

Jan. 15, 1963

P. STAMBERGER

3,073,308

DIAPER INSERTS

Filed July 25, 1956

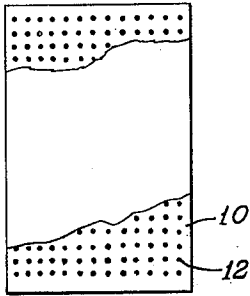


Fig. 1.

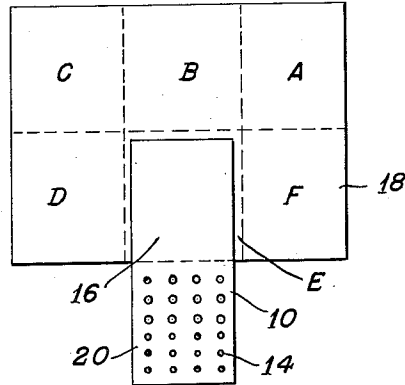


Fig. 4.

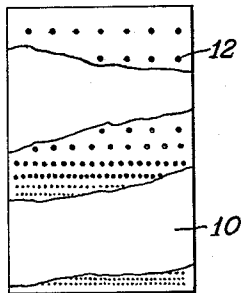


Fig. 2.

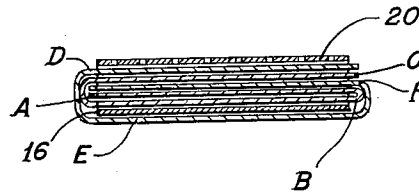


Fig. 5.

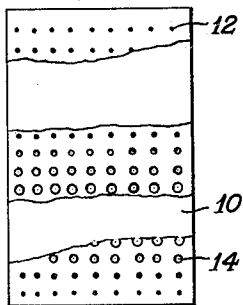


Fig. 3.

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3,073,308

DIAPER INSERTS

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5 Claims. (Cl. 128—287)

This invention relates to disposable inserts for diapers which are adapted to prevent staining of the diaper by feces, and its principal object is to provide such disposable inserts which retain the feces while permitting substantially free passage of urinary fluids into the body of the diaper.

One of the problems facing mothers with infants has been that of preventing soiling of diapers with feces; and the conventional method of overcoming the problem has been the use of absorbent paper inserts, which absorb the urinary fluids and prevent passage of the feces. A principal problem with such inserts is that in order to be both non-irritant and highly absorbent for urine, they must be very soft, and consequently lack wet strength so that they are difficult to handle on removal from the diaper, and generally must be put in a toilet bowl with the diaper, and flushed while the diaper is immersed in the water of the bowl.

I overcome this difficulty, in accordance with the present invention, by providing an insert which has sufficient wet strength to allow easy removal and handling, and which is perforated so as to allow passage of the urinary fluids, the perforations being small enough, in the anal portion of the insert, to retain the feces. Most preferably, the perforations are larger or more numerous in the non-anal portion of the insert to allow more rapid passage of urine through the insert into the diaper portion.

In another form of my invention, the insert can be combined in a single sheet with a disposable urine resistant insert which acts to prevent urine from passing completely through the diaper on overnight contact (as disclosed in my copending application Serial No. 415,741, filed March 12, 1954, now Patent No. 2,860,637) and the combination so folded into the diaper that the perforated urine passing portion is placed next to the infant's skin, while the urine resistant portion of the insert is placed near the outside fold of the diaper.

The invention can best be understood by reference to the accompanying drawings, in which

FIG. 1 shows an insert in accordance with my invention in which the perforations are uniformly spaced throughout the insert;

FIG. 2 shows an insert with a variable spacing of perforations;

FIG. 3 shows an insert with variable sizing of perforations;

FIG. 4 shows a two part insert ready for folding into a diaper;

FIG. 5 is an elevation of a folded diaper with the insert of FIG. 4 in it.

Referring to FIG. 1 of the drawings, I provide a diaper insert 10 of wet strength material with uniform perforations 12 thereon. The perforations are small holes, preferably pin holes, which permit the passage of liquid while retaining solid matter. I have found that in ordinary sheet material, holes up to about 1 to 3 mm. in one dimension, or diameter, will retain feces; but a large number of pinholes will pass urine just as effectively as a small number of larger holes. The holes can be round, elliptical, slitted, or in any convenient and useful shape.

In FIG. 2, it will be noted that the perforations 12 are almost non-existent at the top of the insert, and are very numerous at the bottom. This insert is placed with the top portion at the back, anal end of the diaper, and the forward portion at the point of urine discharge. I

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prefer to have a few perforations even at the anal end, to remove liquid; but this is not essential, since the highly perforated forward end removes the urine rapidly as it is discharged, so that it can be absorbed by the diaper proper.

FIG. 3 shows the use of larger holes 14 at the point of urine discharge, with the pin holes 12 at the anal end of the diaper.

As indicated above, it is essential that the insert have sufficient wet strength so that it can be lifted or pulled out from the diaper, thereby avoiding the necessity for wetting the entire diaper in a toilet bowl to pry it loose, as is the case with soft paper inserts. However, it is also necessary that the insert be pliable and soft, so that it can be flushed down a toilet bowl. Finally, since it comes into contact with the baby's skin, it must not cause allergic reactions or other discomfort.

Suitable materials are papers sized or coated sufficiently so that they retain their strength to a considerable degree in the presence of water, such as wet strength papers, and supported and non-supported water insoluble films, for example cellulose acetate, ethyl-cellulose, polyethylene, polyvinylidene chloride, and the like water insensitive films. But my preferred materials are those which, while insoluble in water, are pervious to water vapor and are capable of swelling in water. Hydrated cellulose (cellophane), partially saponified polyvinyl acetate, polyvinyl acetate, films in which water sensitive swelling agents, such as methyl cellulose and other cellulose ethers, are introduced in quantities making the substrate water sensitive, carboxy-methyl cellulose, and insolubilized proteins, such as HCHO treated gelatine and zein, are examples of such materials.

The fact that the films are pervious to water vapor permits "breathing," making the diaper more comfortable than rubber pants. The property of swelling in water permits the materials to soften in a toilet bowl and flush easily.

The thickness should be kept low as possible and is only limited by the ease of handling, strength and wet strength of the material. I have found, that the lower limit is about one thousandth of an inch and I prefer to use thickness between 5 and 15 thousandths of an inch.

My inserts, in addition to the advantage of ready removability, have a second important advantage. Once the urine passes through the holes and is absorbed by the diaper, the child is protected from the bulk of the sodden diaper by the insert. This is particularly true in the case of those materials which are water impervious (the plastics and cellophane). A baby who urinates into a diaper with my insert will be much more comfortable than a baby who urinates into an unprotected diaper or one with conventional inserts.

As shown in FIGS. 4 and 5, my inserts can be modified so as to provide protection for bed clothes, and outer garments, and effectively overcome the need for rubber pants. The insert as shown has the form of insert 10 shown in FIG. 3, with pinholes 12 for the anal portions and larger holes 14 for the urinary portion. Integral therewith is an unperforated portion 16. A diaper 18, with sections A—B—C—D—E—F, is shown. The portion 16 of the insert is placed over portion E of the diaper, and the half A—B—C folded forward. A—F is then folded centrally over B, and C—D folded centrally over F, and finally the forward 20 portion of the insert 10 is folded over D. The resultant diaper is shown in FIG. 5 and includes a completely urine retarding ply 16, with 5 diaper plies above it to absorb urine, and a urine passing feces retentive ply 20 to protect the diaper.

This form of the invention has the advantage that it can be withdrawn or lifted from the soiled diaper as a

unit and disposed down a toilet drain, practically without touching the wet diaper.

For this form of the device, at least the impervious portion of the insert must be of urine impervious material. I may use the various plastic films described above but again I prefer to use the water-swellable water insoluble films such as cellophane, polyvinyl acetate and the like. If desired, the lower halves of these inserts may be coated with wax, polyethylene etc. to improve their resistance to water; but care should be taken that the films are still disposable and the coating is very thin, to permit breathing. This two piece embodiment of my invention has the additional advantage that the insert is kept in position under the infant and can not slip to a position not protecting the diaper.

Obviously, changes can be made in the specific forms of my invention disclosed without departing from the scope thereof as defined in the claims.

I claim:

1. A protective insert for a diaper comprising a sheet of material having perforations therein, from pinhole size to openings of 3 mm. maximum in any dimension, which will permit urinary fluids to pass therethrough while retaining solid materials on the surface, and means forming an integral extension of the sheet for insertion within the outer folds of a diaper to anchor the entire insert being of sheet material having sufficient wet strength to be withdrawable as a unit from a diaper that is urine soaked and sufficiently soft when immersed in water to be flushable down a toilet drain.

2. A protective disposable insert for a diaper comprising a sheet of material adapted to overlay a folded diaper to lie next to an infant's body and to prevent staining of the diaper by feces while removing urinary fluids from immediate contact with the infant's body,

said sheet having perforations therein of at least pinhole size, up to a maximum opening of 3 mm. in one direction, the perforations lying in the portion of the sheet adapted to overlay the urethral region occupying a relatively large proportion of the urethral area of the sheet and those adapted to overlay the anal region occupying a relatively small proportion of the anal area of the sheet, whereby urinary fluids are discharged rapidly through the perforations into the diaper, and the anal regions are protected against staining, the insert being sufficiently resistant to water to be removable from a urine soaked diaper in a single piece, and sufficiently soft and pliable in the presence of water to be flushable down a drain.

3. The diaper insert of claim 1, in which the sheet material comprises a water insoluble but water swellable film former in the form of a film pervious to water vapor but resistant to the passage of liquid water.

4. The diaper insert of claim 1, in which the protective insert has means integral therewith to anchor the sheet in the folds of a diaper.

5. The diaper insert of claim 4, in which the integral means is a sheet of material the same size as a folded diaper, and is resistant to the passage of urine there-through.

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**UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION**

Patent No. 3,073,308

January 15, 1963

Paul Stamberger

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 3, line 26, after "anchor" insert -- the insert, --; column 4, lines 14 and 18, for the claim reference numeral "1", each occurrence, read -- 2 --.

Signed and sealed this 21st day of April 1964.

(SEAL)

Attest:

ERNEST SWIDER

Attesting Officer

EDWARD J. BRENNER

Commissioner of Patents