

[54] **WEIGHTED PROSTHETIC BREAST**

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[22] Filed: **Aug. 31, 1972**

[21] Appl. No.: **285,157**

[52] U.S. Cl. 3/36, 128/463, 156/245, 264/222

[51] Int. Cl. **A61f 1/00**, A41c 3/10

[58] Field of Search 3/36; 128/478-481, 462, 463

[56]

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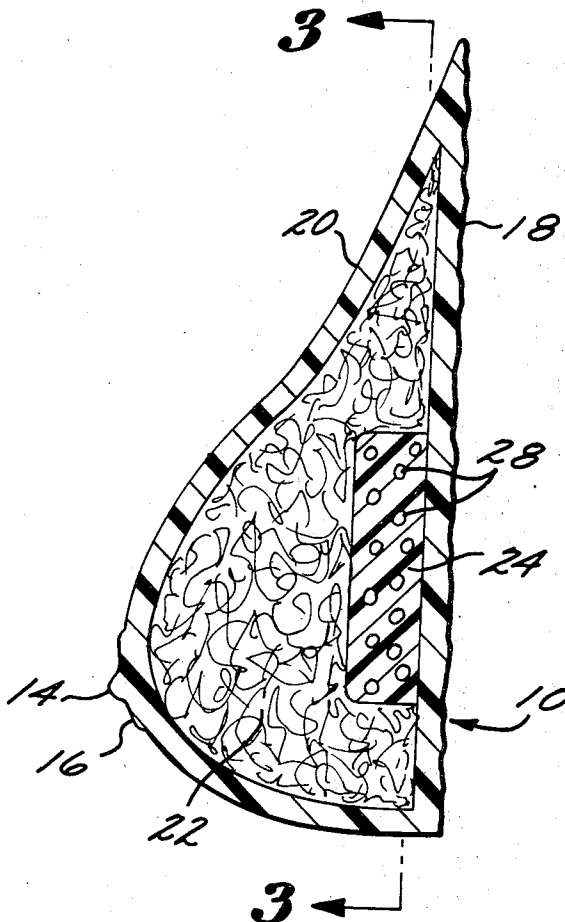
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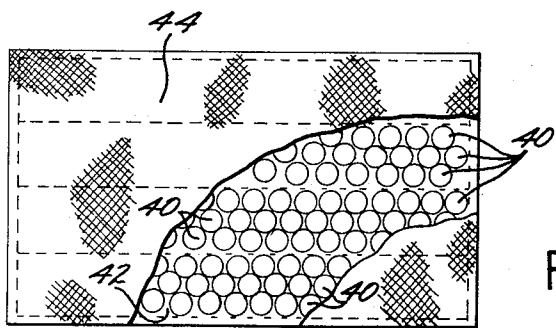
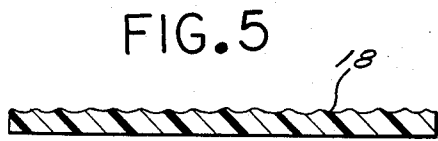
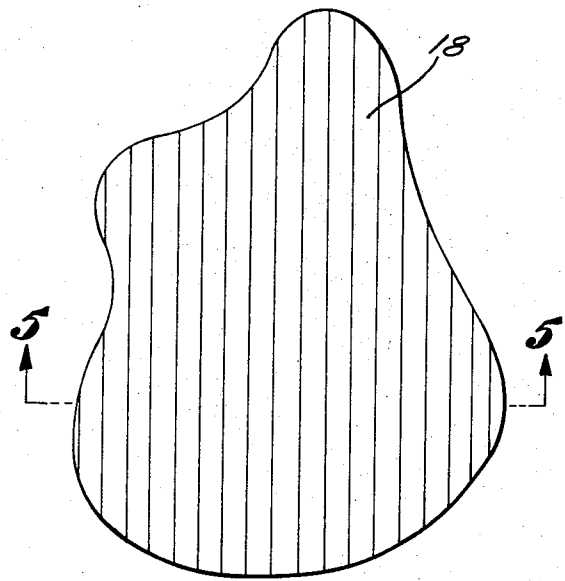
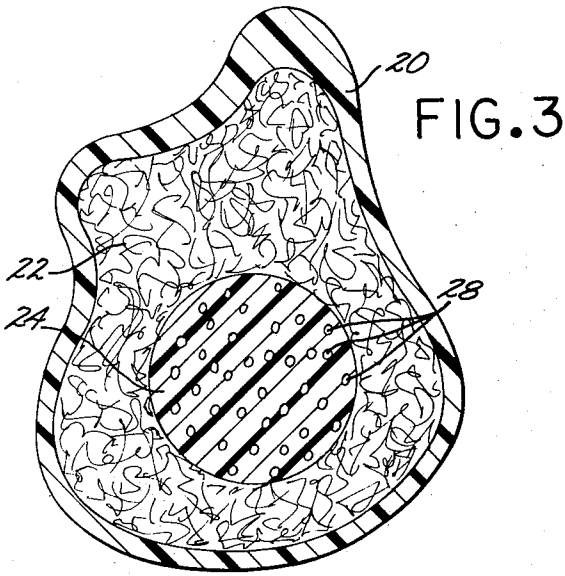
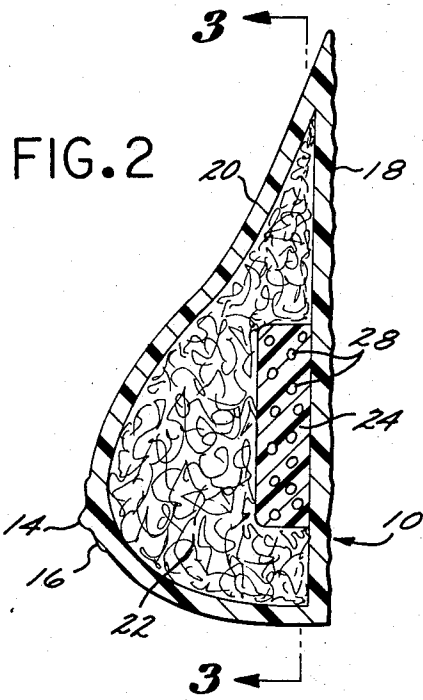
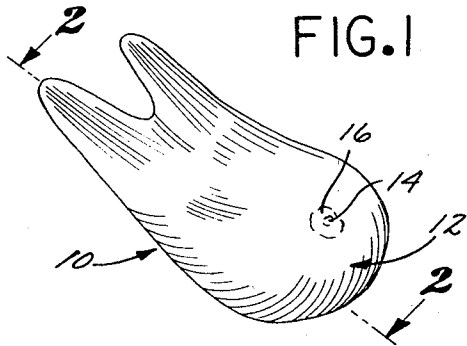
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[57] **ABSTRACT**

Prosthesis making results in a superior product when a hollow plastic form is filled with a resilient wadding and a discrete weight. The attributes of external appearance and feel on one hand and the feel associated with wearing the prosthesis on the other hand are dealt with separately. No attempt is made to provide homogeneity or uniform density. Skin is represented by a plastic outer shell or form, inner flesh by wadded fibers compressed to provide feel, and weight is represented by one or more discrete, flexible weights placed to facilitate holding the prosthesis in position. Flesh color is simulated by including cosmetic powder of selected color in the translucent plastic shell. The process and the product of the process are described and a breast restoration is described in particular.

5 Claims, 6 Drawing Figures





WEIGHTED PROSTHETIC BREAST

This invention relates to cosmetic prostheses or "restorations."

Prosthetic restorations are worn by persons, portions of whose bodies are missing. Some restorations, and portions of others, are worn primarily for cosmetic purposes and their value is enhanced if they look and feel natural rather than artificial.

No material has been found which has the color, the resilience, the feel, and the density of human skin and flesh. A number of plastic materials are now available that can be made to have a resilience that approximates the resilience of skin. However, some of those materials have an unpleasant feel and some are difficult to color properly or present other problems. Only a very limited number of materials survive even approximate screening for suitability.

It has been discovered that soft vinyl plastic can be made to have the proper resilience and feel to represent skin. However, it is not satisfactory for representing flesh and attempts to make prosthetic restoration of solid pieces of vinyl plastic have not produced an adequate realism in the finished product. Some attempts have been made to make prostheses in the form of air or liquid-filled, properly shaped balloons. Making the balloons of vinyl has improved them but they have been difficult to keep from leaking and both the air-filled and liquid-filled variety lack realism. They feel and behave like what they are — air balloons and water bags.

The difficulty is solved in the invention by creating a relatively thin walled form of soft plastic material, advantageously vinyl, and stuffing the cavity of that form with a resilient fibrous material such, for example, as a wad of synthetic fibrous material. "Nylon", "Orlon" and "Dacron" are names of suitable materials. The quantity of fibrous material is varied so that the requisite under-surface, or under-skin, resiliency is achieved. Neither the plastic form nor the wad of fibers has a density approximating that of skin and flesh but that difficulty is overcome in the invention by adding a weight inside the form. The weight is placed at a point where it aids in keeping the restoration in place and making it feel natural, but where it does not have an adverse effect on the resilience. The invention takes advantage of the fact that the density of a prosthetic restoration does not affect its appearance. Weight is of importance only to the wearer of the restoration. The weight should closely approximate the weight of the body part being restored and the weight should be distributed enough to feel right. But density need not be uniform and the use of specific weights in an otherwise light-weight restoration makes it easier to keep the restoration in place.

The difficulty in achieving realism is increased as the volume, and in particular, as the bulk of the restoration is increased. Making a breast restoration is particularly difficult because of its size. The problem is simplified somewhat because it is normally held in place with a bra and is not exposed to view. Nonetheless, natural appearance and feel is demanded by the wearers of artificial breasts and contributes greatly to an improved attitude in the patient about her plight. The invention, while applicable to production of cosmetic prosthetic restorations in general, is particularly well suited to the making of breasts. Its object is to produce better, more

realistic, prosthetic restorations and in particular to produce better and more realistic breasts.

Another object is to provide a method for making restorations in a color that matches the color of the wearer, that are realistic in other respects as well, that will last indefinitely, and that are relatively inexpensive to manufacture. By their very nature, most cosmetic prosthetic restorations are custom made. They must fit a particular individual, have an outward appearance consistent with the wearer's size and shape, and they must be colored to match the wearer's color. If it meets those requirements, a restoration can contribute greatly to the appearance, the feeling, and the mental attitude of the wearer and an object of the invention is to make those benefits more easily available to more people.

In the drawings:

FIG. 1 is a pictorial view of a prosthesis embodying the invention;

FIG. 2 is a cross-sectional view taken on line 2—2 of FIG. 1;

FIG. 3 is a cross-sectional view taken on line 3—3 of FIG. 2;

FIG. 4 is a view in rear elevation of the prosthesis of FIG. 1;

FIG. 5 is a cross-sectional view of a fragment of the rear wall of the prosthesis taken on line 5—5 of FIG. 4; and

FIG. 6 is a view in elevation of an alternative form of weight, a portion of its cover having been removed to show its interior.

The prosthesis shown in FIG. 1 is a representation of a breast and parts of those muscles that are removed from a patient in a radical mastectomy. The prosthesis itself is designated by the reference numeral 10. The breast portion 12 includes a representation of a nipple 14 and a surrounding areola 16. The rear surface 18 is best shown in FIG. 4. It is shaped as the complement of the scar surface over which the prosthesis is to be applied. The other side 20 is called the forward or outer side. The rear and forward surface walls are joined or are integrally cast to create a hollow breast form. The walls are made of a soft resilient material having the approximate resilience of human skin. In a preferred embodiment of the invention that form is made of a soft vinyl plastic sufficiently pliant so that it would collapse under its own weight if unfilled. It is filled, however, with a wadding 22 of fibrous material. The material is wadded so that it is resilient. It is not essential that the entire filling or stuffing comprise a single wad prior to being disposed within the form. Smaller wads can be inserted and together they form the equivalent of a single wad in the finished product.

Enough wadding is inserted so that its resilience gives the product a realistic feel. The walls 18 and 20 need not be of the same thickness or even the same resiliency or even of the same material. However, it is found that best results are achieved when they are made of the same material and of approximately the same thickness. That provides the functional advantage that the outer wall 20 looks and behaves like skin when viewed from the outside and that the rear wall 18 feels and behaves like skin to the wearer. The thickness is variable with the hardness of the material but is advantageously between one-sixteenth and one-quarter of an inch thick. Advantageously, the forward wall is between one-sixteenth and three-sixteenths of an inch thick.

The thickness will be increased somewhat at the margins where the rear wall and forward wall are joined as illustrated in FIGS. 2 and 3. The dimensions given are appropriate for the intermediate parts of the wall.

It is important from the wearer's standpoint that the breast be weighted to simulate a natural breast. In the invention a weight is disposed within the form in proximity to the rear wall 18. It is not necessary that the weight be fastened to the rear wall or even to touch it. It is enough if it is imbedded in the wadding 22 so that it is relatively close to the rear wall and is separated from the forward wall by a substantial amount of the wadding. In the embodiment shown in FIGS. 1 through 5 of the drawing, the weight 24 is bonded to the rear wall 18. It is located centrally on the rear wall at a position opposite the fullest or nipple portion of the breast.

Both the form and the wadding are lightweight. Accordingly, the weight must be quite heavy. Its actual value depends upon the volume of the prosthesis and will vary from less than a pound to several pounds so its density must be substantial. It is a feature of the invention that the weight is made flexible. In preferred form, bits of metal are imbedded in a very flexible casing. Bits of metal such as lead shot housed in a bag of plastic felt or imbedded in a body of soft, pliant plastic has been found to be particularly well suited to the task. The weight 24 is formed by stirring lead pellets in melted vinyl plastic so that all of the pellets are coated with the plastic. An additional quantity of melted plastic is added and the plastic-coated pellets are stirred into that. The mixture is allowed to harden to form a heavy but very flexible weight. Some of the pellets are visible in FIGS. 2 and 3 where a few of them are designated by the reference numeral 28 for identification. Making the weight of vinyl plastic is convenient because it is necessary only to apply sufficient heat to melt their surfaces to permit bonding of the weight and the rear wall 18.

Examination of FIGS. 2 and 3 will show that the weight 24 is placed so that the center of gravity of the finished prosthesis lies substantially on that horizontal line where it would lie in a natural breast. However, the center of gravity is located more rearwardly than would be true in a natural breast. For the wearer, the feeling is made much more natural if the weight is placed at the rear adjacent the wearer's chest wall. Some cosmetic prostheses are attached to the body with adhesives. When the weight is placed against the rear wall as it is shown to be in FIG. 2, the use of adhesives is ordinarily unnecessary and the weight of the breast can ordinarily be supported adequately by the user's bra.

To improve adhesion of the prosthesis to the body without actual sticking, the rear surface of the prosthesis is made somewhat irregular. This is done conveniently by corrugating the rearmost surface as shown in FIG. 4 and in the cross-sectional view of FIG. 5.

An alternate weight construction is shown in FIG. 6. Here, lead or steel shot 40 is placed between two layers 42 and 44 of felt, such for example as a "Dacron felt." The felt layers are sewn together around their margins and along a number of parallel seams so that the shot is distributed rather uniformly in long parallel pockets. The result is a very high density and very flexible weight which may simply be inserted in the form in close proximity to its rear wall.

To achieve proper coloring, the forward wall 20 is made of a transparent material, or nearly transparent material, which is coated with, or has imbedded within it, cosmetic powder of a shade that matches the wearer's skin color. Realism is enhanced if the material itself is slightly colored with mother-of-pearl. It is not essential that the rear wall 18 be colored but it is preferred.

To make prostheses of this and other kinds one makes an impression, in the negative, of the area over which the prosthesis is to be applied. That mold or impression may be made with plaster-of-paris bandage placed over the surgery area. In the case of a mastectomy, a mold is made of the entire chest including the remaining breast if any. A positive mold is then made of the surgery area of that impression. That mold is advantageously made of a mixture of hydrocal and water from which air has been removed. Liquid floor wax makes a good parting agent. The mold is built up of layers of that hydrocal and water mixture and fiberglass mesh to produce a mold substantially in sheet form. The edges are trimmed to desired finished size.

After the mold has hardened, a model of the forward surface is made. This can be done by sculpture using clay to produce the shape that the finished product is to have. That completed, a second positive mold is made of the forward surface of the restoration. That second mold is also advantageously made of wetted hydrocal and fiberglass mesh. The second mold is hardened and the clay is removed.

The product of the effort to that point is a two-part, positive mold of the restoration. One part is a mold of the rear surface of the restoration and the other part is a mold of the forward surface. This specific arrangement is advantageous because it facilitates making the restoration form by painting melted plastic on the inner mold surface or by introducing a quantity of molten plastic into one side of the mold and by putting the two parts together to form a complete hollow mold which is then rotated so that its interior surface is coated with the hot plastic in a slush casting process.

A small amount of pearl coloring is added to the plastic melt and is stirred into the melt so that it is evenly distributed. In the preferred form of the method, color is added by blowing cosmetic face powder of selected color on the inner surface of the cast while it is still hot. That coloring step is accomplished after one or more thin layers of vinyl plastic have been applied to the inner surface of the forward mold but before any attempt is made to add the rear mold. The face powder having been added, additional layers of vinyl are added. Since subsequently added plastic melt results in some melting of previous layers, the two parts of the mold need not be placed together until the forward and rear portions of the form have substantially the desired thickness. Then a quantity of melted plastic is placed in one-half of the mold; the two halves are placed together and the combined mold is rotated to add the final inner coating and to bond the two sections together.

The form is permitted to harden and the mold removed to expose what is then a hollow plastic form. That form is then cut open to permit insertion of a stuffing material. The cut is advantageously made on the rear side. Stuffing is inserted until the form is filled and has the desired resilience or substantially so.

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Thereafter, a weight is inserted. The method of making a preferred form of weight was described above. When the weight is made of plastic of the same kind from which the remainder of the form is made, and particularly when they are both made of vinyl plastic, a small quantity of melted plastic inserted through the opening and applied to the rear surface of the weight permits bonding of the weight to the inner surface of the rear wall. This is easily done by orienting the restoration so that the weight presses down on the rear wall as the melted plastic hardens. A small quantity of molten plastic can be used to seal the opening. Alternatively, the opening can be sealed by melting its edges together with a hot iron.

In the preferred method, before the form is closed its inner surface is painted with a brush to add nipple and areolia color. The product is realistic enough in appearance to make it feasible to provide even greater realism by painting representations of veins on the inner surface.

As a final step the outer rear surface of the prosthesis is provided with grooves or corrugations of the kind shown in FIGS. 4 and 5 using a metal comb which is sufficiently hot to melt the plastic surface. The comb is drawn over the surface slowly but steadily.

Although I have shown and described certain specific embodiments of my invention, I am fully aware that many modifications thereof are possible. My invention, therefore, is not to be restricted except insofar as is necessitated by the prior art.

I claim:

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1. A prosthetic breast comprising:

a hollow form of soft plastic defining a shell having a rear wall shaped to complement the shape of the user's chest and having a forward wall shaped like a breast;

a resilient wad of fibrous material filling said hollow form; and

a weight contained in the form and separated from said forward wall by said fibrous material;

said weight comprising a body of resilient material in which weights are imbedded and which is bonded to the interior side of the rear wall of said shell in the central region of its area.

2. The invention defined in claim 1 in which the forward wall of said form has a thickness between one-sixteenth and three-sixteenths of an inch throughout the region surrounding its nipple and is made of translucent plastic containing a quantity of pearl coloring.

3. The invention defined in claim 2 in which said forward wall has imbedded within it a layer of cosmetic powder.

4. The invention defined in claim 1 in which the whole exterior of the rear surface of said form is grooved to form parallel serrations.

5. The invention defined in claim 4 in which said form is made of a vinyl plastic, the front and rear parts of said form being bonded into a completely sealed shell, and said fibrous material comprising a wad of synthetic fibers.

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