

ARTICLE OF CLOTHING WITH CUPS

The invention pertains to an article of clothing with cups, each suitable for receiving one female breast, which have an interior side facing the breast and an opposite exterior side, wherein a stiff wire is disposed in the area of the lower edge of each cup facing the breast attachment.

Such articles of clothing are known primarily in the form of brassieres, which are used worldwide in numerous variations. Brassieres have a structure with a front piece that essentially comprises two bust cups, which may be connected to one another over a center bridge. The outer side edges of the front piece each have connected to them a side piece, the free ends of which can be connected in the back area of an individual wearing the brassiere by means of a back closure. The side pieces can be sewed to the front piece or may be designed as a single piece. For additional support, shoulder straps may be provided, connecting the bust cups with the rear sections of the side pieces. Additional articles of clothing in the sense of the invention which likewise have a brassiere-like part include corsets, body stockings, negligees, bikinis, bathing suits and the like.

Essential functions of these articles of clothing include the support and positioning as well as the advantageous shaping of the bust, combined with high comfort in wearing and a pleasing external appearance.

For particularly advantageous support and shaping of the bust, brassieres are known in which stiffening wires are disposed along the lower edges of each of the cups facing the breast base. Each of these wires, which consist of a relatively stiff, flexible, elastic material such as metal or plastic is inserted in an elongated pocket of textile material, a so-called wire channel, extending along the edges of the cups. As a result of their rigid shape, the wires reproduce the curve of the breast base. In addition, the wires ensure that the cups support and carry

the breasts uniformly over their entire width. Compared to brassieres without wires, brassieres of this class are thus characterized by better supporting and shaping function.

However, it has been found that the wires can interfere with the wearing comfort. By applying the wire channel on the inside of the cups, elevated areas are formed relative to the remainder of the inside. When the back fastening is closed, the tensile forces from the side pieces lead to a pressure concentration in the area of the elevations, causing pressure points experienced as unpleasant.

To be sure, attempts have been made in the past to avoid these pressure points by using soft materials in manufacturing the wire channel or by cushioning the wire channel with foam or silicone, but the basic problem cannot be solved in this way, namely that the wire channel on the inside of the cup always forms elevated areas with a high contact pressure.

Against this background, the invention is based on the goal of further developing known brassieres with wires to increase their wearing comfort.

This object will be accomplished by a brassiere with the features of claim 1.

Advantageous embodiments will result from the subclaims.

The basic concept of the invention consists of making the cups, at least in the area of the lower edge facing the breast base, out of a material of predetermined thickness which makes it possible to form an indentation along the edge. This indentation serves to accommodate a wire or a wire channel with a wire enclosed in it.

It is especially advantageous if the depth of the recess corresponds approximately to the thickness of the wire or the wire channel plus the wire or is somewhat larger, so that after insertion and fixing of the wire or wire channel, no projection beyond the inside of the cup takes place. Thus an essentially smooth-

surfaced interior of the cup results, which distributes the pressure uniformly and thus avoids pressure points. But even in the case of embodiments in which the depth of the recess is smaller than the thickness of the wire or wire channel, the projection of the wire or wire channel above the inside of the cup is still reduced, and thus the formation of pressure points is decreased. Therefore an article of clothing according to the invention is characterized by a higher overall comfort in wearing. This increases the interest in purchasing and acceptance of articles of clothing with wires by buyers, which forms the basis for economic success of the invention.

Advantageously the cups have a foam that can undergo thermoplastic deformation, for example polyurethane, at least in the area of their lower edge. This foam can be covered with a layer of fabric on the inside and/or the outside. This embodiment offers the advantage that the indentation can already be produced during molding, i.e., by application of pressure and heat within a predetermined mold, by local material consolidation and densification. Thus the increased cost of an additional working step is eliminated.

Preferably the indentation is disposed on the interior of the cups, since this allows it to remain invisible while being worn and thus does not interfere with the external appearance of the article of clothing.

The possibility exists of arranging the recess at a lateral distance from the lower edge of the cup, so that the wire or wire channel is embedded in the cup on both sides. In addition it is possible to design the indentation without any distance from the edge, as a result of which the inserted wire or wire channel forms the lower end portion of the cup and therefore follows directly along the breast base.

In a preferred embodiment of the invention the wire is sewn into a wire channel made of textile material, inserted into the indentation, and fixed there as

such a combination. Fixation can take place for example by sewing, gluing or welding.

However, this does not rule out the possibility that a wire without a wire channel can also be laid in the indentation. A wire suitable for this purpose can preferably be covered with a plastic jacket to eliminate sharp edges. The fixation of the wire can then take place by gluing or thermal welding of the plastic jacket with the bust cup.

To additionally secure the position of the wire or wire channel in the indentation, but also to make the appearance on the inside of the brassiere more appealing, the indentation with the wire or wire channel in position can be covered with an additional layer of fabric.

In the following, the invention will be explained in further detail based on the exemplified embodiments in the form of a brassiere shown in the drawings.

These show:

- Fig. 1 a front view of the brassiere in accordance with the invention,
- Fig. 2 an inside view of only one cup of the brassiere shown in Fig. 1,
- Fig. 3 a section through the brassiere shown in Figs. 1 and 2 along the line III – III,
- Fig. 4 a detailed view of the brassiere shown in Fig. 3 in the area of the indentation,
- Fig. 5 a partial view of the inside of a cup of an additional embodiment of the invention,
- Fig. 6 a section through the embodiment shown in Fig. 5 along the line V – V there and
- Fig. 7 a detailed view of the brassiere shown in Fig. 6 in the area of the indentation.

Figs. 1 to 4 show a first embodiment of the invention. In Fig. 1 a brassiere 1 in accordance with the invention is shown in a front view and in Fig. 2 in a view from the interior, thus the side facing the wearer. The brassiere 1 has a front part 2 with two bust cups 3 for receiving the bust. The two bust cups 3 are connected together by, in this example, an approximately trapezoidal-shaped center bridge 4. On the side edges of the bust cups 3 in each case a side piece 7 is attached, of which the left side piece 7 in the drawing has a strip of hooks 8 on its free end and the other side piece 7 is provided with a strip of eyes 9. The hook strip 8 and the eye strip 9 interact to form a back closure. Straps 10 which extend from the upper edge 12 of the cups 3 to the free ends of the side piece 7 are also visible.

The design of the bust cups 3 is especially apparent from Figs. 3 and 4. The bust cups 3 have a polyurethane foam core 11, which in the area of the lower edge 13 has a thickness of a few millimeters, for example 5 mm, and which diminishes continually toward the upper edge 12 of the cup 3. The inside of the cup 3 is formed by a textile layer 14 which lines the foam core 11. On the opposite, front side of the cup 3 a textile layer is loosely placed on the foam core 11 and connected along its edges with the inner textile layer 14 and the foam core 11. The cups 3 are produced by molds, i.e., they achieve their three-dimensional shape through the application of pressure and heat between a male and a female mold section.

As is apparent from Figs. 1 and 2, a wire channel 16 with a wire 17 enclosed in it extends along the lower edge 13 of the cup 3. The wire channel 16 consists of a firm textile material that surrounds the wire 17, made of metal or plastic, on all sides. For receiving the wire channel 16 with wire 17, indentations 18 extending along the lower edge 13 from the inside of the cups 3 are molded in, the width of which corresponds approximately to the width of the wire channel 16 and the height corresponds approximately to its thickness. The indentations 18 end with the lower edge 13 of the cups and thus are open toward the bottom (Figs. 3 + 4). The indentations 18 are advantageously produced during the

molding of the cups 3, wherein material compaction and consolidation takes place under application of pressure and heat. Then the wire channel 16 with the wire 17 can be introduced into the indentations 18 produced in this way and fixed within them, which for example can be achieved by sewing along the edge of the wire channel 16 or by gluing.

In the finished state the insides of the cups 3 are flush with the side areas of the wire channels 16, so that elevated areas on the inside of a brassiere in accordance with the invention are eliminated and thus the problem of resulting pressure points is removed.

Figs. 5, 6 and 7 show a modified embodiment of the invention, wherein identical reference symbols are used for the same or similarly named elements. Figs. 5 and 6 show only a partial area of a brassiere in accordance with the invention, shown as a whole in Figs. 1 and 2, so that the statements made there apply correspondingly. Once again a bust cup 3 with an upper edge 12 and a lower edge 13 is visible. The bust cup is formed by an outer textile layer 15 and an inner textile layer 14, enclosing a foam core 11. To this extent, there is agreement with the previously described embodiment of the invention.

Likewise a wire channel 16 with wire 17 travels along the lower edge 13 of the bust cup 3, wherein in this embodiment of the invention the position of the wire channel 16 with wire 17 maintains a lateral distance from the lower edge 13. Therefore the indentation 18' is not open toward the lower edge 13, but is delimited by the foam core 11 with an inner textile layer 14. The indentation 18' with its rectangular cross-section produced in this way once again serves to receive the wire channel 16 with wire 17, which is placed therein and fixed in position. Here also in the finished state a flush position is formed between the inside of the cup 3 and the side surface of the wire channel 16, which contributes to increased comfort in wearing.

Not shown, but nevertheless falling within the scope of the invention, are embodiments of the brassiere in accordance with the invention, in which the wire is placed directly, thus without a wire channel, in the indentation 18, 18' and fastened there. A wire of this type can be coated with a plastic jacket to reduce the risk of injury and facilitate fixation in the indentation. When a suitable material is used for covering, such a wire can even be simply welded to the bottom of the indentation by applying heat, or it may be glued.

According to a likewise advantageous embodiment of the invention it is provided to close the indentation 18, 18' with wire channel 16 and/or wire 17 disposed therein by means of a textile strip – not shown – which is connected on its edges with the inside of the cup 3.

Claims:

1. Article of clothing, especially a brassiere (1), with two cups (3), each suitable for receiving one female breast, each [cup] having an interior side facing the breast and an exterior side opposite to it, wherein a stiff wire (17) is disposed in the area of the lower edge (13) of each cup facing the breast base, characterized in that each cup (3), at least in the area of the lower edge (13), has a foam layer (11) between the inside and the outside, and an indentation (18, 18') is molded into each cup (3) along the lower edge (13), wherein the wire (17) is disposed inside the indentation (18, 18').
2. Article of clothing according to claim 1, characterized in that the indentation (18, 18') is molded in, beginning from the inside of the cup (3).
3. Article of clothing according to claim 1 or 2, characterized in that the indentation (18') proceeds at a distance from the lower edge (13) of the cup (3).
4. Article of clothing according to claim 1 or 2, characterized in that the indentation (18) begins directly at the lower edge (13) of the cup (3).
5. Article of clothing according to one of the claims 1 to 4, characterized in that the wire (17) is disposed inside a wire channel (16) and wire channels (16) with wires (17) are disposed inside the indentation (18, 18').
6. Article of clothing according to one of the claims 1 to 5, characterized in that the indentation (18, 18') with wire (17) is enclosed with a textile layer on the inside of the cup (3).

7. Article of clothing according to one of the claims 1 to 6, characterized in that the indentation (18, 18') is produced by molding.
8. Article of clothing according to one of the claims 1 to 7, characterized in that the wire (17) is jacketed with plastic.
9. Article of clothing according to claim 8, characterized in that the plastic used for the jacket is soft.
10. Article of clothing according to one of the claims 1 to 9, characterized in that the wire (17) or the wire channel (16) is fixed in the indentation (18, 18') by sewing, gluing or welding.