May 6, 1969 W. H. BIRD 3,442,268

BREAST PAD

Filed Jan. 13, 1966

Fig. 1.

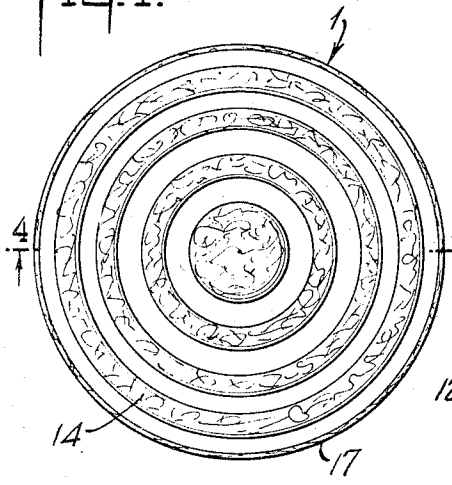


Fig. 2.

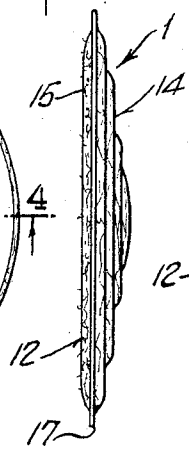


Fig. 3.

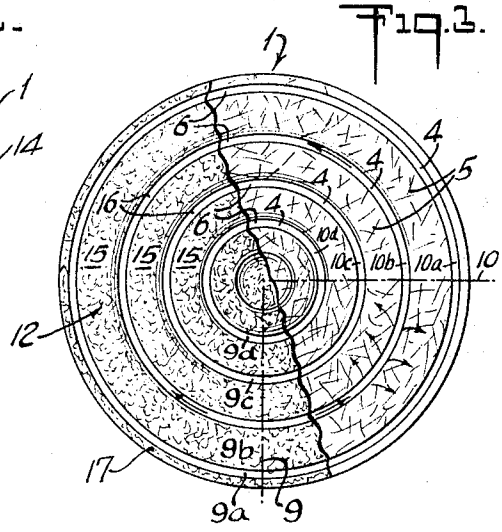


Fig. 4.

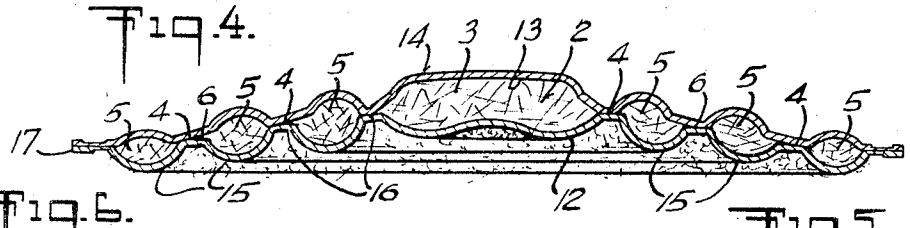


Fig. 6.

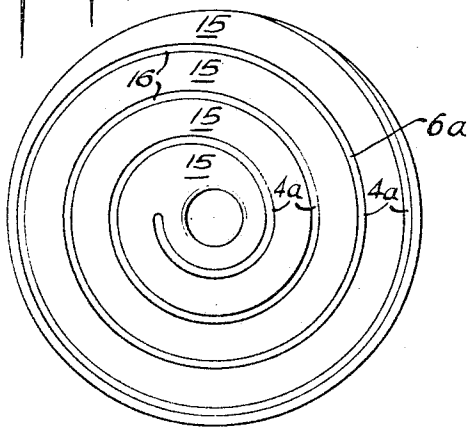


Fig. 5.

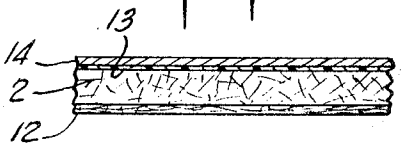


Fig. 8.

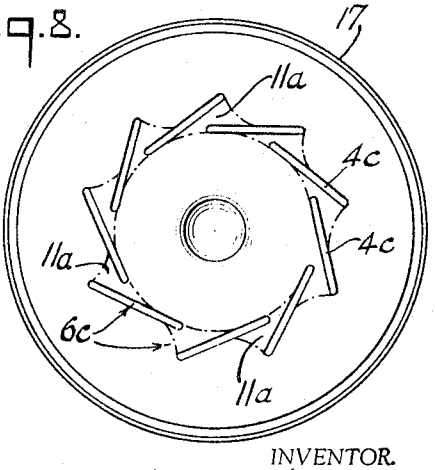
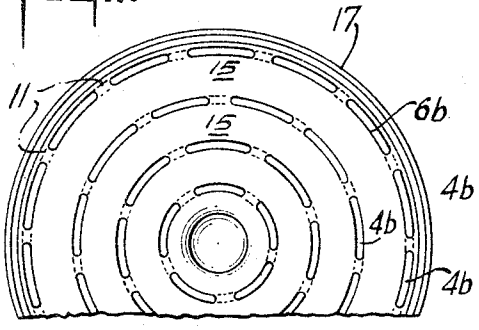


Fig. 7.



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United States Patent Office 3,442,268 Patented May 6, 1969

3,442,268

BREAST PAD

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Filed Jan. 13, 1966, Ser. No. 520,508
Int. Cl. A41c 3/10
U.S. Cl. 128—280 10 Claims

ABSTRACT OF THE DISCLOSURE

A pad for absorbing the lactal exudate from the female breast is constructed with a central portion designed to be positioned over the nipple of the breast and an absorbent layer having portions of relatively high fluid transfer rate and portions of lower fluid transfer rate extending outwardly from the central portion. The portions of high fluid transfer rate are positioned so that they substantially surround the central portion and so that they are oriented in a substantially circumferential direction.

This invention relates to pads worn by nursing mothers to absorb the lactal fluid which may exude from the breasts.

In the specification and claims the following terminology is used:

By conducting fluid in a "generally circumferential direction" it is meant that the fluid is conducted around a central point or, in other words, it is conducted from an area adjacent one radial line projected from a central point to an area adjacent a second radial line projected from the central point. The area from which the fluid is conducted and the area to which it is conducted need not be equadistant from the central point.

By "circumferential position" it is meant a position along a particular radial line projected from a central point.

By positions of high transfer rate "surrounding the central portion" it is meant that these portions lay on all sides of the central portion but do not necessarily enclose the same.

It is generally the practice of nursing mothers to wear absorbent pads under their clothing in contact with the nipples of the breasts in order to absorb any lactal fluid which may exude from the breasts. This fluid may otherwise leave unsightly stains on the clothing and cause embarrassment and the underclothes may otherwise become damp and clammy and cause discomfort.

It is desirable to provide breast pads which may be discarded after use. From the viewpoint of economy and because of the active life resumed by many nursing mothers immediately following childbirth, it is desirable that such a disposable pad have sufficient absorbent capacity that the pads need only be changed at infrequent intervals.

Breast pads are generally worn so that the nipple of the breast contacts the pad at a central location. The absorbed lactal fluid is then carried by capillary action throughout the pad. However, since the pads are normally worn in the vertical position, that is, the wearer is usually standing, the force of gravity causes the lactal fluid to migrate more rapidly downward toward the bottom of the pad. The lower portions of the pad thus tend to become fully saturated with the fluid while the upper portions of the pad remain relatively unsaturated. Since the pad generally must be discarded when these lower portions of the pad reach maximum saturation and since this tends to occur long before the upper portions of the pad becomes saturated, much of the absorbent capacity of the pad is never used. Thus, not only is the cost of using disposable pads increased, but the frequent changing of the pad may be an inconvenience to the wearer.

It has heretofore been proposed to compress only selected areas of an absorbent pad to decrease the capillary size in those areas and form fluid conducting channels radiating from the center of the pad outward toward the perimeter. However, the capillary fluid transfer rate in such a pad would still be essentially equal in all major radial directions and, because of the added force of gravity, the lactal fluid would still tend to migrate toward the bottom of the pad. While fluid conducting channels could be provided which radiate in all directions except toward the bottom of the pad, it would be necessary to instruct the potential wearer to insert the pad in its supporting harness in a certain position. This proper positioning not only consumes extra time when the wearer is attempting to discreetly remove and replace the pad, but, in addition, there is always the danger that the pad will be inserted into its holding harness with the fluid conducting channels disposed in the wrong direction. If the wearer is not in a standing position, such a pad would not function properly even if correctly positioned in its harness.

It is now proposed to provide a pad for absorbing the lactal exudate from the female breast comprising a central portion designed to be positioned over the nipple of the breast and an absorbent layer having portions of relatively high fluid transfer rate and portions of lower fluid transfer rate in which at least some of the portions of relatively high fluid transfer rate are disposed somewhat outward of the central portion of the pad and somewhat inward of the perimeter of the pad and essentially surrounding the central portion of the pad to form areas which conduct lactal fluid in a generally circumferential direction. In the breast pad thus provided, if the lactal fluid tends to migrate outward radially in one direction more rapidly than in another, the areas which conduct fluid in a generally circumferential direction tend to convey the lactal fluid from relatively saturated circumferential positions to less saturated circumferential positions. Thus, if the pad is worn in the vertical position and the lactal fluid tends to flow toward the bottom of the pad, as the portions of the absorbent layer adjacent to this line of flow become more saturated than comparable portions of the absorbent layer situated at the top and sides of the pad, the fluid will be conveyed around toward the sides and top of the pad. Thus the lactal fluid is dispersed relatively uniformly circumferentially throughout the pad independent of the position of the wearer, that is, whether reclining, bending or standing. The wearer may, therefore, pursue normal activities without the lactal fluid collecting in one portion of the pad as a result of the position of the body.

Breast pads according to this invention maximize the benefit attainable from the inventive concept when portions of the absorbent layer having a relativley high fluid transfer rate continuously enclose the entire central portion. Thus, fluid which collects at any circumferential position may be rapidly conducted to any other circumferential position which is less saturated.

Other objects and advantages of this invention will become apparent by reference to the following description and the attached drawings. In the drawings,

FIG. 1 is a top plan view of a nursing pad illustrating one embodiment of the present invention;

FIG. 2 is a side view of the pad illustrated in FIG. 1;

FIG. 3 is a bottom plan view of the pad shown in FIG. 1 with a portion of the inner covering removed;

FIG. 4 is a cross section of the pad shown in FIG. 1 taken along line 4—4;

FIG. 5 is an enlarged portion of the cross section of the pad of FIG. 1 showing the various component layers;

FIG. 6 is a bottom plan view showing the inner surface of a nursing pad illustrating another embodiment of this invention;

FIG. 7 is a bottom plan view of still another embodiment of this invention;

FIG. 8 is a bottom plan view of a still further embodiment of this invention.

Referring now to FIGURES 1 through 4, the breast pad **1** comprises an inner covering **12** of open mesh nonwoven fabric, an absorbent fibrous layer **2**, a moisture impervious film **13** positioned outward of the absorbent layer, and an outer covering **14** of nonwoven fabric. The various layers are bonded together in an area **17** at their perimeter. The pad is shaped to form a central portion **3** designed to be positioned over the nipple of the breast surrounded by a plurality of concentric rings **4** of increasing diameter where the absorbent fibrous layer is compressed to provide continuous areas having a relatively high capillary fluid transfer rate and the portions **5** in between the compressed areas **4** having a lower capillary fluid transfer rate. These compressed portions **4** of the absorbent layer having a relatively high capillary fluid transfer rate are disposed somewhat outward of the central portion **3** and somewhat inward of the perimeter **17** of the pad and form area **6** which conducts lactal fluid in a generally circumferential direction.

In the breast pad thus provided, as the lactual fluid is deposited in the central portion **3** of the absorbent layer, it will tend to disperse slowly radially in all directions by virtue of the capillary action of the fibers in the absorbent **2**. However, because of the force of gravity, the fluid will tend to migrate more rapidly toward the bottom of the pad when positioned in a vertical plane, for example in the direction of radial line **9** illustrated in FIG. 3. Thus, areas *9a*, *9b*, *9c* and *9d* tend to become more saturated than comparable areas **10***a*, **10***b*, **10***c* and **10***d*. By virtue of the fluid conducting areas **6**, however, a portion of the fluid is conducted rapidly from these relatively saturated areas along line **9** to the less saturated areas **10***a*, **10***b*, **10***c* and **10***d*. The lactal fluid is then dispersed more slowly outward from the areas **6** into the adjacent portions **5** of lower capillary fluid transfer rate. By virtue of this construction, the entire absorbent layer becomes more uniformly saturated with the lactal fluid, thus increasing substantially the length of the period during which the breast pad will function satisfactorily.

The fluid conducting areas may comprise a series of continuous closed lines enclosing entirely the central portion and formed through the compression of the fiber absorbent, the same forming a series of concentric circles as illustrated in FIGS. 1 through 4 or taking other configurations designed to move the absorbent fluids generally circumferentially. Thus, in the breast pad of FIG. 6, the portion **4***a* of high capillary fluid transfer rate is in the form of a single continuous line in the form of a spiral **6***a* along which the fibers of the absorbent layer **2** are compressed.

The fluid conducting areas may also comprise a series of shorter lines surrounding but not enclosing the central portion of the pad as illustrated in the breast pads of FIGS. 7 and 8. This is illustrated by areas **4***b* in FIG. 7 and **4***c* in FIG. 8 in which the fibers have been compressed to give a high capillary fluid transfer rate, these lines being disposed in proximate end to end relation to each other. Although portions, **11** and **11***a*, having a lower capillary fluid transfer rate are interposed between the portions, **4***b* and **4***c*, having a high capillary fluid transfer rate, areas **6***b* and **6***c* shown in part by phantom lines in FIGS. 7 and 8, which rapidly conduct fluid in a generally circumferential direction, will nevertheless be formed when the distance between the discreet portions having a high transfer rate is relatively short in relation to their length. It should be pointed out, however, that these discreet portions need not be disposed close together to satisfy the inventive concept.

The portions of fluid conducting areas having high fluid transfer rate may extend outward somewhat toward the outer edge of the pad as in the embodiment shown in FIG. 8. These portions should not extend too far outward since the raidal flow may then be substantially increased. If the compressed areas are straight instead of arcuate, the closer they are disposed to the center of the pad, the more nearly they approximate a series of radial channels. If, therefore, these relatively straight compressed areas are disposed near the central area of the pad, they should be somewhat short in length.

It is preferable that the width of the portions of high fluid transfer rate be relatively narrow so that the circumferential wicking of the fluid is obtained without substantially increasing the speed of the radial migration of the fluid. There will always, of course, be some increase in radial migration due to the compressed areas, but this increase is small compared to the substantial increase in the speed of angular migration.

Where there is advantages to having a series of fluid conducting areas at various radial distances from the center of the pad as in the breast pads of FIGS. 1 through 7, it is desirable that the distance between the successive fluid conducting areas be relatively large in relation to the width of each of the areas, the large spaces between the successive areas tending to break up any radial capillary pattern and limit the radial flow.

The pads of this invention may be flat or they may be shaped to conform to the breast of the wearer. If it is desired, the central nipple contacting area may be shaped to conform to the shape of the nipple. The absorbent layer of the pad may be made of any absorbent material. While fibrous webs of various compositions are particularly suitable, other materials such as absorbent sponge could also be used. A fiber layer which has been found to be particularly suitable consists of 7% 1.5 denier ¾" Vinyon staple fibers and 93% bleached pulp fiber. The presence of thermoplastic fibers provides relatively permanently compressed areas when the compressing is carried out by heat embossing.

When a fibrous web is used as the absorbent layer, the areas of relatively high fluid transfer rate and the portions of high fluid transfer may be conveniently formed by embossing the absorbent fibrous web, thus compacting the fibers in the embossed areas to create smaller capillary channels. As long as these portions of the web are compacted to any degree, channels are formed which are within the inventive concept. When the pads utilize an absorbent layer of the above composition, it has been found to be suitable to compress portions of the absorbent layer to a density of from about 2 to about 6 and preferably about 4 times of its original density to form the portions of high capillary fluid transfer rate.

In addition to the fluid transfer properties, other advantages are provided by the embossed pads heretofore described. As can be seen most clearly in FIG. 4, the areas **15** between the embossed areas **16** tend to puff up and form pillow-like surfaces. As a result, only about 60% or 70% of the surface of the breast pad will contact the skin of the wearer and the feeling of clamminess or dampness is thereby reduced. The embossed areas **16** also act to provide spaces through which air may circulate. The degree of these effects can be controlled substantially by the spacing between the successive embossed areas. In addition to the above mentioned advantages, the nursing pads having the embossed patterns of this invention are pleasing to the eye.

Although specific embodiments of the inventive concept have been presented, they have only been presented to better describe the inventive concept and should not be construed to limit the invention. The invention is only limited by the scope of the following claims.

What is claimed is:

1. A pad designed to absorb the lactal exudate from the female breast comprising a central portion designed to be positioned over the nipple of the breast and an absorbent layer having portions of relatively high fluid trans-

fer rate and portions of lower fluid transfer rate, at least one of said portions of relatively high fluid transfer rate being disposed between said central portion and the perimeter of said pad and being formed from a continuous portion of relatively high fluid transfer rate or a plurality of closely spaced discontinuous arcuate portions of relatively high fluid transfer rate that are each oriented in a substantially circumferential direction to form an area of relatively high fluid transfer rate essentially surrounding said central portion, whereby a breast pad is provided in which lactal fluid tends to migrate from relatively saturated circumferential positions and in which the lactal fluid is dispersed relatively uniformly independent of the position in which the pad is worn and independent of the position of the wearer.

2. A pad of claim 1 in which said portions of said absorbent layer having a relatively high fluid transfer rate are disposed essentially symmetrically around the central portion of the pad.

3. A breast pad of claim 2 in which the central portion is entirely enclosed by a continuous portion of high fluid transfer rate.

4. A breast pad of claim 2 in which said area which conducts fluid generally circumferentially comprises a series of discreet portions having a relatively high fluid transfer rate which are disposed in proximate end to end relation to each other.

5. A breast pad of claim 3 in which said continuous portion having a high fluid transfer rate is essentially circular.

6. The breast pad of claim 3 in which said continuous portion having a high fluid transfer rate is in the form of a spiral.

7. A breast pad of claim 3 in which the central portion is enclosed by a plurality of continuous circular portions having a high fluid transfer rate and in which the radial distance between any two of said portions is substantially greater than the width of said portions.

8. A breast pad of claim 3 in which the absorbent layer is a fibrous layer in which portions have been compressed to form smaller capillary channels and thus form portions of relatively high fluid transfer rate.

9. A breast pad of claim 8 in which the absorbent fibrous layer comprises thermoplastic fibers and nonthermoplastic fibers.

10. A breast pad of claim 4 in which the width of each portion having a high fluid transfer rate is substantially shorter than the length of said portion.

References Cited

UNITED STATES PATENTS

2,630,119	3/1953	Aagesen	128—461
2,715,733	8/1955	Dubner	128—479
2,783,474	3/1957	Campagna et al.	2—267
2,788,003	4/1957	Morin	128—284
2,891,544	6/1959	London	128—280
2,896,623	7/1959	Fitzgerald	128—280

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U.S. Cl. X.R.

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