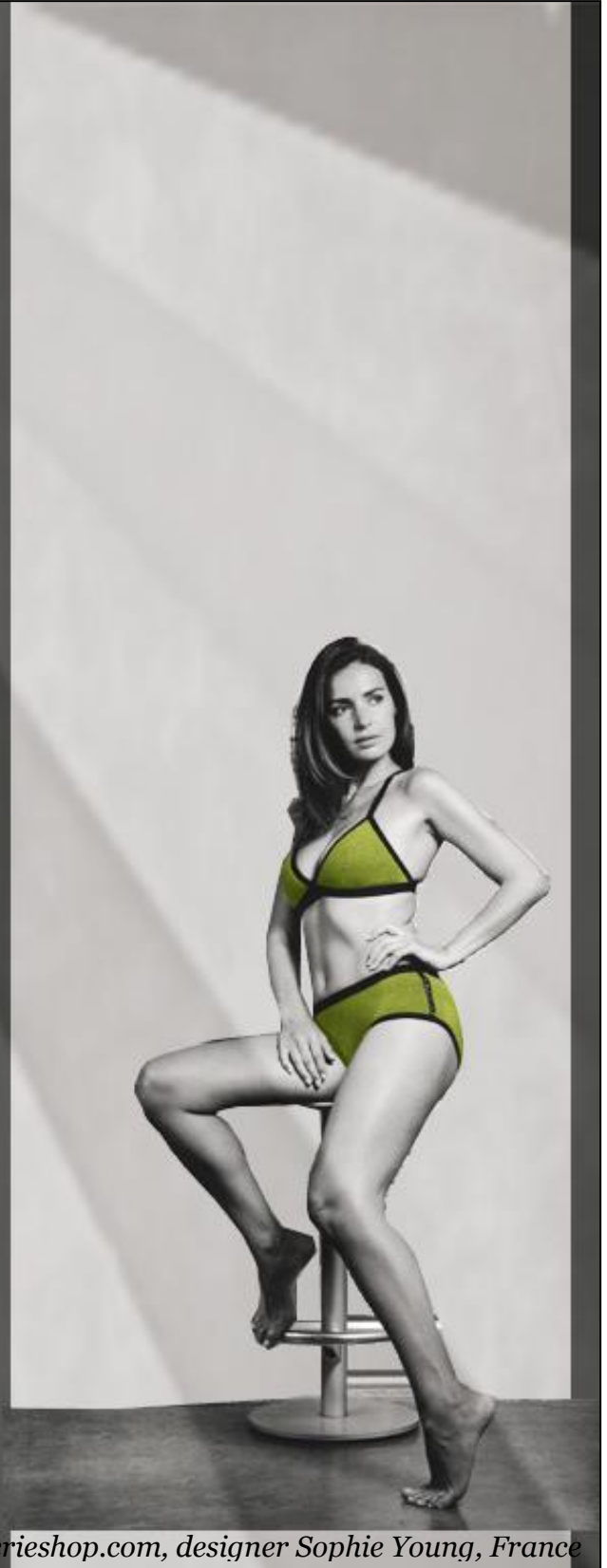


THE PEERLESS WORLD OF THE BRASSIERE

**BY:
DR. NOOPUR ANAND**



frenchlingerieshop.com, designer Sophie Young, France

The Peerless World of the Brassiere

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The Brassiere is the inimitable intimate wear which has been around for more than a century and it still stays a design and fit challenge for the designers and manufacturers.

Besides the obsession of achieving a perfect fit and comfort its utility and need has been much debated upon. There are various arguments and reasons provided to establish that the need for brassiere is much more than that of support, lift and concealment.

The Brassiere prevents sagging as gravity tends to make breasts lose shape- the fact is just the opposite; the brassiere actually 'causes' sagging. A study conducted for over 15 years by Frenchman Jean-Denis Rouillon proved that the breasts becomes dependent on the external support of brassiere and tend to sag more quickly.

The Brassiere prevents cancer – A study done by Sidney Ross Singer and Soma Grismaijer suggest that brassieres exert enough pressure on the breasts and surrounding areas to inhibit the flow of lymph, which then causes toxins and other waste material to remain in the breasts instead of being flushed out which may cause cancer.

The above arguments have been proven to be nothing but myths; essentially a brassiere performs the following functions and no more

A Brassiere enhances beauty – through improvement in appeal, concealment of nipples, smoothing of body lines, and creating attractive cleavage through lift and size enhancement.

A Brassiere restrains breast movement during activity - Breasts are made up of delicate tissue and ligaments. The force during high activity can cause damage to these tissues and ligaments, causing pain and discomfort.

From garment fit perspective breasts are a difficult body part. High-tech design and fabric combinations are required to achieve the perfect fit. This essentially makes Brassiere design and construction a challenging task for both the designers and engineers. An article in issue of Science and Mechanics journal in year 1964 titled "Brassieres: an engineering miracle" stated that designing a brassiere was as challenging as to design a cantilevered bridge or a skyscraper.

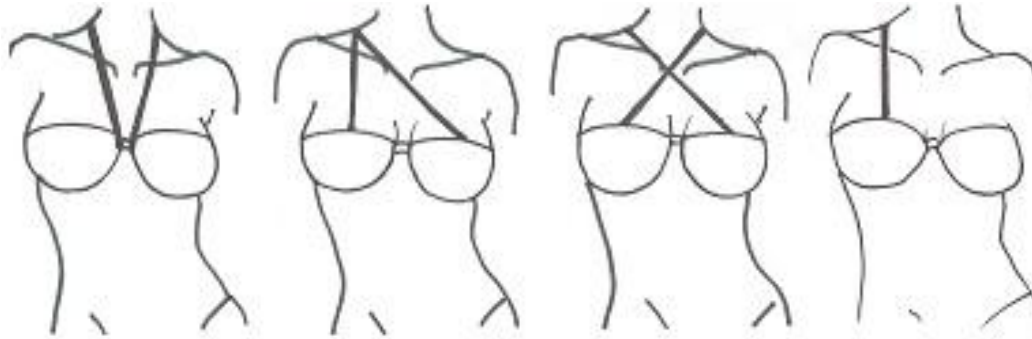
There is continuous and a significant amount of work which is ongoing to achieve the perfect fitting, utterly comfortable and novel designed brassiere. Innovation is taking place, many of them commercially viable and practical, in the areas of fit, design, production, and functionality of the brassiere. Some of the innovations and trends have been documented below.

1. INNOVATIONS IN FIT AND DESIGN

The brassiere is said to be fitting well if its band fits snugly without biting into the skin, the center panel is resting on the sternum, breasts are contained in the cups, the band is horizontal on the back, straps are not digging into the skin and the cups do not pucker. Hence finding a well fitting brassiere is a mammoth task and the fact that they change size due to menstrual cycles, weight gain or loss, stress, etc. and that many times there is size difference between the breasts augments the problem.

“Pick Your Perfect Pair” Brassiere (by *Fruit of the Loom*) for the women having different sizes of breasts, had both front and back closures so the brassiere had two parts and each could be purchased separately. The concept was great but did not catch on as it was confusing to pick two different sizes for two sides of body.

- 1.1. Size adaptable Brassiere** - A two way stretch fabric is placed in the center and side panel of brassiere. This provides the desired enhancement when the breast size fluctuates. This inherent size adjustability function has been incorporated by many brands.
- 1.2. Customized Brassiere** - there is a definite trend towards customization of the brassiere. There are many custom made brassiere companies which provide a complete solution to fitting problems, such as Zyrre, Evlove intimates, True & Co, Underwear, etc.
- 1.3. Mass Customization** - the concept of mass customization has also been explored but not many brassiere companies have ventured in mass customization of brassieres. Though there are companies like Victoria’s Secret who introduced a new strategy for ‘mass customization’ in 2008 when they launched a ‘Biofit Brassiere’ which claimed to fit all size and shape of customers like a personal custom made brassiere. The product was designed such that with an increase in cup size the padding decreased but it was still a mass produced product and not mass customized.
- 1.4. Convertible Multi-way Brassiere** - A Brassiere should be aesthetic enough to make the wearer feel special and has to be functional enough to conceal itself under the clothes. Depending upon the style of the clothes a woman wears, her wardrobe may require her to stock multiple designs of brassiere like halter, strapless, cross back, one shoulder, etc. which is a challenge. The solution came in the form of an innovation called the convertible Multi-way Brassiere. These brassieres have detachable straps. Each cup and strap has multiple hook positions so can be worn in variety of ways, so it is a single solution for many problems.



Convertible Multi-way Brassier

2. INNOVATIONS IN MANUFACTURING

In the early days, brassieres were made in pieces and sewn together, this created uncomfortable seams that rubbed and grazed the skin thereby causing irritation and discomfort. Innovation in brassiere construction to make a seamless brassiere was a much appreciated solution for this problem. Seamless brassieres are manufactured by having molded and contoured cups which make them more comfortable to wear.

2.1. Molded and Contoured brassiere - in a molded brassiere, synthetic fabric is stretched over a hot mold having pre-defined breast shape to form a molded cup since there is no seam over the breast it is comfortable to wear. But molded brassieres are single layer and have the issue of opacity. These brassieres were further improved by adding a layer of foam to give better coverage, smoother lines and improved support; these are called Contoured brassieres or T-shirt brassieres.

2.2. Silicon brassiere - a silicone gel brassiere includes two silicone gel cups and a connector. Inside surface of these cups is coated with a reusable adhesive layer which helps them to stick to the body and they can be worn without straps.

There have been a number of innovations in technology for improving the fabric and trims. These innovations make brassieres breathable, lighter, comfortable and invisible.

3. INNOVATION IN FABRIC

The first brassieres were made from a cotton-based material and then nylon and satin. Lycra brought revolution in the field of brassieres with its elastic properties. The high tech fusion fabrics allow the skin to breathe and remove moisture from the body. These fabrics feel smooth, cool and dry all day making them very comfortable. The trend is toward sustainability and eco friendliness and options like bamboo, pine tree pruning, and soy-based fabrics are being explored.

3.1. Memory foam: memory foam is used by many brassier manufacturers as it conforms to the shape of breasts perfectly without any gaps and bulges. This technology was first developed by NASA and later it was used by famous mattress manufacturing company.

3.2. Spacer fabric: Creation of spacer foam or spacer fabric eliminates the layering and gluing of pieces of fabric completely. This fabric is like corrugated cardboard. It has a top and bottom layer with filaments in between that can be adjusted to create a thickness. The structure creates little air pockets which gives a very cushiony feel to the hand and is breathable

4. INNOVATIONS IN TRIMS

The most common complaint of a brassiere wearer is that the under wires poke in the skin and the straps bite into the skin. Some small innovations in this have addressed these complaints.

4.1. Hidden Underwire - Under wires are almost universally and unanimously treated as an 'essential evil.' Though on one hand they are required to provide good lift, neat separated shape, on the other they tend to poke into the skin. The first innovation of coating the metallic wires with gel/ plastic although helped but it didn't really solve the issue. Bioform Brassiere by Carnos did replace the underwire with a molded wing but the product didn't do well. Then came plastic molded under wires, which were pliable and didn't cause discomfort. To better this now these under wires are encased in foam / padding which conceals them completely and reduces the risk of them popping out.

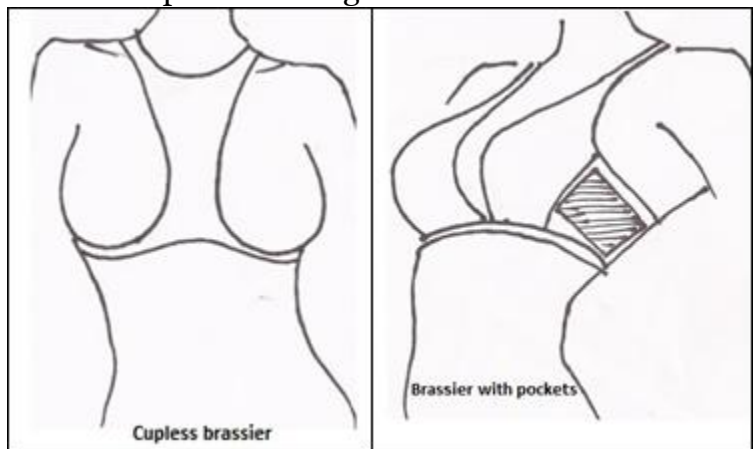
4.2. Straps gel and cushioned Brassiere straps - one of the common complaint is that the brassier straps bite into the skin and are a frequent source of discomfort and even headaches. In a simple innovation the straps have been made broader especially for bigger breasts to give better support without hurting the shoulder. In another innovation the strap has been cushioned which doesn't let the strap bite in the skin. The latest, the straps are filled with silicone gel which distributes the pressure evenly on the shoulder hence straps doesn't dig in the shoulder.

5. INNOVATION FOR ENHANCED FUNCTIONALITY

At times a brassiere ceases to be a simple brassiere and provides some additional features to increase functionality. Some such examples of adding additional features are

5.1. Anti-rape lingerie - Anti-rape lingerie is fitted with electric circuit which delivers a 3,800 kilovolt shock to any would-be attacker.

5.2. Cupless brassiere - This anti wrinkle brassiere is cupless and has a foam lined panel which separates the breasts thus not letting the skin wrinkle up between the breasts. It has been designed by La Decollette, a Netherlands based company.

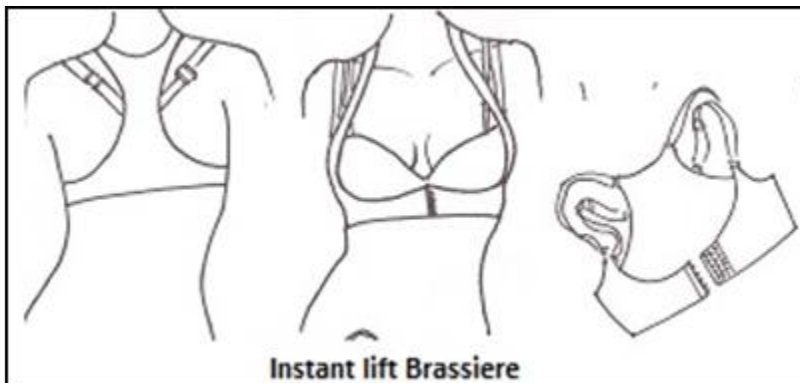


- 5.3. A Brassiere with pockets** - a brassiere has been designed for hands free comfort with pockets on the side. This pocket can be used to keep small items such as mobile phones, credit cards, money or an iPod.

6. INNOVATIONS IN BRASSIERE ACCESSORIES AND AUXILIARIES

Some innovations have been done in the field of brassiere auxiliaries which can enhance the look, functionality and feel good factor of the brassiere.

- 6.1. Instant lift Brassieres** - the objective of this brassiere innovation is to give instant breast enhancement. It has been designed without cups having a band of elastic which creates upwards lift by pushing the breasts inside and upward thereby creating a nice cleavage. The product though provides instant lift but it appears like a 'harness' because of the two widely set straps and a high back.



- 6.2. Fragrance pads** - positive impact of fragrance on mood elevation, stress reduction and "feel good" sensation is well known. To add this "feel good" factor fragrance pads are available which include a pressure-resistant bag made of gas-pervious thin plastic material which is filled with liquid, gel or other substance that enables diffusion of fragrance. This pad can be positioned in a brassiere cup.
- 6.3. Snap-on - Inset** - women wearing a garment with a deep scooped neckline may want to display the cleavage or alternatively cover it depending upon the occasion and situation. In For cover up the snap-on camisoles, which are small triangle of fabric which snaps onto the brassiere straps, are used thus providing the cover and the look of a modest undergarment. It is called Cleava and has been designed by BraNovations, Inc.

7. SOME "ONE-OF-ITS-KINDS" BRASSIERE INNOVATIONS

In the zest to create exclusive, unique and novel brassieres, sometimes passion gets the best of the innovators.

- 7.1. Clap off brassiere** - this innovation done in Syria will unclasp the Bra and make it fall to the ground at the sound of clapping.
- 7.2. The Wine Rack Brassiere** - The Wine Rack allows the wearer to fill the special cups with their chosen drink which will make smaller cup sizes bigger up to three sizes and has a straw for the woman to have a sip of her drink as well.

7.3. Solar brassiere -. This brassiere invented in Japan has a solar panel which can store energy when exposed to the sun which can be used to power devices like an iPod.

7.4. Man Brassiere - this innovation is for men who develop breasts with age, obesity or due to a medical condition, this product helps in flattening and concealment.

Many innovations and many creations have been carried out in the zeal to achieve the “dream brassiere” which is perfect fitting, utterly comfortable and is of a novel design. Industry designers and researchers are still struggling and toying with style, size, band, cups and straps. It appears that the search for dream brassiere will stay a dream for some more time to come.

About the Author:

Dr. Noopur Anand is a Professor at the National Institute of Fashion Technology.