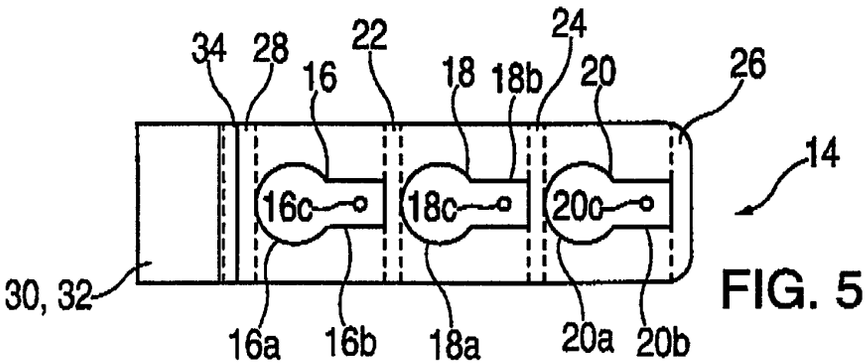


FIG. 5

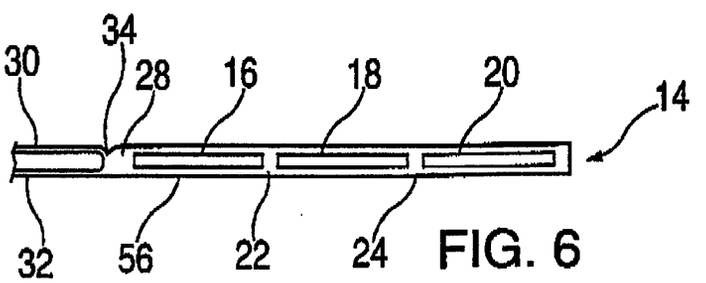


FIG. 6

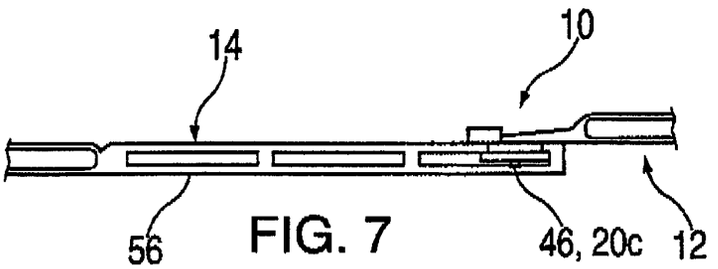


FIG. 7

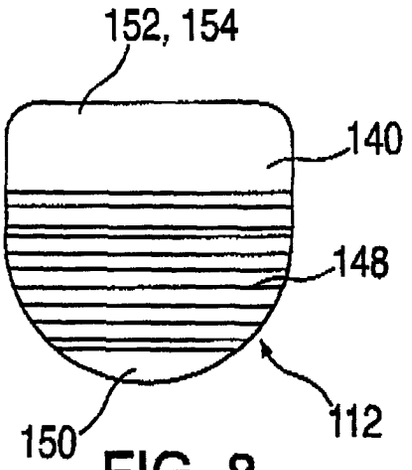


FIG. 8

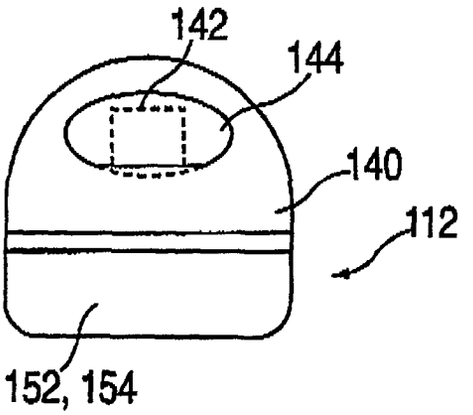


FIG. 9

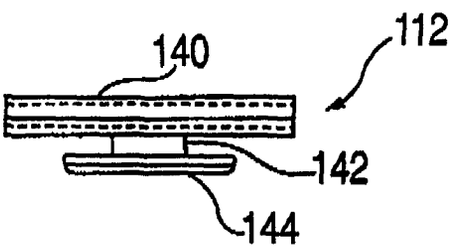


FIG. 10

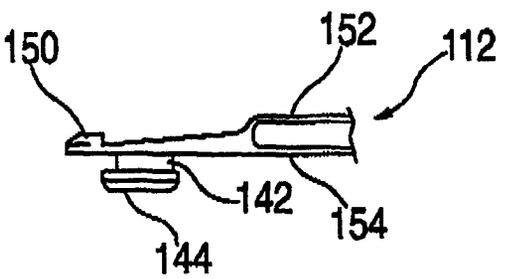


FIG. 11

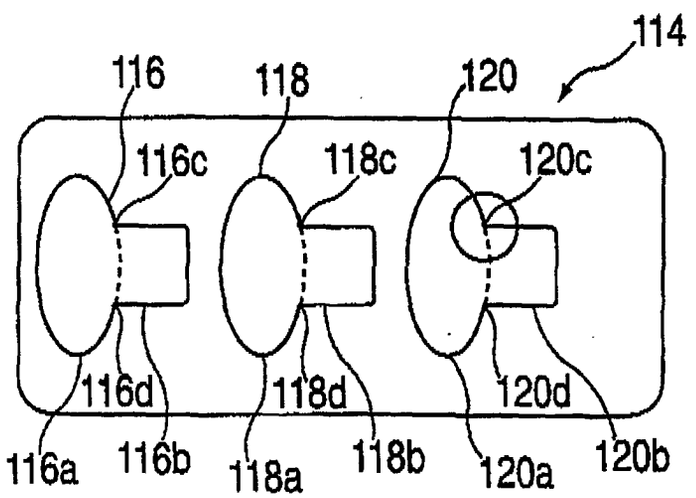
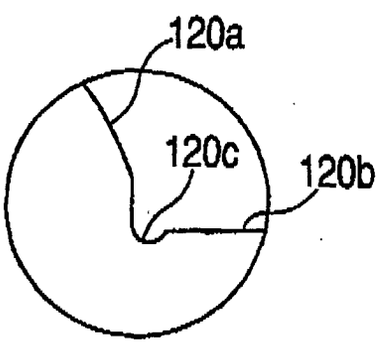


FIG. 12



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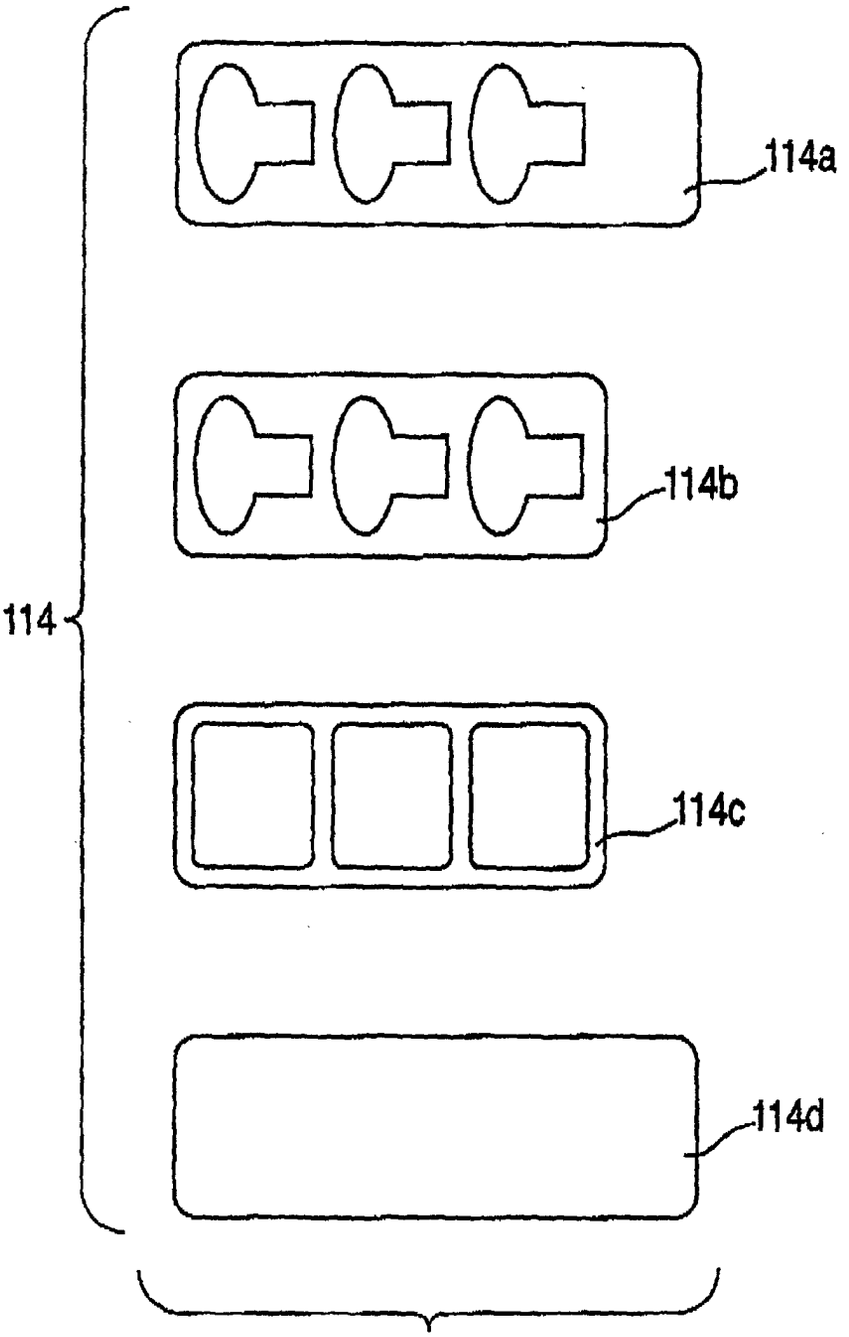

FIG. 14

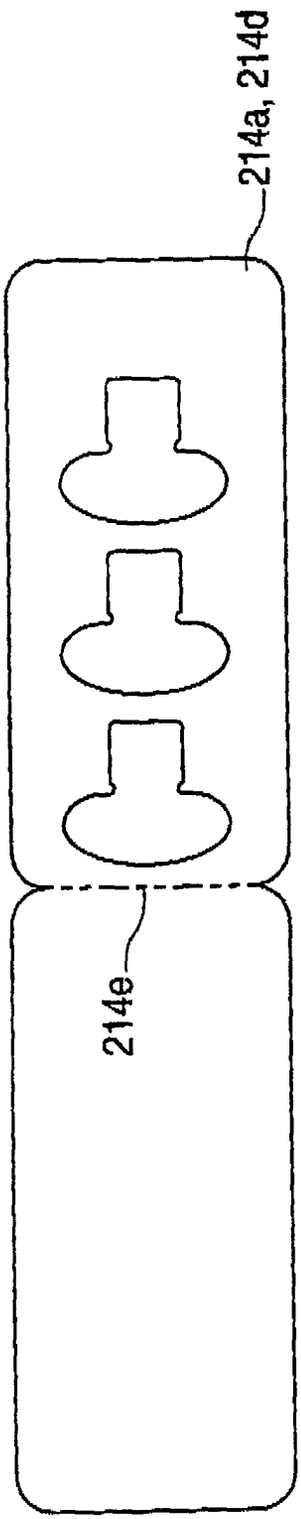

FIG. 15

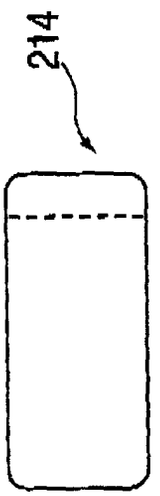

FIG. 18

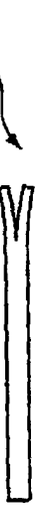

FIG. 19

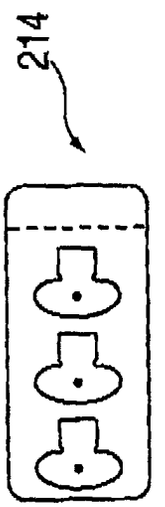

FIG. 20

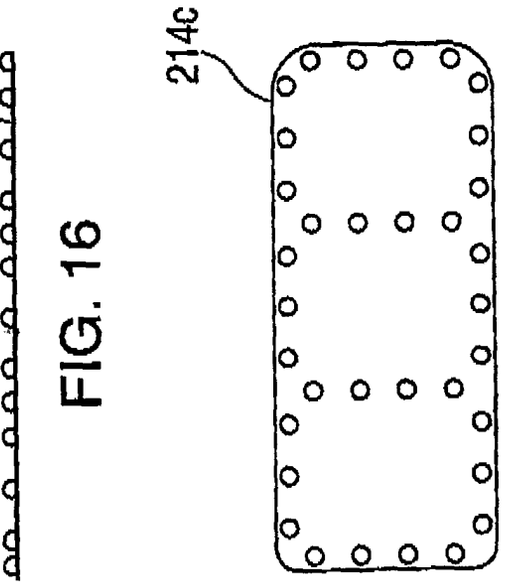

FIG. 17

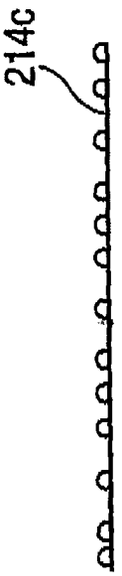

FIG. 16

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 07 6272

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.7)
X	DE 26 06 576 A (MEKU METALL KUNSTSTOFF) 25 August 1977 (1977-08-25) * page 7, paragraph 2 - paragraph 4 *	1,2	A41F1/00
Y	* page 8, line 6; figures 1-3 *	8-10, 14-16	
Y	US 6 309 489 B1 (FILDAN GERHARD ET AL) 30 October 2001 (2001-10-30) * column 6, line 20 - line 23 * * column 6, line 29 - line 30 * * column 6, line 56 - column 7, line 10; figures 21-23 *	8-10, 14-16	
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The present search report has been drawn up for all claims

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THE HAGUE	21 August 2002	Monné, E

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