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(54) **Button fastener**

(57) A garment fastener according to the invention comprises a female fastener member including a first flexible carrier tape composed of a synthetic resin and having at least one hole, a ring molded from said first flexible tape and surrounding said hole, and an eyelet fitting into said hole and composed of ring-shaped elements pressed one into another through said hole and having respective flanges on opposite sides of the first flexible carrier tape overlying said ring of said first flexible tape; the garment fastener also comprises a male fastener member including a second flexible carrier tape composed of a synthetic resin and having at least one hole, a ring molded from said second flexible tape, and a press button fitting into said hole of said second flexible tape and composed of ring-shaped elements pressed one into another through said hole of said second flexible tape and having respective flanges on opposite sides of said second flexible tape overlying said ring of said second flexible tape.

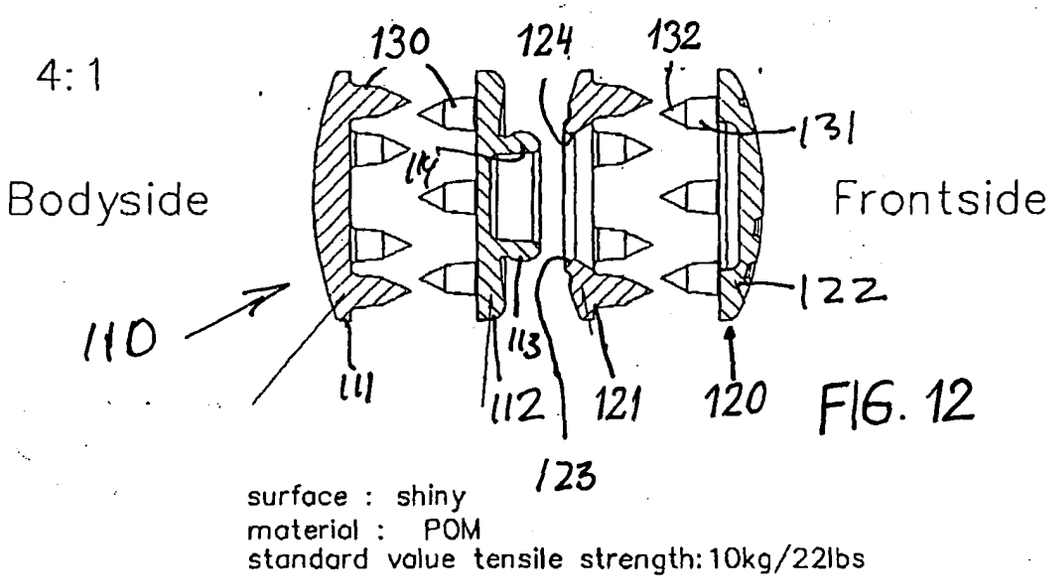

FIG. 12

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Description

[0001] Our present invention relates to a button fastener, especially for brassieres and, more particularly, to a fastener which can be used to attach a strap or the like to a garment, such as a brassiere, utilizing a press-fit between male and female members. The invention also relates to a flexible fastener for garments and especially bathing suits and lingerie, particularly for use as a back strap fastener and to a method of making same.

[0002] While a variety of fasteners have been used heretofore to attach, for example, the strap of a brassiere to the body thereof or two parts of a brassiere together, there is a continuing desire for improvement in this field. Hook and loop fasteners, for example, have aesthetic disadvantages, while eyelet type fasteners may require stitching of fabric pieces or fastener parts to the garment. Most fasteners provided heretofore have been relatively complex, time-consuming in application to the garment or unsatisfactory from the point of view of laundering and manipulation by the user.

[0003] It is, therefore, the object of the present invention to provide an improved garment fastener which can be connected and disconnected easily, is capable of withstanding repeated laundering and poses no danger to other delicate garments in the wash, and is aesthetic in appearance in all stages.

[0004] These objects are attained, in accordance with the invention, in a fastener for two parts of a garment, e.g. a strap and a brassiere body, and having respective fastener parts attached to the two parts of the garment to be joined together. According to the invention, one of these parts is a ring which is formed with an opening and is composed of two sections, one on each side of the fabric piece carrying the fastener part and welded together through the fabric so that the fabric is exposed through the opening. The other fastener part forms a press button with the first fastener part and preferably has a formation complementary to the formation on either of the two sections of the ring and can be press-fitted onto it. The formations are respectively a male formation and a female formation. The female formation can be an inwardly-extending overhang surrounding the opening in the respective ring section while the male formation can be a generally cylindrical collar boss or rib having an outward bulge engageable behind the overhang.

[0005] The outer configuration of the male member can correspond to that of the female members so that when the two parts of the fastener are joined together, they appear identical from front and back. The male member can engage in the female fastener part at either one of its sections, i.e. on one side of the fabric or the other and in that case the fastener may be reversible and the garment carrying the fastener can be reversible. The fact that the fabric of the garment is exposed through the openings in both the male and female fastener parts has been found to contribute to the overall aesthetics of the fastener which has a press button configuration and in which the female fastener part can form a decorative element for the body of the garment even if no strap is applied.

[0006] According to a feature of the invention, one of the sections of the female part of the fastener can be provided with a plurality of spaced-apart pins which are pointed and can pierce the fabric when the two parts of the female fastener are pressed together and joined by welding to one another and to the fabric. The other sections of the female fastener parts may have a plurality of recesses or depressions dimensioned to receive the projections.

[0007] The male fastener part can be connected to the strap by a pair of shield-shaped plates which straddle the strap and are welded thereto. It has been found to be advantageous to form the male fastener part with a laterally-projecting lug which is connected to the aforementioned plates. The lug can be provided with pins engageable in holes in the plates or holes can be provided in the lug through which pins of one or both of the plates can extend. For aesthetic reasons, it is desirable to have the pins connecting the plates together and/or to the lug project from a side of one of the plates. In this case, one of the plates can be provided with the pins which pass through holes in the lug and in the other plate.

[0008] The invention also encompasses the garment provided with such a fastener, especially a brassiere. In that case, a body of the brassiere is provided with the female fastener and the male fastener can engage in this female fastener from either side and can be carried by the strap.

[0009] The fastener of the invention has been found to be particularly effective with reversible garments, especially reversible undergarments such as brassieres. A brassiere, according to the invention, can be fabricated from molded cups entirely by a welding process, i.e. without stitched seams, and such that the fabrics on the opposite sides of the brassiere have different colors so that either of these colors or fabrics may be the outer fabric and the other the inner fabric of the brassiere, depending upon how the garment is reversed. According to the present invention, one of the annuluses of the female fastener may be of one color while the other annulus is of another color to match the fabric or side of the brassiere to which the respective annulus is welded.

[0010] Since the male fastener part is attached to the strap by welding and the female fastener part has its annuluses or rings also attached by welding, not only is the garment itself fabricated by a welding process free from stitching but the reversible fastener can be applied also entirely by welding operations. Naturally, the opposite sides of the male fastener part may be of different colors corresponding to the colors of the annuluses or rings of the female fastener part so that the male fastener part, upon reversible of the garment, need only be turned over to provide a match between the visible portions of the two fastener parts.

[0011] Where the fabric is a soft fabric, a thick fabric and certain delicate weaves and knits, such as those for brassieres, lingerie, swimwear and babywear, both sides can have prongs each pointing toward the other. The prongs preferably have cylindrical shanks and conical pointed tips.

[0012] In the drawing:

FIG. 1 is a perspective view of a brassiere provided with a fastener according to the invention;
FIG. 2 is an elevational view showing one side of the female part of this fastener applied to a fabric;
FIG. 3 is a perspective view of one section of the female fastener part;
FIG. 4 is a perspective view of the other section;
FIG. 5 is a perspective view of the two sections joined together, albeit without the fabric between them;
FIG. 6 is a perspective view broken away showing the two sections joined and without the fabric between them;
FIG. 7 is a perspective view partially broken away showing the fastener with the male and female parts joined but again without the fabric between the two sections of the female parts;
FIG. 8 is an enlarged elevational view of the male portion of the fastener seen from one side;
FIG. 9 is a view similar to FIG. 8 showing the male fastener part as seen from the opposite side;
FIG. 10 is a side elevational view of the plates affixing the male fastener part to the strap;
FIG. 11 is a side elevational view of the two plates connected together but without the strap or the lug of the male fastener part.
FIG. 12 is a cross sectional view for a press-button fastener for baby garments and the like;
FIGS. 12a - 12d are details of the fastener of FIG. 12;
FIG. 13 is a cross sectional view illustrating an eyelet forming one coupling element of a fastener according to the invention;
FIG. 14 is a cross sectional view of the press button;
FIG. 15 is an elevational view of the female fastener for a swimsuit or brassiere;
FIG. 16 is a plan view of the male fastener, seen from below;
FIGS. 17, 18 and 19 are plan views of other fastener arrangements in which a single press button is used;
FIGS. 20, 21 and 22 are views similar to FIGS. 17 to 19 in which rows of coupling members are provided;
FIG. 23 is a cross sectional view through one element of the male coupling member;
FIG. 24 is an elevational view taken in the direction of arrow XXIV of FIG. 23
FIG. 25 is a cross sectional view through the male part of an eyelet in accordance with the invention;
FIG. 26 is a view in the direction XXVI-XXVI of FIG. 25
FIG. 27 is a diagram showing assemblies of the press button;
FIG. 28 is an assembly diagram for the eyelet;
FIG. 29 is a plan view of an injection molded unit facilitating mounting of the eyelets;
FIG. 30 is an elevational view of the tape of the female member prior to application of the eyelets;
FIG. 31 is a cross sectional view taken along the line XXXI-XXXI of FIG. 30
FIG. 32 is a cross sectional detailed view through one of the holes;
FIG. 33 is a view similar to FIG. 30 but showing the tape of the male fastener;
FIG. 34 is a cross sectional view taken along the line XXXIV-XXXIV of FIG. 33;
FIG. 35 is an elevational view showing the interconnected coupling member partly in section and without the carrying tapes; and
FIG. 36 is a cross sectional view of an upper male part for a press button which is intended to be used for attachment to a soft plastic foil;
FIG. 37 is a bottom view thereof;
FIG. 38 is a cross sectional view of the lower part of the female member of the press button; and
FIG. 39 is a plan view of this female part of the press button.

[0013] The principles of the invention will be apparent from FIG. 1 which shows half of a brassiere 10 having a cup 11 and a back strap 12. A shoulder strap 13 can be connected to the brassiere by a pair of press-button fasteners represented at 14 and 15, respectively.

[0014] The fastener 15 comprises male and female members 16 and 17 attached to the strap 13 and to the brassiere body 10, respectively, and interconnected at a button 18 of circular shape. The cylindrical boss 19 of the male member 16 can be seen within the hole formed by the ring 20 of the female member. The male and female members are both carried via lugs 21 and 22 by pairs of shield-shaped plates 23 and 24, welded to the strap 13 and to the cup fabric, respectively.

[0015] The press-button fastener 25-28 differs from that shown at 15 in that the female member is formed from two ring-shaped sections, one of which is visible at 25 in FIG. 1. A similarly-shaped circular ring fastener part is provided on the opposite side of the strap 12 of the body of the brassiere and is not visible in FIG. 1. The male member 26, however, is engageable in the opening on either of these two annuluses and thus can be affixed to the female fastener part on either side of the strap 12. In either case, a fabric portion 27 is visible through the opening of the female member and will be visible through the opening 28 of the male member when the latter is pressed onto the female member.

[0016] The female member of the fastener is identified at 30 in FIG. 5 and is formed as two halves or sections

31 and 32 straddling the fabric 33 of the garment. The external appearances of the two halves are identical and thus each has an opening 34 surrounded by a thin ridge 35 separated by a groove 36 from a thicker bead 37. The ring half 31 has been shown in FIG. 3 and the complementary half 32 has been illustrated in FIG. 4. From FIGS. 3 and 4 it will be apparent that each of the female fastener sections has a flat surface 38 or 39 adapted to lie against the fabric 33 while the section 31 has angularly-equispaced pointed pins 40 adapted to pierce the fabric and engage in corresponding recesses 42 formed in the member 32. The two sections are joined together as shown in FIG. 6 with the projections 40 in the recesses 42 and the sections thermally or ultrasonically welded together and to the fabric 33 sandwiched between them but not visible in FIGS. 5, 6 or 7.

[0017] As is also apparent from FIG. 6, the narrow ribs 35 of the two sections form overhanging edges 43 and 44 which engage behind a bulge 45 in the cylindrical rib 46 projecting from the flat surface 47 of the male member of the fastener. The side of the male member 50 of the fastener from which the cylindrical projection 46 juts is visible in FIG. 9. The opposite side is seen in FIG. 8 and has a narrow rib 51 separated by a groove 52 from a wider bead 53 similar to that of the sections 31 and 32 shown in FIGS. 3-7 so that the appearance remains generally the same whether the male and female members are connected or the female member is seen alone. In any case, the fabric piece 27 can be viewed through the openings in the male and female members. The male member is in addition formed with a lateral lug 54 which can have holes receiving pins 57 of a plate 58 projecting through these holes and through holes in another shield-shaped plate 59.

[0018] The pins 57 are visible in FIGS. 10 and 11 as well and the plates 58 and 59 can be seen to have projections 60 which grip the strap 13 when the latter is sandwiched between the plates and is welded thereto. Of course the plates 58 and 59 are not only welded to the strap 13 but to one another and to the lug 54 via the pins 57.

[0019] The welding here as well can be ultrasonic or thermal or a combination of the two.

[0020] The parts of the fastener can be injection molded from synthetic resin material and the plates 58 and 59 can have a different color from that of the male fastener portion and/or the female fastener portion and, while all of the parts can be of a matte finish, various textures or finishes can be provided.

[0021] As will be apparent from FIG. 1, the brassiere body 10 can be fabricated entirely by welding processes, the cups 11 of the brassiere being molded. Advantageously, the opposite sides of the brassiere 10, shown by different shading in FIG. 1, may be of different colors and hence the ring of the female fastener part applied to one side of the garment can be of a different color from the ring applied to the opposite side. The male fastener part may be of different colors on opposite sides as well so that, like the garment, the strap can be reversed to ensure a match between the respective side of the male fastener part and the ring of the female fastener part which it engages. In that case, each of the male and female fastener parts are of two colors to match the two colors of the garment.

[0022] From FIGS. 12 and 12a through 12d, it can be seen that the fastener 110 on the body side of the garment and the fastener 120 on the side of the garment to be attached thereto and adapted to be turned away from the body can such comprise a pair of annular members 111 and 112 or 121 and 122 which are flat, disk-shaped and are each provided with a set of prongs 130 turned toward the prongs of the other fastener element so that the prongs penetrate into the fabric. While only the element 121 has a central hole 123 through which the fabric is visible, it will be understood that, like the structures of the press button of FIG. 1, the fabric can be visible through each of the elements and each of he elements can be annular. The hole 123 has an inwardly projecting rib 124 which can engage an outwardly projecting bulge 113 on the boss 114 forming the male member. When the elements 111 and 112 are pressed together with the fabric between them, the prongs of one are ultrasonically welded to the other through the fabric. Similarly, the prongs of member 121 are welded to the member 122 and the prongs of member 122 are welded to member 121 when the two members are pressed together with the fabric between them.

[0023] In FIG. 12a, member 112 is shown in greater detail and the array of prongs 130 thereof is shown to be six angularly equispaced prongs lying along a circle. The member 112 is here a flat disk.

[0024] Member 121 (FIG. 12c) differs in that it has the hole 123 which forms the female member but is also a generally flat disk. The members 111 and 121 (FIGS. 12b and 12d) are somewhat rounded and can be embossed with, say, a star and comet pattern at 115 as shown in FIG. 12b.

[0025] Each of the prongs 130 has a cylindrical or slightly tapered shank 131 and a pointed tip 132 which can be conical (FIG. 12).

[0026] The configuration of the press button shown allows it to be flatter than metal parts and since the parts are made by injection molding, no prestamping is required. The outside shape can be round as shown but also can be a square, triangular or even a flower shape.

[0027] From FIGS. 15 and 16 it will be apparent that the fastener according to the invention can comprise a female fastener member 210 and a male fastener member 211, adapted to be mounted on the separable parts of a swimsuit back or a brassiere back and to be connected together. The female fastener member includes a flexible carrier tape 212 which may be composed of a synthetic resin, especially transparent polyurethane which can be stitched or ultrasonically welded to the respective part of the backstrap by a flange 213. The carrier tape 212 is formed with three rows of eyelets 214,

each row consisting of two eyelets positioned to be engaged by the press buttons 215 carried by a similar transparent carrier tape 216 of the male fastener member 211.

[0028] As will be apparent from FIG. 13, each eyelet 214 can be composed of a ring-shaped male member 217 and a female member 218 which are pressed together through a hole in the tape 212 and are ultrasonically welded together.

[0029] The male ring-shaped element 217 has been shown in greater detail in FIGS. 25 and 26 and comprises a flange 219 which is formed with a cylindrical stud 220 fitting into the stud 221 of the female member 218 which has a corresponding flange 222 (see FIG. 13).

[0030] The outer surface 223 of the stud 220 and the inner surface of the stud 221 are tapered as shown in FIG. 25 so that the two parts can be pressed together with a snug fit.

[0031] The flange 219, like the flange 222 (FIG. 13), can be formed with a ridge 224 engageable in a respective groove 225 surrounding the hole 226 in the carrier tape 212 (see FIGS. 30 through 32). Such grooves 225 are provided on both sides of the tape 212 around the hole. Similarly, holes 227 and annular grooves 228 are provided on the tape 16 of the male fastener member (see FIGS. 33 and 34).

[0032] As will be apparent from FIGS. 23 and 24, the press button 215 also can comprise ring-shaped elements 230 and 231 (FIG. 14), the ring-shaped element 230 having a projection 232 which is split at 233 and is formed with bulges 234 engageable in and behind a constriction 235 formed in the eyelet in which the press button is fitted (see FIG. 13).

[0033] A large diameter boss 236 of element 230 has a tapered surface 238 complementary to that of the element 231 so that the male and female elements 230 and 231 can be pressed together so that their flanges 239 and 240 (FIG. 35), respectively, have their ridges 241 and 242 engaged in the grooves 228 (FIG. 33) of the tape 216.

[0034] In addition, the engaging surfaces of the element 217 and 231 of the eyelet 214 and the press button 215 (FIG. 35) may be complementarily contoured at 243 so that the overall height of the engaged members is as small as possible.

[0035] The ring-shaped elements of each fastener member may be of the same or different colors and can be composed of polyoxymethylene.

[0036] As can be seen from FIGS. 17 to 19, the female fastener members 210.1, 210.2 and 210.3 may have 1, 2 or 3 eyelets 214.1, 214.2 or 214.3 which can be selectively engaged by the single press-button 215.1 of the male fastener member 211.1 to allow adjustment of the strap.

[0037] Alternatively, the number of rows of eyelets 214.3 of the female member 210.3 of 210.4 may vary as can be seen by a comparison of FIGS. 20 to 22, using a single pair of press-button elements 215.3 on the tape of the male fastener member 211.3. FIGS. 27 to 29 show in principle the way in which the fasteners can be formed. The elements of the coupling members to be disposed on opposite sides of a tape 212.5, for example, are injection molded on a common trunk 250 with break away locations or thin points 251. The trunk 250 is then bent at 252 to lie on opposite sides of the tape 212.5 and the male and female elements of the press button (FIG. 27) or the eyelet (FIG. 28) can be pressed together and ultrasonically welded together in the preformed holes of the tape 212.5. Using the handles 253, the trunk 250 is then torn away at the weakened points 251, leaving the eyelets or press buttons in place.

[0038] As can be seen from FIGS. 36, 37, 38 and 39, the flanges 339 of the male member 315 and 317 of the female member 314 can be provided with teeth 300 adapted to bite into a soft plastic film when the latter is used as a carrier.

Claims

1. A garment fastener comprising: a female fastener member including a first flexible carrier tape composed of a synthetic resin and having at least one hole, a ring molded from said first flexible tape and surrounding said hole, and an eyelet fitting into said hole and composed of ring-shaped elements pressed one into another through said hole and having respective flanges on opposite sides of the first flexible carrier tape overlying said ring of said first flexible tape; and a male fastener member including a second flexible carrier tape composed of a synthetic resin and having at least one hole, a ring molded from said second flexible tape, and a press button fitting into said hole of said second flexible tape and composed of ring-shaped elements pressed one into another through said hole of said second flexible tape and having respective flanges on opposite sides of said second flexible tape overlying said ring of said second flexible tape.

2. The flexible fastener defined in claim 1 wherein each of said flanges has a ridge engaging behind the respective ring and each of said rings is surrounded by an annular groove receiving the respective ridge.

3. The garment fastener defined in claim 2 wherein said first garment carrier tape is formed with a row of pairs of holes, rings surrounding said holes and eyelets of said female fastener member filling into said holes, said male fastener member having a pair of said press buttons each adapted to fit into an eyelet of a respective row of said female fastener, the elements of each member being ultrasonically welded together through the respective hole.

4. The garment fastener defined in claim 1 wherein one of the elements of said male fastener member abuts one of the elements of said female fastener when said press button is engaged in said eyelet, the abutting elements having complementary contours with mutually engaging convex and concave configurations respectively.

5. A method of making a garment fastener for a garment wherein a garment carrier tape is provided with a plurality of fasteners, comprising the steps of:

a) molding a plurality of elements on a respective trunk and adapted to engage a garment carrier tape from opposite sides;

b) providing said garment carrier tape with a plurality of holes and respective rings surrounding said holes;

c) folding said trunk and positioning same so that said elements are aligned with said holes and said rings and pressing said elements on opposite sides of said tape together through said holes whereby said elements define respective fasteners extending through said holes;and

d) ultrasonically welding the elements together through the respective holes.

6. The method defined in claim 5 wherein said tape is composed of a synthetic resin, further comprising the step of molding into said tape a ring around each of said holes on each side of said tape, said elements being formed with flanges engaging over the respective rings, each of said rings being surrounded by a respective groove and each of said flanges has a ridge engaging in a respective one of said grooves.

7. The method defined in claim 6 wherein said tape is composed of polyurethane and is transparent and said elements are molded onto a trunk having a folding region and are applied to said tape by folding said trunk, inserting one of said elements into another through a respective hole and then ultrasonically welding the elements together.

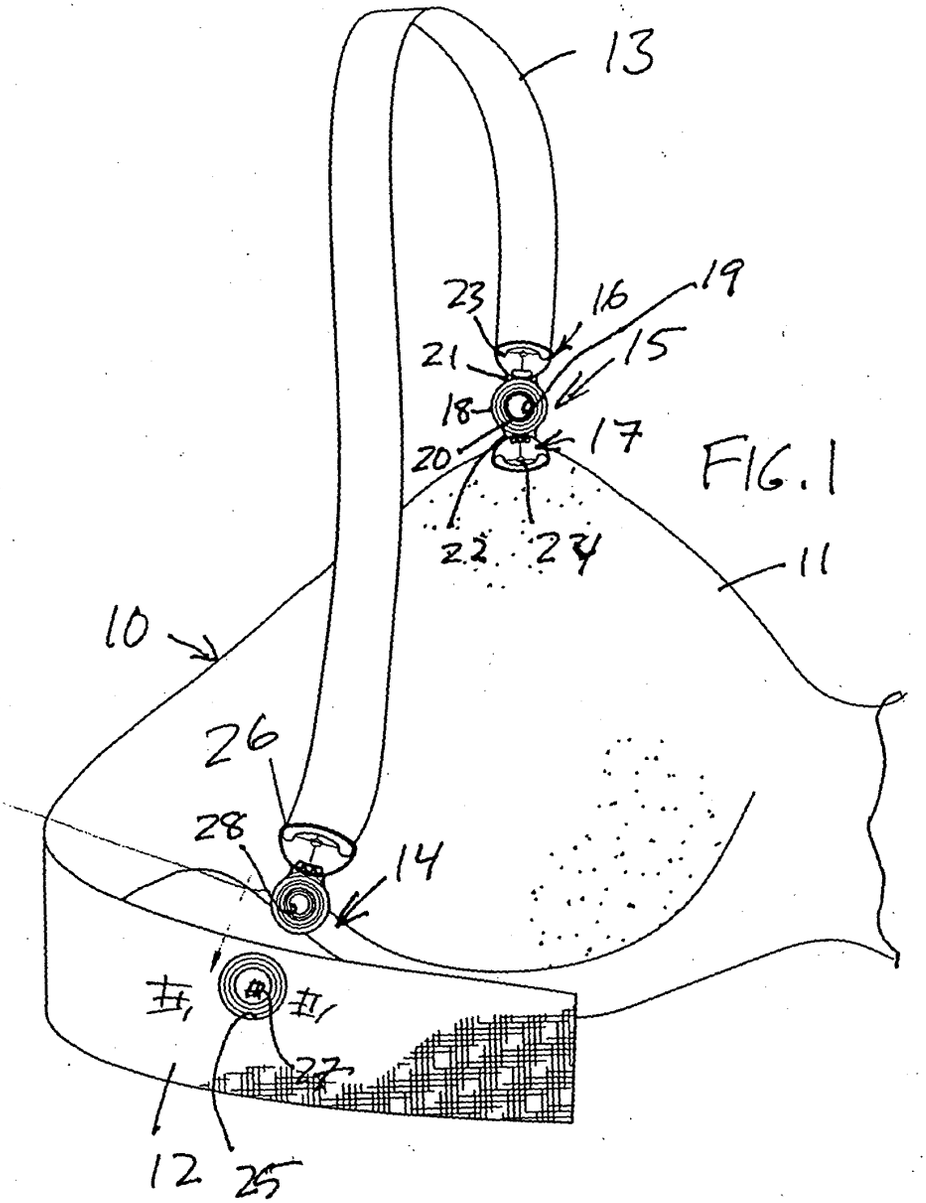


FIG. 1

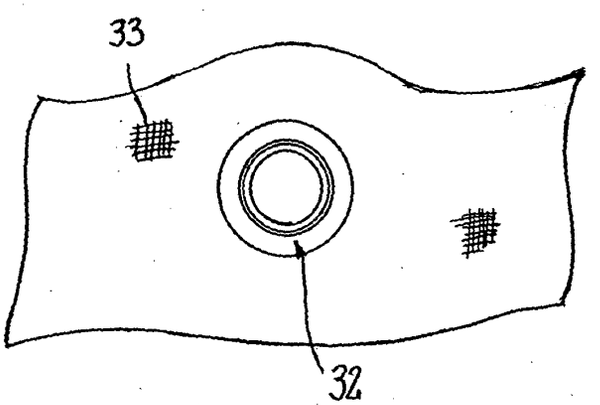


FIG. 2

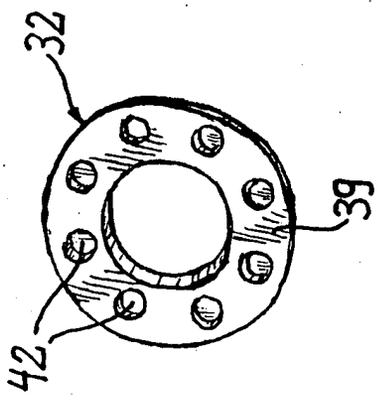


FIG. 4

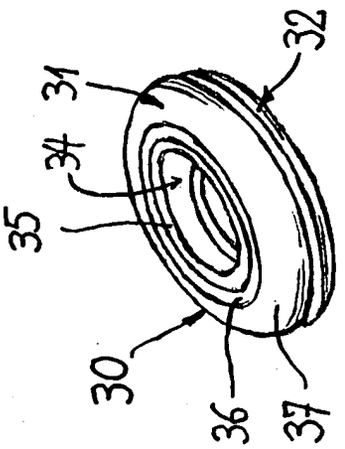


FIG. 5

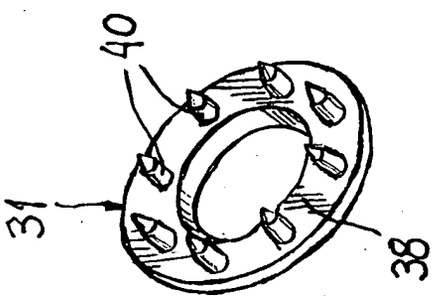


FIG. 3

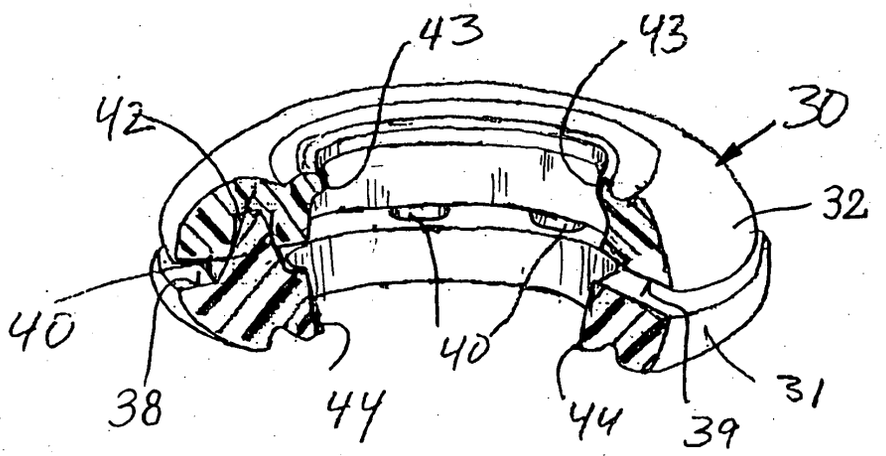


FIG.6

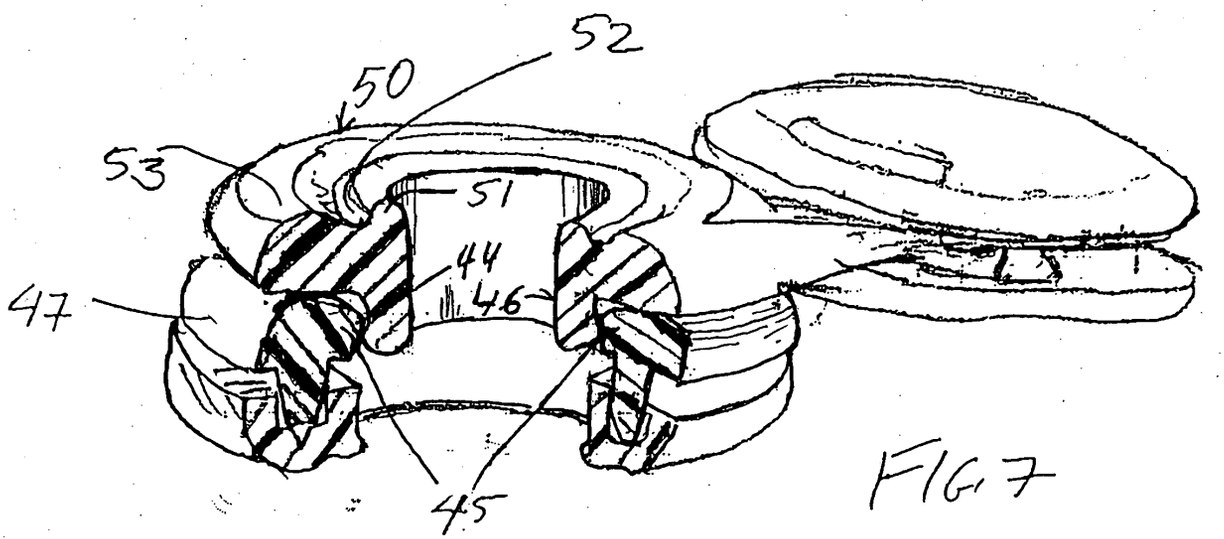


FIG.7

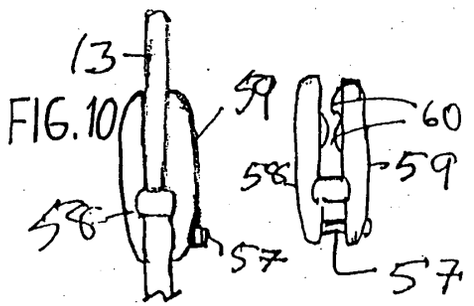


FIG. 10

FIG. 11

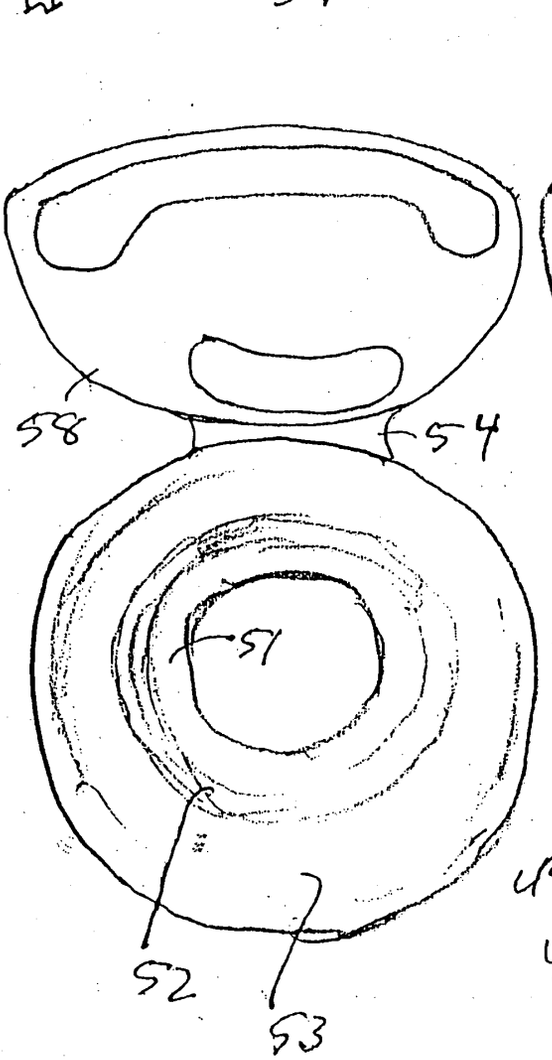


FIG. 8

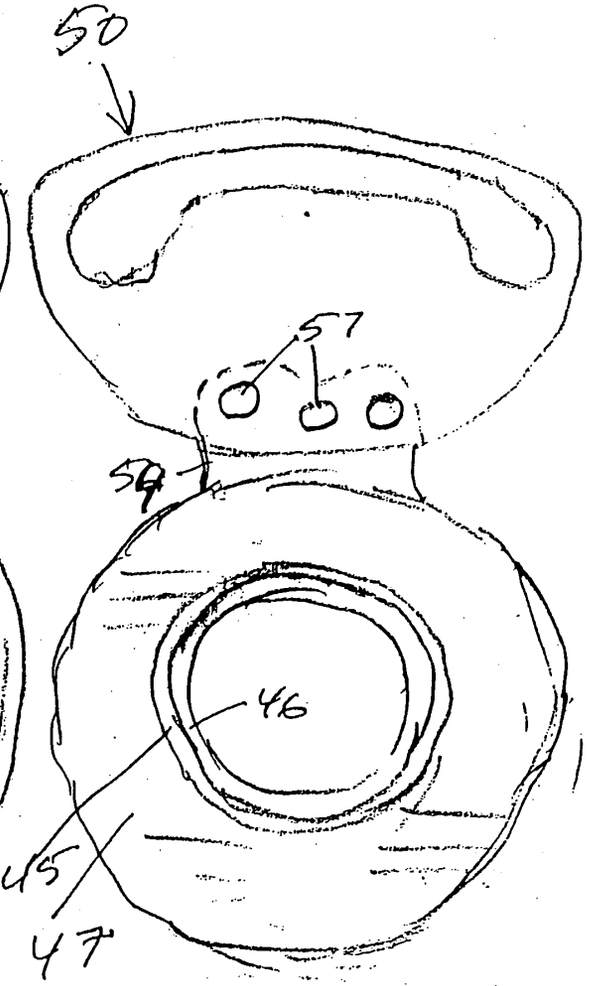


FIG. 9

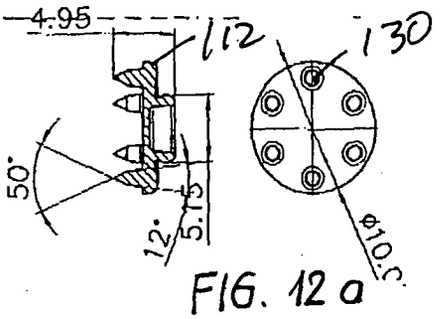


FIG. 12 a

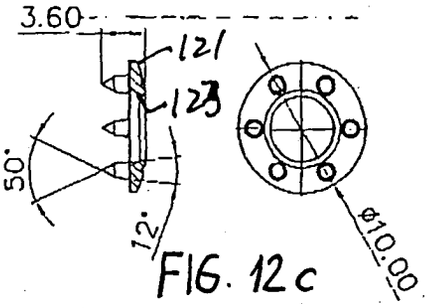


FIG. 12 c

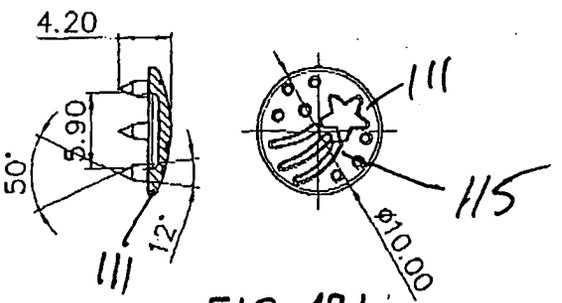


FIG. 12 b

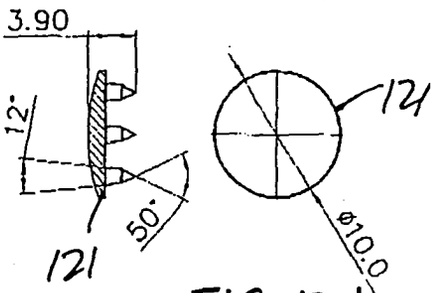


FIG. 12 d

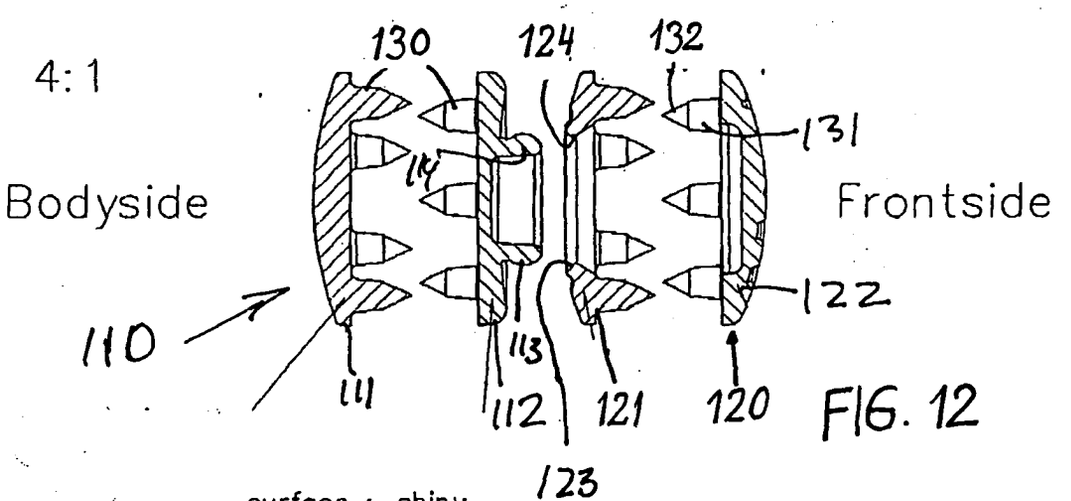


FIG. 12

surface : shiny
material : POM
standard value tensile strength: 10kg/22lbs

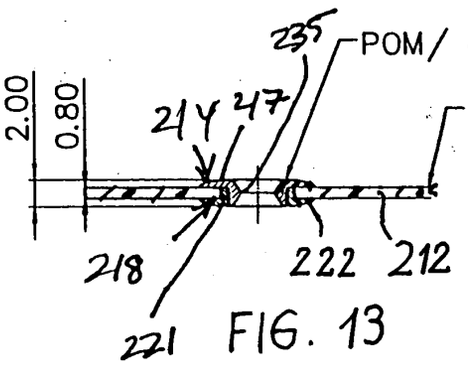


FIG. 13

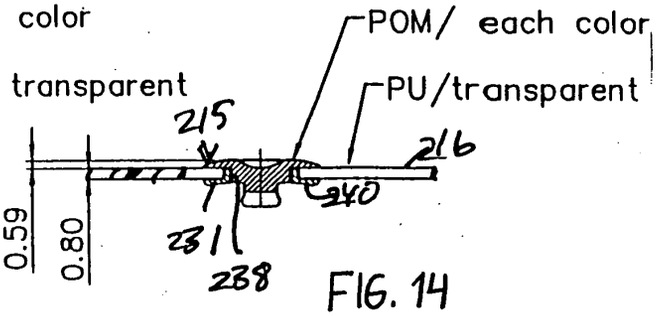


FIG. 14

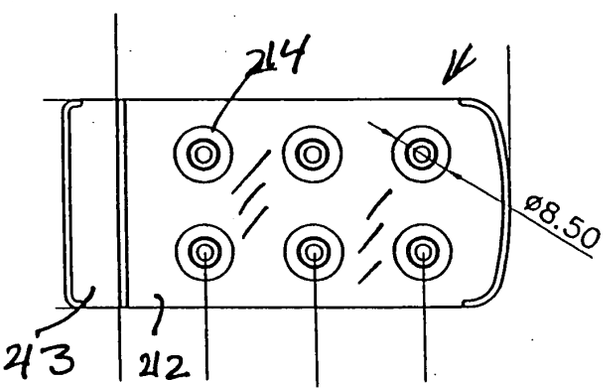


FIG. 15

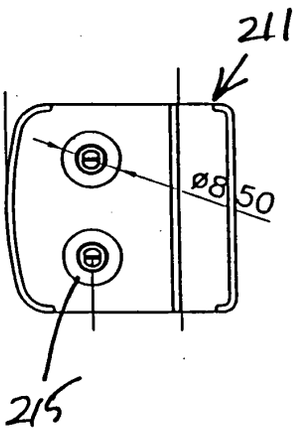
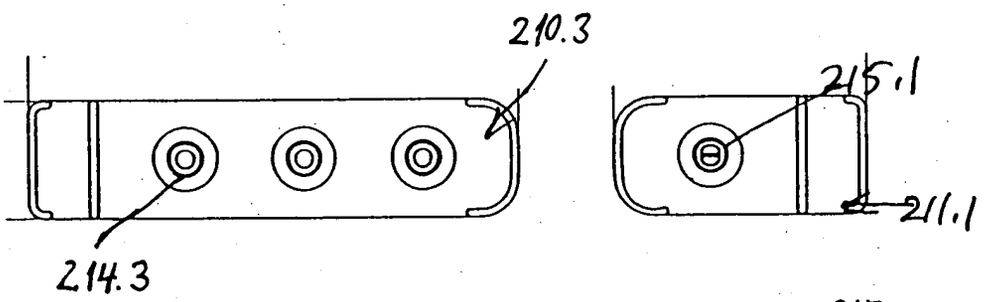


FIG. 16

FIG. 19



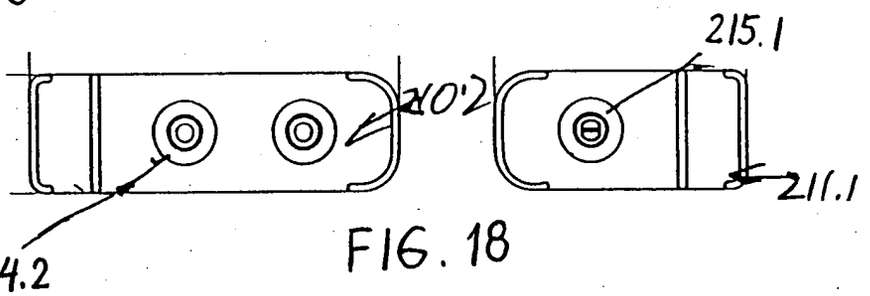


FIG. 18

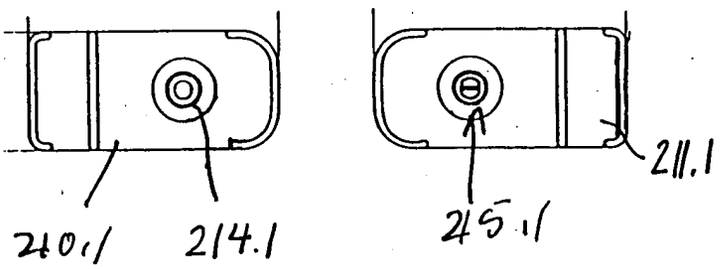
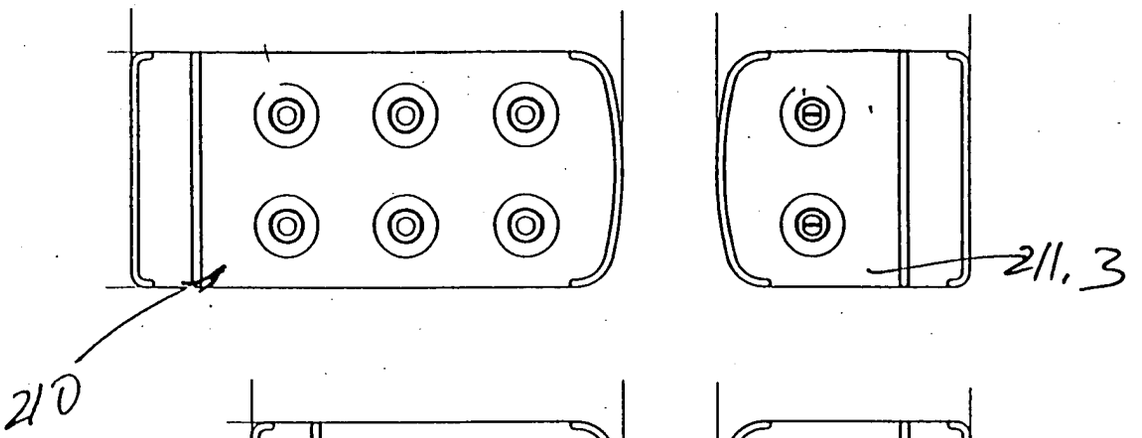


FIG. 17

FIG. 22



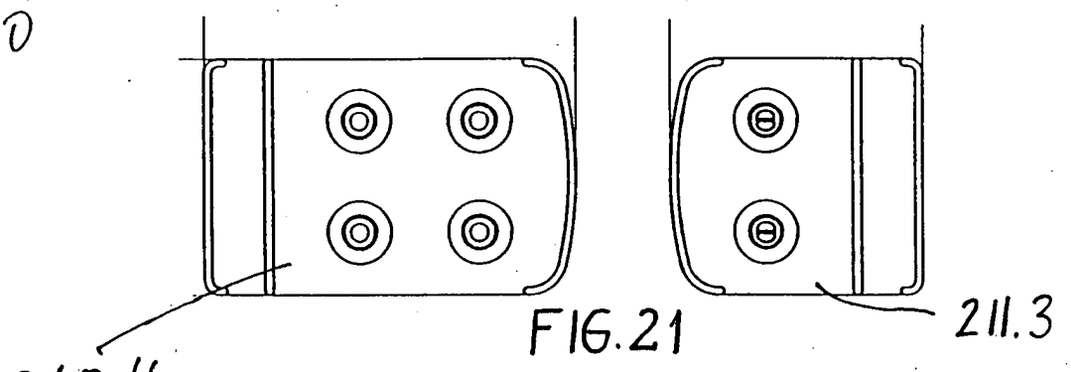


FIG. 21

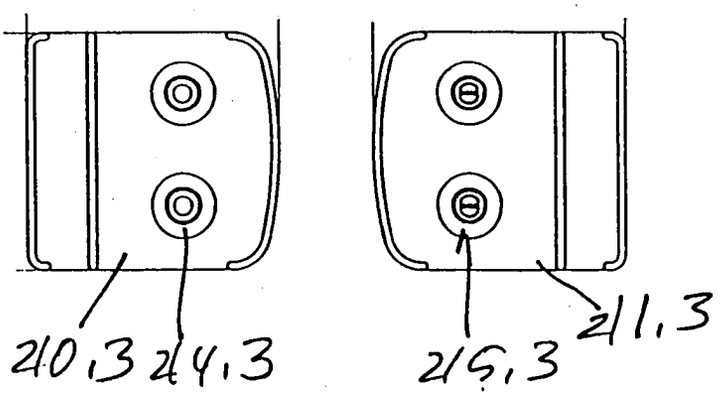


FIG. 20

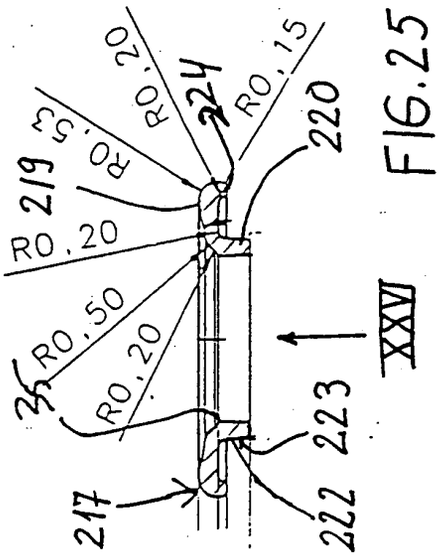


FIG. 25

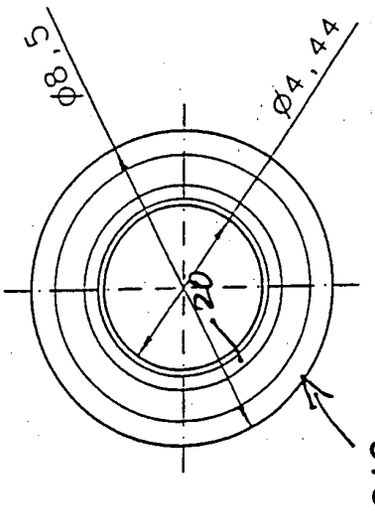


FIG. 26

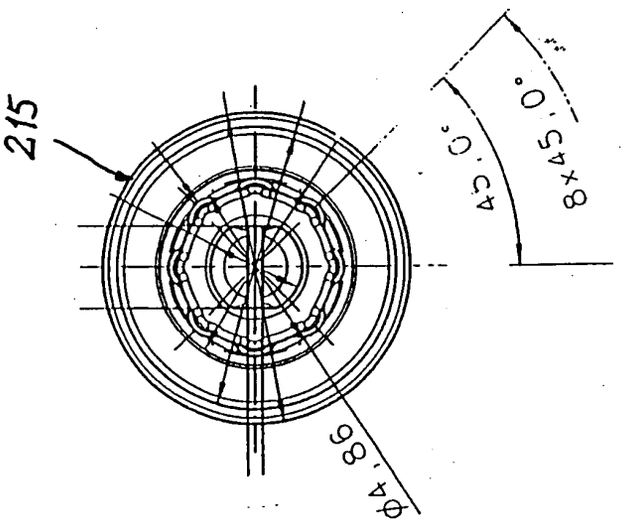


FIG. 24

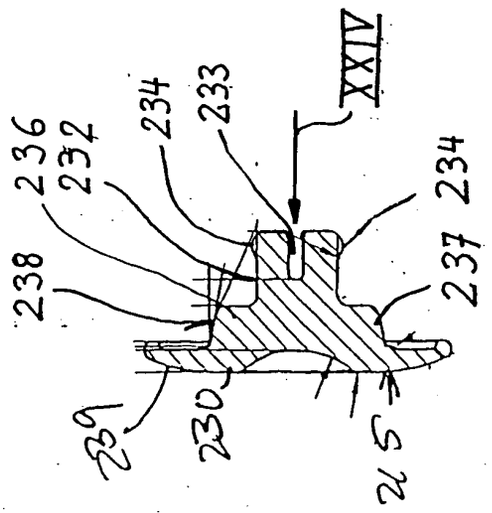


FIG. 23

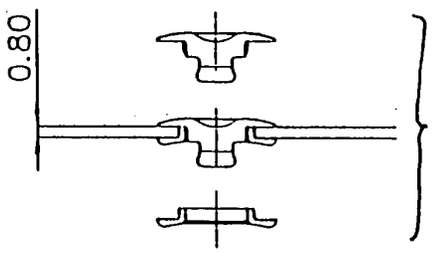


FIG.27

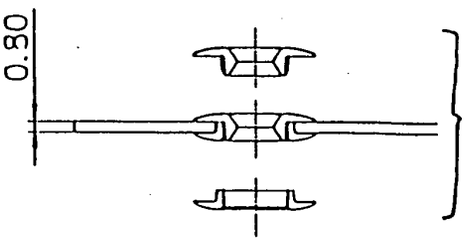


FIG.28

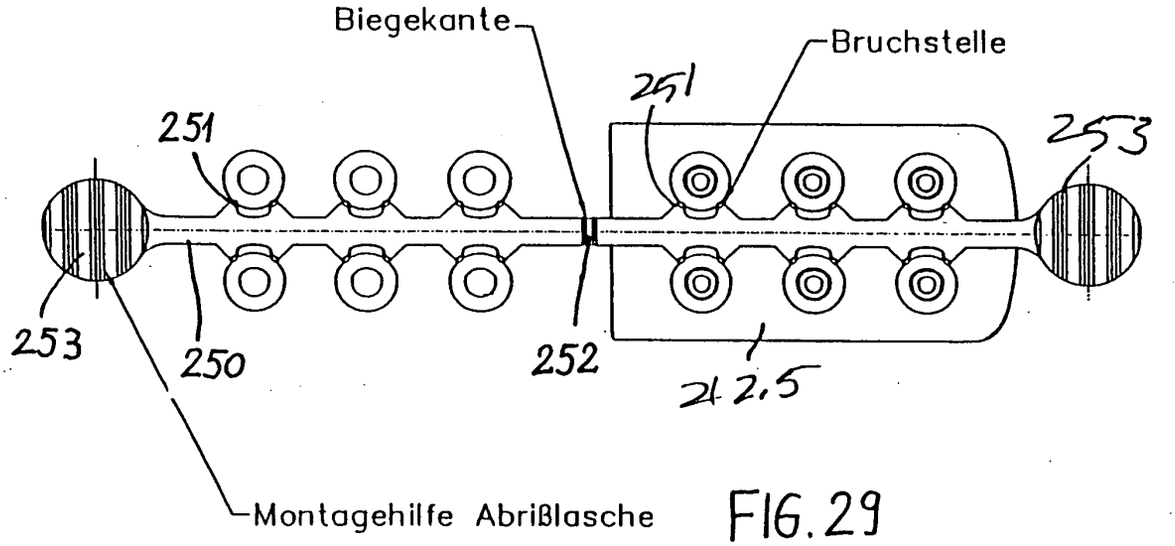


FIG.29

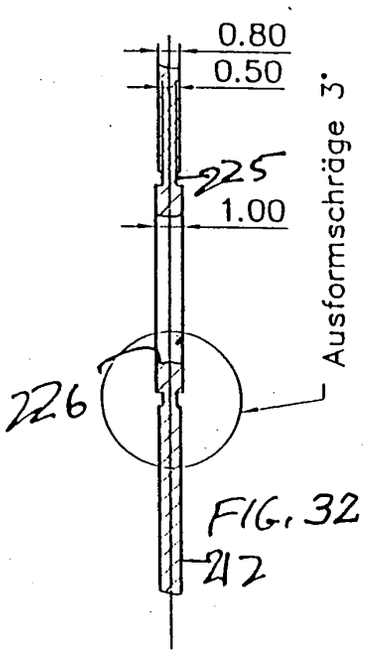


FIG. 32

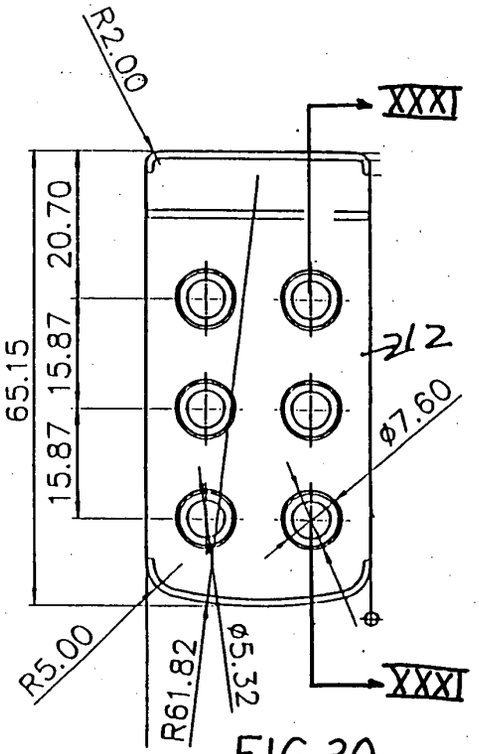


FIG. 30

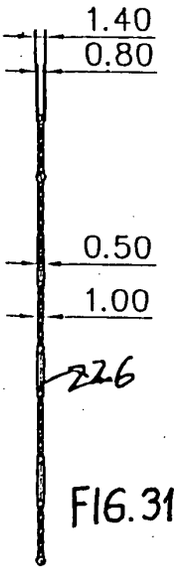


FIG. 31

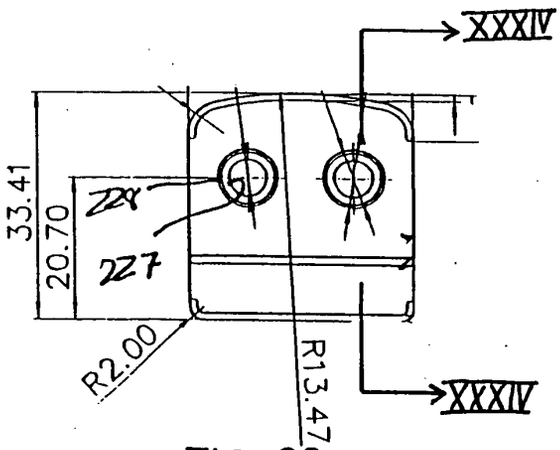


FIG. 33

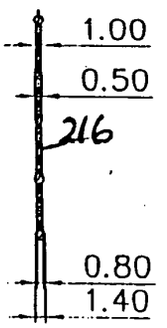


FIG. 34

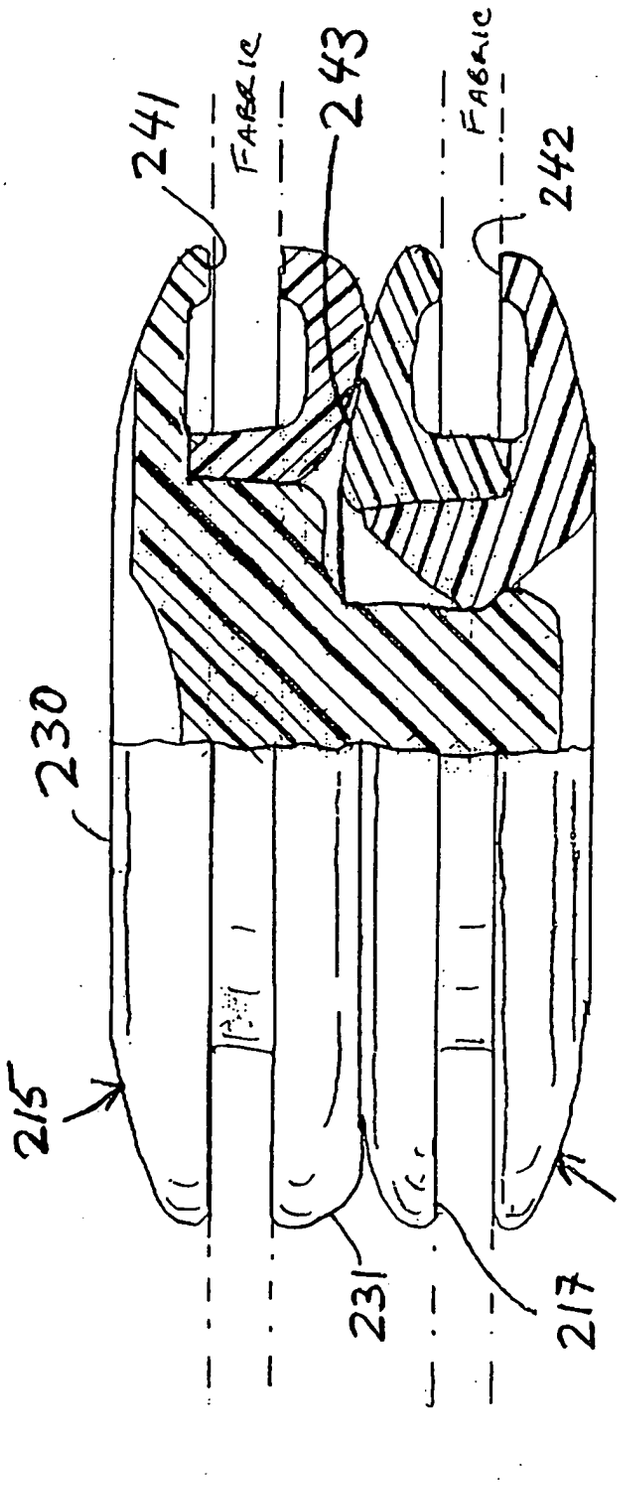


FIG. 35

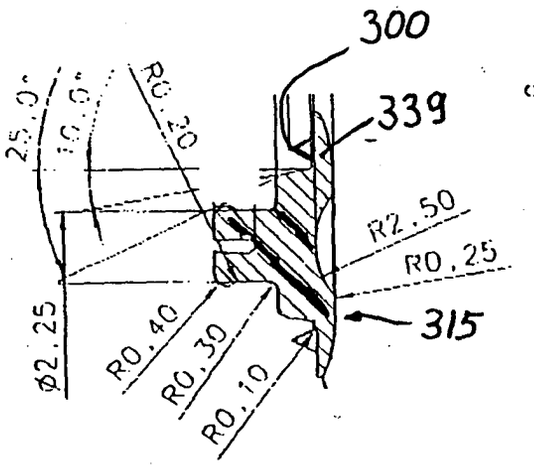


FIG. 36

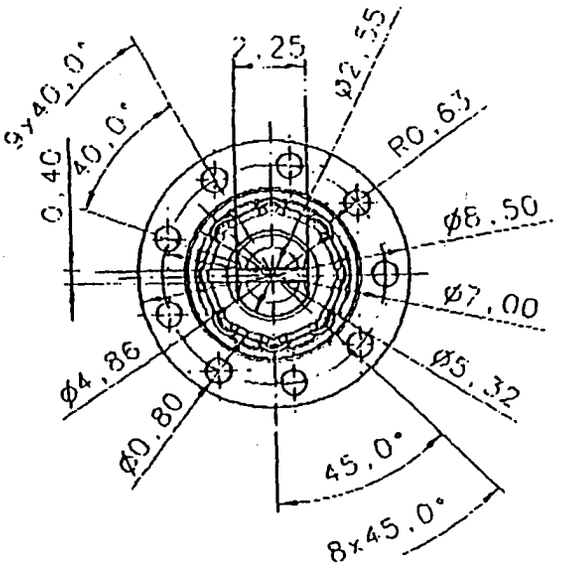


FIG. 37

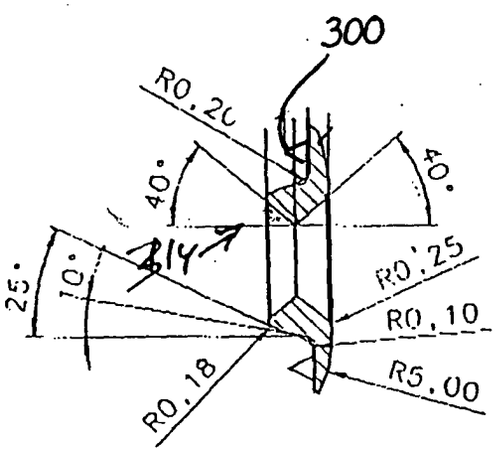


FIG. 38

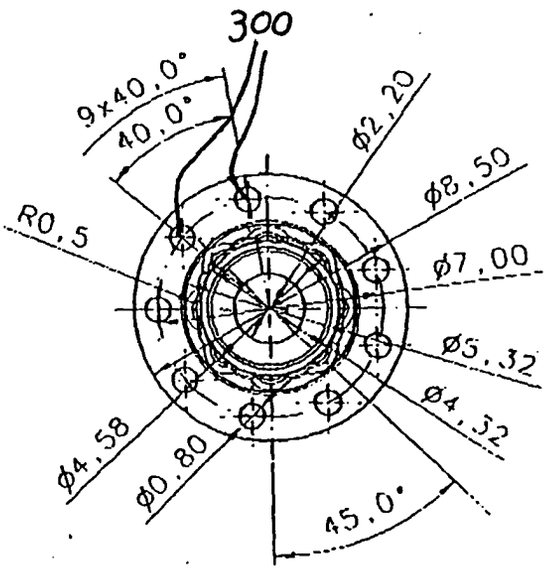


FIG. 39

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 00 4597

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 3 685 105 A (COX BERNARD H ET AL) 22 August 1972 (1972-08-22) * column 2, line 44 - column 4, line 7 * * column 4, lines 29-43 * * figures *	5	A44B17/00
A		1	
A	US 3 553 796 A (CARLILE ALFRED E) 12 January 1971 (1971-01-12) * abstract; figures *	1,5	
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			A44B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	15 June 2004	Kock, S

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