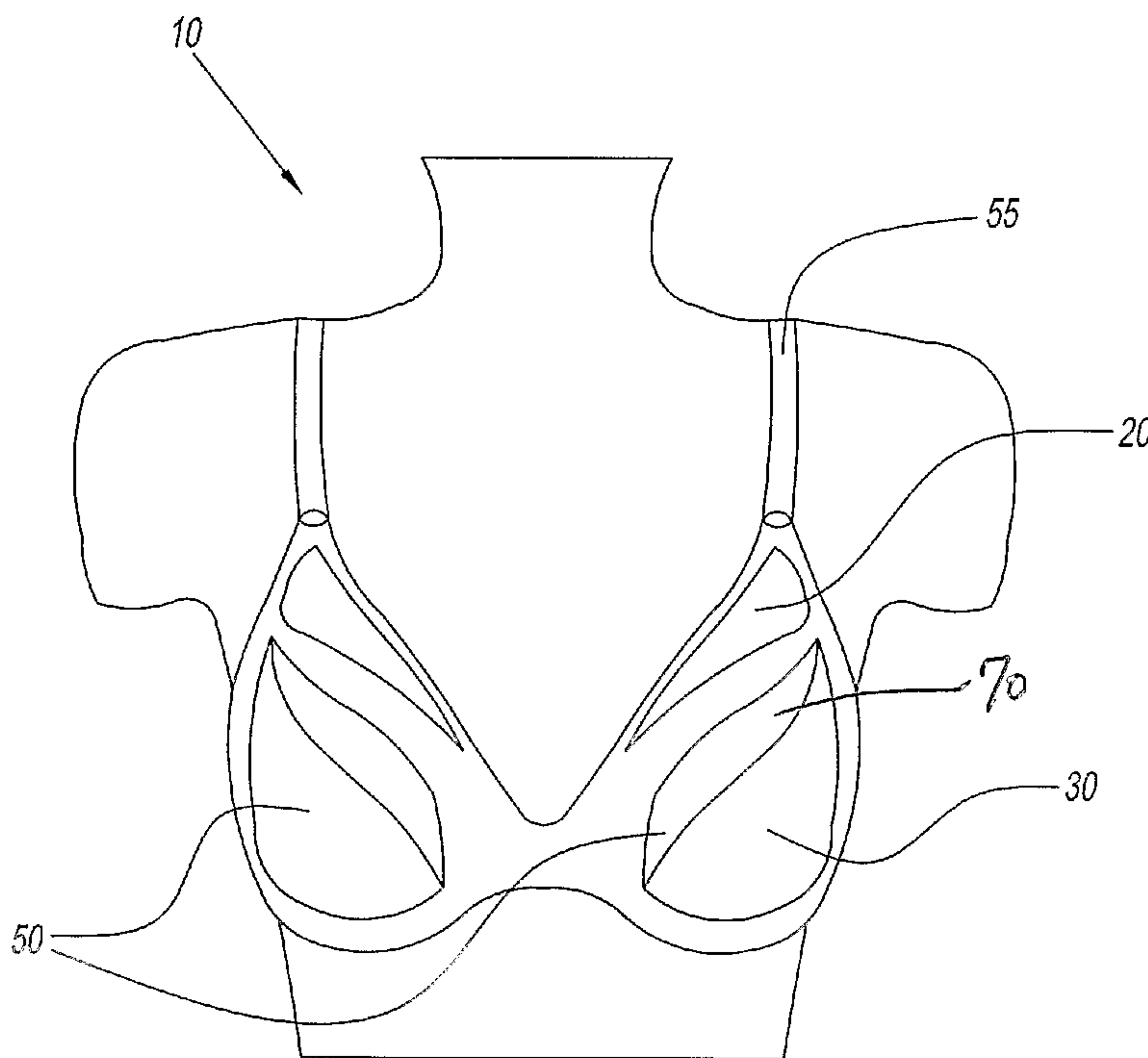




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 (71) Demandeur/Applicant:  
SARA LEE CORPORATION, US  
 (72) Inventeurs/Inventors:  
WARREN, ROGER, US;  
WAITZ, SANDRA ANN, US  
 (74) Agent: GOWLING LAFLEUR HENDERSON LLP

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 (54) Title: FUSION UNDERGARMENT



(57) **Abrégé/Abstract:**

A fusion undergarment (10), and more particularly a brassiere, having a transparent layer (20) with an inner surface and an outer surface, a support layer (30) having an inner surface and an outer surface, and an adhesive layer 40 for fusing the transparent layer (20) with the support layer (30). The undergarment provides balance of comfort, support and sensual appeal. The fusing process comprising the steps of fusing the adhesive layer (40) to the support layer (30), cutting the fused adhesive-support layer (40) into a desired shape, fusing the cut adhesive-support layer (40) to the transparent layer (20), forming the breast supporting cup portions of the bra, preferably in a subsequent molding action. When the bra is worn, the support layer (30) extends primarily under a wearer's breasts along a lower and side breast profile providing an optimal balance of comfort and support, while the transparent layer (20) provides the requisite sensual appeal.

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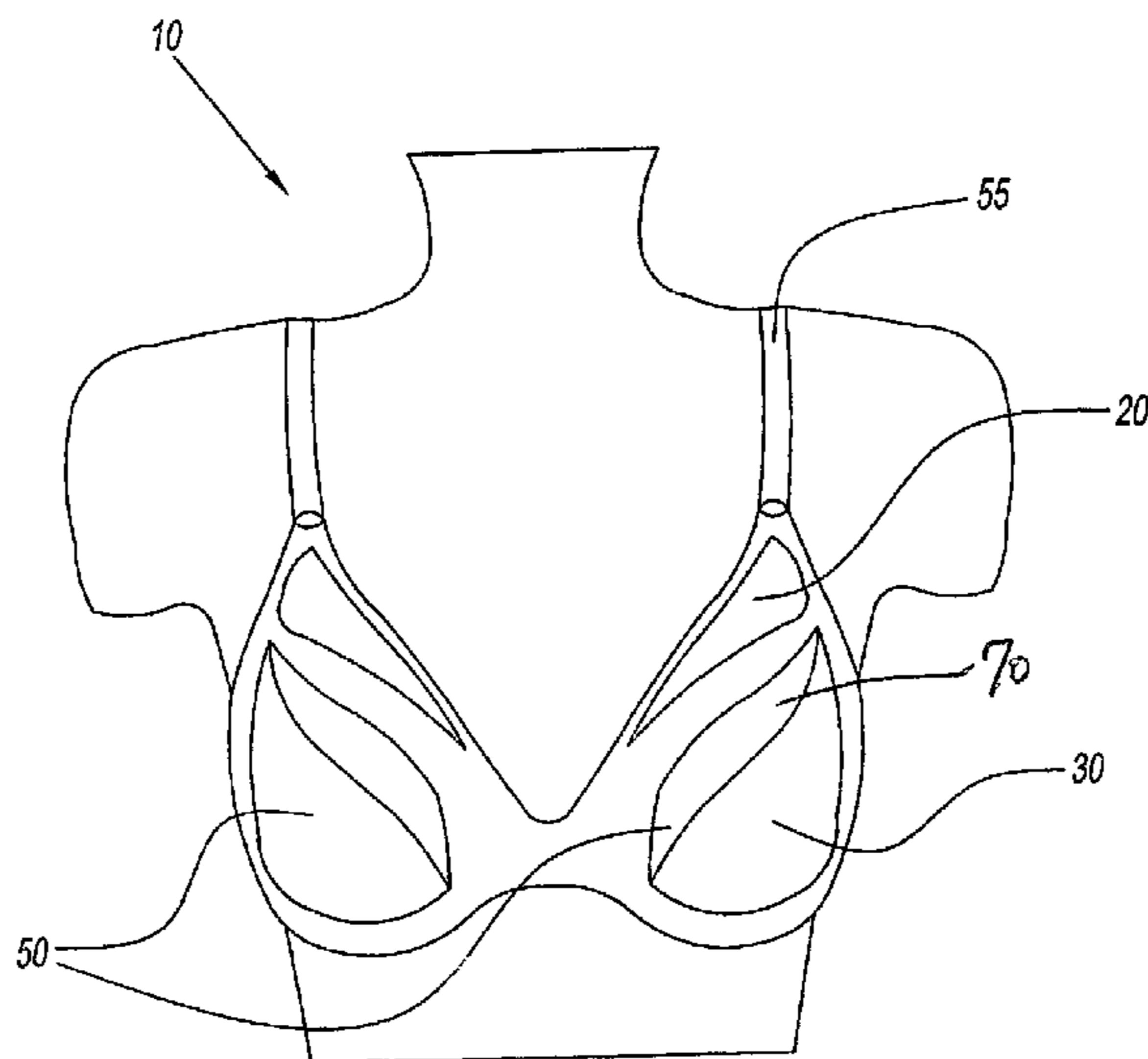
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- (71) Applicant (for all designated States except US): **SARA LEE CORPORATION** [US/US]; 1000 East Hanes Mill Road, Winston-Salem, NC 27105 (US).
- (72) Inventors: **WARREN, Roger**; 5166 Overlook Drive, Claremont, NC 28616 (US). **WAITZ, Sandra Ann**; P.O. Box 833, DingmanS Ferry, PA 18328 (US).
- (74) Agent: **RUGGIERO, Charles N.J.**; Ohlandt, Greeley, Ruggiero & Perle, L.L.P., One Landmark Square, 10th Floor, Stamford, CT 06901-2682 (US).
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**FUSION UNDERGARMENT**

## BACKGROUND OF THE INVENTION

5 1. Field of the Invention

The present invention relates to women's undergarments. More particularly, the present invention relates to brassieres.

2. Description of the Related Art

Conventional brassieres have a pair of breast cups, which  
10 provide support for the breasts, and preferably one or more  
straps for fastening over the shoulders and around the thorax to  
keep the breasts in place. The manufacturers of brassieres are  
constantly challenged to develop brassieres that provide optimal  
comfort, effective support, as well as a sensual appeal and  
15 feminine allure. Traditionally, brassieres have been made using  
cut pieces of fabric that are sewn together, particularly in the  
zones intended to form a three-dimensional capacity such as the  
breast supporting cup portions of the brassieres. Over the  
years, manufacturers, in an effort to meet the above noted  
20 challenges, have developed brassieres that improve wearing  
comfort through bonding techniques that reduce and even eliminate  
the need for stitched seams, support through inserts and/or  
support pads that cooperate with the breast supporting cups to  
reduce breast mastoptosis and deformation caused by gravity, and

that improve feminine allure through the use of more soft, sheer and even transparent fabrics.

It is often the situation that undergarments, and more particularly brassieres, when designed for improved comfort and support, substantially lack sensual appeal. The opposite being true when emphasis is placed on sensual appeal rather than comfort and support. Thus, there remains a need for providing an undergarment, and more specifically a brassiere or bra, that offers an optimal balance of comfort, support and sensual appeal.

10

#### SUMMARY OF THE INVENTION

It is an object of the present invention to provide an undergarment that meets the above identified need for providing the optimal balance of comfort, support and sensual appeal.

15 It is another object of the present invention to provide an undergarment that offers improved durability and longevity.

These and other objects and advantages of the present invention are achieved by an undergarment, and more particularly a bra, having a transparent layer with an inner and outer surface, a support layer also having an inner and outer surface, and an adhesive layer for fusing the inner surface of the transparent layer with the outer surface of the support layer. The fusing process has the steps of first, fusing the adhesive layer to a surface of the support layer, then, cutting the fused

20

adhesive-support layer into a desired shape, followed by, fusing  
the cut adhesive-support layer to the inner surface of the  
transparent layer, and finally, in a subsequent molding action,  
forming the breast supporting cup portions of the bra such that  
5 when the bra is worn, the support layer extends primarily under a  
wearer's breasts along the lower and side breast profile. The  
support layer provides an optimal balance of comfort and support,  
while the transparent layer provides the requisite sensual  
appeal.

10

## BRIEF DESCRIPTION OF THE DRAWINGS

Other and further objects, advantages and features of the  
present invention will be understood by reference to the  
15 following specification in conjunction with the accompanying  
drawings, in which like reference characters denote like elements  
of structure.

Fig. 1 is a front view of a brassiere in accordance with an  
20 illustrative embodiment of the present invention;

Fig. 2 is an exploded perspective view of the brassiere of  
Fig. 1;

Fig. 3 is an enlarged cross-sectional view illustrating a  
first forming step in accordance with the present invention;

Fig. 4 is an enlarged cross-sectional view illustrating a second forming step in accordance with the present invention;

Fig. 5 is a cross-sectional view illustrating a third forming step in accordance with the present invention; and

5 Fig. 6 is a cross-sectional view illustrating a molding step in accordance with the illustrative embodiment of the present invention.

#### DETAILED DESCRIPTION OF THE INVENTION

10

Referring to the drawings and, in particular, to Figs. 1 and 2, there is shown an illustrative embodiment of an improved undergarment, for example a brassiere, generally represented by reference numeral 10. The brassiere 10 essentially has a transparent inner layer 20, an outer, support layer 30, and an adhesive layer 40, shown in Fig. 4, for fusing a surface of the transparent layer with a surface of the support layer. The brassiere 10 also has a pair of cups 50, preferably a pair of shoulder straps 55 associated with each respective cup, and preferably a pair of back straps 60 being selectively secured via a fastener 65 at the back of a wearer. Preferably shoulder straps 55 extend from an upper part of each respective cup 50 over the wearer's respective shoulders and are connected to the back of the brassiere 10.

The transparent layer 20 is preferably a thin piece of material made of either natural or man-made fiber, or a combination of both. Transparent layer 20 is preferably  
5 lightweight and has a sheer, shimmering characteristic, such as that provided by chiffon, georgette, voile, illusion, organza, or tulle. It is also preferable that man-made fibers having at least a moderate degree of elasticity, flexibility and resiliency, may be incorporated into the transparent layer. The  
10 transparent layer 20 may also take the form of a mesh of synthetic blends and/or form a variety of attractive patterns and providing improved comfort and flexibility. Most preferably, transparent layer 20 is a nylon/lycra mix. The transparent layer 20 can preferably be shaped into any desirable form sufficient to  
15 accommodate the breasts of a wearer and create a more sensual appeal and feminine allure thereto. The transparent layer 20 has an inner surface 22 and an outer surface 24 shown in Fig. 5.

The support layer 30 preferably takes the form of at least  
20 one piece of material made of either natural or man-made fiber, or a combination of both. The support layer 30 is at least somewhat less flexible than transparent layer 20. The support layer 30 can be formed from any material suitable for improving the comfort and support provided to the breasts of a wearer.  
25 Preferably, support layer 30 is a nylon/lycra mix. The support layer 30 can preferably be shaped and sized to conform comfortably against the breasts of a wearer and to provide

support and/or augmentation thereto. Preferably, support layer 30 is secured only where essential for breast support. As shown in Fig. 4, support layer 30 has an inner surface 32 and an outer surface 34. In another embodiment, the support layer 30 can be  
5 transparent.

The adhesive layer 40 is preferably a thermoadhesive material that is sufficient for use with a variety of different types of fibers, films and materials, including those materials  
10 identified above for use with transparent layer 20 and support layer 30. The adhesive layer 40 preferably has elastic properties sufficient to compliment those properties associated with the fibers or materials used in transparent layer 20 and/or support layer 30. It is noted that adhesive layer 40 is  
15 preferably suitable for use with a variety of fibers and fabric forming techniques, including microfibers and specialized nonwovens. The precise selection and matching of adhesive layer 40 to transparent layer 20 as well as support layer 30, is determined to a large extent by the nature and characteristics of  
20 the fibers and weave pattern used to form said layers, as well as the forming process requirements.

Adhesive layer 40 can be applied so as to create aesthetic designs or patterns that are visible through transparent layer  
25 20. Moreover, adhesive layer 40 can be selectively applied so as to provide support in specific areas of brassiere 10. A non-limiting example of selective application of adhesive layer 40

provides support in the area of brassiere 10 corresponding to the lower portion of the wearer's breasts. Adhesive layer 40 may further be applied to create both an aesthetic appearance in select portions of brassiere 10 and support in select portions of  
5 brassiere 10. Alternatively, adhesive layer 40 can be virtually transparent so that any designs or patterns provided on support layer 30 are visible through transparent layer 20 and the adhesive layer.

10 Referring again to Fig. 1, in a preferred embodiment of the present invention, brassiere 10 additionally has design aspects represented by reference numeral 70. Design aspects 70 may be formed by or on any of transparent inner layer 20, outer support layer 30 or adhesive layer 40.

15 Having described some of the preferred characteristics of the present invention, the process for forming undergarment or brassiere 10, includes at least the following steps. First, fusing or adhering adhesive layer 40 to a surface of support  
20 layer 30, then cutting or shaping the fused adhesive-support layer into a desired shape, thereafter fusing or adhering the cut adhesive-support layer to a surface of transparent layer 20. Subsequently, forming breast supporting cup portions 50 of the undergarment, preferably by a subsequent molding action. The  
25 formed undergarment or brassiere 10 when worn has the support layer extending primarily under a wearer's breasts along the lower and side breast profile to provide an optimal balance of

comfort and support, while the transparent layer provides the requisite sensual appeal.

The present invention having been thus described with particular reference to the preferred forms thereof, it will be obvious that various changes and modifications may be made therein without departing from the spirit and scope of the present invention as defined herein.

## WHAT IS CLAIMED IS:

1. An undergarment, comprising:

an inner transparent layer having an inner and outer  
5 surface;

an outer layer having an inner and outer surface; and

a third, intermediate layer for adhering or fusing said  
inner layer and said outer layer,

wherein the undergarment provides a balance of comfort,  
10 support and sensual appeal.

2. The undergarment of claim 1, wherein the undergarment  
is a brassiere.

15 3. The undergarment of claim 2, wherein said outer layer  
is a transparent material.

4. The undergarment of claim 3, wherein said transparent  
material has sheer characteristics.

20

5. The undergarment of claim 4, wherein said support

material has firm resilient characteristics.

6. The undergarment of claim 2, wherein said outer layer is a support material.

7. The undergarment of claim 2, wherein said third layer is an adhesive or fusing material.

8. The undergarment of claim 2, wherein said outer layer is shaped to essentially extend under a wearer's breasts and along a lower and side breast profile when the undergarment is worn.

9. An undergarment, comprising:

a seamless transparent layer;

a seamless support layer; and

an adhesive or fusing layer,

wherein said adhesive or fusing layer securely adheres or fuses said seamless transparent layer to said seamless support layer,

wherein the undergarment provides a balance of comfort, support and sensual appeal.

10. The undergarment of claim 9, wherein the undergarment is a brassiere.

11. The undergarment of claim 10, wherein said seamless transparent layer is made of a material having sheer characteristics.

5

12. The undergarment of claim 10, wherein said seamless support layer is made of a material having resilient characteristics.

10

13. The undergarment of claim 10, wherein said support layer is shaped to extend under a wearer's breasts along the lower and side breast profile to substantially support said breasts when the undergarment is worn.

15

14. A method for forming an undergarment, comprising the steps of:

(a) providing a support layer;

(b) applying an adhesive or fusing layer to said support layer;

20

(c) cutting said support layer combined with said adhesive or fusing layer to a desired shape;

(d) adhering or fusing said support layer with said adhesive

or fusing layer to a transparent layer to provide seamless connection; and

(e) molding said support layer, said adhesive layer and said transparent layer to form a unitary molded breast cup, wherein  
5 said support layer provides reinforcing support along a lower profile portion of said cup,

wherein the undergarment provides a balance of comfort, support and sensual appeal.

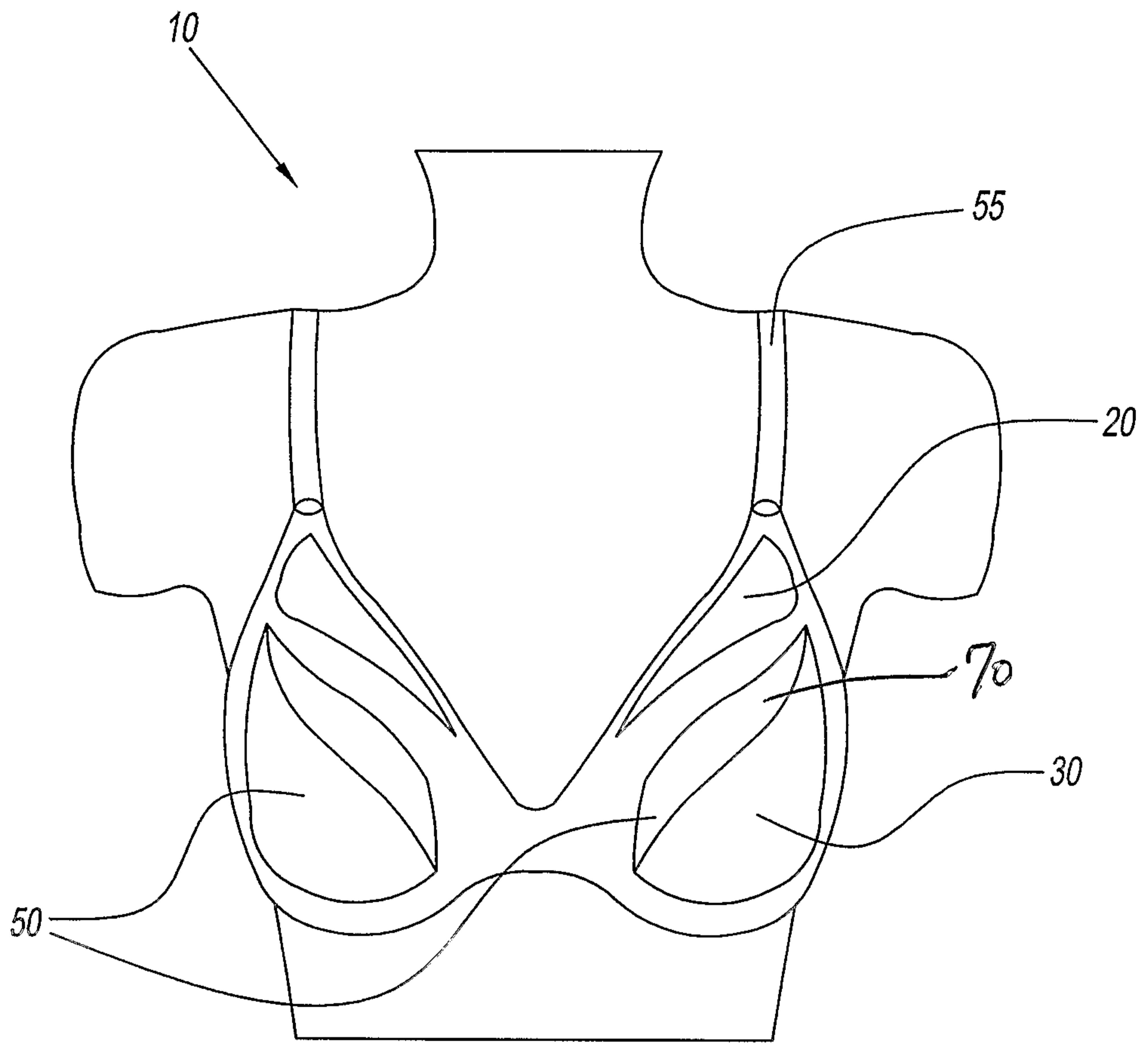
10 15. The method of claim 14, wherein the undergarment is a brassiere.

16. The method of claim 15, wherein said transparent layer is a material having sheer characteristics.

15

17. The method of claim 15, wherein said support layer is a material having firm resilient characteristics.

18. The method of claim 15, wherein said support layer is  
20 shaped so that when the undergarment is worn, said support layer essentially extends under a wearer's breasts and along the lower and side breast profile.



*Fig. 1*

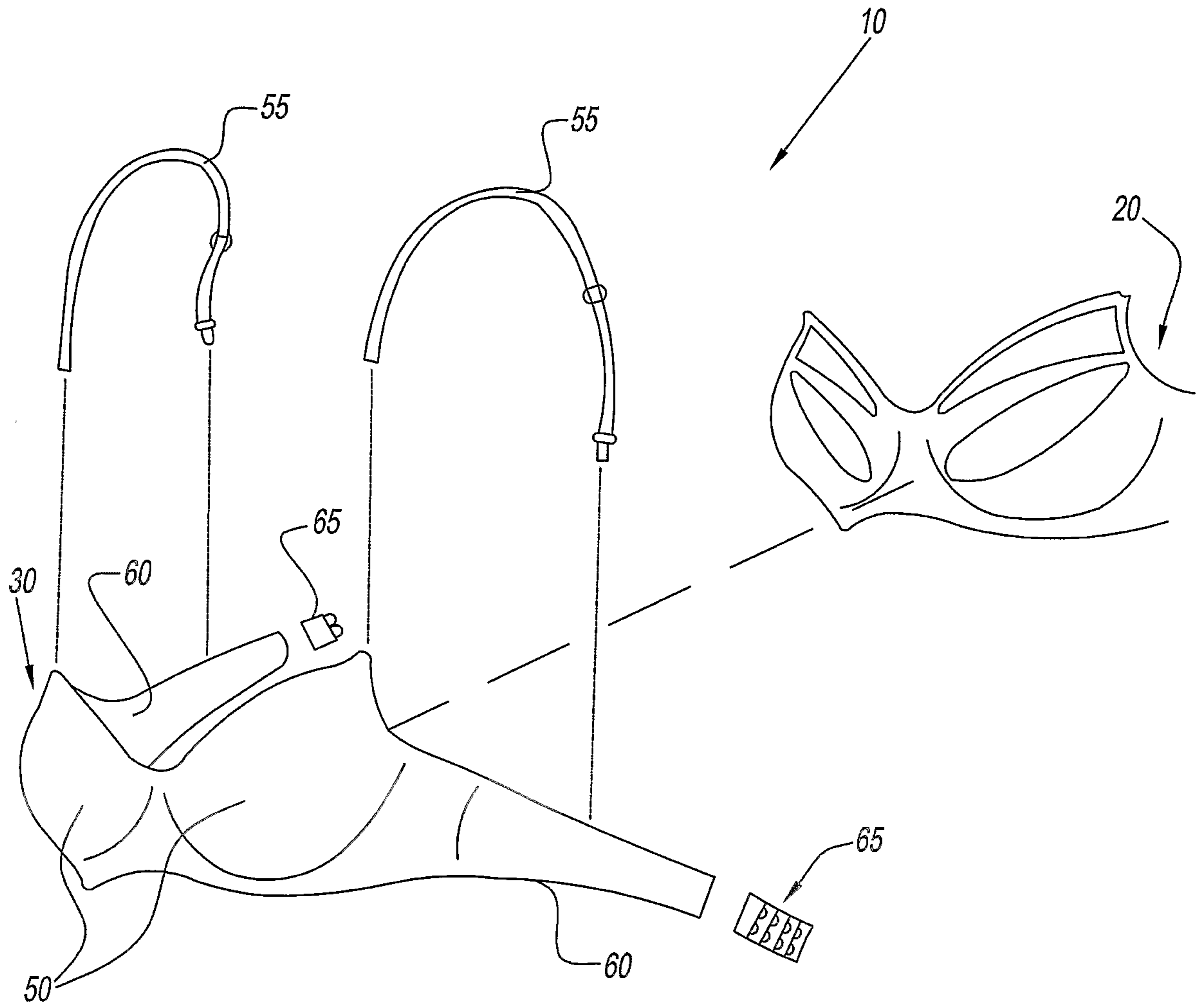


Fig. 2

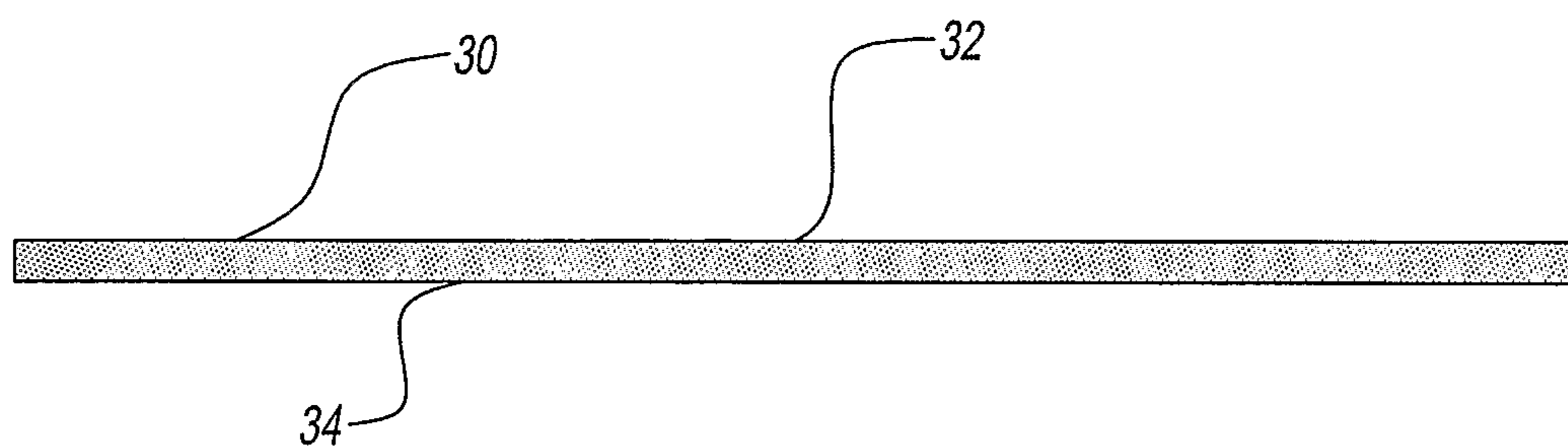


Fig. 3

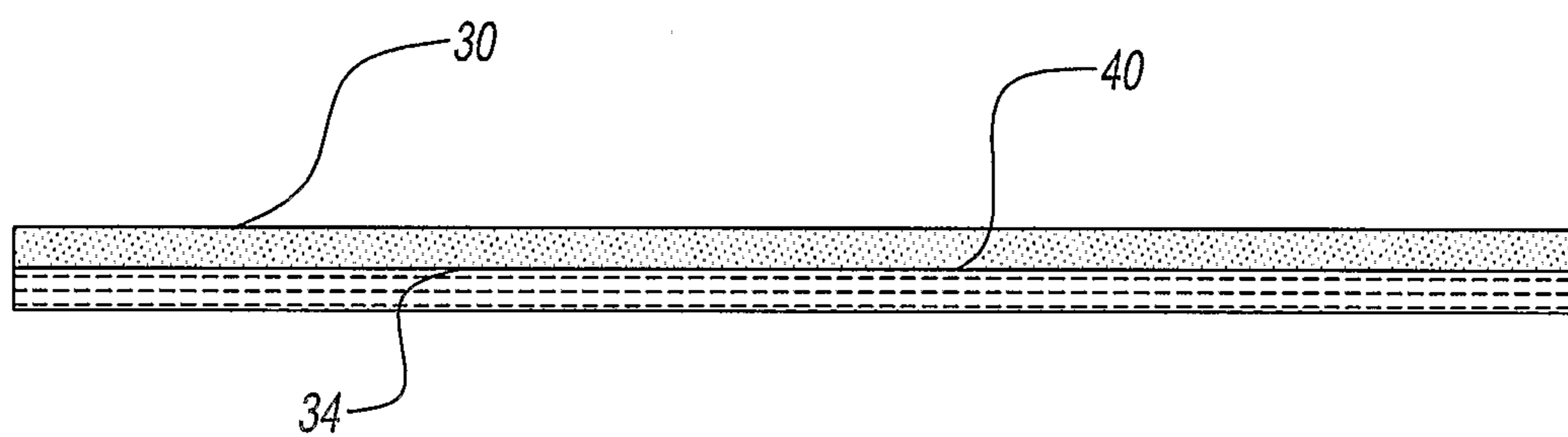


Fig. 4

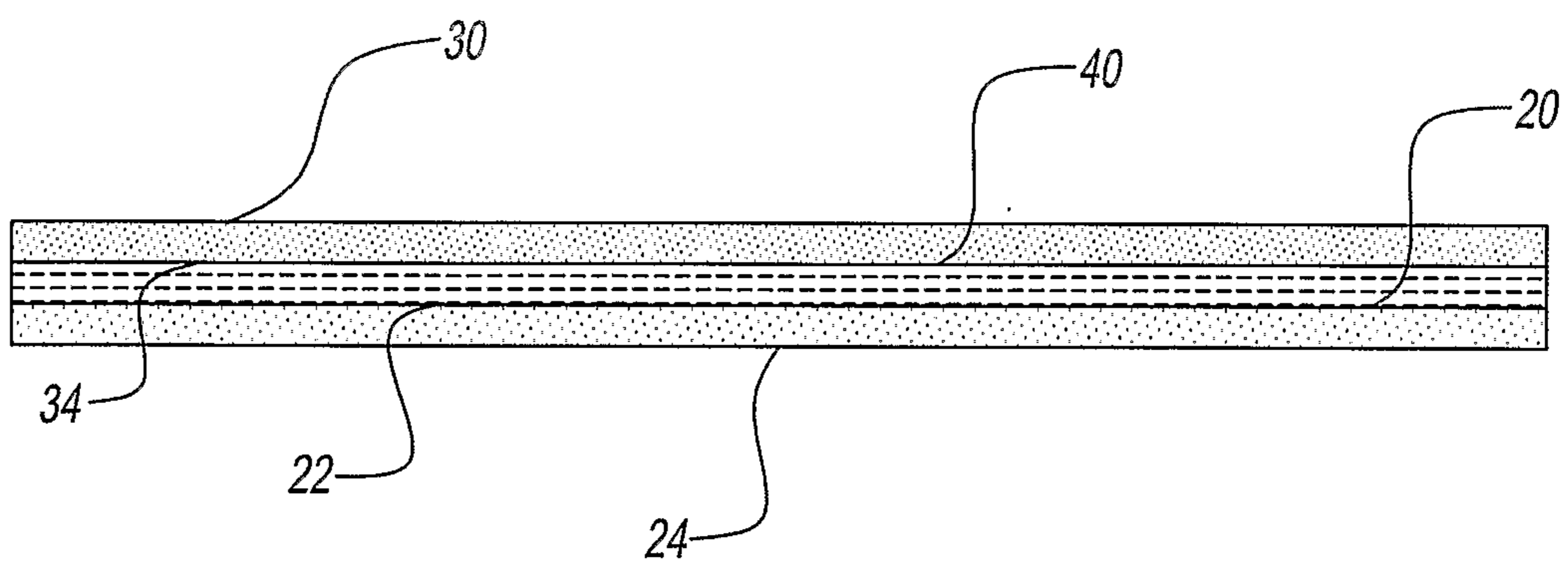
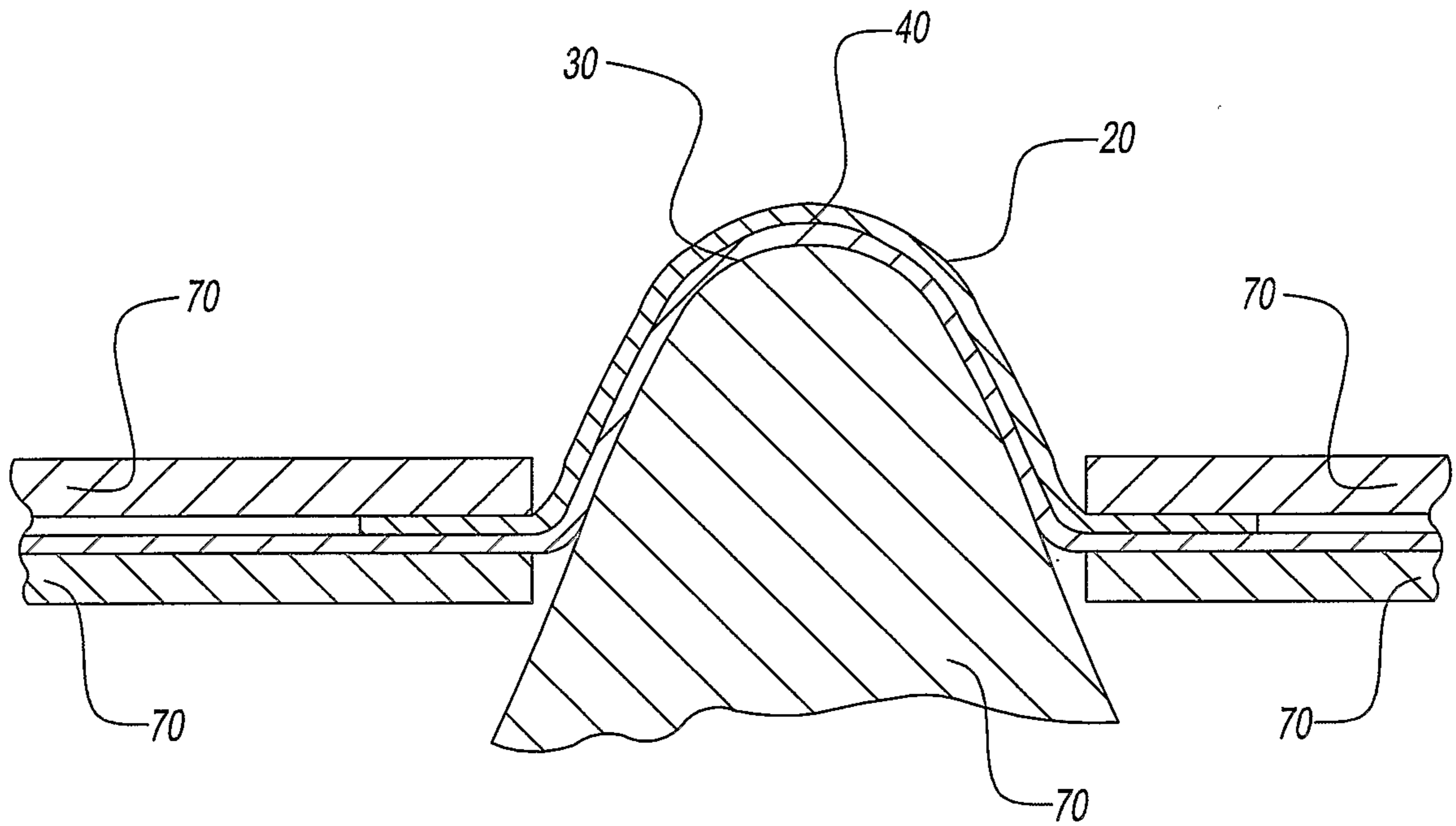


Fig. 5



*Fig. 6*

