A disposable sanitary pad or napkin having a flush-disposable absorbent pad on the upper side and a flush-disposable backing of paper or similar material, with a thin flexible layer of liquid-retarding material (such as a greasy or waxlike material) between the two, so that liquid from the pad cannot reach the backing to dissolve it, but liquid reaching the backing from its exposed side will disintegrate it so that it can be disposed of by flushing in a toilet, the thin layer being unable to remain as a film without the support of the backing material, so that it also disintegrates when the backing material disintegrates.
FLUSHABLE MOISTURE-RETAINING SANITARY PAD

The problem of providing a sanitary napkin, incontinency pad, disposable baby diaper, geriatric pad, etc., which can be disposed of by flushing it away in a toilet has been a difficult one because the requirement that the entire pad be thus disposable means that it must be made of materials which will disintegrate in water, yet, in the case of sanitary napkins for menstrual use, for example, the menstrual fluids will also tend to disintegrate any material which can be disintegrated by flushing. This problem is solved, according to the present invention, by providing a pad having a backing covered with a thin film of waterproof material which has no mechanical strength except that provided by the backing on which it is spread, so that moisture coming from the pad side of the backing cannot penetrate to reach the backing, but moisture reaching the backing from the other side, as occurs when it is flushed in a toilet, will disintegrate the backing, and thereby cause the thin waterproof layer to be broken up so that it also will be flushed away. As a further refinement, the upper side of the absorbent pad may be provided with depressed, groovedlike portions which tend to diffuse the flow of menstrual fluid and to direct it toward the thicker portions of the absorbent pad where it can be more readily absorbed.

Sanitary pads made according to the invention are suitable for use with the “menstrual panty” described in U.S. Pat. application No. Ser. No. 651,760 filed July 7, 1967 by Phyllis M. Larson, but can be used also with any suitable sanitary napkin belt or girdle, or any situation where conventional sanitary pads are used.

The specific nature of the invention as well as other objects and advantages thereof will clearly appear from a description of a preferred embodiment, as shown in the accompanying drawings, in which:

FIG. 1 is a top view of a sanitary napkin according to the invention;
FIG. 2 is a view taken on lines 2–2 of FIG. 1;
FIG. 3 is a side view of the napkin shown in FIG. 1;
FIG. 4 is a sectional view taken on line 4–4 of FIG. 1;
FIG. 5 is a view showing a modified form of the invention;
FIG. 6 is a view of another modification assembled but not folded;
FIG. 7 is a sectional view taken on lines 7–7 of FIG. 6;
FIG. 8 is a sectional view similar to FIG. 6, but in the final folded condition;
FIG. 9 is a sectional view of a different modification; and
FIG. 10 is a final-folded view similar to FIG. 9.

According to the Figs. in which the invention is exemplified by a sanitary napkin, the napkin consists of a backing sheet 2, made of paper or any similar flush-disposable material which will disintegrate upon contact with swirling water, and an upper absorbent pad 3, also made of flush-disposable material, which may be nonwoven rayon or cotton fibers, crepe paper, wood pulp, or similar material, very lightly compressed to form a self-contained pad capable of absorbing and retaining a maximum amount of fluid, the individual fibers of the pad being however sufficiently compressed to somewhat retard absorbency, so that the fluid material does not flow too freely through it. Between the pad 3 and the backing sheet 2 there is a thin film 4 of greasy or waxy material forming a waterproof barrier between the pad 3 and the backing 2. This film may be a silicon ointment, Diaprene Periainal cream (Sterling), cold cream, Plastibase (Squibb), etc., which also serves as a bonding agent between the pad 3 and the backing 2, as well as to compress the absorbent pad 3.

To further hold the two elements together, a heavy crimping track is formed as shown at 6 and 7, which may be accomplished by crimping rollers, as is well known, in the assembly line formation of the napkins. This crimping track operation, together with the cutting operation which cuts the pads to the proper size and therefore tends to somewhat compress the edge portions 8 and 9 so that they are much thinner than the body of pad 3, provides edges regions on the pad, which not only tend to hold the pad 3 and backing 2 together (in addition to the waterproof film), but also serve to retard the flow of fluid outwardly away from the central longitudinal axis of the pad, and to retain such fluid in the bulky portion of the pad. The upper and lower edges of the pad are similarly compressed, and this compressed rim around the entire perimeter of the pad tends to not only bind the unit together, but also tends to retain moisture in the central absorbent portion, to prevent it from seeping out along the edges.

The top surface of the absorbent pad 3 is preferably provided over its major area with closely-spaced dents or depressions 10, which tend to diffuse the flow of fluid reaching the top surface of the pad and to spread it over a larger area of the pad, and also to permit such fluid to more readily enter into the main body portion of the pad, while at the same time the depressions are so oriented, as will be apparent from the FIGS., that they tend to direct the flow of such fluids from the area where it first reaches the pad in a longitudinal direction generally toward the bulky absorbent portion of the pad. For this reason, several rows of such depressions are provided as shown at 11 at the lower end of the pad oriented oppositely from the depressions 9, so as to direct the flow of fluid toward the central portion of the pad.

The backing sheet 2 may be made of any suitable material such as paper, polyvinyl alcohol film, etc., which has a reasonable wet strength, but is not indissoluble in plain water, water with detergent solution, or any chemical composition usually present in septic tanks or sewerage system. The bonding and waterproof layer 4 may be applied either with a blade or a spray nozzle, or in any known fashion, but must form a complete film over the surface which it covers, to prevent the entrance of water from the pad to the backing strip. The material employed should remain nonhardening for the useful life of the product, and must, of course, be nontoxic to the skin.

The depressions 9 and 11 may be omitted in the case where the pad is formed of a relatively coarse-grained material having a somewhat rough or corrugated upper surface, which would tend to produce the same general effect. In this case, of course, the general grain of the material should run in a longitudinal direction so as to increase the amount of fluid which is carried by the pad, mainly by working it away from the place of greatest flow, in the center of the pad. The dents or depressions can readily be formed at the same time that the pad is assembled, by passing the pad under or through rollers which are properly embossed to form the desired configuration. However, the amount of pressure should be greater on the edges, so as to compress the edge portions more firmly than the center portion, for the reasons noted above.

The pad shown in FIG. 1 is suited to be carried in the pocket of a menstrual panty such as shown in the above-referred to patent application, or in any similar garment, a tab space 12 being left at the front of the pad for daintiness in handling a used pad. This can be accomplished by leaving the backing sheet 2 exposed at the tab portion, the absorbent pad 3 being cut away for this purpose.

FIG. 5 shows a slight modification in which two tabs 13 and 14 are provided at the ends of the sanitary napkin for attachment to a carrier such as a belt or any similar device, in lieu of the menstrual panty. If the tab material used is such that crimping alone will not provide sufficient bonding between the pad 3 and the backing strip 2, then spot gluing or other means of attachment may be provided so that the tab portion may be sufficient to prevent slippage of the top pad from the lower base, to keep them together during use and during removal, but to allow each to part from the other when flushed.

Instead of the backing sheet 2 being made of paper or other relatively nonabsorbent sheet material, it may be a sheet of absorbent pad material similar to the top sheet 3, but preferably thinner, there being however the same or smaller difference between the upper and lower portions to prevent moisture from striking through the lower backing pad; however, if a small amount of moisture does strike through, the second pad would tend to absorb this.
FIGS. 6—8 show another way of making a pad according to the invention. In this case, the backing sheet 2 of FIG. 1 is extended as shown at 2a and then folded over the top of the pad, to provide a firmer top surface, which is yet sufficiently porous to readily absorb and spread moisture, and which may also be suitably crimped or indented if desired.

FIGS. 9 and 10 show another form similar to FIG. 8, but with the waterproof layer on the folded side. Instead of being made from a single sheet as shown in FIGS. 6—10, the top and bottom layers could also be made from two separate sheets similar to the backing sheet material.

The backing sheet 2, 2a or 2b should be uniformly saturable, i.e., a drop of moisture at any point will spread until it is uniformly absorbed. Crepe paper with considerable wet strength is preferred, the wet strength being only barely sufficient for removal by careful handling when wet by normal use. It should be noted that the greasy layer helps in this respect, as it tends somewhat to keep the fibers together when the backing sheet is damp, although not in swirling water.

It will be apparent that the embodiments shown are only exemplary and that various modifications can be made in construction and arrangement within the scope of the invention as defined in the appended claims.

1. A flush-disposable sanitary pad composed entirely of flush-disintegrating material comprising: a. an upper layer comprising a flush-disposable mass of highly absorbent material, b. a lower backing sheet of flush-disintegrable material secured to the lower side of said mass, c. a thin, flexible continuously impervious layer of fluid-blocking material, incapable of holding itself together in the swirling water of a flush toilet, secured and supported between said upper layer and said lower backing sheet, said impervious layer extending substantially coextensively with the effective area of said pad to block the passage of fluid from said upper layer to said lower sheet.

2. The invention according to claim 1, said impervious layer being a layer of greaselike material supported by said backing sheet.

3. The invention according to claim 1, said pad being in the form of an elongated strip, the side and end edges of the strip being compressed to be thinner than the center portion so as to retard liquid flow from the center toward the edges and thus tend to retain moisture in the center portion of the pad.