TAMpon OR SIMILAR SANITARY NAPKIN CONTAINING VITAMIN A

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FIG. 1

FIG. 2

FIG. 3

FIG. 4

FIG. 5

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TAMPON OR SIMILAR SANITARY NAPKIN CONTAINING VITAMIN A

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2 Claims

ABSTRACT OF THE DISCLOSURE

A tampon or similar sanitary napkin containing vitamin A either microencapsulated within the fibrous matrix of the tampon or enclosed within one or more rupturable membranes or capsules within the tampon matrix, such rupturable membranes or capsules being broken by the exertion of slight finger pressure or mechanical opening before insertion of the tampon or similar article. The microencapsulated vitamin A is also released by slight finger pressure, or by the heat of the body adjacent the vaginal tampon, sanitary napkin, etc.

This application is a continuation-in-part of copending application, Ser. No. 637,270, filed May 9, 1967, now abandoned.

The present invention relates to new and improved tampons and sanitary napkins or similar articles and more particularly to such tampons, sanitary or similar articles which contain a minor amount of vitamin A microencapsulated throughout the fibrous matrix of the article or encapsulated within one or more rupturable membranes or capsules within the matrix of the tampon or similar article.

There exists in the female body a complicated process which maintains the vagina and other related delicate areas in a normal healthy state most of the time. During the menses, however, this normal healthy state of the vaginal area is disrupted to some extent and at such time the vagina may become more susceptible to infection than usual. Such infection is commonly called vaginitis, a condition which develops more easily in some women than others, and which is frequently associated with their monthly discharge period. The danger of infection increases during this time because foreign microorganisms or other outside sources of infection may be introduced through careless handling of sanitary napkins, or more especially, through careless handling and insertion of absorbent tampons.

The normally healthy vaginal area is also disrupted during the time of pregnancy. The vaginal area at this time, therefore, is similarly subject to various disorders such as vaginitis. Other disorders of the vagina and vulva which can occur during the menses and during pregnancy include for example, abnormal senile vaginitis, keratosis, dyskeratosis, hyperkeratinization and cornification of the vagina and vulva.

It has now been found in accordance with the present invention that such disorders of the vagina and vulva can be prevented or treated by the incorporation within a conventional tampon or sanitary napkin or similar device a minor amount of vitamin A. In addition to preventing or treating the disorders of the vagina and vulva and other related areas which are prevalent during menses and pregnancy, the vaginal tampon, sanitary napkin, or similar device in accordance with the present invention also, in providing a ready method for the administration of vitamin A, allows for the regeneration of cornified vaginal epithelium.

It is, therefore, a principal object of the present invention to provide a new and improved vaginal tampon, sanitary napkin, or similar article which eliminates the inherent deficiencies and disadvantages of previously employed articles.

It is still a further object of the present invention to provide a new and improved vaginal tampon, sanitary napkin or similar article containing a minor amount of vitamin A, either microencapsulated within the matrix of the article or encapsulated within one or more larger rupturable membranes or capsules within such matrix, said vitamin A being released either by the exertion of slight mechanical pressure or by the heat of the body adjacent the vaginal tampon, sanitary napkin, etc.

It is yet a further object of the present invention to provide a method of supplying vitamin A to the vagina and vulva and other related areas so as to prevent and treat disorders associated with menses, pregnancy, etc.

Still further objects and advantages of the article and process of the present invention will become more apparent from the following more detailed description of the present invention and the accompanying drawings wherein:

FIG. 1 is a perspective view of a conventional vaginal tampon;

FIG. 2 is a cross-sectional view of the vaginal tampon of FIG. 1 taken along line 2—2 showing one embodiment of the present invention;

FIG. 3 is a modified cross-sectional view of the tampon of FIG. 1 taken along line 2—2 showing a further embodiment of the present invention.

FIG. 4 is a further modified cross-sectional view of the vaginal tampon of FIG. 1 taken along line 2—2 showing a further embodiment of the present invention.

FIG. 5 is a further modified cross-sectional view of the vaginal tampon of FIG. 1 taken along line 2—2 showing a further embodiment of the present invention.

In all of the figures like numerals represent like elements.

FIG. 1 shows a conventional vaginal tampon 1.

FIG. 2 shows a vaginal tampon 1 containing a conventional cellulose or paper wrapper 3 and a fibrous matrix 5 in accordance with one embodiment of the present invention.

Vaginal tampons suitable for use in this invention are usually made of absorbent fibers, including natural and synthetic fibers, compressed into a unitary body of a size which may easily be inserted into the vaginal cavity. They are normally made in an elongated cylindrical form in order that they may have a sufficiently large body of material to provide the required absorbing capacity, but may be made in a variety of shapes. The tampon may or may not be compressed, although compressed types are now generally preferred. The tampon described in U.S. Pat. No. 2,761,449, dated Sept. 4, 1956, is typical. This patent shows a tampon made of various fiber blends in-
including both absorbent and nonabsorbent fibers, which may or may not have a suitable jacket or wrapper. The fibrous matrix 5 ordinarily used to make absorbent products, such as vaginal tampons, are usually cellulose. Cotton and rayon, because of their highly absorbent properties, have been found particularly suitable. These cellulose materials may be chemically modified to form cellulose derivatives which have acidifying properties and at the same time retain essentially their original fibrous characteristics, thus permitting their use in absorbent products requiring a fibrous form and requiring the absorbent capacities obtainable with such fibers. For use in tampons, the fibers are usually modified so that they are essentially water insoluble so that they retain their fibrous form in order that they may be withdrawn intact from the vagina after use. Examples of such modified cellulose materials include cellulose acid succinate, cellulose acid maleate and cellulose acid malonate; tricarboxylic acid esters, such as cellulose acid citrate; mineral acid esters, such as cellulose acid sulphate, phosphorylated cellulose and sulfonated cellulose; cellulose acid ethers, such as carboxymethyl cellulose; cellulose esters; cellulose ethers, such as cellulose carboxymethyl anhydride; alkyl sulfonic acid ethers, such as sulfoethyl cellulose; phosphono alkylated celluloses; and mixtures thereof.

As shown in FIG. 2, the vaginal tampon 1 may contain a string 7 of any suitable material to assist in withdrawal of the tampon 1 after use. Additionally, the vaginal tampon 1 may have associated therewith a conventional insertion device, not shown.

Incorporated within the fibrous matrix 5 is a rupturable membrane 9 containing vitamin A 11 either alone or in aqueous or other suitable system, e.g., mineral oil. While vitamin A does not form a true solution in water, it does form a colloidal suspension closely resembling a true solution and thus such a system can be advantageously employed within the rupturable capsules. Such a "solution" of vitamin A is shown in U.S. Pat. 2,417,291 and according to the term aqueous "solution" as employed throughout this application is meant to embrace such a system.

The rupturable capsule 9, in accordance with this embodiment of the present invention, can be formed of an easily rupturable material which can be ruptured by the exertion of slight mechanical pressure exerted by pulling string 13. Suitable materials include, for example, gelatin, egg white, various synthetic resins, such as ethylene, polyethylene, etc. The beneficial vitamin A is dispersed in the fibrous matrix by pulling string 13 extending from the tampon immediately before insertion. In this manner, the rupturable membrane breaks and the vitamin A is dispersed in liquid form in the fibrous matrix so that it can be easily and readily administered to the areas of the vagina and vulva to be treated. While FIG. 2 shows a large rupturable capsule 9 within the conventional tampon 1, it should be clear that this embodiment of the present invention also contemplates two or more rupturable capsules within the fibrous matrix 5.

While the fibrous matrix 5 alone is generally sufficient to retain the rupturable capsule 9 in an immobile position, FIG. 2 illustrates an alternate embodiment wherein an end wall 15 containing perforations 17 is provided adjacent the rupturable capsule 9. The end wall 15 can be made of any suitable paper, cardboard or plastic material. The perforations 17 allow passage of string 13 and vitamin A when released from the capsule 9. The end wall 15 prevents movement of the capsule 9 when string 13 is pulled before insertion.

The use of such a tampon 1 therefore, allows for a method of administering or distributing vitamin A to the vaginal area of the female body so as to prevent or treat those disorders associated with menses, pregnancy, etc. Such disorders include vaginitis and other disorders relating to the keratinization of the mucus membranes, of the vaginal area. It is believed that the vitamin A acts to prevent or treat such disorders of the vaginal area by reversing the keratinization of the mucus membranes.

Additionally, the vitamin A tends to regenerate abnormal cornified vaginal epithelium tissue when applied as in accordance with the present invention.

Conventional vaginal tampons generally range in weight from about 1.8 to about 3 grams. Although they are capable of absorbing from about 5 ml of fluid in the lower part of the range to about 10 ml of fluid in the upper part of the range, they are generally discarded before they become saturated and usually when they have absorbed about one half of the amounts of menstrual fluid they are capable of absorbing, e.g., from about 2.5 to about 5 ml. The amount of vitamin A to be incorporated in such a conventional tampon comprises only that amount necessary to be absorbed into the vaginal area so as to create the beneficial effect associated with the intake of vitamin A. Generally such amount ranges from about 0.01% to about 10% by weight of the tampon article, although lesser or greater amounts can be advantageously employed where desired.

FIG. 3 illustrates a modified form of the tampon in accordance with the present invention. The tampon 1 shown in FIG. 3 again comprises a wrapper 3 having therein a fibrous matrix 5. Incorporated within the fibrous matrix 5 are two rupturable membranes or capsules 9 containing vitamin A 11 either alone in aqueous or other suitable systems, e.g., mineral oil. While two rupturable capsules 9 are shown in this embodiment of the present invention, it is of course, obvious that a single capsule can be utilized, or alternatively, a multiplicity of smaller capsules can be suitably employed. The rupturable capsules 9 in accordance with this embodiment of the present invention can again be formed of any easily rupturable material which is capable of being ruptured by the exertion of slight pressure applied by pressing the fingers against the outer wrapper 3 prior to insertion of the tampon or similar device. In accordance with this embodiment of the present invention the rupturable capsule or membrane 9, can be formed of the same or similar materials as previously set forth for the rupturable capsule shown in FIG. 2 which rupturable capsule is ruptured by the exertion of mechanical pressure by the pulling of the string attached to the membrane or capsule. By the embodiment shown in FIG. 3, the beneficial vitamin A is dispersed within the fibrous matrix by squeezing the tampon immediately before insertion. In this manner, the rupturable membrane, or capsule breaks and the vitamin A is dispersed in liquid form within the fibrous matrix so that it can be easily and readily administered to the areas of the vagina and vulva to be treated.

While the rupturable capsules or membranes 9 as shown in FIG. 3 are located near one end of the tampon or similar device, it is of course, obvious that one or more rupturable capsules or membranes 9 can be located anywhere within the tampon body. In this respect, some outer marking, e.g., coloration on the wrapper of the tampon can be used to indicate at what point slight pressure should be exerted so as to effect the rupturing of the capsules or membranes 9 so as to release the beneficial vitamin A.

In this embodiment again, the vitamin A need only be employed in that amount necessary to supply its beneficial effect to the vagina, vulva and related areas so as to prevent or treat those disorders associated with menses, pregnancy, etc., again, an amount of from 0.01 to about 10% by weight of the tampon or similar article is generally effective for this purpose although lesser or greater amounts can be employed where desired.

A further embodiment of the present invention is illustrated in FIG. 4. This embodiment again shows a conventional tampon 1 having an outer paper or cellulose wrapper 3 and an inner cellulose matrix 5. Within the cellulose matrix 5 of the tampon 1 are located tiny micro-encapsulated droplets or aerosol 19 of vitamin A. Thus, this embodiment of the invention utilizes tiny microencapsulated droplets or aerosol of vitamin A.
capsulated droplets of vitamin A in lieu of one or more larger rupturable membranes or capsules located within the matrix 5 of the tampon 1. These tiny microencapsu-
ated droplets of vitamin A located within the matrix 5 of the tampon 1 are susceptible to rupturing by the exert-
on of slight pressure and thus, as was the case with the
embodiment shown in FIG. 3, it is only necessary for the
user to exert slight finger pressure prior to insertion in
order to affect the release of the valuable vitamin A. In ac-
cordance with this embodiment of the present invention the
tiny encapsulated droplets of vitamin A can be uniformly
or randomly dispersed throughout the matrix 5 of
the tampon 1. If the encapsulated vitamin A is located
in one portion of the tampon, it is preferable that the
outer wrapper 3 be marked as such so as to in-
dicate at what portion the slight pressure should be exerted
so as to release the valuable vitamin A.

Again, in this embodiment of the present invention the
amount of vitamin A that is included within the micro-
capsules is that same amount as set forth above with re-
spect to the employment of the larger rupturable cap-
sules of FIGS. 2 and 3.

In addition to employing an aqueous or oil solution of
vitamin A in accordance with this embodiment of the pres-
ent invention, it is also possible to employ a solid form of
vitamin A microencapsulated within the tampon. Thus,
a suitable system can comprise powdered vitamin A in a
conventional phosphate carrier.

A further embodiment of the present invention is shown
in FIG. 5. Here, instead of employing the vitamin A in the
fibrous matrix 5 of the tampon 1, the vitamin A is pre-
sent in the microcapsules 21 within the outer wrap-
per 3 of the tampon 1. In this way, while the microcap-
sules 21 can be ruptured by slight pressure prior to use as
indicated with the embodiments presented previously,
it is also an important feature of this embodiment of the
present invention that the microcapsules 21 of vitamin A
can be ruptured merely by the heat of the body adjacent
the vaginal tampon. Here, again the amount of vitamin
A employed is as set forth above. Again, a solid vitamin
A system can be suitably utilized.

Similarly, while this embodiment illustrates the micro-
capsules of vitamin A within the outer wrapper 3 of the
tampon, the same effect of rupturing by body heat can be
achieved by incorporating the microcapsules of vitamin A
in the fibrous matrix close to the outer portion there-
of.

While FIGS. 1 through 5 illustrate the employment of
vitamin A in accordance with the present invention in a
conventional vaginal tampon, it is also contemplated to
employ vitamin A in combination with an extremely worn
sanitary napkin. When the vitamin A can be incor-
porated within the matrix of the napkin either as tiny droplets
or in a rupturable capsule, such vitamin A can have its
therapeutic value when a napkin is in contact with the
external genitalia. This is extremely useful in cases where
the external genitalia are easily irritated or subject to
minor infections. In this way, the vitamin A can be ab-
sorbed into the mucous membranes of the vagina and
vulva as is capable with the employment of a vaginal tampon.
The tampon or similar article therefore acts as a douche
in its administration of vitamin A, etc.

While the present invention has been described primar-
ily to the employment of vitamin A in a vaginal tampon,
sanitary napkin, or similar article, it should be under-
stood that the present invention can also include the in-
corporation of other vitamins, minerals and nutrients, al-
one or in combination with vitamin A, which can be
administered to the mucous membranes of the vagina area.
Additionally, other substances, such as antioxidants, sta-
bilizers, surface active agents, deodorants, etc., can be
conventionally employed in the tampon, sanitary napkin
or similar article in accordance with the present inven-
tion. In this respect, it is sometimes advantageous to em-
ploy a stabilizer in conjunction with vitamin A so as to
stabilize such material against unwanted deterioration
before use.

Such unwanted deterioration may be present due to the
effect of heat, air and/or light. Suitable stabilizing
agents or; antioxidants which can be employed in accord-
ance with the present invention include, for example, the
phenolic antioxidants, e.g., alkyl phenols, alkyl bisphenols,
biphenol sulfides, quinones, such as hydroquinone, antra-
quinone, naphthalenes and substituted derivatives there-
of and heterocyclic compounds such as pyridines, piperi-
dines, quinolines, etc. A particularly preferred stabilizer
for vitamin A comprises ethoxyquin-1,2-dehydro-6-ethoxy-
2,4,4-trimethyl quinoline sold by Monsanto Chemical
Company under the trademark "Sanpoquin."

It has been found particularly advantageous in accord-
ance with the present invention to include chlorophyll or a
similar material within the vitamin A system. Such a
material tends to eliminate any odors which may be pre-
sent as a result of the menses or pregnancy discharge.
Additionally, it has been found that a particularly advan-
tageous combination of ingredients comprises vitamin A
in combination with an estrogenic substance. Thus, for
example, a suitable system to be employed in accordance
with the present invention comprises vitamin A and a
material such as estradiol, estrone or the conjugated
estrogens produced from the urine of pregnant mares.
Because of the water solubility of such conjugated estro-
gens, such estrogenic substances can be conveniently em-
ployed in the water "solution" of vitamin A, preferably
employed in accordance with the present invention. The
estrogenic material if employed in combination with
vitamin A in accordance with the present invention, tends
to promote the beneficial effect of the vitamin A. In
addition, the employment of the estrogenic material is
beneficial in helping to supply the physiological balance
of hormones produced by the normal ovary. This material
is generally employed in approximately equal amounts
with the vitamin A present within the sanitary napkin,
vaginal tampon, etc.

The present invention, therefore, provides a new and
novel tampon, sanitary napkin, or similar article con-
taining a minor amount of vitamin A. The present inven-
tion also, however, comprises a method of administering
vitamin A and other vitamins, minerals and nutrients to
the vaginal area so as to prevent or treat various dis-
orders associated with menses, pregnancy, etc.

The articles of the present invention wherein the
vitamin A is microencapsulated or included within one
or more rupturable capsules or membranes, provide a
great improvement over the mere inclusion of a valuable
substance within the matrix of a tampon or an article.
Thus, by including the vitamin A within the micro-
capsules or rupturable capsules or membranes the vita-
min A is protected until use from any harmful effects
associated with heat, light or other atmospheric conditions.

While the present invention has been specifically
described by reference to the accompanying drawings, it
should be understood that the present invention is in
no way to be deemed as limited thereto, but should be
construed as broadly as all or any equivalents thereof.

I claim:
1. A compressed vaginal tampon or sanitary napkin
adapted to be inserted within or applied adjacent to the
vaginal cavity under normal conditions of use and capable
of increasing the integrity of the epithelial lining of the
vaginal cavity, said compressed vaginal tampon or sanitary
napkin comprising an outer wrapper and a matrix of
compressed absorbent fibers within said outer wrapper,
and containing, dispersed in said matrix of compressed
absorbent fibers or outer wrapper, a minor amount of
vitamin A encapsulated alone or in the form of an
aqueous or mineral oil solution of the active vitamin.

2. A compressed vaginal tampon or sanitary napkin
adapted to be inserted within or applied adjacent to the
vaginal cavity under normal conditions of use and capable
of increasing the integrity of the epithelial lining of the vaginal cavity, said compressed vaginal tampon or sanitary napkin comprising an outer wrapper and a matrix of compressed absorbent fibers within said outer wrapper, and containing, dispersed in said matrix of compressed absorbent fibers or outer wrapper, a minor amount of vitamin A in solid form.

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U.S. Cl. X.R.