

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



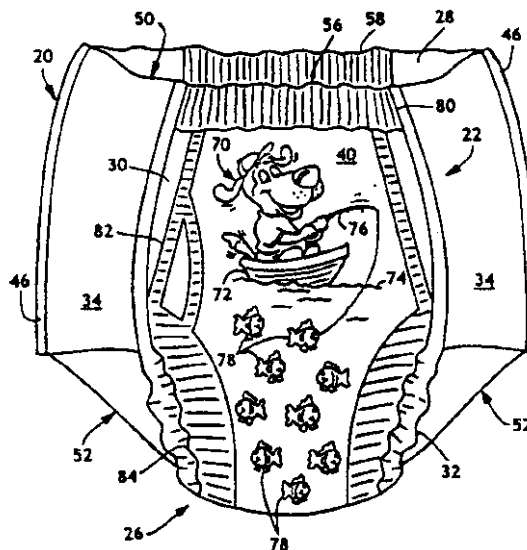
(43) International Publication Date
21 December 2000 (21.12.2000)

PCT

(10) International Publication Number
WO 00/76442 A1

- (51) International Patent Classification⁷: A61F 13/42 (74) Agents: GAGE, Thomas, M. et al.; Kimberly-Clark Worldwide, Inc., 401 N. Lake St., Neenah, WI 54956 (US).
- (21) International Application Number: PCT/US00/16405
- (22) International Filing Date: 15 June 2000 (15.06.2000)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 09/333,222 15 June 1999 (15.06.1999) US
- (71) Applicant: KIMBERLY-CLARK WORLDWIDE, INC. [US/US]; 401 N. Lake Street, Neenah, WI 54956 (US).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- (72) Inventors: OLSON, Christopher, Peter; 1012 Pendleton Road, Neenah, WI 54956 (US). RATLIFF, Kathleen, Irene; 1058 Laurel Court, Neenah, WI 54956 (US). WEBER, Shirlee, Ann; 1576 Nelson Court, Neenah, WI 54956 (US).
- Published:
— With international search report.
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: ABSORBENT ARTICLES HAVING WETNESS INDICATING GRAPHICS PROVIDING AN INTERACTIVE TRAINING AID



(57) Abstract: A disposable absorbent article such as a training pant includes wetness indicating graphics that provide an interactive training aid. The interactive graphics can include a permanent character graphic and one or more active object graphics, which "appear" or "disappear" from view in response to exposure to urine or the environment. The interactive graphics can also include a story line in which the permanent character graphic is illustrated performing an activity involving the active object graphic. The wetness indicating feature and the graphic story line allow the caregiver to interact with the child in an educational and motivational manner to enhance the toilet training process.



WO 00/76442 A1

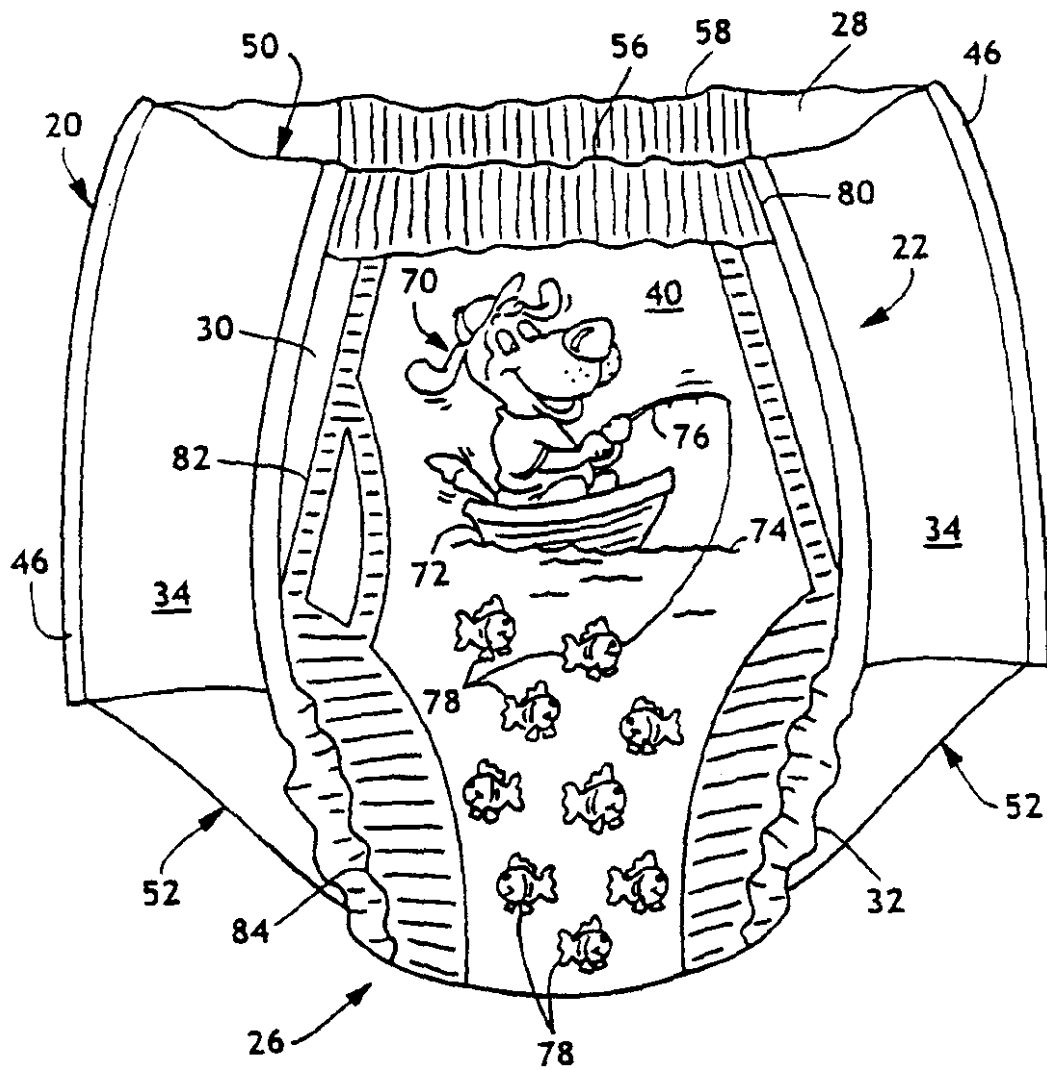


FIG. 1

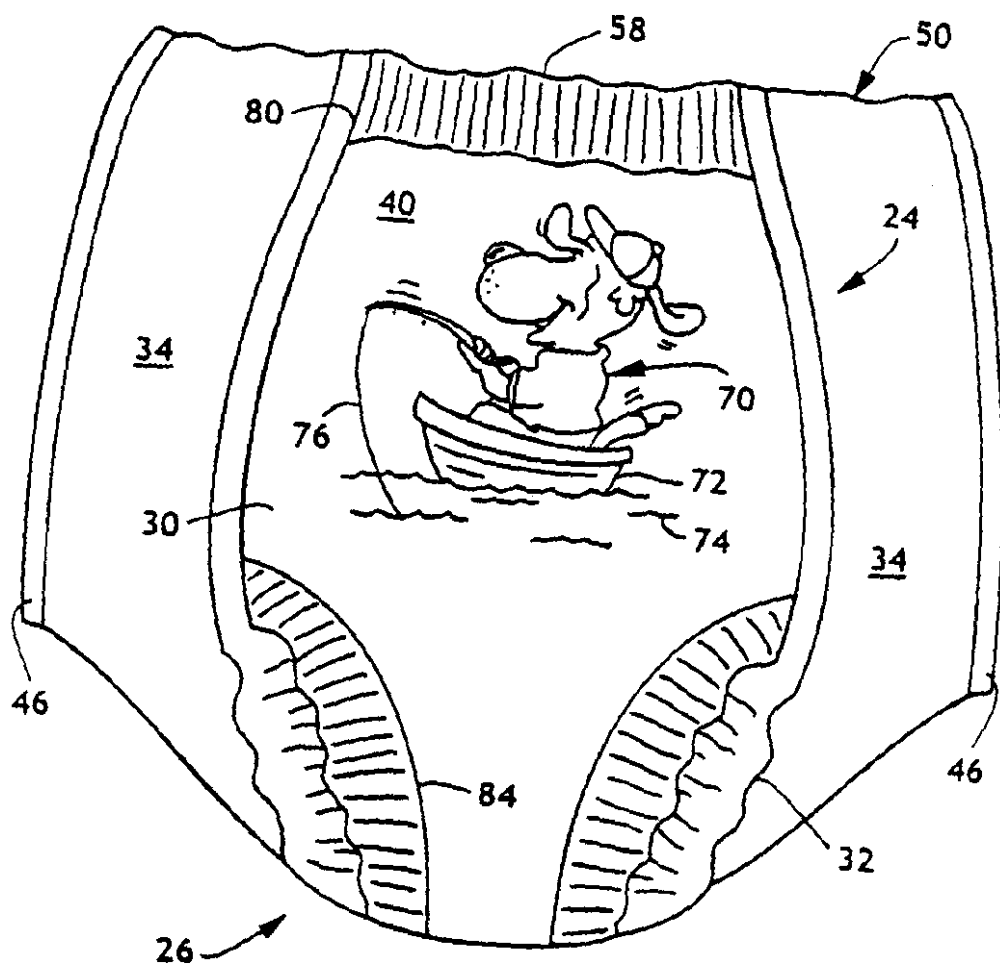


FIG. 2

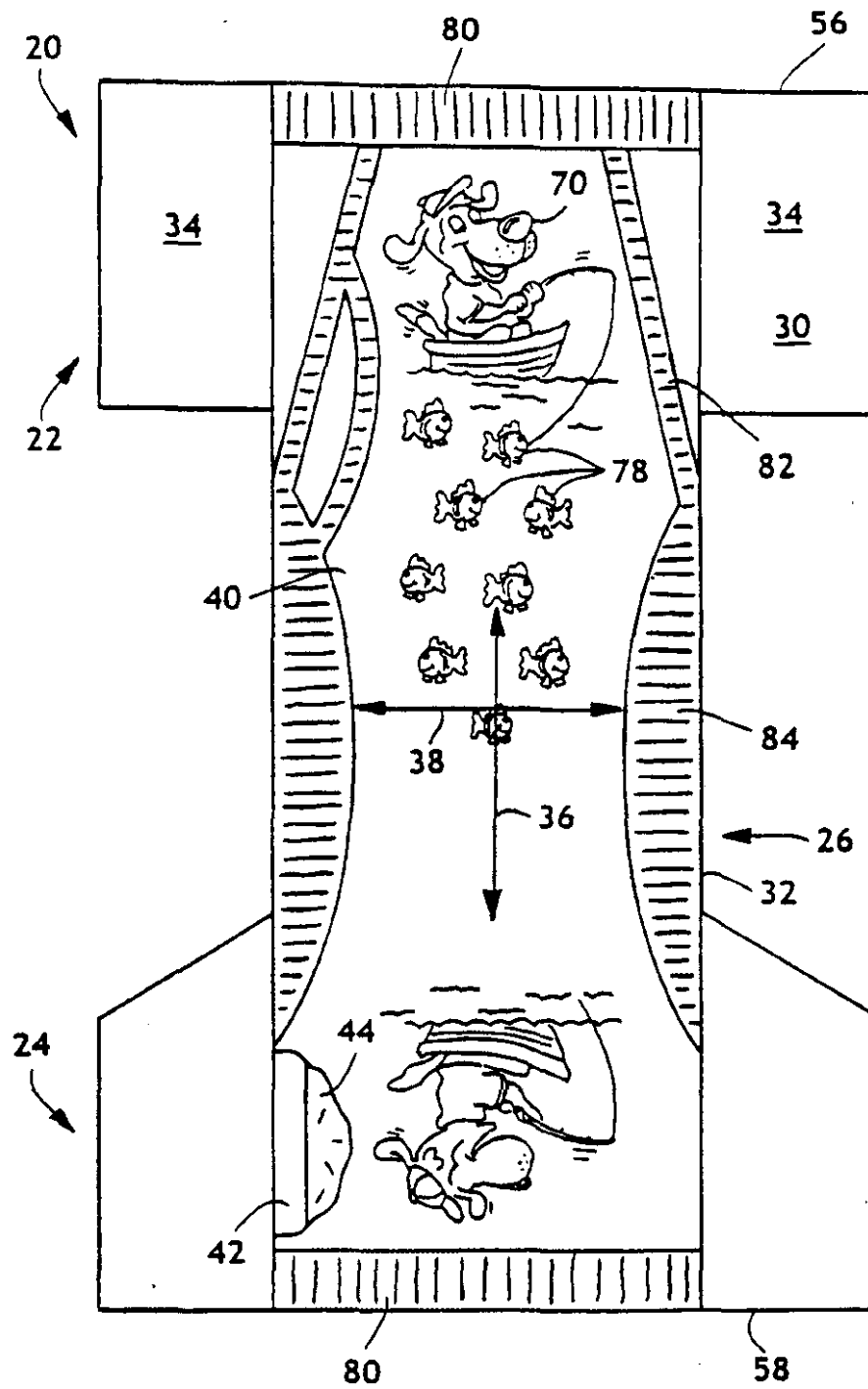


FIG. 3

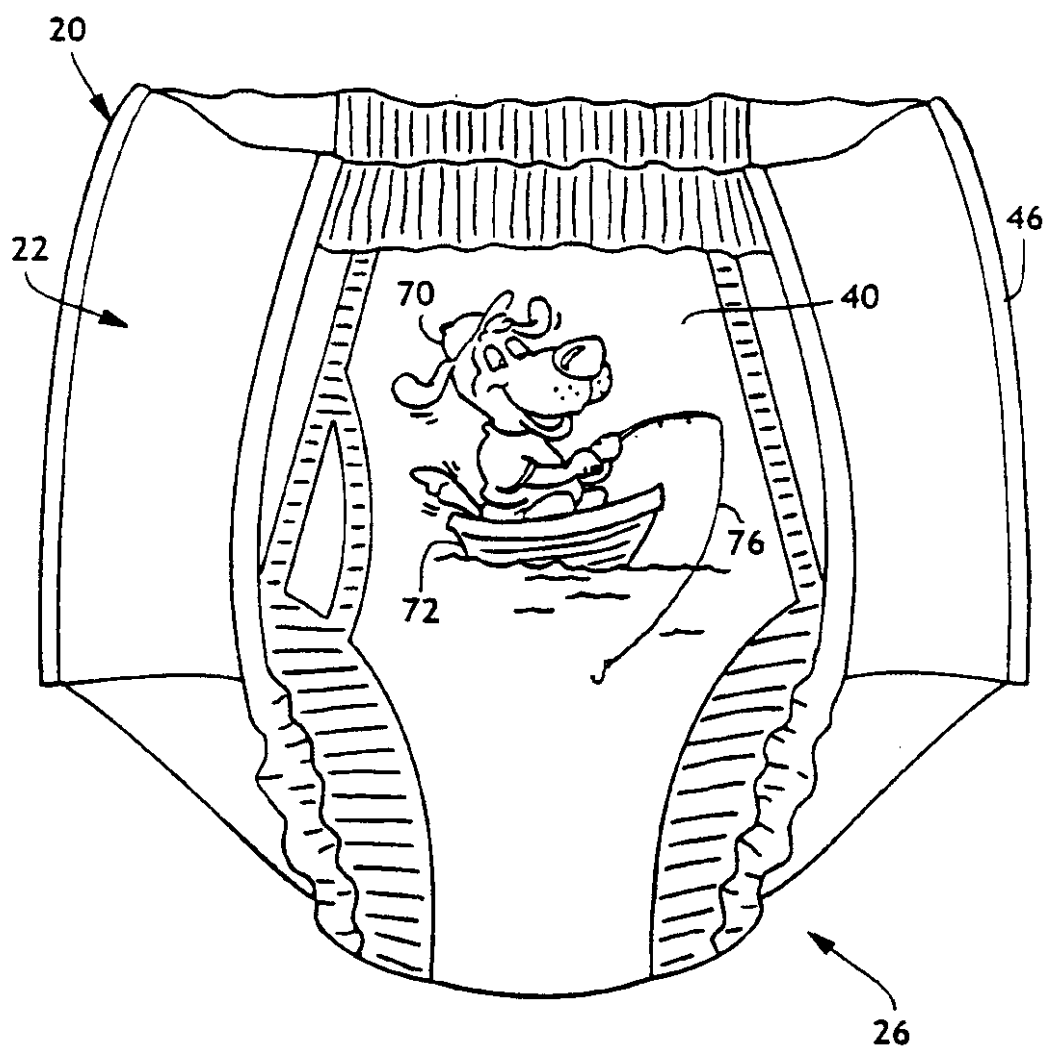


FIG. 4

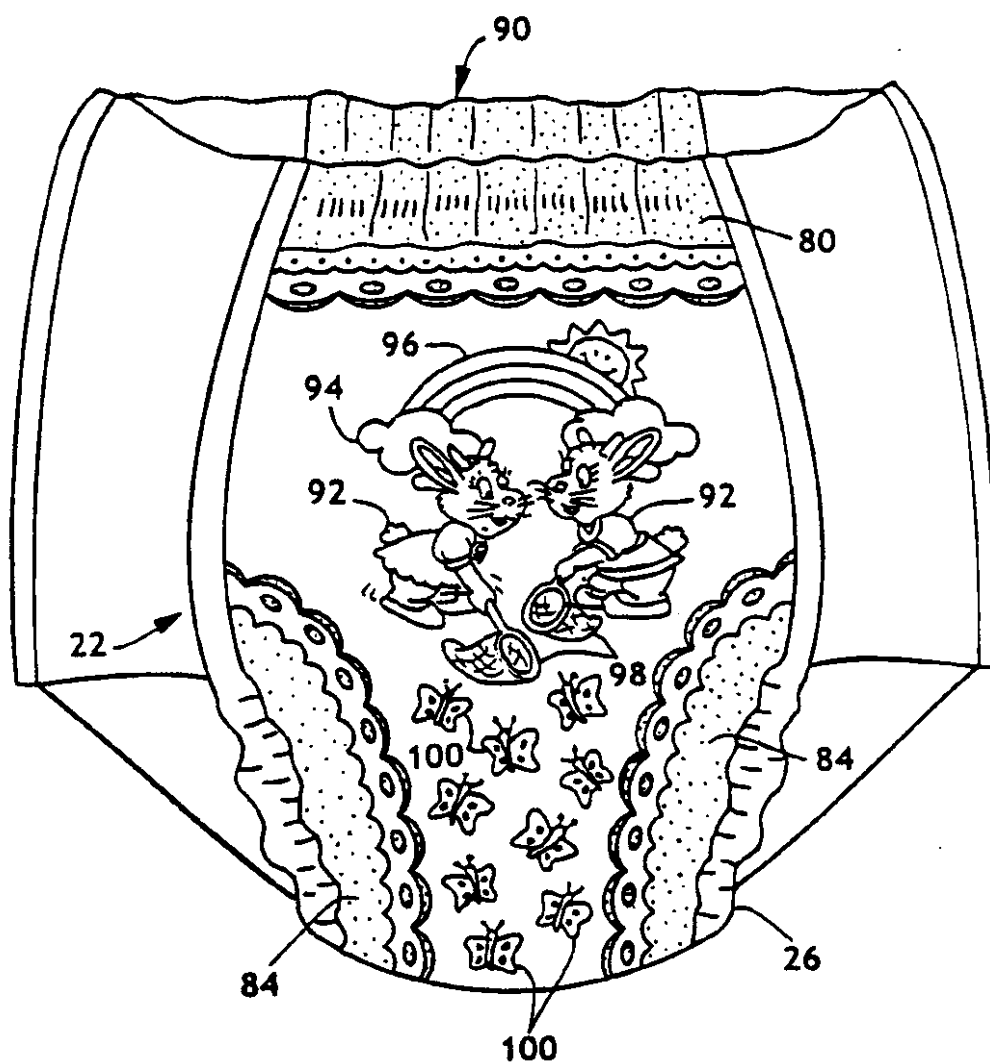


FIG. 5

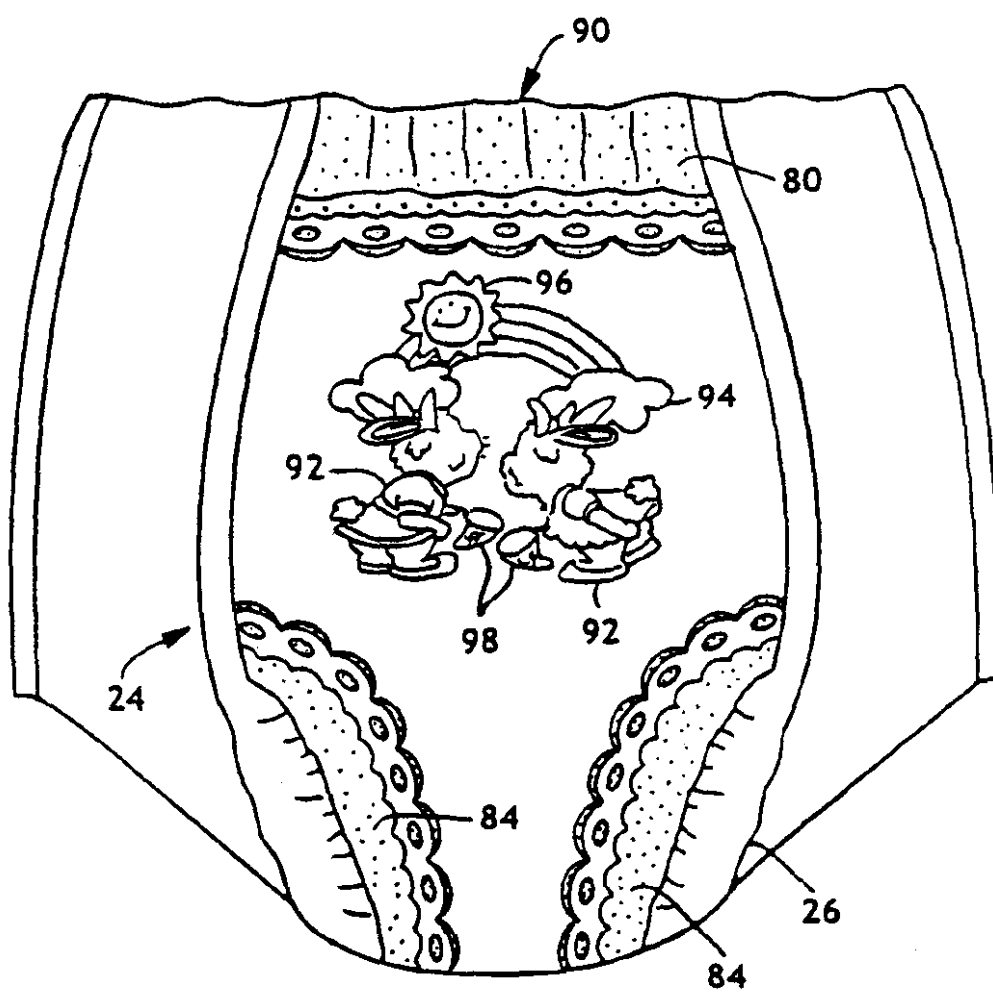


FIG. 6

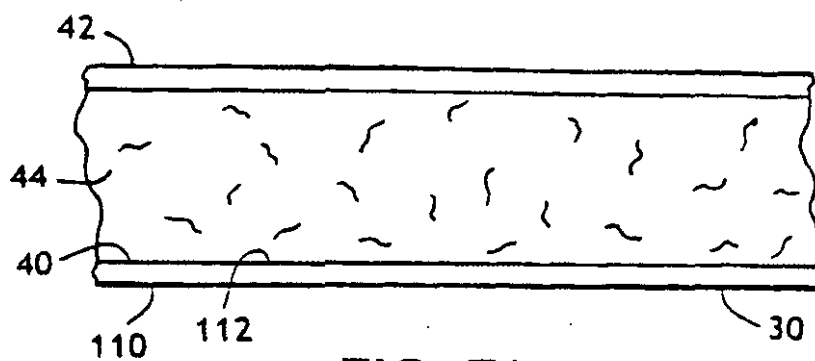


FIG. 7A

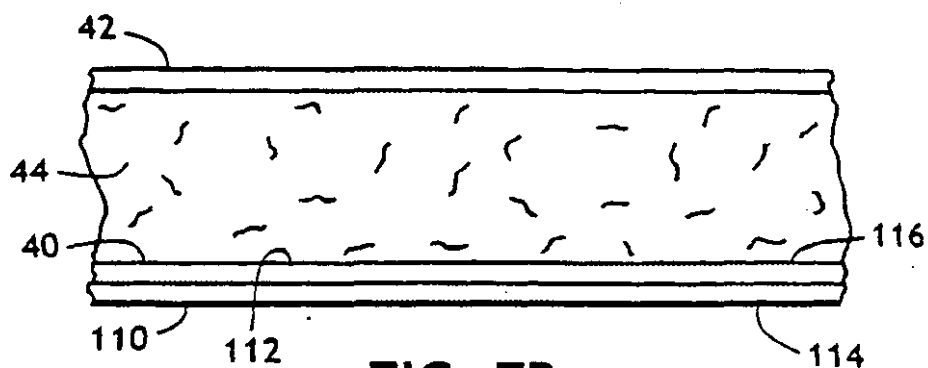


FIG. 7B

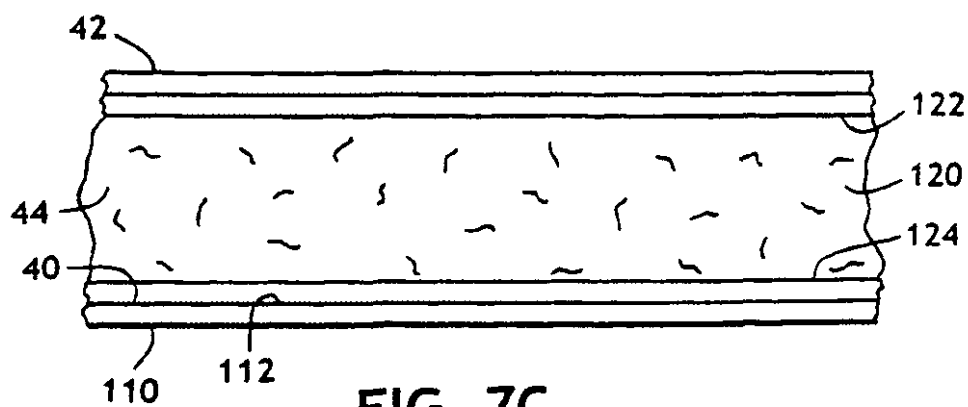


FIG. 7C

ABSORBENT ARTICLES HAVING WETNESS INDICATING GRAPHICS
PROVIDING AN INTERACTIVE TRAINING AID

Background of the Invention

The present invention relates to absorbent articles, and more particularly to absorbent articles having wetness indicating graphics providing an interactive training aid.

The toilet training process may incorporate a wide variety of different
5 *aspects, including many training techniques and training aids that may be used by*
parents and caregivers, hereinafter simply referred to as caregivers. One aspect of
the total toilet training process is the change from diapers to training pants to help
the child understand that he or she should now use the toilet just like adults.
Another aspect of the total toilet training process includes caregiver instruction as
10 *a positive encouragement and reinforcement to the child that he or she should*
now be using a toilet instead of diapers. Although the use of training pants and
positive encouragement from the caregiver has been helpful in the toilet training
process, there is still much room for improvement. Specifically, caregivers are still
searching for easier and quicker ways to guide their children successfully through
15 *the toilet training process.*

Many caregivers have difficulty in determining the readiness of a child to begin the toilet training process, and underestimate the difficulty of teaching the toilet training process to young children. If a child does not respond to an initial toilet training instruction or introduction, the caregiver can be at a loss for finding
20 techniques, methods, or teaching tools to encourage the child to master the art of toilet training. Thus, while various teaching tools such as books, videotapes, charts with stickers, personalized toilets, and interactive toilet training kits are available, there remains a need for new and improved educational and motivational mechanisms to facilitate the toilet training process.

Summary of the Invention

In response to the discussed deficiencies associated with prior absorbent garments, an absorbent article has been developed that provides toilet training aid benefits through the use of interactive graphics that inform the caregiver and child when an accident has occurred. The interactive graphics can include a permanent character graphic and one or more active object graphics. The object graphics are referred to as "active" because they are constructed to "disappear" or "appear" from view, particularly when the child has an accident and the active object graphic is contacted with urine, but also when the product is in use and the disappearance or appearance occurs over time as a result of exposure to the environment, such as molecules in the air. The interactive wetness indicating graphics can also include a story line in which the permanent character graphic is illustrated performing an activity involving the active object graphic. In this way, the absorbent article may permit the caregiver to interact with the child regarding the story line created by the graphics and may provide an opportunity for the caregiver to teach the child important lessons regarding toilet training due to the active nature of the object graphic.

Hence, in one embodiment, the invention concerns an absorbent article including an outer cover having an interior surface and an opposite exterior surface, and an absorbent assembly disposed on the interior surface of the outer cover. The absorbent article also includes a permanent character graphic and an active object graphic that are disposed on the outer cover, with the permanent character graphic being interactively interrelated with the active object graphic.

The term "active graphic" as used herein refers to an appearing graphic, a fading graphic, or a combination of appearing and fading graphics. The term "appearing graphic" is used herein to refer to a graphic that becomes visible or becomes significantly more visible when exposed to urine, or that becomes visible or becomes significantly more visible with the passage of time when exposed to the environment but not exposed to urine. Conversely, the term "fading graphic" is used herein to refer to a graphic that becomes invisible or significantly less visible when exposed to urine, or that becomes invisible or significantly less visible with the passage of time when exposed to the environment but not exposed to urine.

In particular embodiments, the active graphic can comprise a fading graphic which is formed from an ink that is soluble in aqueous solutions such as urine. The ink is positioned in the absorbent article so that it becomes wet and dissolves when the product is insulted with liquid. Once dissolved, the ink washes away from the outer cover and is obscured by the outer cover. As a result, the active graphic
5 seems to disappear from view.

Suitable urine-soluble inks are available from a variety of commercial vendors, such as Sun Chemical Corp. of Philadelphia, Pennsylvania, USA under the trade designation AQUA DESTRUCT. Particular urine-soluble compositions
10 are disclosed in U.S. Patent 4,022,211 issued May 10, 1977 to Timmons et al., which is incorporated herein by reference. The ink color can be selected to provide a pleasing appearance and graphic impact, including fading rapidly upon contact with liquid. To facilitate rapid fading, the fading graphics can comprise line drawings having a line width of from about 1 to about 2 millimeters.

15 The active graphic can also comprise a fading or an appearing graphic which is formed from a composition such as an ink or adhesive that changes color when exposed to an aqueous solution such as urine. A color change composition can be adapted to blend in with a background or surrounding color, either before or after exposure to the aqueous solution. Suitable compositions of this color-change type
20 are available from a variety of commercial vendors, such as a pH-change/color-change hot melt adhesive available from Findley Adhesives, Inc. of Wauwatosa, Wisconsin, USA. Alternatively, the active graphic can comprise pH sensitive inks, fugitive inks, colored absorbent particles, hydratable salts, moisture sensitive films, enzymes, heat sensitive inks and dyes, or the like.

25 Fading graphics can simply disappear from view, relative to the exterior surface of the outer cover. For example, fading object graphics can be made to disappear into a permanent background graphic. Representative examples include an object graphic such as yellow fish disappearing or fading into a background graphic such as blue water or green weeds; an object graphic such as pink flowers
30 fading into a background graphic such as a green lawn; an object graphic such as lavender sand toys fading into a background graphic such as tan sand; an object graphic such as pink sea shells fading into a background graphic such as tan sand; an object graphic such as small animals fading into a background graphic

such as a jungle scene; an object graphic such as frogs fading into a background graphic such as water lilies; an object graphic such as green toys fading into a background graphic such as a yellow floor or blanket area; an object graphic such as pink angels fading into a background graphic such as blue clouds; an object
5 graphic such as a red bone fading from a background graphic such as the inside of a dog's dish; an object graphic such as a cat's yellow yarn balls fading from a background graphic such as a green checkered floor; an object graphic such as a toy car disappearing from a background graphic such as a road; or the like.

The active graphic can also be configured to appear over time due to
10 exposure to the environment. In particular, the active graphic can be responsive to time intervals, temperature levels, oxygen levels, or the like, and combinations thereof. Various visual indicators that appear over time in response to particular conditions are disclosed in U.S. Patent 5,058,088 issued October 15, 1991 to Haas et al.; U.S. Patent 5,053,339 issued October 1, 1991 to Patel; U.S. Patent
15 5,045,283 issued September 3, 1991 to Patel; U.S. Patent 4,987,849 issued January 29, 1991 to Sherman; U.S. Patent 4,903,254 issued February 20, 1990 to Haas; U.S. Patent 4,812,053 issued March 14, 1989 to Bhattacharjee; and U.S. Patent 4,292,916 issued October 6, 1981 to Bradley et al.; all of which are incorporated herein by reference. An active graphic that appears over time may be
20 applied to the product when use is initiated, or formed as an integral component of the product.

In contrast to active graphics, the term "permanent graphic" is used herein to refer to a graphic that does not substantially change its degree of visibility when the absorbent article is insulted with urine and when the absorbent article is
25 exposed to the environment, in simulated use conditions. The change in visibility of a graphic or a portion of a graphic can be determined based on a person's observation of the graphic before and after the article containing the graphic is exposed to liquid. For purposes hereof, an article is exposed to liquid by immersing the article completely in an aqueous solution containing 0.9 weight
30 percent sodium chloride, used at room temperature ($\approx 23^{\circ}\text{C}$), for a period of twenty minutes. After 20 minutes the product is removed from the aqueous solution and placed on a TEFLONTM coated fiberglass screen having 0.25 inch openings, which is commercially available from Taconic Plastics Inc., Petersberg,

New York, USA, which in turn is placed on a vacuum box and covered with a flexible rubber dam material. A vacuum of 3.5 kilopascals (0.5 pounds per square inch) is drawn in the vacuum box for a period of 5 minutes, after which the article is removed and observed. The person with normal or corrected vision of 20-20
5 should make the observations from a distance of 1 meter in an environment providing 30 footcandles (320 Lux) of illumination. Changes in the visibility of the graphic should be identified, and distinguished where necessary from changes in the color of other materials such as fluff pulp within an absorbent assembly. Desirably, the permanent graphic can be configured so that the entire graphic also
10 does not substantially change its appearance, size or shape when the product is insulted with liquid or exposed to the environment.

The graphics of the absorbent article can be constructed to provide a story line involving a permanent character graphic and an active object graphic. The term "character graphic" is used herein to refer to a graphic containing an
15 anthropomorphous image, and in particular an image having or suggesting human form or appearance which ascribes human motivations, characteristics or behavior to inanimate objects, animals, natural phenomena, cartoon characters, or the like. Ideally the character graphic would be suitable for children's underwear and could be utilized to motivate children to wear the pants and use a potty or toilet. To that
20 end, the character graphics can be associated with popular characters in the media, advertising or well known in a particular culture. Ideally they are characters that the child or caregiver care about and want to identify with. Ideally the child can imagine himself or herself taking the place of the character. The character graphics can comprise permanent graphics, active graphics, or both permanent
25 and active graphics.

The role of the character graphic can be to help a child feel like a BIG KID® (a registered trademark of Kimberly-Clark Corporation) and to motivate them to become toilet trained. The character graphic can also give parents and caregivers an interactive element for use during toilet training. One embodiment comprises a
30 permanent character graphic that cannot complete some action or observation after the fading graphics have disappeared. This facilitates nonthreatening and gentle communications between the child and caregiver when the child has had an accident and wet his or her pants. The character graphic is a third party that the

caregiver can use to deflect blame and shame from the child while still communicating the desire that the child not wet his or her pants. It may be easier for the child to accept criticism when the caregiver seems to be talking about a third person. It may also be less stressful for the caregiver because he or she does not need to directly confront the child over the mistake. Similarly, the character graphic may provide a source of comfort for the child and a buddy who reduces stress during the training period.

The character graphic can desirably comprise a portion of the entire training pant graphic that sets up a theme for the illustrated scene. As such, the character graphic can provide an opportunity for educational interaction between the child and the parent or caregiver. More specifically, the parent or caregiver can use the graphic story-line to make up a game or story for the purpose of toilet training progress. In the case of fading object graphics which "disappear" when the child wets his or her training pant, the caregiver may take an approach such as: "See the little bear in the boat fishing. Try not to go potty in your training pants, because if you do the fish under the boat will disappear."

Suitable character graphics can include animals, people, inanimate objects, natural phenomena, cartoon characters, or the like that can or can not be provided with human features such as arms, legs, facial features or the like. For purposes of enhanced toilet training, it may be desirable for the character graphic to be familiar to the child, such as an identifiable cartoon character. The character graphics should at least be a type that the child can relate to, examples of which could include animals, toys, licensed characters, or the like. Character graphics can be made more personable and friendly to the child by including human-like features, human-like expressions, apparel, abilities, or the like. By way of illustration, an animal character graphic can be shown smiling, wearing clothing, playing sports, fishing, driving, playing with toys, or the like. In particular embodiments, the character graphic can desirably be created to project an appearance that could be described as friendly, positive, non-intimidating, silly, independent, inspirational, active, expressive, dauntless and/or persevering.

As referenced above, the permanent character graphic is desirably interactively interrelated with the active object graphic. The term "object graphic" is

used herein to refer to a graphic representing an object or thing, which can include an inanimate object or a character.

As used herein, the term "interactively interrelated" is used to mean that the character graphic is illustrated to be involved in or performing an action or activity, and the object graphic is the object of or is associated with the action or activity. Without wishing to be limited to the specific embodiments listed, suitable examples of a character graphic interactively interrelated with an object graphic can include: the character graphic holding or using a racquet, bat, glove, other sporting equipment or the like and the object graphics comprising balls, related sporting equipment or the like; the character graphic illustrated on a soccer field, football field, basketball court or the like environment and the object graphics comprising balls, related equipment or toys; the character graphic holding a butterfly net or the like and the object graphics comprising butterflies or the like; the character graphic holding a fishing pole, sitting in a boat or the like and the object graphics comprising fish, inflatable water toys or the like; the character graphic holding flowers, plants, gardening tools or the like and the object graphics comprising flowers or plants; the character graphic feeding, training or nurturing the object graphics which comprise animals, plants or the like; the character graphic playing in a specific environment such as a doll house, barn yard or the like and the object graphics comprising dolls, animals or the like which are specifically adapted to the environment; the character graphic holding or using a telescope or the like and the object graphics comprising stars, planets or the like; the character graphic comprising a racecar and the object graphic comprising race flags; the character graphic comprising a submarine and the object graphic comprising fish, bubbles, shells or the like; the character graphic comprising a pet or other animal and the object graphics comprising dog bones, pet toys, food or the like; the character graphic comprising a large a sandbox and the object graphic comprising toys in the sandbox; the character graphic comprising a dog near a large dog dish and the object graphic comprising the dog bones inside or near the dog dish; or other suitable interactively interrelated graphics.

The absorbent article can also include a permanent object graphic that facilitates the interactive nature of the graphics, and provides the caregiver with greater opportunity to develop a story for interacting with the child. Hence, in one

embodiment, an absorbent article includes an outer cover having in interior surface and an opposite exterior surface, and an absorbent assembly disposed on the interior surface of the outer cover. A permanent character graphic, a permanent object graphic, and an active object graphic are each disposed on the outer cover. The permanent character graphic is interactively interrelated with the active object graphic, and the permanent object graphic is related in subject matter to the active object graphic.

As used herein, the phrase "related in subject matter" refers to the situation where the subject matter of one graphic is the same as or is linked to the subject matter of another graphic. The subject matter relationship can be between two or more text messages, between two or more pictorial images, or between a combination of one or more text messages and one or more pictorial images. The term "text message" means a graphic consisting of one or more alphanumeric symbols, and the term "pictorial image" means a graphic consisting of one or more pictures. The terms "text image" and "pictorial image" are mutually exclusive as used herein. The general term "graphic" is used herein to mean any design, pattern, or the like that is or becomes visible on an absorbent article, and specifically includes text messages that consist of one or more alphanumeric symbols, pictorial images that consist of one or more pictures, and combinations thereof.

By way of example, two pictorial images are considered related in subject matter where the images are identical; separately illustrate different sizes, shapes, colors of a common object; each illustrate one and the other of two objects that are commonly associated with one another, such as the moon and stars, a body of water and water toys, a sandbox and suitable toys, a baseball bat and ball, a barn and animals, or the like; illustrate different items used in a particular activity, such as a sporting activity, a gardening activity or the like; jointly illustrate geometrically mating or engaging elements such as a triangle and a triangularly-shaped aperture, or two halves of a zipper; each illustrate one part of a multipart picture; or the like. Similarly, two text messages are considered related in subject matter where the messages: are identical; jointly form a sentence, thought, or action such as "jump" and "up"; each refer to one and the other of two items that are commonly associated with one another, such as "bat" and "ball," "Big" and "Kid,"

"Big" and "Girl," or "Big" and "Boy"; jointly present a question and answer; or the like. Likewise, a text message and a pictorial image are considered to be related in subject matter where the text names, defines or describes the image; or the like.

The permanent object graphic can be interactively related to the permanent character graphic. Hence, in particular embodiments, an absorbent article includes an outer cover having an interior surface and an opposite exterior surface, and an absorbent assembly disposed on the interior surface of the outer cover. A permanent character graphic, a permanent object graphic, and an active object graphic are each disposed on the outer cover. The permanent character graphic is interactively interrelated with both the permanent object graphic and the active object graphic.

More particularly, the graphics of the absorbent article can include a permanent character graphic, one or more permanent object graphics, and one or more active object graphics, all of which are related by a common story line, which would be generally known through books, movies, or other media sources. Further, the permanent character graphic is involved in an activity utilizing the permanent object graphics, and the active object graphics are the subject of the activity. For example, the graphics can include a permanent character graphic consisting of an animal having human clothing, features and abilities engaged in an activity such as fishing using a fishing pole, which is typically an activity undertaken by humans. The permanent object graphics can comprise objects such as a boat, a lake and a fishing pole which are associated with and/or define the activity of fishing. The active object graphics can comprise a plurality of fish, which are the subject of the activity and are adapted to fade or disappear from view when the absorbent article is insulted with urine.

The permanent object graphic can alternatively be interactively unrelated to the permanent character graphic. For example, the permanent object graphic can comprise background graphics that are unrelated to the activity of the character graphic. By way of illustration, the permanent object graphics can comprise images of the sky, the sun, grass, or the like.

In use, the active graphic can appear or fade when an accident occurs and urine comes into contact with the active graphic. Desirably, the active graphic appears or fades in about 3 minutes or less, particularly in about 1 minute or less,

and more desirably in about 20 seconds or less, when the absorbent article is insulted with 200 milliliters or more of urine, and more desirably about 40 to about 60 milliliters or more of urine.

The changed condition of the graphic presents a tool for the caregiver to interact with the child and explain why the graphic changed. This is particularly useful at the stage of toilet training where the child is being taught to be aware of going potty and the need to use the bathroom. The combination of story line graphics and active graphics are believed to make children more interested in the toilet training process and therefore lead to enhanced results.

When the active graphic is a fading graphic, the training opportunity is based on the fact that the activity being performed by the permanent character graphic is halted when the child has an accident and the object graphics disappear. A slight sense of disappointment may be gently communicated to the child, because the object graphics are no longer present and the character graphic can no longer interact with the object graphics. A caregiver might take a positive approach: "Try not to wet in your pants so the Bear at the beach still has his sand toys to play with." Significantly, this can be used as a motivational basis for teaching the child that it is within the child's control to permit the activity to continue for as long as the child can go without wetting his or her pants.

Another training opportunity exists when fading graphics are employed in the present absorbent articles, such as training pants. The caregiver can teach the child that the child is supposed to interrupt playing when the child has to use the bathroom, similar to the character graphic having to cease its activity when the active object graphics disappear.

When the active graphic is an appearing graphic as opposed to a fading graphic, the training opportunity is based on the fact that the caregiver can explain the appearance of a new graphic for a reward, therefore a more positive approach can be taken. For example, the active graphic can be adapted to appear over time, and it may be viewed as a reward for the child for staying dry. It can in this case be used as a tool to identify toilet training queues. For instance, if an active graphic appeared over time, such as one every hour while staying dry, the caregiver could say "Hey, look how good you are doing; you stayed dry for 2 hours."

The active graphic can alternatively change color to a brighter and/or darker color. By way of illustration, a teddy bear outlined and colored very pale, such as yellow or tan, can when in contact with urine turn into bright reds, greens, and/or blues. Alternatively, only the outline of the active graphic can be present and a
5 pattern or solid color can appear over time or when in contact with urine. For example, the active graphic can include an outline of a fire truck, which fills in to become a solid color when urine comes in contact with the truck.

To provide proper focus on the permanent character graphic, the permanent
10 character graphic can be positioned in the front waist region along or near the longitudinal centerline of the product. The permanent character graphic, or a supplemental or complementary permanent character graphic, can be positioned in the back waist region along or near the longitudinal centerline of the product. In particular embodiments, a front view of the character graphic is shown in the front waist region and a back view of the same character graphic is shown in the back
15 waist region. The permanent character graphic can be spaced from the first and second end edges of the product, for example, approximately 5 centimeters from the front end edge.

The active object graphics can be positioned closer to the transverse centerline of the product than the permanent character graphic. In particular
20 embodiments, the active object graphics are positioned between the transverse centerline of the product and the permanent character graphic so as to be properly focused and not hidden from view during use. Locating the active graphics in the crotch region of the product, near the target spot for urination, can also assist with rapid exposure of the active graphic to urine upon insult. For active graphics that
25 are triggered by contact with urine, it is desirable for the active graphics to be located on the area of the outer cover that is most likely to experience wetness during the first void. Of course, alternative positioning of the permanent and active characters are possible, such as the permanent character graphic in the crotch region and the active object graphic in one of the waist regions, both permanent
30 and active graphics in one or both of the waist regions or the crotch region, or the like. The active object graphics can but need not necessarily be positioned on one or more sides of the permanent character graphic, such as "floating" under the

character graphic. Alternatively, the permanent character graphic can surround the active object graphic.

In one particular embodiment, all of the active object graphics are located in a distinct active graphic region where the child can focus attention. The active graphic region suitably has a length dimension measured parallel to the longitudinal centerline of about 10 centimeters, more particularly about 9 centimeters, and a width dimension measured parallel to the transverse centerline of about 6 centimeters. The active graphic region may, for instance, be spaced from the first end edge of the product by approximately 13 to 16 centimeters.

There can be one or more active object graphics. It is believed desirable to use a plurality of active object graphics in order provide the greatest impact to the child. In particular embodiments, a training pant comprises 3 or more active object graphics, particularly from 4 to 8, such as 5 arranged in a 2-1-2 pattern.

The size of the active object graphics may depend in part on their number and type. It is generally preferred that the active object graphics have a size of at least about 1.5 by 1.5 centimeter and less than about 3 by 3 centimeters, and particularly at least about 1.8 by 1.8 centimeter and less than about 2.5 by 2.5 centimeters.

The overall size of the permanent character graphic can be significantly larger than the overall size of each discrete active object graphic. In particular embodiments, for instance, the permanent character graphic has a size measured by overall surface area that is at least twice as large, and more particularly at least three times as large, as the size of a single object graphic. The maximum length dimension of the permanent character graphic, measured parallel to the longitudinal centerline, is desirably about 8 to about 9 centimeters.

The permanent character graphics, the permanent object graphics and the active object graphics are suitably disposed on the outer cover. The term "disposed on" and variations thereof are intended to mean that one element can be integral with another element, or that one element can be a separate structure bonded to or placed with or placed near another element. Thus, the graphics can be formed or applied directly or indirectly to a surface of the outer cover, formed or applied between layers of a multiple layer outer cover, formed or applied to a

substrate that is placed with or near the outer cover, formed or applied within a layer of the outer cover or another substrate, or other variations or combinations thereof. In particular embodiments, the graphics can be printed, sprayed, or otherwise applied directly on a layer of the outer cover. In other embodiments, the
5 graphics can be applied to a layer placed with or near the outer cover, such as a substrate associated with the absorbent assembly, including but not limited to tissue layers, liquid handling layers, absorbent layers, or the like.

The permanent graphics can be located on the exterior surface of the outer cover to enhance the visual impact of the permanent graphics. Alternatively,
10 however, the permanent graphics can be located on the interior surface of the outer cover or between layers of a multilayer outer cover, provided the permanent graphics remain visible from the exterior of the product.

The active graphics can be located on the interior surface of the outer cover, which is particularly desirable for active graphics that are triggered by urine in
15 order to enhance the speed at which the graphics are contacted with urine and thus change their visual appearance. The outer cover desirably comprises a material that is formed or treated to be liquid impermeable. In alternative embodiments, the outer cover can comprise a material that is formed or treated to be at least partially liquid permeable. In this latter case, the active graphics can be
20 located between layers of a multilayer outer cover, or, particularly for appearing graphics, on the exterior surface of the outer cover. Regardless of location, fading graphics should be visible from the exterior of the product before activation and appearing graphics should be visible from the exterior of the product after activation.

25 "Liquid impermeable", when used in describing a layer or multi-layer laminate, means that a liquid, such as urine, will not pass through the layer or laminate, under ordinary use conditions, in a direction generally perpendicular to the plane of the layer or laminate at the point of liquid contact. Liquid, or urine, can spread or be transported parallel to the plane of the liquid impermeable layer or
30 laminate, but this is not considered to be within the meaning of "liquid impermeable" when used herein.

The outer cover can comprise a translucent material that has sufficient opacity, or a transparent or translucent material that is otherwise treated, to mask

a urine soluble ink after it has dissolved. Such an outer cover should not be so opaque that the graphics printed on the interior surface of the outer cover or adjacent to the interior surface are obscured. Polymer films used to form the outer cover can be treated with titanium dioxide to make the film appear white and to
5 develop sufficient opacity to mask urine, BM and dissolved inks. Examples of suitable outer cover materials include films formed of polyethylene, polypropylene, cataloy, bi-component, any polymer based extruded film, or the like. One such film is a polyethylene film having a thickness of about 0.2 millimeter (0.75 mil).

The permanent and active graphics can be formed on or applied to the outer
10 cover or another substrate bonded to or placed with or placed near the outer cover by any suitable technique. The graphics are desirably registered with other components of the absorbent article during manufacture such that the graphics are positioned in the desired regions of the product.

For active graphics that are triggered by contact with urine, the active graphic
15 can be in liquid communication with the absorbent assembly of the product. As used herein, the term "liquid communication" means that liquid such as urine is able to travel from one layer or element to another layer or element. The absorbent assembly can but need not include a slot or densified region, incorporate a liquid distribution layer, or the like, to channel or direct liquid to the
20 location near the outer cover where the active graphics are located.

As noted previously, liquid soluble inks can be used to form the active graphics. It is theorized that migration of the dissolved inks away from the outer cover and into the absorbent assembly can improve the fading or disappearing quality of the active graphics. To enhance this effect, the outer cover can be
25 attached to the absorbent assembly in a windowpane design, whereby the active graphic region of the outer cover is not bonded to the absorbent assembly and the regions of the outer cover surrounding the active graphic region are bonded to the absorbent assembly. One suitable method and apparatus for adhesively bonding the outer cover to the absorbent assembly in a windowpane design is disclosed in
30 U.S. Patent 5,683,752 issued November 4, 1997 to Popp et al., which is incorporated herein by reference.

Absorbent articles suitable for use with the present invention include diapers, training pants, incontinence products, diaper pants, disposable underwear, or the

like. Suitable training pants and diaper pants can have seamed side portions or refastenable side portions. The present invention is particularly suited for use with training pants or diaper pants to aid in toilet training. One particular training pant suitable for use with the present invention is disclosed in U.S. Patent 4,940,464
5 issued July 10, 1990 to Van Gompel et al., which is incorporated herein by reference. The Van Gompel et al. patent describes various materials of which the training pant can be made, and a method of constructing a training pant. The training pant can also be constructed using the methods and apparatus disclosed in U.S. Patent 5,766,389 issued June 16, 1998 to Brandon et al., which is also
10 incorporated herein by reference.

The above-mentioned and other features and advantages of the present invention and the manner of attaining them will become more apparent, and the invention itself will be better understood by reference to the drawings and the following description of the drawings.

15

Brief Description of the Drawings

Figure 1 illustrates a front perspective view of a training pant incorporating the principles of the present invention, showing both permanent graphics and active graphics.

20 Figure 2 illustrates a rear perspective view of the training pant of Figure 1.

Figure 3 illustrates a top plan, partially disassembled view of the training pant of Figures 1 and 2, in a stretched and laid flat condition and with portions broken away for purposes of illustration.

25 Figure 4 illustrates a front perspective view similar to Figure 1, although showing only the permanent graphics.

Figure 5 illustrates a front perspective view of an alternative embodiment of a training pant incorporating the principles of the present invention.

Figure 6 illustrates a rear perspective view of the training pant of Figure 5.

30 Figures 7A, 7B and 7C illustrate various partial section views of absorbent articles according to the present invention.

Detailed Description of the Drawings

The principles of the present invention can be incorporated into a variety of absorbent articles, and particularly disposable absorbent articles. The term "disposable" refers to articles which are designed to be discarded after a limited use rather than being laundered or otherwise restored for reuse. For ease of explanation, the description hereafter will be in terms of a child's training pant.

A training pant 20 is illustrated in a fully assembled condition in Figures 1 and 2 and in a partially disassembled, stretched and laid flat condition in Figure 3. The training pant 20 defines a first or front waist region 22, a second or back waist region 24, a crotch region 26 positioned between and interconnecting the front and back waist regions, an inner surface 28 (Figure 1) which is configured to contact the wearer, and an outer surface 30 opposite the inner surface which is configured to contact the wearer's clothing. The illustrated training pant 20 comprises an absorbent chassis 32 and a plurality of transversely opposed side panels 34. The absorbent chassis 32 and side panels 34 can be integrally formed or comprise two or more separate elements, as shown.

The training pant 20 defines a longitudinal centerline 36 (Figure 3), a transverse centerline 38 (Figure 3), a first or front longitudinal end edge 56, and a second or back longitudinal end edge 58. The first waist region 22 abuts the first longitudinal end edge 56, and the second waist region 24 abuts the second longitudinal end edge 58. "Longitudinal" and "transverse" have their customary meaning. The longitudinal axis lies in the plane of the article and is generally parallel to a vertical plane that bisects a standing wearer into left and right body halves when the article is worn. The transverse axis lies in the plane of the article generally perpendicular to the longitudinal axis. The article as illustrated is longer in the longitudinal direction than in the transverse direction.

The illustrated absorbent chassis 32 comprises an outer cover 40 and a bodyside liner 42 (Figure 3) which is connected to the outer cover in a superposed relation. The absorbent chassis 32 also comprises an absorbent assembly 44 (Figure 3) which is located between the outer cover and the bodyside liner, and can optionally include a pair of containment flaps (not shown).

With the training pant 20 in a fully assembled condition as illustrated in Figures 1 and 2, the front and back waist regions 22 and 24 are joined together by

side seams 46 to define a waist opening 50 and a pair of leg openings 52. The front waist region 22 comprises the portion of the training pant 20 which, when worn, is positioned on the front of the wearer while the back waist region 24 comprises the portion of the training pant which, when worn, is positioned on the back of the wearer. The crotch region 26 of the training pant 20 comprises the portion of the training pant which, when worn, is positioned between the legs of the wearer and covers the lower torso of the wearer. The side panels 34 comprise the portions of the training pant 20 which, when worn, are positioned on the side hip regions of the wearer. The longitudinal end edges 56 and 58 of the training pant 20 are configured to encircle the waist of the wearer when worn and provide the waist opening 50.

The absorbent chassis 32 is configured to contain and/or absorb any body exudates discharged from the wearer. For example, the absorbent chassis 32 desirably although not necessarily comprises the pair of containment flaps (not shown) which can be configured to provide a barrier to the transverse flow of body exudates. Suitable constructions and arrangements for the containment flaps are generally well known to those skilled in the art and are described in U.S. Patent 4,704,116 issued November 3, 1987 to Enloe, which is incorporated herein by reference.

To further enhance containment and/or absorption of body exudates, the training pant 20 can include a front waist elastic member, a rear waist elastic member, and leg elastic members (not shown), as are known to those skilled in the art. Waist elastic members and leg elastic members can be operatively joined to the outer cover 40 and/or bodyside liner 42 of the training pant 20. Elastic members for the containment flaps, waist elastics and leg elastics can be formed of any suitable elastic material. As is well known to those skilled in the art, suitable elastic materials include sheets, strands or ribbons of natural rubber, synthetic rubber, or thermoplastic elastomeric polymers. The elastic materials can be stretched and adhered to a substrate, adhered to a gathered substrate, or adhered to a substrate and then elasticized or shrunk, for example with the application of heat, such that elastic constrictive forces are imparted to the substrate. In one particular embodiment, for example, the leg elastic members comprise a plurality of dry-spun coalesced multifilament spandex elastomeric threads sold under the

trade name LYCRA® and available from E. I. Du Pont de Nemours and Company, Wilmington, Delaware.

5 The outer cover 40 has an exterior surface corresponding to the outer surface 30 of the training pant and an opposite interior surface. The outer cover 40 desirably comprises a material that is substantially liquid impermeable. The outer cover 40 can be a single layer of liquid impermeable material, but desirably comprises a multi-layered laminate structure in which at least one of the layers is liquid impermeable. For instance, the outer cover 40 can include a liquid permeable outer layer and a liquid impermeable inner layer that are suitably joined
10 together by a laminate adhesive (not shown). Suitable laminate adhesives, which can be applied continuously or intermittently as beads, a spray, parallel swirls, or the like, can be obtained from Findley Adhesives, Inc., of Wauwatosa, Wisconsin, or from National Starch and Chemical Company, Bridgewater, New Jersey. The liquid permeable outer layer can be any suitable material and desirably one that
15 provides a generally cloth-like texture. One example of such a material is a 20 gsm (grams per square meter) spunbond polypropylene nonwoven web. The outer layer can also be made of those materials of which liquid permeable bodyside liner 42 is made. While it is not a necessity for outer layer to be liquid permeable, it is desired that it provides a relatively cloth-like texture to the wearer.

20 The inner layer of the outer cover 40 can be both liquid and vapor impermeable, or can be liquid impermeable and vapor permeable. The inner layer is desirably manufactured from a thin plastic film, although other flexible liquid impermeable materials can also be used. The inner layer, or the liquid impermeable outer cover 40 when a single layer, prevents waste material from
25 wetting articles, such as bedsheets and clothing, as well as the wearer and caregiver. A suitable liquid impermeable film for use as liquid impermeable inner layer, or a single layer liquid impermeable outer cover 40, is a 0.025 millimeter (1.0 mil) polyethylene film commercially available from Edison Plastics Company of South Plainfield, New Jersey. If the outer cover 40 is a single layer of material, it
30 can be embossed and/or matte finished to provide a more cloth-like appearance. As earlier mentioned, the liquid impermeable material can permit vapors to escape from the interior of the disposable absorbent article, while still preventing liquids from passing through the outer cover 40. A suitable "breathable" material is

composed of a microporous polymer film or a nonwoven fabric that has been coated or otherwise treated to impart a desired level of liquid impermeability. A suitable microporous film is a PMP-1 film material commercially available from Mitsui Toatsu Chemicals, Inc., Tokyo, Japan, or an XKO-8044 polyolefin film
5 commercially available from 3M Company, Minneapolis, Minnesota.

As shown in Figures 1-3, the training pant 20 and in particular the outer cover 40 desirably comprises one or more appearance-related components. Examples of appearance-related components include, but are not limited to, graphics; highlighting or emphasizing leg and waist openings in order to make
10 product shaping more evident or visible to the user; highlighting or emphasizing areas of the product to simulate functional components such as elastic leg bands, elastic waistbands, simulated "fly openings" for boys, ruffles for girls; highlighting areas of the product to change the appearance of the size of the product; registering wetness indicators, temperature indicators, and the like in the product;
15 registering a back label, or a front label, in the product; and registering written instructions at a desired location in the product.

The illustrated training pant 20, which is designed for use by young boys, includes registered outer cover graphics, including interactive wetness indicating graphics. More specifically, the training pant includes a permanent character
20 graphic 70 in the form of a dog having human-like expressions and wearing a shirt and a hat, permanent object graphics 72, 74 and 76 in the form of a boat, curved line segments denoting the surface of water, and a fishing pole, respectively, and a plurality of active object graphics 78 representing fish. The outer cover graphics also include a simulated elastic waistband 80, a simulated fly opening 82, and
25 simulated elastic leg bands 84, all of which can be permanent graphics.

The active object graphics 78 can be disposed on the interior surface of the outer cover 40 and are visible from the exterior surface of the outer cover. The active object graphics 78 are in liquid communication with the absorbent assembly 44, meaning that liquid such as urine is capable of moving between the
30 active object graphic and the absorbent assembly under ordinary use conditions.

When the child wets the training pant 20, liquid is communicated to the active object graphics 78, whereupon the object graphics either dissolve, change color, appear, or the like. The effect is illustrated in Figure 4, showing the situation where

the active object graphics 78 disappear upon contact with urine. The front view of Figure 4 shows that the active object graphics 78 are no longer present. Where appearing graphics are employed, the situation would work in reverse and the appearance of the pant would change from Figure 4 to Figure 1 upon liquid insult.

5 Alternatively, the active object graphics 78 can comprise appearing graphics that are triggered upon use by exposure to the environment.

An alternative embodiment of a training pant 90 designed for use by young girls is illustrated in Figures 5 and 6. The illustrated training pant 90 includes permanent character graphics 92, permanent object graphics 94, 96 and 98 in the form of clouds, rainbow and sun, and butterfly nets, respectively, and a plurality of active object graphics 100 representing butterflies. The outer cover graphics also include a simulated elastic waistband 80 with ruffles, and simulated elastic leg bands 84 with ruffles, which are both permanent graphics.

The liquid permeable bodyside liner 42 generally overlies the outer cover 40 and absorbent assembly 44, and can but need not have the same dimensions as the outer cover 40. The bodyside liner 42 is desirably compliant, soft feeling, and non-irritating to the child's skin. Further, the bodyside liner 42 can be less hydrophilic than the absorbent assembly 44, to present a relatively dry surface to the wearer and permit liquid to readily penetrate through its thickness.

20 The bodyside liner 42 can be manufactured from a wide selection of web materials, such as synthetic fibers (for example, polyester or polypropylene fibers), natural fibers (for example, wood or cotton fibers), a combination of natural and synthetic fibers, porous foams, reticulated foams, apertured plastic films, or the like. Various woven and nonwoven fabrics can be used for the bodyside liner 42. For example, the bodyside liner can be composed of a meltblown or spunbonded web of polyolefin fibers. The bodyside liner can also be a bonded-carded web composed of natural and/or synthetic fibers. The bodyside liner can be composed of a substantially hydrophobic material, and the hydrophobic material may, optionally, be treated with a surfactant or otherwise processed to impart a desired level of wettability and hydrophilicity. For example, the material can be surface treated with about 0.28 weight percent of a surfactant commercially available from the Rohm and Haas Co. under the trade designation Triton X-102. The surfactant can be applied by any conventional means, such as spraying, printing, brush

coating or the like. The surfactant can be applied to the entire bodyside liner 42 or can be selectively applied to particular sections of the bodyside liner, such as the medial section along the longitudinal centerline.

A suitable liquid permeable bodyside liner 42 is a nonwoven bicomponent web having a basis weight of about 27 gsm. The nonwoven bicomponent can be a spunbond bicomponent web, or a bonded carded bicomponent web. Suitable bicomponent staple fibers include a polyethylene/polypropylene bicomponent fiber available from CHISSO Corporation, Osaka, Japan. In this particular bicomponent fiber, the polypropylene forms the core and the polyethylene forms the sheath of the fiber. Other fiber orientations are possible, such as multi-lobe, side-by-side, end-to-end, or the like.

The absorbent assembly 44 (Figure 3) is positioned between the outer cover 40 and the bodyside liner 42, which components can be joined together by any suitable means such as adhesives as is well known in the art. The absorbent assembly 44 can be any structure which is generally compressible, conformable, non-irritating to the child's skin, and capable of absorbing and retaining liquids and certain body wastes. The absorbent assembly 44 can be manufactured in a wide variety of sizes and shapes, and from a wide variety of liquid absorbent materials commonly used in the art. For example, the absorbent assembly 44 can suitably comprise a matrix of hydrophilic fibers, such as a web of cellulosic fluff, mixed with particles of a high-absorbency material commonly known as superabsorbent material. In a particular embodiment, the absorbent assembly 44 comprises a matrix of cellulosic fluff, such as wood pulp fluff, and superabsorbent hydrogel-forming particles. The wood pulp fluff can be exchanged with synthetic, polymeric, meltblown fibers or with a combination of meltblown fibers and natural fibers. The superabsorbent particles can be substantially homogeneously mixed with the hydrophilic fibers or can be nonuniformly mixed. The fluff and superabsorbent particles can also be selectively placed into desired zones of the absorbent assembly 44 to better contain and absorb body exudates. The concentration of the superabsorbent particles can also vary through the thickness of the absorbent assembly 44. Alternatively, the absorbent assembly 44 can comprise a laminate of fibrous webs and superabsorbent material or other suitable means of maintaining a superabsorbent material in a localized area.

Suitable superabsorbent materials can be selected from natural, synthetic, and modified natural polymers and materials. The superabsorbent materials can be inorganic materials, such as silica gels, or organic compounds, such as crosslinked polymers. Suitable superabsorbent materials are available from various commercial vendors, such as Dow Chemical Company located in Midland, Michigan and Hoechst-Celanese Corporation located in Portsmouth, Virginia. Typically, a superabsorbent material is capable of absorbing at least about 15 times its weight in water, and desirably is capable of absorbing more than about 25 times its weight in water.

In one embodiment, the absorbent assembly 44 is generally rectangular in shape, and comprises a blend of wood pulp fluff and superabsorbent material. One preferred type of fluff is identified with the trade designation CR1654, available from Kimberly-Clark Corporation, Neenah, Wisconsin, and is a bleached, highly absorbent sulfate wood pulp containing primarily soft wood fibers. As a general rule, the superabsorbent material is present in the absorbent assembly 44 in an amount of from about 5 to about 90 weight percent based on total weight of the absorbent assembly. The absorbent assembly 44 suitably has a density within the range of about 0.10 to about 0.35 grams per cubic centimeter. The absorbent assembly 44 may or may not be wrapped or encompassed by a suitable tissue wrap that maintains the integrity and/or shape of absorbent assembly.

The absorbent chassis 32 can also incorporate other materials that are designed primarily to receive, temporarily store, and/or transport liquid along the mutually facing surface with absorbent assembly 44, thereby maximizing the absorbent capacity of absorbent assembly. One suitable material is referred to as a surge layer (not shown) and comprises a material having a basis weight of about 50 grams per square meter, and comprising a through-air-bonded-carded web of a homogenous blend of 60 percent 3 denier bicomponent fiber comprising a polyester core/polyethylene sheath, commercially available from BASF Corporation, and 40 percent 6 denier polyester fiber, commercially available from Hoechst Celanese.

Various placements of the permanent and active graphics may be better understood with reference to the partial section views of absorbent articles that are shown in Figures 7A, 7B and 7C. The various layers of the illustrated

embodiments can be secured together using adhesives, thermal bonds, mechanical bonds, or other means known to those skilled in the art.

Figure 7A illustrates a partial section view of an absorbent article having an absorbent assembly 44 sandwiched between an outer cover 40 and a bodyside liner 42. The illustrated outer cover 40 consists of a single layer having an exterior surface 110 and an opposite interior surface 112. The permanent and active graphics can be disposed on the outer cover 40, which includes on either surface 110 or 112 of the outer cover, on the surface of the absorbent assembly 44 that faces the outer cover, or between the absorbent assembly and the outer cover.

10 The outer cover 40 is desirably formed of a material that is liquid impermeable. In such embodiments and where the active graphics are triggered by contact with urine, it is desirable for the active graphics to be disposed on the interior surface 112 of the outer cover 40, on the surface of the absorbent assembly 44 that faces the outer cover, or between the absorbent assembly and the outer cover. The

15 permanent and active graphics need not be located in the same position or on the same substrate.

Figure 7B illustrates a partial section view of another absorbent article having an absorbent assembly 44 sandwiched between an outer cover 40 and a bodyside liner 42. The illustrated outer cover 40 consists of a two-layer composite comprising an outer layer 114 and an inner layer 116. The outer cover 40 has an exterior surface 110 and an opposite interior surface 112. The permanent and active graphics can be disposed on the outer cover 40, which includes, in particular, on the exterior surface 110, on the interior surface 112, between the outer and inner layers 114 and 116, on either or both facing surfaces of the outer and inner layers 114 and 116, on the surface of the absorbent assembly 44 that faces the outer cover, or between the absorbent assembly and the outer cover.

20

25

Figure 7C illustrates a partial section view of a further absorbent article having an absorbent assembly 44 sandwiched between an outer cover 40 and a bodyside liner 42. The illustrated absorbent assembly includes a liquid storage layer 120 sandwiched between absorbent assembly substrates 122 and 124. The substrates 122 and 124 can comprise tissue wrap sheets, liquid distribution or liquid handling layers, or the like. The illustrated outer cover 40 consists of a single layer having an exterior surface 110 and an opposite interior surface 112, but can

30

alternatively comprise a multiple-layer composite. The permanent and active graphics can be disposed on the outer cover 40, which includes specific locations such as on the exterior surface 110, on the interior surface 112, on either surface of the substrate 124 that is placed with or placed near the outer cover, between
5 the substrate 124 and the outer cover, on the surface of the liquid storage layer 120 that faces the outer cover, or between the liquid storage layer and the substrate 124. Various other locations for the permanent and active graphics can be suitable where different configurations of the absorbent assembly 44 and outer cover 40 are employed, including but not limited to within a layer of the absorbent
10 assembly or outer cover.

As noted previously, the illustrated training pant 20 has a side panel 34 disposed on each side of the absorbent chassis 32. In the illustrated embodiment, the pair of transversely opposed side panels 34 are permanently bonded to the absorbent chassis 32 and permanently bonded to one another, using attachment
15 means known to those skilled in the art such as adhesive, thermal or ultrasonic bonding.

The side panels 34 desirably comprise an elastic material capable of stretching in a direction parallel to the transverse axis 49 of the training pant 20. Suitable elastic materials, as well as one described process of incorporating
20 elastic side panels into a training pant, are described in the following U.S. Patents: 4,940,464 issued July 10, 1990 to Van Gompel et al.; 5,224,405 issued July 6, 1993 to Pohjola; 5,104,116 issued April 14, 1992 to Pohjola; and 5,046,272 issued September 10, 1991 to Vogt et al.; all of which are incorporated herein by reference. In particular embodiments, the elastic material comprises a
25 stretch-thermal laminate (STL), a neck-bonded laminate (NBL), a reversibly necked laminate, or a stretch-bonded laminate (SBL) material. Methods of making such materials are well known to those skilled in the art and described in U.S. Patent 4,663,220 issued May 5, 1987 to Wisneski et al.; U.S. Patent 5,226,992 issued July 13, 1993 to Mormon; and European Patent Application
30 No. EP 0 217 032 published on April 8, 1987 in the names of Taylor et al.; all of which are incorporated herein by reference. Alternatively, the side panel material can comprise other woven or nonwoven materials, such as those described above as being suitable for the outer cover 40 or bodyside liner 42.

It will be appreciated that details of the foregoing embodiments, given for purposes of illustration, are not to be construed as limiting the scope of this invention. Although only a few exemplary embodiments of this invention have been described in detail above, those skilled in the art will readily appreciate that

5 many modifications are possible in the exemplary embodiments without materially departing from the novel teachings and advantages of this invention. Accordingly, all such modifications are intended to be included within the scope of this invention, which is defined in the following claims and all equivalents thereto.

Further, it is recognized that many embodiments may be conceived that do not

10 achieve all of the advantages of some embodiments, particularly of the preferred embodiments, yet the absence of a particular advantage shall not be construed to necessarily mean that such an embodiment is outside the scope of the present invention.

CLAIMS

What is claimed is:

1. An absorbent article comprising:

an outer cover having an interior surface and an opposite exterior surface;

an absorbent assembly disposed on the interior surface;

a permanent character graphic disposed on the outer cover;

5 an active object graphic disposed on the outer cover;

wherein the permanent character graphic is interactively interrelated with the active object graphic.

2. An absorbent article comprising:

an outer cover having an interior surface and an opposite exterior surface;

an absorbent assembly disposed on the interior surface;

a permanent character graphic disposed on the outer cover;

5 a permanent object graphic disposed on the outer cover;

an active object graphic disposed on the outer cover;

wherein the permanent character graphic is interactively interrelated with the active object graphic, and the permanent object graphic is related in subject matter to the active object graphic.

10

3. An absorbent article comprising:

an outer cover having an interior surface and an opposite exterior surface;

an absorbent assembly disposed on the interior surface;

a permanent character graphic disposed on the outer cover;

5 a permanent object graphic disposed on the outer cover;

an active object graphic disposed on the outer cover;

wherein the permanent character graphic is interactively interrelated with the permanent object graphic and the active object graphic.

4. The absorbent article of claim 1, further comprising a permanent object graphic, wherein the permanent character graphic, the permanent object graphic and the active object graphic are related by a common story line.
5. The absorbent article of claim 2, 3 or 4, wherein the permanent character graphic is illustrated to be involved in an activity utilizing the permanent object graphics, and the active object graphics are the subject of the activity.
6. The absorbent article of claim 1, 2 or 3, wherein the active object graphic comprises an ink that is soluble in urine and the active object graphic is in liquid communication with the absorbent assembly.
7. The absorbent article of claim 1, 2 or 3, wherein the active object graphic comprises an ink that changes color when exposed to urine and the active object graphic is in liquid communication with the absorbent assembly.
8. The absorbent article of claim 1, 2 or 3, wherein the active object graphic comprises an appearing graphic that becomes significantly more visible when exposed to urine and the active object graphic is in liquid communication with the absorbent assembly.
9. The absorbent article of claim 1, 2 or 3, wherein the active object graphic comprises an appearing graphic that becomes significantly more visible when exposed to the environment during use and prior to contact with urine.
10. The absorbent article of claim 1, 2 or 3, wherein the active object graphic is disposed on the interior surface of the outer cover.
- 825 11. The absorbent article of claim 1, 2 or 3, wherein the outer cover comprises a liquid permeable outer layer and a liquid impermeable inner layer, the active object graphic is disposed on one surface of the inner layer that forms the interior surface of the outer cover, and the permanent character graphic is disposed on an opposite surface of the inner layer.

12. The absorbent article of claim 1, 2 or 3, wherein the active object graphic is disposed on a surface of the absorbent assembly that faces the outer cover.

13. The absorbent article of claim 1, 2 or 3, wherein the outer cover is adhesively attached to the absorbent assembly in a windowpane pattern, and the region of the outer cover containing the active object graphic is unadhered to the absorbent assembly.

14. The absorbent article of claim 1, 2 or 3, wherein the absorbent article defines a longitudinal centerline and a transverse centerline, and the absorbent article comprises a plurality of active object graphics that are located in a distinct active graphic region having a length dimension measured parallel to the longitudinal centerline of about 10 centimeters and a width dimension measured parallel to the transverse centerline of about 6 centimeters.

830

15. The absorbent article of claim 14, wherein the active graphic region is spaced from a first longitudinal end edge of the absorbent article by approximately 13 to 16 centimeters.

835

16. The absorbent article of claim 1, 2 or 3, wherein the absorbent article defines a longitudinal centerline, a transverse centerline, opposite first and second longitudinal end edges, first and second waist regions abutting the respective first and second longitudinal end edges, and a crotch region disposed between and interconnecting the first and second waist regions, the permanent character graphic being disposed in the first waist region and the active object graphic being disposed in the crotch region.

17. The absorbent article of claim 16, wherein the active object graphic is longitudinally disposed between the permanent character graphic and the transverse centerline.

18. The absorbent article of claim 1, 2 or 3, wherein the active object graphic comprises lines having a line width of from about 1 to about 2 millimeters.

19. The absorbent article of claim 1, 2 or 3, wherein the absorbent article comprises from 4 to 8 active object graphics that have a size of at least about 1.5 by 1.5 centimeter and less than about 3 by 3 centimeters.

20. The absorbent article of claim 19, wherein the permanent character graphic has a size that is at least twice as large as the size of the active object graphics.

840 21. A disposable absorbent training pant defining a longitudinal centerline, a transverse centerline, opposite first and second longitudinal end edges, first and second waist regions abutting the respective first and second longitudinal end edges, and a crotch region disposed between and interconnecting the first and second waist regions, the absorbent article comprising:

845 a liquid impermeable outer cover having an interior surface and an opposite exterior surface;

an absorbent assembly disposed on the interior surface of the outer cover;

a liquid permeable liner disposed on the absorbent assembly sandwiching the absorbent assembly between the outer cover and the liner;

850 a permanent character graphic disposed on the outer cover in the first waist region;

a permanent object graphic disposed on the outer cover;

a plurality of active object graphics disposed on the outer cover in the crotch region between the permanent character graphic and the transverse centerline,

855 the active object graphics being in liquid communication with the absorbent assembly;

wherein the permanent character graphic, the permanent object graphic and the active object graphics are related by a common story line in which the permanent character graphic is involved in an activity utilizing the permanent
860 object graphic, and the active object graphics are the subject of the activity.

22. The training pant of claim 21, wherein the active object graphics comprise an ink that is soluble in urine.

23. The training pant of claim 21, wherein the active object graphics comprise an ink that changes color when exposed to urine.

24. The training pant of claim 21, wherein the outer cover comprises a liquid permeable outer layer and a liquid impermeable inner layer, the active object graphics are disposed on one surface of the inner layer and the permanent character graphic is disposed on an opposite surface of the inner layer.

25. The training pant of claim 21, wherein the outer cover is adhesively attached to the absorbent assembly in a windowpane pattern, and the region of the outer cover containing the active object graphic is unadhered to the absorbent assembly.

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US 00/16405

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61F13/42

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 148 115 A (LEVY RENE) 10 July 1985 (1985-07-10) the whole document	1-8, 14, 15, 18-20
A	---	21-23
A	FR 2 559 037 A (SOCIETE COTONNIERE DU MIDI) 9 August 1985 (1985-08-09) the whole document	1-4, 6, 7, 10, 14, 15, 18, 19, 21-23
A	US 4 022 211 A (TIMMONS, ENDRES) 10 May 1977 (1977-05-10) cited in the application column 2, line 51 -column 3, line 63; figures	1-3, 6, 7, 10-12, 14, 15, 18, 19, 21-24
	--- -/-	



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

12 September 2000

Date of mailing of the international search report

20/09/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5618 Patentaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Seabra, L

INTERNATIONAL SEARCH REPORT

Inter. nat. Application No
PCT/US 00/16405

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 897 541 A (UITENBROEK, O'ROURKE) 27 April 1999 (1999-04-27) column 1, line 35-44 column 5, line 56 -column 6, line 54; figures ---	1-3,13, 21,25
A	US 5 389 093 A (WESLEY HOWELL) 14 February 1995 (1995-02-14) abstract; figures ---	1-3,8,9, 21
A	US 5 766 389 A (BRANDON, CHAPDELAINE, KACZMARZYK, KASTMAN, KUSKE, LAGER, MILLER) 16 June 1998 (1998-06-16) column 4, line 59 -column 5, line 49; figures 1,2,2A -----	1-3,21

INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/US 00/16405

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0148115 A	10-07-1985	CH 657021 A AU 3749385 A WO 8502981 A ES 283929 U JP 60246802 A	15-08-1986 30-07-1985 18-07-1985 16-03-1987 06-12-1985
FR 2559037 A	09-08-1985	NONE	
US 4022211 A	10-05-1977	NONE	
US 5897541 A	27-04-1999	AU 702372 B AU 3214095 A CA 2152407 A DE 69515891 D EP 0785762 A ES 2143063 T FR 2725155 A GB 2293573 A, B JP 10506586 T WO 9610380 A ZA 9507567 A	18-02-1999 26-04-1996 31-03-1996 27-04-2000 30-07-1997 01-05-2000 05-04-1996 03-04-1996 30-06-1998 11-04-1996 17-04-1996
US 5389093 A	14-02-1995	US 5197958 A AU 3942493 A WO 9319716 A	30-03-1993 08-11-1993 14-10-1993
US 5766389 A	16-06-1998	AU 712443 B AU 1418397 A BR 9612308 A CA 2240577 A CN 1213956 A CZ 9802062 A EP 0957867 A HU 9902204 A JP 2000502649 T NZ 325633 A PL 327500 A SK 85798 A WO 9724094 A	04-11-1999 28-07-1997 13-07-1999 10-07-1997 14-04-1999 13-01-1999 24-11-1999 28-10-1999 07-03-2000 28-05-1999 21-12-1998 11-02-1999 10-07-1997

[12] 发明专利申请公开说明书

[21] 申请号 00811743.8

[43] 公开日 2002 年 9 月 18 日

[11] 公开号 CN 1370060A

[22] 申请日 2000.6.15 [21] 申请号 00811743.8

[30] 优先权

[32] 1999.6.15 [33] US [31] 09/333,222

[86] 国际申请 PCT/US00/16405 2000.6.15

[87] 国际公布 WO00/76442 英 2000.12.21

[85] 进入国家阶段日期 2002.2.19

[71] 申请人 金伯利-克拉克环球有限公司

地址 美国威斯康星州

[72] 发明人 C·P·奥尔森 K·I·拉特利夫

S·A·维贝尔

[74] 专利代理机构 中国专利代理(香港)有限公司

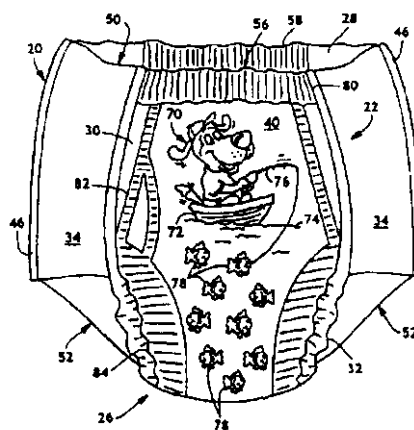
代理人 崔幼平 章社杲

权利要求书 3 页 说明书 18 页 附图页数 7 页

[54] 发明名称 具有提供交互式训练教具的湿润指示图形的吸收制品

[57] 摘要

一种一次性吸收制品,例如训练裤,其包括提供交互式教具的湿润指示图形。交互式图形可包括角色图形和一个或多个活动物体图形,响应暴露到尿中或环境中时视觉上表现为“显示”或“不显示”。该交互式图形还包括一个故事线索,其中,所示永久角色图形实施一个涉及活动物体图形的动作,湿润指示特征和该图形故事线索使得关怀者在教育和动机机理上与儿童相互作用,以加强大小便训练过程。



ISSN 1008-4274

权 利 要 求 书

- 1、 一种吸收制品，它包括：
具有一个内表面和一个相对的外表面的外覆盖物；
设置在该内表面上的吸收组件；
5 设置在外覆盖物上的永久角色图形； 和
设置在外覆盖物上的活动物体图形，
其中，该永久角色图形和活动物体图形交互作用地相关。
- 2、 一种吸收制品，它包括：
具有一个内表面和一个相对的外表面的外覆盖物；
10 设置在该内表面上的吸收组件；
设置在外覆盖物上的永久角色图形；
设置在外覆盖物上的永久物体图形；
设置在外覆盖物上的活动物体图形；
其中，该永久角色图形与活动物体图形交互作用地相关，且该永久
15 物体图形在主题上与该活动物体图形相关。
- 3、 一种吸收制品，它包括：
具有一个内表面和一个相对的外表面的外覆盖物；
设置在该内表面上的吸收组件；
设置在外覆盖物上的永久角色图形；
20 设置在外覆盖物上的永久物体图形；
设置在外覆盖物上的活动物体图形； 和
其中，该永久角色图形与永久物体图形和活动物体图形交互作用地相
关。
- 4、 如权利要求 1 所述的吸收制品，其特征在于，其还包括永久
25 物体图形，其中，永久角色图形、永久物体图形和活动物体图形与一
共同故事线索相联系。
- 5、 如权利要求 2、3 或 4 所述的吸收制品，其特征在于，图示的永
久角色图形涉及一种利用了永久物体图形的动作，而该活动物体图形是该
动作的主题。
- 30 6、 如权利要求 1、2 或 3 所述的吸收制品，其特征在于，活动物
体图形包括可溶于尿的墨水，且该活动物体图形与吸收组件液体连通。
- 7、 如权利要求 1、2 或 3 所述的吸收制品，其特征在于，活动物

体图形包括当暴露在尿中时变色的墨水，且该活动物体图形与吸收组件液体连通。

8、如权利要求 1、2 或 3 所述的吸收制品，其特征在于，活动物体图形包括当暴露在尿中时变的明显更看的见的显示图形，且该活动物体图形与吸收组件液体连通。

9、如权利要求 1、2 或 3 所述的吸收制品，其特征在于，活动物体图形包括使用期间当暴露在环境中时和与尿接触之前变的明显更看的见的显示图形。

10、如权利要求 1、2 或 3 所述的吸收制品，其特征在于，活动物体图形设置在外覆盖物的内表面上。

11、如权利要求 1、2 或 3 所述的吸收制品，其特征在于，外覆盖物包括一个可透液的外层和一个不可透液的内层，活动物体图形设置在形成外覆盖物的内表面的内层的一个表面上，而永久角色图形设置在该内层的一个相对的表面上。

12、如权利要求 1、2 或 3 所述的吸收制品，其特征在于，活动物体图形设置在面向外层的吸收组件的一个表面上。

13、如权利要求 1、2 或 3 所述的吸收制品，其特征在于，在窗玻璃图案中外覆盖物粘合地与吸收组件连接，且包含活动物体图形的外覆盖物的区域不粘合到吸收组件上。

14、如权利要求 1、2 或 3 所述的吸收制品，其特征在于，吸收制品限定了一条纵向中心线和一条横向中心线，且吸收制品包括若干活动物体图形，该活动物体图形定位在一个特定的活动图形区，该活动图形区具有平行于纵向中心线测得为约 10 厘米的长度尺寸，和平行于横向中心线测得为约 6 厘米的宽度尺寸。

15、如权利要求 14 所述的吸收制品，其特征在于，活动图形区与该吸收制品的第一纵向端边缘相隔约 13 至 16 厘米。

16、如权利要求 1、2 或 3 所述的吸收制品，其特征在于，吸收制品限定了一条纵向中心线、一条横向中心线、相对的第一和第二纵向端边缘、邻接相应的第一和第二纵向端边缘的第一和第二腰部，和设置在第一和第二腰部之间并使之互连的裆部，永久角色图形设置在第一腰部内，而活动物体图形设置在裆部内。

17、如权利要求 16 所述的吸收制品，其特征在于，活动物体图形

纵向设置在永久角色图形和横向中心线之间。

18、如权利要求 1、2 或 3 所述的吸收制品，其特征在于，活动物体图形包括具有约 1 至约 2 毫米线宽的线。

19、如权利要求 1、2 或 3 所述的吸收制品，其特征在于，吸收制品包括 4 至 8 个活动物体图形，该活动物体图形具有至少约 1.5 乘 1.5 厘米的尺寸并小于约 3 乘 3 厘米。

20、如权利要求 19 所述的吸收制品，其特征在于，永久角色图形具有至少约为活动物体图形尺寸的两倍的尺寸。

21、一种一次性的吸收训练裤，它限定一条纵向中心线、一条横向中心线、相对的第一和第二纵向端边缘、邻接相应的第一和第二纵向端边缘的第一和第二腰部、和设置在第一和第二腰部之间并使之互连的裆部，该吸收制品包括：

具有一个内表面和一个相对的外表面的不透液的外覆盖物；

设置在该外覆盖物的内表面上的吸收组件；

15 设置在该吸收组件上的可透液的内层，将该吸收组件夹置在外覆盖物和内层之间；

设置在第一腰部内的外覆盖物上的永久角色图形；

设置在外覆盖物上的永久物体图形；

20 设置在裆部内的外覆盖物上并在该永久角色图形和横向中心线之间的多个活动物体图形，该活动物体图形与该吸收组件液体连通；

其中，永久角色图形、永久物体图形和活动物体图形与一共同故事线索相联系，其中永久角色图形涉及一种利用了永久物体图形的动作，而该活动物体图形是该动作的主题。

22、如权利要求 21 所述的吸收制品，其特征在于，活动物体图形包括可溶于尿的墨水。

23、如权利要求 21 所述的吸收制品，其特征在于，活动物体图形包括当暴露到尿中时变色的墨水。

24、如权利要求 21 所述的吸收制品，其特征在于，外覆盖物包括一个可透液的外层和一个不可透液的内层，活动物体图形设置在内层的一个表面上，和永久角色图形设置在内层的一个相对的表面上。

25、如权利要求 21 所述的吸收制品，其特征在于，在窗玻璃图案中，外覆盖物与吸收组件粘合地连接，而包含活动物体图形的外覆盖物的区域与吸收组件不粘合。



说明书

具有提供交互式训练教具的湿润指示图形的吸收制品

技术背景

5 本发明涉及吸收制品，特别是涉及具有湿润指示图形以提供交互式教具的吸收制品。

大小便训练过程可包括许多不同的方面，这包括可由父母和关怀者使用的许多训练技术和教具，父母和关怀者以后简称为关怀者。总体的大小便训练过程的一个方面是从尿布变化到训练裤，以帮助儿童理解他或她现在应象成人那样使用厕所。总体的大小便训练方法的另一个方面包括关怀者应对儿童进行正面鼓励和强化以指导他或她现在应使用厕所来代替尿布。尽管关怀者在大小便训练过程中利用训练裤和正面鼓励一直很有帮助，但仍有很大的改进余地。特别是，关怀者还在寻找更简单快捷的方式以便在大小便训练过程中成功地引导儿童。

许多关怀者很难确定儿童开始大小便训练过程的愿望，并低估给小儿童教导大小便训练方法的难度。如果儿童不响应初始的大小便训练指导或引导，在找到鼓励儿童掌握大小便训练的技巧的技术、方法或教导工具方面，关怀者将感到困惑。这样，尽管市场上可买到不同的教学工具，例如书、录象带、带粘接剂的图表、个性化厕所和交互式大小便训练工具，仍需要新的和改进的教育和动机机理，以便于大小便训练过程。

发明内容

针对与已有技术的吸收衣服有关的上述不足，已开发了一种吸收制品，它通过使用当偶然有事时通知关怀者和儿童的交互式图形，提供大小便教具的好处。交互式图形可包括永久角色图形和一个或多个活动物体图形。特别是当儿童偶然有事且活动物体图形与尿接触时，而且当产品使用时，其暴露到环境例如空气分子中而随着时间的消逝产生不显示或显示时，由于物体图形构形成视觉上为“不显示”或“显示”，因此，物体图形被称为“活动的”。交互式湿润指示图形也可包括一故事线索，其中所示的永久角色图形表现一种涉及该活动物体图形的动作。这样，该吸收制品可允许该关怀者与该儿童就由图形产



生的故事线索相互作用，并可为该关怀者提供机会，以教导该儿童有关由于该物体图形的活动性质的大小便训练的重要课程。

因此，在一个实施例中，本发明涉及一种吸收制品，该吸收制品包括具有内表面和相对的外表面的外覆盖物，和设置在外覆盖物的内表面上的吸收组件。吸收制品还包括永久角色图形和设置在外覆盖物上的活动物体图形，该永久角色图形和活动物体图形交互作用相关。

术语“活动图形”在此用来代表显示的图形、消失的图形、或者显示和消失图形的结合。术语“显示的图形”在此用来指当接触到尿时变的可见或变的明显更易看见，或者，当暴露在不与尿接触的环境中时随时间的消逝变的可见或更易看见的图形。相反，术语“消失的图形”在此用来指当接触到尿时变的不可见或明显更不易看见，或者，当暴露在不与尿接触的环境中时随时间的消逝变的不可见或更不易看见的图形。

在特定的实施例中，活动图形包括由可溶于水溶液例如尿中的墨水形成的消失图形。该墨水放在吸收制品中，这样当产品被液体污损时，它变湿和溶解。一旦溶解，墨水从外覆盖物冲洗掉，并被外覆盖物遮掩。结果，活动图形看起来似乎不显示。

适当的可溶于尿的墨水可从许多商业卖主例如 Philadelphia, Pennsylvania, USA 的 Sun Chemical Corp. 以商业名称 AQUA DESTRUCT 购得。特定的可溶于尿的合成物在授予 Timmons 等人的 1977 年 5 月 10 日公开的 4022211 号美国专利中公开，该专利在此提供作为参考。墨水颜色可选择，以提供悦人的外观和图形效果，包括与液体接触时迅速消失。为便于迅速消失，消失图形可包括具有从约 1 至约 2 毫米线宽的线条画。

活动图形还可包括由例如墨水或粘合剂的合成物形成的消失或显示图形，该合成物当暴露在水溶液例如尿中时可变色。在暴露于水溶液之前或之后，颜色改变合成物可适合与背景颜色或周围色混合。该颜色变化型式适当的合成物可购自许多商业卖主，例如 PH 改变/颜色改变热熔粘合剂购自 Wauwatosa, Wisconsin, USA 的 Findley Adhesives, Inc.. 另一种形式是，活动图形包括 PH 敏感墨水、易褪色墨水、彩色吸收颗粒、可水合的盐、易潮湿的膜、酶、热敏墨水和颜料、或类似物。

消失图形相对于外覆盖物的外表面可简单地从视觉中消失。例如，

- 消失物体图形可制成消失在永久背景图形中。典型的例子包括一个物体图形例如黄鱼，该黄鱼不显示或消失在背景图形例如蓝色的水或绿草中；物体图形例如粉红色的花消失在背景图形例如绿色草地中；物体图形例如淡紫色沙玩具消失在背景图形例如棕褐色沙中；物体图形例如粉红色海螺壳消失在背景图形棕褐色沙中；物体图形例如小动物消失在背景图形例如丛林景色中；物体图形例如薄雾消失在背景图形例如水百合中；物体图形例如绿色玩具消失在背景图形例如黄色地板或地毯区域；物体图形例如粉红色天使消失在背景图形例如蓝色云雾中；物体图形例如红色骨头从在背景图形例如狗的盘子的内部消失；
- 5 物体图形例如猫的黄色纱线球从在背景图形例如绿色方格地板中消失；物体图形例如玩具车从背景图形例如马路消失等等。

- 活动图形还可构形成暴露在环境中时随时间的消逝而显示。特别是，活动图形可响应时间间隔、温度水平、氧水平、或类似条件，以及其结合。响应特定条件随时间消逝显示的不同的视觉指示器在授予
- 15 Haas 等人的 1991 年 10 月 15 日公开的 5058088 号美国专利；授予 Patel 的 1991 年 10 月 1 日公开的 5053339 号美国专利；授予 Patel 的 1991 年 9 月 3 日公开的 5045283 号美国专利；授予 Sherman 的 1991 年 1 月 29 日公开的 4987849 号美国专利；授予 Haas 的 1990 年 2 月 20 日公开的 4903254 号美国专利；授予 Bhattacharjee 的 1989 年 3 月 14 日公
- 20 开的 4812053 号美国专利；和授予 Bradley 等人的 1981 年 10 月 6 日公开的 4292916 号美国专利中公开，所有这些专利的内容在此提供作为参考。当产品开始使用时，随时间流逝显示的活动图形可应用于产品中，或形成产品的整体部件。

- 与活动图形相反，术语“永久图形”在此用来指当吸收制品受尿
- 25 的污损并当吸收制品在模拟使用条件下暴露在环境中时，基本上不改变其可见程度的图形。图形或图形的一部分的可见程度的改变可根据在包含图形的制品暴露到液体中之前或之后人对图形的观察来确定。为此目的，制品通过在室温（约等于 23°C）下完全浸入包含重量百分比为 0.9% 的氯化钠的水溶液内达 20 分钟，从而暴露在液体中。20 分
- 30 钟后，产品从水溶液中取出并放在具有 0.25 英寸开口的 TEFLON™ 涂层的纤维玻璃屏上，然后依次放在真空箱上并用柔性橡胶坝材料覆盖，该纤维玻璃屏商业上购自 Taconic Plastics Inc., Petersberg, New

York, USA. 在 5 分钟的时间里, 在真空箱内抽出 3.5 千帕 (每平方英寸 0.5 磅) 的真空, 此后, 制品取出并观察。具有正常或校正视力 20-20 的人应在提供 30 尺烛光 (320Lux) 照明的环境下在 1 米远的距离进行观察。应辨别图形可见度的改变, 并在需要时辨别吸收组件内的其它材料例如绒毛浆的颜色的改变。最好, 永久图形可构形成当产品由液体污损或暴露到环境中时整个图形基本上不改变其外观、尺寸或形状。

吸收制品的图形构形成提供涉及一永久角色图形和活动物体图形的故事线索。术语“角色图形”在此用来指包含有人形的图案的图形, 特别是具有或暗示人类外形或外观的图案, 该图案将人类动机、特征或行为归于无生命物体、动物、自然现象、卡通人物或类似物的形式或外观。理想的是, 角色图形适合儿童内衣裤并可用来激发儿童穿着裤子和使用便壶或厕所。为此目的, 角色图形可与媒体、广告或特定文化中公知的流行角色相关联。理想的是, 它们是儿童或关怀者关注和希望辨别的角色。理想的是, 儿童可想象自身代替该角色。角色图形可包括永久图形, 活动图形或永久和活动图形的结合。

角色图形的作用是可帮助儿童感觉象 BIG KID® (Kimberly-Clark 公司的注册商标) 并激发他们大小便训练。角色图形还可给父母和关怀者在大小便训练期间供使用的相互作用的元素。一个实施例包括一个永久角色图形, 该图形不能完成某些动作并在该消失图形已消失后进行观察。这易于当儿童偶然有事而弄湿他或她的裤子时在儿童和关怀者之间无惊吓的和温和的沟通。角色图形作为第三方, 它使关怀者可用于转移使儿童免于责备和羞愧, 并传递儿童不要弄湿他或她的裤子的要求。当关怀者似乎与第三人交谈时儿童更易于接受批评。对应关怀者来说, 因为他或她不必直接面对儿童的错误也许有较小的压力。类似地, 角色图形可提供儿童和伙伴舒适的源泉, 以降低训练期间的压力。

角色图形可希望包括整个训练裤图形的一部分, 该部分建立所示情景的主题。如此, 该角色图形可提供用于在儿童和父母或关怀者之间的教育交互作用的机会。特别是, 父母或关怀者可以使用图形故事线索来制作一用于大小便训练改进的游戏或故事。在当儿童弄湿他或她的裤子时消失图形“消失”的情况下, 关怀者可采用一种方法, 例



如“看在船上钓鱼的小熊。不要在你的训练裤中方便，因为要是你这样做的话船下的鱼就会消失。”

适当的角色图形可包括动物、人、无生命物体、自然现象、卡通人物或类似物，他们可能或不可能具有人的特征例如臂、腿、面部特征或类似特征。为了增强大小便训练，最好使儿童熟悉角色图形，例如可辨别的卡通人物。角色图形应至少是与儿童有关的类型，其例子包括动物、玩具，许可角色或类似物。角色图形通过包含人形特征、人形表情、衣服、能力等可变得更人性化和友好。通过说明，动物角色图形可表现为微笑、穿着衣服、进行体育运动、钓鱼、开车、玩玩具等。在特定的实施例中，角色图形最好设计成一种外观，它表现为友好、积极、非胁迫、憨态、独立、有灵感、活跃、富于表情、勇敢、和/或坚定地。

如上所述，永久角色图形最好与活动物体图形交互作用地相关。术语“物体图形”在此用来指代表物体或事物的图形，它包括无生命物体或特征。

如在此使用的，术语“交互作用相关”用来指图示的角色图形涉及或实施一个动作或行为，物体图形是该动作或行为的物体或与该动作或行为相关联。不希望限制在特定的所列的实施例，与物体图形交互作用相关的角色图形的例子包括：角色图形手握或使用球拍、球棒、手套、其它体育器材等，而物体图形包括球，相关的体育设施或类似物；角色图形图示在英式足球场、美式足球场、篮球场或类似环境中，而物体图形包括球、相关的设施或玩具；角色图形手握蝴蝶网或类似物，而物体图形包括蝴蝶等；角色图形手握钓鱼杆，坐在船上或类似物上，而物体图形包括鱼、可充气的水玩具或类似物；角色图形手持花、植物、园艺工具或类似物，而物体图形包括花或植物；角色图形喂养、训练或培育包括动物、植物或类似物的物体图形；角色图形在一个特定的环境例如洋娃娃之家、养牲畜的院子或类似地方中活动，而物体图形包括特别适合该环境的洋娃娃或动物等；角色图形握持或利用望远镜或类似物，而物体图形包括星、行星或类似物；角色图形包括赛车，而物体图形包括赛车旗；角色图形包括潜艇，而物体图形包括鱼、水泡、贝壳或类似物；角色图形包括宠物或其他动物，而物体图形包括狗骨头、宠物玩具、食物或类似物；角色图形包括大的沙

箱，而物体图形包括沙箱中的玩具；角色图形包括靠近大的狗盘的狗，而物体图形包括狗盘内部或附近的狗骨；或其他相互作用相关的图形。

吸收制品还可包括永久物体图形，它便于图形的相互作用的特性，并给关怀者提供更多的机会以便改进与儿童相互作用。因此，在一个
5 实施例中，吸收制品包括一个具有一个内表面和一个相对的外表面的外覆盖物，和一个设置在该外覆盖物的内表面上的吸收组件。一个永久角色图形，一个永久物体图形，和均设置在外覆盖物上的一个活动物体图形。永久角色图形可与活动物体图形交互作用地相关，且该永久物体图形在主题上与活动物体图形相关。

10 如这里所使用的，短语“主题相关”指以下情况，一个图形的主题与另一个图形的主题相同或相关联。主题关系是在两个或多个正文信息之间、两个或多个绘画图案之间、或者一个或多个正文信息和一个或多个绘画图案的结合之间。术语“正文信息”指图形由一个或多个文字数字符号组成。术语“正文图案”和“绘画图案”在此相互不包
15 含。一般的术语“图形”在此用来指在吸收制品上可见或者变得可见的任何设计、图案或类似物，特别包括由一个或多个字母符号构成的正文信息、由一个或多个图画构成的绘画图案以及其结合。

通过该例子，两个绘画图案在以下情况下被认为在主题上相关：该图案相同；分别说明一个共同的物体的不同尺寸、形状和颜色；每
20 次解释相互通常相关联的两个物体中的一个和另一个，例如月亮和星星，储水池和水玩具，沙箱和适当的玩具，棒球拍和球，牲畜和动物，或诸如此类；在特定的活动，例如体育活动、园艺活动等中使用的不同物品；相联系地解释几何匹配或接合元件例如三角形和三角形的孔，或拉链的两部分；均解释多部分图画中的一部分；或诸如此类。类似
25 的，两个正文信息被认为在主题上是相关的，该信息是：相同的；联系起来形成一个句子、思想或动作例如“跳”和“向上”；解释相互通常相关联的两个物体中的一个和另一个，例如“球拍”和“球”，“大”和“小孩”，“大”和“女孩”，或者“大”和“男孩”；联系起来表示问题和答案；或诸如此类。类似的，正文信息和图案被认为是主题
30 上相关，这里的正文对图象起名称，定义或描述；或诸如此类。

该永久物体图形可与永久角色图形交互作用地相关。因此，在特定实施例中，一个吸收制品包括一个具有内表面和一个相对的外表面

的外覆盖物，和一个设置在该外覆盖物的内表面上的吸收组件。一个永久角色图形，一个永久物体图形，和均设置在外覆盖物上的一个活动物体图形。永久角色图形可与永久物体图形和活动物体图形交互作用地相关。

- 5 更特别地，该吸收制品的图形可包括一个永久角色图形，一个或多个永久物体图形，和一个或多个活动物体图形，所有的图形都与一个共同的故事线索相联系，该故事线索一般可通过书籍、电影或其它媒体源了解到。进而，该永久角色图形包括采用永久物体图形的活动，而活动物体图形是活动的主题。例如，图形可包括永久角色图形，该永久角色图形由穿有人的衣服，并具有在通常由人从事的活动例如钓鱼的活动中使用钓鱼杆的特点和能力的动物。永久物体图形可包括物体例如船、湖、钓鱼杆，这些物体与钓鱼活动相关联和/或限定了钓鱼活动。活动物体图形包括许多鱼，鱼是活动的主题，并适于在该吸收制品被尿污损时消褪或消失。
- 10

- 15 另一种形式是，永久物体图形与永久角色图形相互交互作用地无关。例如，永久物体图形可包括与角色图形的活动不相关的背景图形。通过解释，永久物体图形可包括天空、太阳、草地或类似物的图画。

- 使用中，当偶然有事时，活动图形可显示或消失，且尿与活动图形接触。最好，当吸收制品用 200 毫升或更多的尿，更特别的是约 40 至约 60 毫升或更多的尿污损时，活动图形在约 3 分钟或更少的时间，特别是约 1 分钟或更少的时间，更特别的是约 20 秒或更少的时间显示或消失。
- 20

- 图形改变的状态表现了一种关怀者与儿童相互作用并解释为什么图形变化的工具。在大小便训练阶段这特别有用，这样儿童会受教导从而知道找便壶和应使用盥洗室。故事线索图形和活动图形的结合相信可使儿童对大小便训练过程更感兴趣，并因此导致增强的效果。
- 25

- 当活动图形是消失的图形时，训练机会基于当儿童偶然有事时活动物体消失的事实。失望的轻微感觉与儿童温和的交流，因为物体图形不再显示，和使儿童得以观看到。显然，它可以与儿童交流，这在儿童的控制之下，以允许物体保持看见的时间足以使儿童不再弄湿他或她的裤子。
- 30

在目前的吸收制品例如训练裤中使用消失的图形时存在有另一训



练机会。关怀者可以教导儿童，建议儿童在其必须使用盥洗室时中断玩耍，类似于在活动物体图形消失时的角色图形必须停止其活动。

当活动图形是与消失图形相反的显示图形时，训练机会基于关怀者为了奖励而解释新图形的显示的事实，因此可采取更正面的接触。

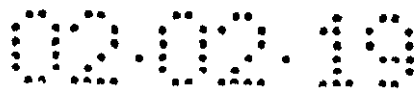
- 5 例如，活动图形可适合一直显示，当儿童保持干燥时，为了奖励它可以看见。在这种情况下，它可以用作一种工具来辨别大小便训练等候。例如，如果活动图形一直显示，例如，在保持干燥时每一小时一次，关怀者可以说“嗨，你做的真棒；你保持干燥已经两个小时了。”

- 10 活动图形可交替地改变颜色至更明亮和/或更暗的颜色。通过解释，轮廓和颜色苍白例如黄色或棕褐色的泰德熊当与尿接触时变成鲜红色、绿色、和/或兰色。另一种形式是，仅活动图形的轮廓可显示，图案或纯色可一直或与尿接触时显示。例如，活动图形可包括救火车的轮廓，当尿与救火车接触时，它充满以变成纯色。

- 15 为了适当关注永久角色图形，永久角色图形可沿或靠近产品的纵向中心线布置在前腰部。永久角色图形或辅助或补充的永久角色图形可沿或靠近产品的纵向中心线布置在后腰部。在特定的实施例中，角色图形的前视图表示在前腰部，而相同的角色图形的后视图表示在后腰部。永久角色图形可与产品的第一和第二端边缘隔开，例如距离前端边缘约5厘米。

- 20 活动物体图形可布置成比永久角色图形更靠近产品的横向中心线。在特定的实施例中，活动物体图形布置在产品的横向中心线和永久角色图形之间，以便在使用期间适当地关注和不隐藏至看不见。将活动图形定位在产品的裆部，靠近撒尿的目的地，还可以有助于活动图形快速暴露至尿中直到污损。对于通过与尿接触而产生的活动图形，
25 最好活动图形定位在外覆盖物的区域，该区域最可能在第一空隙变湿。当然，永久和活动特征的交替布置是可能的，例如永久角色图形在裆部，而活动物体图形在腰部的其中之一，永久和活动图形在腰部或裆部的其中之一或二者上或诸如此类。活动物体图形能够但不一定布置在永久角色图形的一侧或多侧，例如在角色图形下“漂浮”。另一种
30 形式是，永久角色图形可包围活动物体图形。

在一个特定的实施例中，所有活动物体图形定位在独特的活动图形区，在此儿童可集中注意力。活动图形区可适当地具有平行于纵向



中心线的测得约 10 厘米的长度尺寸，更特别的是约 9 厘米，平行于横向中心线测得约 6 厘米的宽度尺寸。活动特性区可例如与产品的第一端边缘相隔约 13 至 16 厘米。

- 存在一个或多个活动物体图形。相信最好使用许多活动物体图形，以便提供对儿童的最大冲击。在特定的实施例中，训练裤包括 3 个或更多的活动物体图形，特别是从 4 至 8 个，例如 5 个排列成 2-1-2 图案。

- 活动物体图形的尺寸可以部分取决于其数量和类型。通常最好活动物体图形具有至少约 1.5 乘 1.5 厘米和小于约 3 乘 3 厘米的尺寸，特别是至少约 1.8 乘 1.8 厘米，且小于约 2.5 乘 2.5 厘米的尺寸。

- 永久角色图形的总尺寸比每个离散的活动物体图形的总尺寸明显大。在特定的实施例中，例如，永久角色图形具有通过总表面积测量的尺寸，该总表面积是单个角色图形的尺寸至少两倍大，更特别的是至少 3 倍大。平行于纵向中心线测量的永久角色图形的最大长度尺寸最好约 8 至约 9 厘米。

- 永久角色图形、永久物体图形和活动物体图形适当地设置在外覆盖物上。术语“设置在..上”及其变化打算用来指一个元件可与另一个结合成整体，或者一个元件可以与是与另一个元件粘合或放置在一起或靠近布置的分离结构。这样，图形可由外覆盖物的表面形成或直接或间接作用，形成或应用于多层外覆盖物的各层之间，形成或应用于放在外覆盖物上或其附近的基底，形成或应用于外覆盖物或另一个基底的一层内，或其它变化或其结合。在特定的实施例中，图形可印刷，喷射或直接作用在外覆盖物的一层上。在其它实施例中，图形可应用于外覆盖物上或其附近的一层上，例如与吸收组件相联系的基底，它包括但不限于织物层、液体处理层、吸收层或诸如此类。

永久图形可定位在外覆盖物的外表面上，以增进永久图形的视觉冲击。然而，另一种形式是，永久图形可定位在外覆盖物的内表面上，或者在多层外覆盖物的各层之间，只要永久图形从产品的外部保持可见。

- 活动图形可定位在外覆盖物的内表面上，特别是，对于通过尿形成的活动图形来说，这是最佳的，因为这增加了图形与尿接触的速度，这样改变了其视觉外观。外覆盖物最好包括形成或处理成液体可渗透

的材料。在替换实施例中，外覆盖物可包括形成或处理成至少部分为液体可渗透的材料。在后一种情况下，活动图形可定位在多层外覆盖物的层之间，或者，特别是对于显示的图形来说，在外覆盖物的外表面上。不考虑位置，消失图形应在激活前从产品的外部可以看见，显示

的图形应在激活后从产品的外部可见。

“液体不可渗透的”当用于描述一层或多层层压制品时，指在正常使用条件下，在液体接触点，在通常垂直于层或层压制品的平面的方向上，液体例如尿不穿过层或层压制品。液体或尿平行于液体不可渗透层或层压制品的平面散布或输送，但这里使用时不考虑在“液体不可渗透”的含义内。

外覆盖物可包括不足够透明的半透明材料，或者经处理的透明材料或半透明材料，以便在它溶解后掩饰可溶于尿的墨水。这种外覆盖物不应太不透明，以致印刷在外覆盖物的内表面上或靠近内表面的图形太暗。用来形成外覆盖物的聚合膜可用二氧化钛处理，以便使膜显示为白，并使其充分不透明以遮住尿、BM 和溶解的墨水。适当的外覆盖物材料的例子包括由聚乙烯、聚丙烯、CATALLOY、双成分、基于挤制膜的任何聚合物、或诸如此类形成的膜。一种这样的膜是具有约 0.2 毫米 (0.75mil) 厚度的聚乙烯薄膜。

永久和活动图形可在外覆盖物上形成或应用于外覆盖物或另一个基底上，该基底通过任何适当的技术粘合或布置在外覆盖物上或外覆盖物附近。在制造过程中，图形最好显示吸收制品的其它部件，因此，图形在产品的理想区域布置。

对于通过与尿接触产生的活动图形来说，活动图形可以与产品的吸收组件液体连通。如这里所使用的，术语“液体连通”指液体例如尿能够从一层或元件移动到另一层或元件。吸收组件能够但不需要包括一个狭缝或致密区域，用于一个液体分布层，或诸如此类，以便将液体通到或引导至靠近外覆盖物的位置，活动图形定位在该外覆盖物上。

如前所述，可溶于液体的墨水可用来形成图形。理论上说，从外覆盖物上溶解掉并进入吸收组件内的墨水的移动可改善活动图形的消逝或不显示质量。为了增强这种效果，在窗玻璃设计中，外覆盖物可与吸收组件连接，因此，外覆盖物的活动图形不与吸收组件粘合，围

绕活动图形区的外覆盖物的区域与吸收组件粘合。在窗玻璃设计中将外覆盖物粘合地粘接在吸收组件上的一种适当的方法和设备在授予 Popp 等人的 1997 年 11 月 4 日公开的 5683752 号美国专利中公开，该专利的内容在此提供作为参考。

- 5 适用于本发明的吸收制品包括尿布、训练裤、失禁用产品、尿布衬裤、一次性内衣、或诸如此类。适当的训练裤和尿布衬裤具有缝合的边部分或可再紧固边部分。本发明特别适用于训练裤或尿布衬裤，以便于大小便训练。适用于本发明的一个特定的训练裤在授予 Van Gompel 等人的 1990 年 7 月 10 日公开的 4940464 号美国专利中公开，
10 该专利在此提供作为参考。Van Gompel 等人的专利描述了可制造训练裤的不同材料，和制造训练裤的方法。训练裤还可利用授予 Brandon 等人的 1998 年 6 月 16 日公开的 5766389 号美国专利中公开的方法和设备制造，该专利在此提供作为参考。

- 15 参考附图并通过下面的描述，将使本发明的上述和其它特征和优点及其实现方式变的更明显，而且本发明本身将更易理解。

附图说明

图 1 显示了结合本发明原理的训练裤的前透视图，图中显示了永久图形和活动图形；

图 2 显示了图 1 所示训练裤的一后透视图；

- 20 图 3 显示了图 1 和图 2 所示训练裤的顶平面、部分拆解图，处于拉伸和平置状态并且为了便于说明去掉了一些部分；

图 4 显示了类似于图 1 的前透视图，虽然仅显示永久图形；

图 5 显示了结合本发明原理的训练裤的一替代实施例的前透视图；

图 6 显示了图 5 所示训练裤的一后透视图；

- 25 图 7A、7B 和 7C 显示了根据本发明的吸收制品的各个部分；

具体实施方式

- 30 本发明的原理可结合于各种吸收制品，特别是一次性的吸收制品中。术语“一次性”指这样的制品，该制品可设计成在有限的使用后被丢弃，而不是洗涤或为再次使用而储存。为便于解释，在后面的描述根据儿童的训练裤进行。

训练裤 20 在图 1 和 2 中处于完全组装好的状态，而在图 3 中处于部分拆解、拉伸和平置状态。训练裤 20 限定了一第一或前腰部 22、一

第二或后腰部 24、置于前和后腰部之间并且使之相互连接的一个裆部 26、一个内表面 28 (图 1), 该内表面 28 构形成接触穿着者, 和一个与内表面相反的外表面 30, 该外表面 30 构形成接触穿着者衣服。显示的训练裤 20 包括一个吸收底盘 32 和若干横向相对的侧片 34。吸收底盘 32 和侧片 34 可整体成形或包括两个或多个单独的元件, 如图所示。

训练裤 20 限定了一条纵向中心线 36 (图 3)、一条横向中心线 38 (图 3), 一第一或前纵向端边缘 56, 和一第二或后纵向端边缘 58。第一腰部 22 邻接第一纵向端边缘 56, 而第二腰部 24 邻接第二纵向端边缘 58。“纵向”和“横向”具有它们的习惯涵义。纵轴线位于制品的平面中, 并且通常与一个垂直平面平行, 在穿着者穿着制品时, 该垂面将站着的穿着者分成左和右两半身体。横轴线位于通常垂直于纵轴线的制品平面中。所显示的制品在纵向上比在横向上长。

所示吸收底盘 32 包括一个外覆盖物 40 和一个体侧衬里 42 (图 3), 该体侧衬里 42 与外覆盖物以重叠关系连接。吸收底盘 32 还包括一个吸收组件 44 (图 3), 该吸收组件 44 位于外覆盖物和体侧衬里之间, 并且可选择地包括一对保持护翼 (未表示)。

处于完全组装好状态的训练裤 20, 如图 1 和 2 所示, 前和后腰部 22 和 24 通过边缝 46 连接在一起, 从而限定一个腰开口 50 和一对腿开口 52。前腰部 22 包括训练裤 20 在穿用时位于穿着者的前部的部分, 而后腰部 24 包括训练裤在穿用时位于穿着者的后部的部分。训练裤 20 的裆部 26 包括训练裤的这样的部分, 该部分在穿用时位于穿着者腿之间, 并且覆盖穿着者的下肢。侧片 34 包括训练裤 20 的这样的部分, 在穿用时这些部分位于穿着者的侧臀围部上。训练裤 20 的纵向端边缘 56 和 58 构形成在穿用时围绕穿着者的腰并且提供腰开口 50。

吸收底盘 32 构形成保持并且/或者吸收由穿着者排出的任何身体渗出物。例如, 吸收底盘 32 最好虽然不是必须包括一对保持护翼 (未表示), 这对护翼构形成提供对身体排出物的横向流动的阻挡件。保持护翼的合适结构和布置通常对本领域的普通技术人员是公知的, 并且在授予 Enloe 的于 1987 年 11 月 3 日公开的 4704116 号美国专利中描述, 该专利结合在这里作为参考。

为了进一步增强对身体排出物的保持和/或吸收, 训练裤 20 可包括一个前腰弹性部件, 一个后腰弹性部件, 和腿弹性部件 (未表示),

这如本领域的普通技术人员所公知的。腰弹性部件和腿弹性部件可操作地连接到训练裤 20 的外覆盖物 40 和/或体侧衬里 42 上。保持护翼的弹性部件，腰弹性体和腿弹性体可由任何合适的弹性材料形成。如本领域的普通技术人员所公知的，合适的弹性材料包括天然橡胶、人造橡胶或热塑弹性材料聚合物的片、线股或带。弹性材料可拉伸或粘接到基底上，粘接到聚拢的基底上，或者粘接到基底上，然后例如使用热进行弹性化处理或皱缩，以便给基底施加弹性紧缩力。在一个特定实施例中，例如，腿弹性部件包括若干干纺并生的多丝斯潘德克斯（Spandex）弹性线，该弹性线可以商标名称 LYCRA® 销售并且可从特拉华州的 Wilmington 的 E. I. Du Pont de Nemours and Company 获得。

外覆盖物 40 具有与训练裤的外表面 30 和一个相对内表面对应的外部表面。外表面 40 最好包括基本不透液的材料。外覆盖物 40 可以是单层不透液材料，但最好包括多层层压结构，其中至少一层是不透液的。举例来讲，外覆盖物 40 可包括由层压粘合剂（未表示）合适地连接在一起的可透液外层和不透液内层。合适的层压粘合剂可从威斯康星州 Wauwatosa 的 Findley Adhesive, Inc. 获得，或者从新泽西州 Bridgewater 的 National Starch and Chemical Company 获得，该粘合剂可如珠状、喷雾、平行漩涡或类似物的连续施加或断续施加。可透液外层可以是任何合适材料，并且最好的一种提供通常布状质地。这种材料的一个实例是 20gsm（克/平方米）纺粘聚丙烯非织造覆面料。外层还可由制造可透液体侧衬里 42 的那些材料制成。尽管外层可透液不是必须的，但希望外层给穿着者提供相对布状质地。

外覆盖物 40 的内层可以是不透液的和不透气的，或者可以是不透液的但透气的。内层最好可由薄塑料膜制成，虽然也可使用其它柔软的不透液材料。内层，或者单层时的不透液外覆盖物 40，防止废弃材料弄湿制品，例如床单和衣服，以及弄湿穿着者和护理者。用作不透液内层的合适的不透液膜，或单层的不透液外覆盖物 40，是 0.025 毫米（1.0mil）聚乙烯膜，该膜商业上可从新泽西州 South Plainfield 的 Edison Plastics Company 获得。如果外覆盖物 40 是单层材料，它可以轧花和/或无光泽加工，以便提供更类似布状的外观。如前所述，不透液材料可允许蒸汽从一次性吸收制品的内部逃出，同时还防止液体流经外覆盖物 40。合适的“可呼吸”材料由多微孔聚合物膜或非织

造织物构成，该膜或织物已经涂敷或处理以给予期望的不透液水平。合适的多微孔膜是市场上可从日本东京的 Mitsui Toatsu Chemicals 公司获得的 PMP-1 膜材料，或者市场上可从明尼苏达州 Minneapolis 的 3M 公司获得的 XK0-8044 聚烯烃膜。

5 如图 1-3 所示，训练裤 20，特别是外覆盖物 40 最好包括一个或多个与表面相关的元件。与表面相关的元件的实例包括，但不局限于，图形；突出或强调腿和腰开口以便使产品造型对穿着者更明显或可见；突出或强调产品的一些区域以便模拟功能元件例如弹性腿绑带、弹性腰带、男孩的模拟“飞口”、女孩的皱边；突出产品的一些区域以便
10 改变产品尺寸的外观；在产品中显示湿润指示器、温度指示器等；在产品中显示后标签，或前标签；并且在产品的期望位置上显示书面说明。

为儿童设计使用的所示训练裤 20 包括显示的外覆盖物图形，该图形包括交互式湿润指示图形。更具体是，该训练裤包括一个狗形状的
15 永久角色图形 70，狗具有人的表情并且穿裙子戴帽子，分别为船、表示水面的曲线段和鱼杆形状的永久物体图形 72、74 和 76，和多个代表鱼的活动物体图形 78。外覆盖物图形还包括一个模拟弹性腰带 80，一个模拟飞口 82 和模拟弹性腿带 84，这些都可以是永久图形。

活动物体图形 78 可设于外覆盖物 40 的内表面上，并且可从外覆盖物的外表面看见。活动物体图形 78 与吸收组件 44 液体连通，这是
20 指在通常使用条件下液体例如尿能在活动物体图形和吸收组件之间运动。

当儿童弄湿训练裤 20 时，液体与活动物体图形 78 连通，物体图形在其上溶解，改变颜色，显现等等。该效果表示在图 4 中，显示该
25 活动物体图形 78 在与尿接触时消失的情况。图 4 的前视图表示该活动物体图形 78 不再存在。在使用显现图形的地方，情况变为相反并且该训练裤的外观在液体污染时从图 4 变化到图 1。另一方案是，活动物体图形 78 可包括显现的图形，使用时通过暴露到环境中触发这些显现的图形。

30 为女孩使用而设计的训练裤 90 的替代实施例如图 5 和 6 所示。所示训练裤 90 包括一个永久角色图形 92，分别为云彩、彩虹和太阳以及蝴蝶网形状的永久物体图形 94、96 和 98，和若干表示蝴蝶的活动物体

图形 100. 外覆盖物图形还包括一个带摺边的模拟弹性腰带 80, 和带摺边的模拟弹性腿带 84, 它们都可包括永久图形。

5 可透液体侧衬里 42 通常叠加在外覆盖物 40 和吸收组件 44 上, 并且可以但不是必须与外覆盖物 40 尺寸相同。体侧衬里 42 最好是顺服、柔软感觉的, 并且对儿童的皮肤无刺激。而且, 体侧衬里 42 可以不如吸收组件 44 亲水, 以便给穿着者提供相对干燥的表面, 并且便于液体很容易穿过其厚度。

10 体侧衬里 42 可由广泛选择的幅面料材料例如人造纤维(例如, 聚酯或聚丙烯纤维)、天然纤维(例如, 木或棉纤维), 天然和人造纤维的混合物, 多孔泡沫、网状泡沫、带孔塑料膜或类似材料制造。各种织造和非织造织物可用作体侧衬里 42。例如, 体侧衬里可包括聚烯烃纤维的熔喷或纺粘幅面料。体侧衬里还可以包括天然和/或人造纤维的粘合-梳理幅面料。体侧衬里可以包括基本疏水材料, 疏水材料可以有选择地经表面活性剂处理或其他工艺处理以便使其具有期望水平的可湿性和亲水性。例如可用约 0.28 重量百分比的表面活性剂表面处理材料, 该表面活性剂商业上可以是由 Rohm and Haas Co. 出品的商标为 Triton X-102 的产品。可通过任何传统的方式, 例如喷洒、印刷、刷涂或类似方式, 施加表面活性剂。表面活性剂可施加到整个体侧衬里 42 上或者可选择施加到体侧衬里的特定区域, 例如沿着纵向中心线的中间部分。

20 合适的可透液体侧衬里 42 是基重约 27gsm 的非织造双组分幅面料。非织造双组分可以是纺粘双组分幅面料, 或粘合梳理双组分幅面料。合适的双组分人造短纤维包括聚乙烯/聚丙烯双组分纤维, 这可从日本大阪的 CHISSO 公司获得。在该特定的双组分纤维中, 聚丙烯形成芯而聚乙烯形成纤维的外壳。其他纤维取向是可能的, 例如多叶、肩并肩、端对端或类似取向。

30 吸收组件 44 (图 3) 位于外覆盖物 40 和体侧衬里 42 之间, 可通过任何合适的装置例如本领域公知的粘合剂将这些元件连接在一起。吸收组件 44 可以是通常可压缩的、舒服的、对儿童的皮肤无刺激的任何结构, 并且能够吸收和保留液体和某些人体渗出物。吸收组件 44 可以制造成各种尺寸和形状, 并且可由本领域常用的各种液体吸收材料制成。例如, 吸收组件 44 可合适地包括亲水纤维的基体, 例如纤维素

绒毛的幅面料，混合有通常公知为超强吸收材料的高吸收性材料的颗粒。在特定实施例中，吸收组件 44 包括纤维素绒毛的基体，例如木浆绒毛和超强吸收水凝胶形成的颗粒。木浆绒毛可与人造、聚合、熔喷纤维或熔喷纤维和天然纤维的混合物互换。超强吸收颗粒可以基本均匀地混合有亲水纤维或可以不均匀混合。绒毛和超强吸收颗粒也可选择置于吸收组件 44 的期望地带，以便更好地容纳和吸收身体渗出物。超强吸收颗粒的浓度在吸收组件 44 的厚度上变化。另一方案是，吸收组件 44 可包括纤维幅面料和超强吸收材料的层压件，或者采用将超强吸收材料保持在局部区域的其它合适的装置。

合适的超强吸收材料可从天然、人造和改性的天然聚合物和材料中选择。超强吸收材料可以是无机材料，例如硅胶，或有机化合物，例如交联聚合物。合适的超强吸收材料可由各种商业卖家，例如位于密歇根州 Midland 的 Dow Chemical Company 和位于维吉尼亚州 Portsmouth 的 Hoechst-Celanese 公司获得。典型地，超强吸收材料能吸收至少约 15 倍于其本身重量的水，最好能吸收超过其本身重量 25 倍的水。

在一个实施例中，吸收组件 44 通常是矩形，并且包括木浆绒毛和超强吸收材料的混合物。绒毛的一个优选类型是由威斯康星州 Neenah Kimberly-Clark 公司获得的商业标记为 CR1654 的商品，并且是主要包含软木纤维的被漂白的、高吸收性硫酸盐木浆。作为通常规则，超强吸收材料以占吸收组件 44 的整体重量约 5 至约 90 的重量百分比显示在该吸收组件 44 中。吸收组件 44 合适地具有约 0.10 至约 0.35 克/立方厘米的密度。吸收组件 44 可以或不可用合适的薄纱卷缠绕或围绕，这种薄纱卷保持该吸收组件的整体性和/或形状。

吸收底盘 32 还可结合其他材料，这些材料主要设计用来接受、暂时储存和/或沿着与吸收组件 44 相互面对的表面输送液体，因此使吸收组件的吸收能力最大。提到的一种合适的材料是用作浪涌层（未表示），并且包括约 50 克/平方米的基重的材料，还包括 60% 的 3 旦尼尔双组分纤维和 40% 的 6 旦尼尔的聚酯纤维的均匀混合物的透气-粘合-梳理幅面料，该双组分纤维包括聚酯芯/聚丙烯护壳，商业上可从 BASF 公司获得，该聚酯纤维商业上可从 Hoechst Celanese 获得。

参考图 7A、7B 和 7C 所示的吸收制品的局部截面图可更好地理解

永久和活动图形的各种布置。使用粘合剂、热粘合、机械粘合或本领域的普通技术人员公知的其他装置可将所示实施例的各层固定在一起。

图 7A 是具有吸收组件 44 的吸收制品的局部截面图，该吸收组件 44 夹置在外覆盖物 40 和体侧衬里 42 之间。所示外覆盖物 40 包括具有外表面 110 和相对的内表面 112 的单层。永久和活动图形可设置于外覆盖物 40 上，这包括在外覆盖物的任一表面 110 或 112 上，在面对外覆盖物的吸收组件 44 的表面上，或在吸收组件和外覆盖物之间。外覆盖物 40 最好由不透液的材料形成。在这些实施例中并且在这些实施例中通过接触尿触发活动图形，活动图形最好设于外覆盖物 40 的内表面 112 上，面对外覆盖物的吸收组件 44 的表面上，或者吸收组件和外覆盖物之间。永久和活动图形无需位于相同位置或在相同基底上。

图 7B 表示另一吸收制品的局部截面图，该吸收制品具有夹置在外覆盖物 40 和体侧衬里 42 之间的吸收组件 44。所示外覆盖物 40 包括两层合成物，该合成物包括一个外层 114 和一个内层 116。外覆盖物 40 具有一个外表面 110 和一个相对的内表面 112。永久和活动图形可设于外覆盖物 40 上，它包括，特别是，在外表面 110 上，在内表面 112 上，在外层和内层 114 和 116 之间，在外层和内层 114 和 116 的任一或两个面对的表面上，在吸收组件 44 的面对外覆盖物的表面上，或在吸收组件和外覆盖物之间。

图 7C 表示又一吸收制品的局部截面图，该吸收制品具有夹置在外覆盖物 40 和体侧衬里 42 之间的吸收组件 44。所示吸收组件包括液体储存层 120，该液体储存层 120 夹置在吸收组件基底 122 和 124 之间。基底 122 和 124 可包括薄纱缠绕片、液体分布层或液体处理层，或类似结构。所示外覆盖物 40 包括具有外表面 110 和对着的内表面 112 的单层，但可替代地包括多层合成物。永久和活动图形可设于外覆盖物 40 上，这包括特定位置，例如在外表面 110 上，在内表面 112 上，在基底 124 放置在外覆盖物或靠近外覆盖物放置的表面上，在基底 124 和外覆盖物之间，在液体储存层 120 的面对外覆盖物的表面上，或在液体储存层和基底 124 之间。永久和活动图形的各种其他位置适合使用吸收组件 44 和外覆盖物 40 的不同构形，包括但不限于在吸收组件或外覆盖物的一层内。

如前所述, 所示训练裤 20 具有一个侧片 34, 该侧片设于吸收底盘 32 的每一侧上。在所示实施例中, 使用本领域的普通技术人员所公知的连接方式例如粘合剂、热或超声粘合, 将该对横向相对的侧片 34 永久地粘合到吸收底盘 32 上, 并且永久地相互粘合。

5 侧片 34 最好包括一种弹性材料, 该弹性材料能在平行于训练裤 20 的横轴线 49 的方向上拉伸。合适的弹性材料, 以及将弹性侧片结合到训练裤上的所述过程, 在下面的美国专利中描述: 授予 Van Gompel 等人的于 1990 年 7 月 10 日公开的 4940464 号专利; 授予 Pohjola 的于 1993 年 7 月 6 日公开的 5224405 号专利; 授予 Pohjola 的于 1992 年 4 月 14
10 日公开的 5104116 号专利; 和授予 Vogt 等人的于 1991 年 9 月 10 公开的 5046272 号专利; 所有这些专利的内容在此提供作为参考。在特定实施例中, 弹性材料包括拉伸-热层压件 (STL), 颈缩-粘合层压件 (NBL), 双面颈缩层压件, 或拉伸-粘合层压件 (SBL) 材料。制造这些材料的方法对本领域的普通技术人员是熟知的, 并且这些方法描述
15 在授予 Wisneski 等人的于 1987 年 5 月 5 日公开的 4663220 号美国专利; 授予 Mormon 的于 1993 年 7 月 13 公开的 5226992 号美国专利; 和以 Taylor 等人名义于 1987 年 4 月 8 日出版的 EP0 217 032 号欧洲专利申请; 所有这些专利的内容在此提供作为参考。替代地, 侧片材料可包括其他织造或非织造材料, 例如上述的适合于外覆盖物 40 或体侧
20 衬里 42 的那些材料。

可以估计, 为达到说明的意图而给出的前述实施例的细节不限制本发明的范围。虽然, 上面仅详细描述了本发明的几个典型实施例, 本领域的普通技术人员容易理解在典型实施例中能进行许多修改而不会从根本上背离本发明的新颖的启示和优点。因此, 所有这些修改包
25 括在本发明的范围内, 这由下面的权利要求书和所有等价物所限定。而且, 应该认识到, 设想许多实施例不会获得某些实施例, 特别是优选实施例的所有优点, 但具体优点的缺少不应意味着这种实施例是在本领域的范围之外。

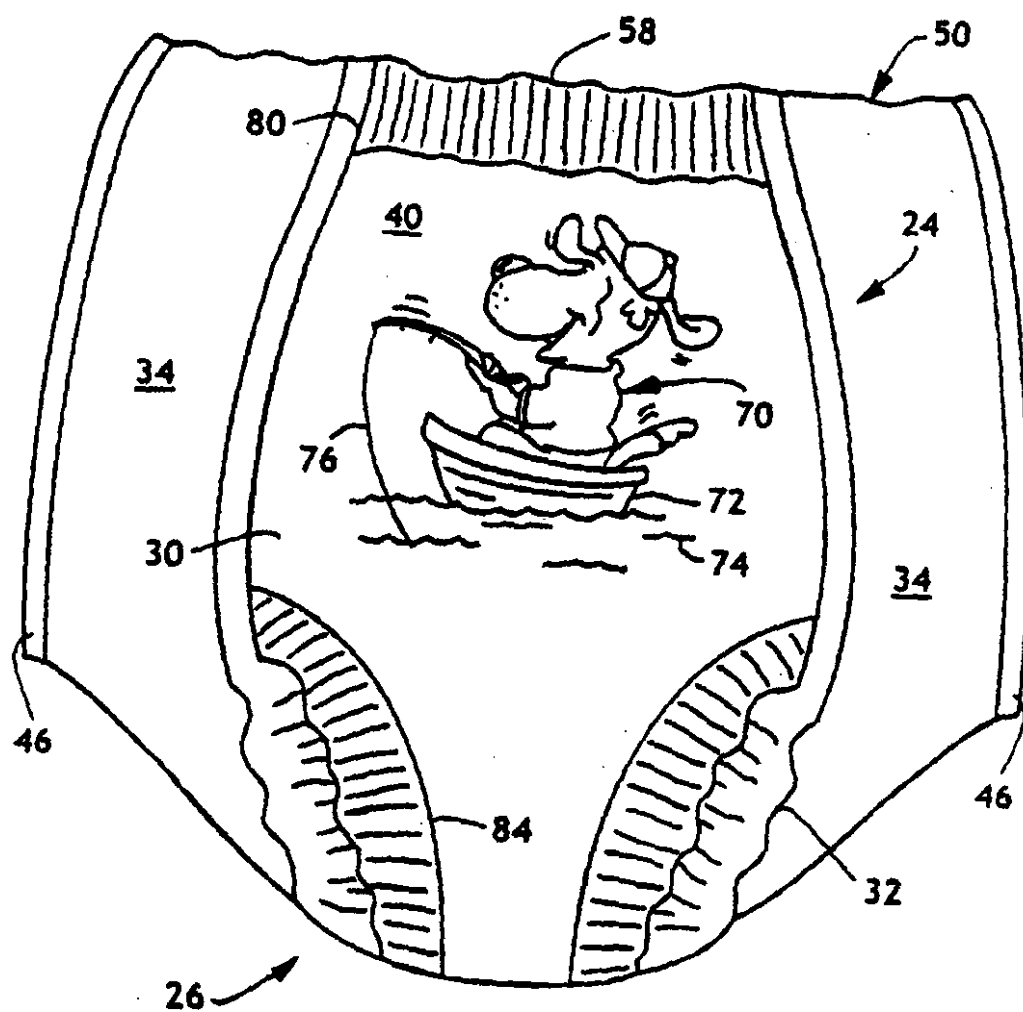


图 2

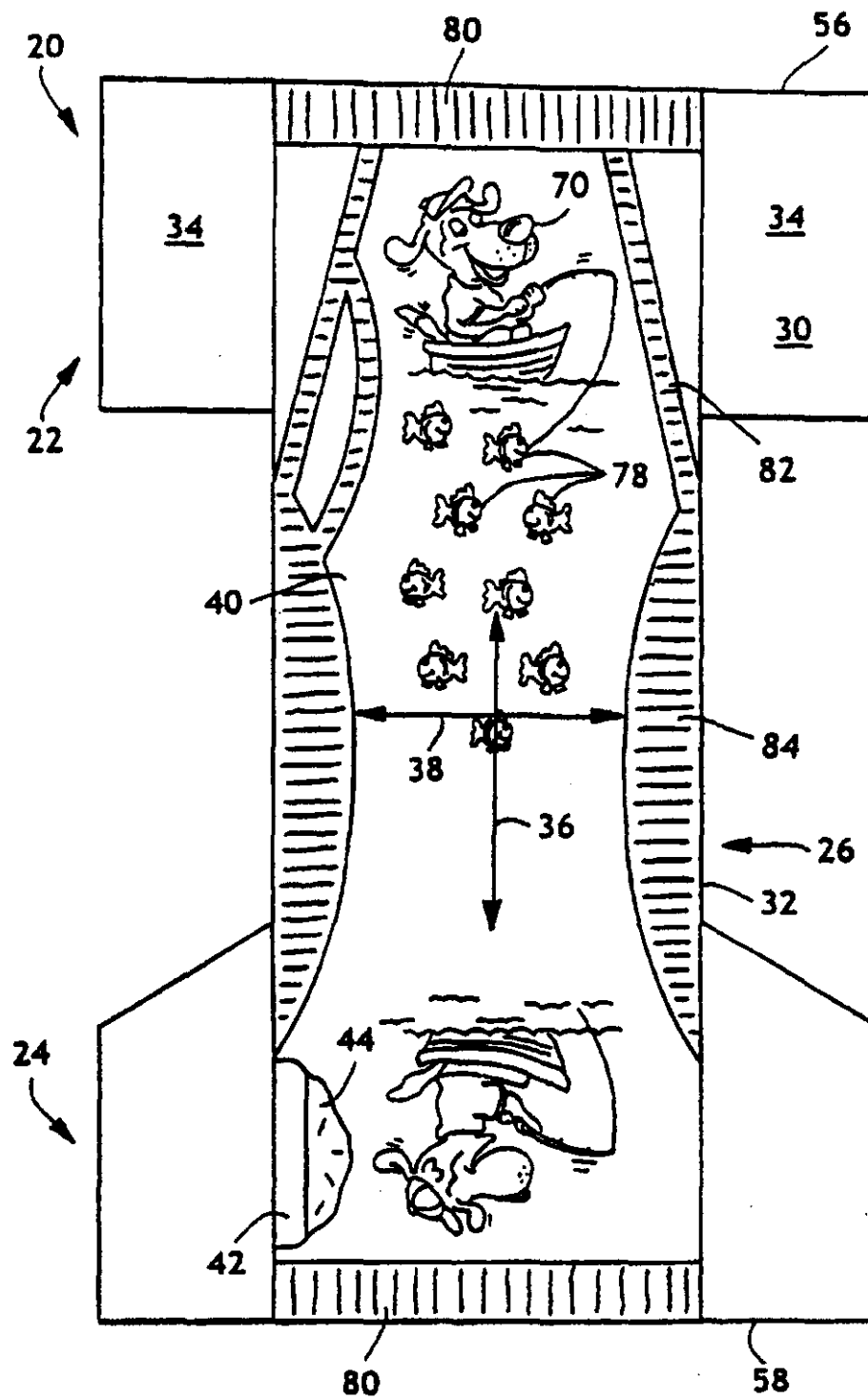


图 3

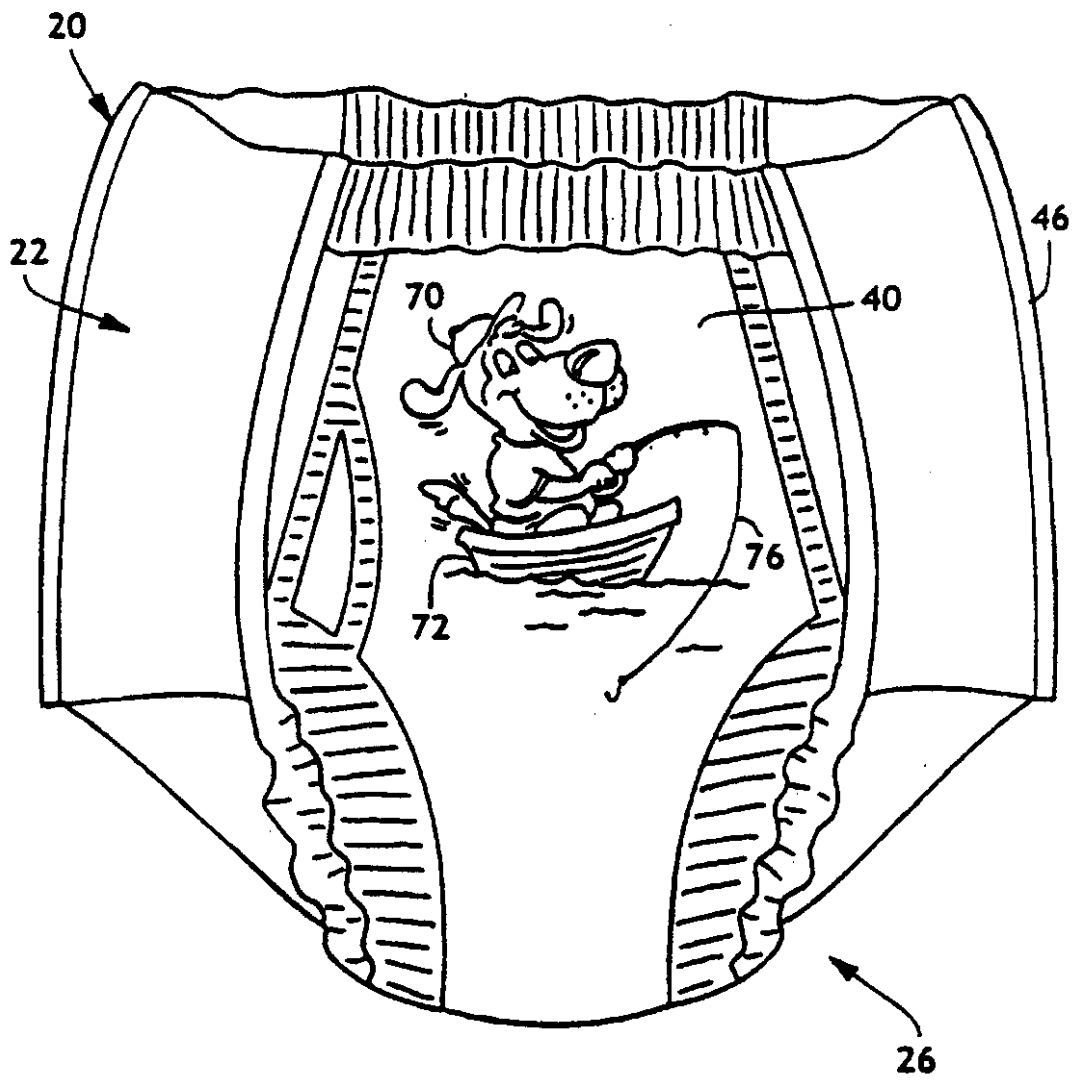


图 4

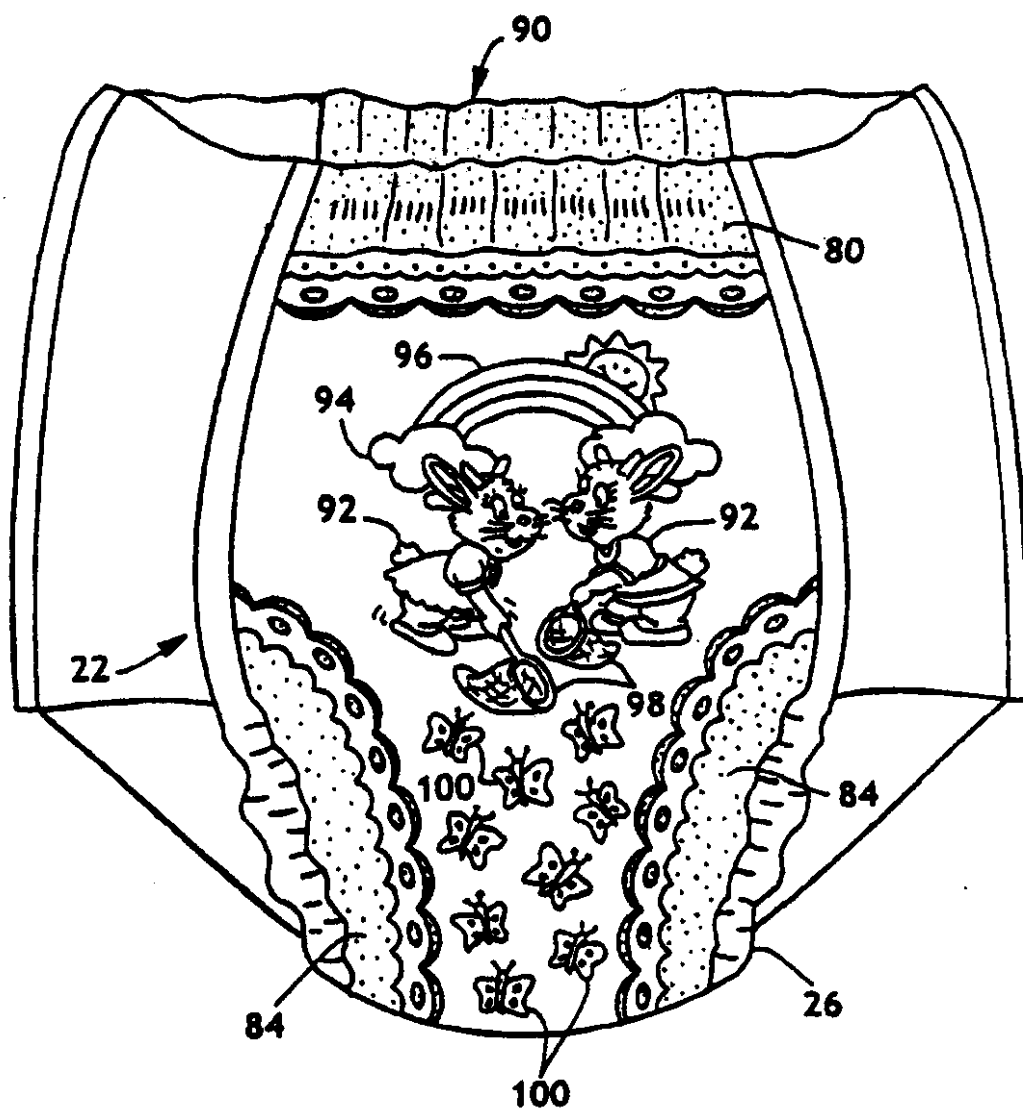


图 5

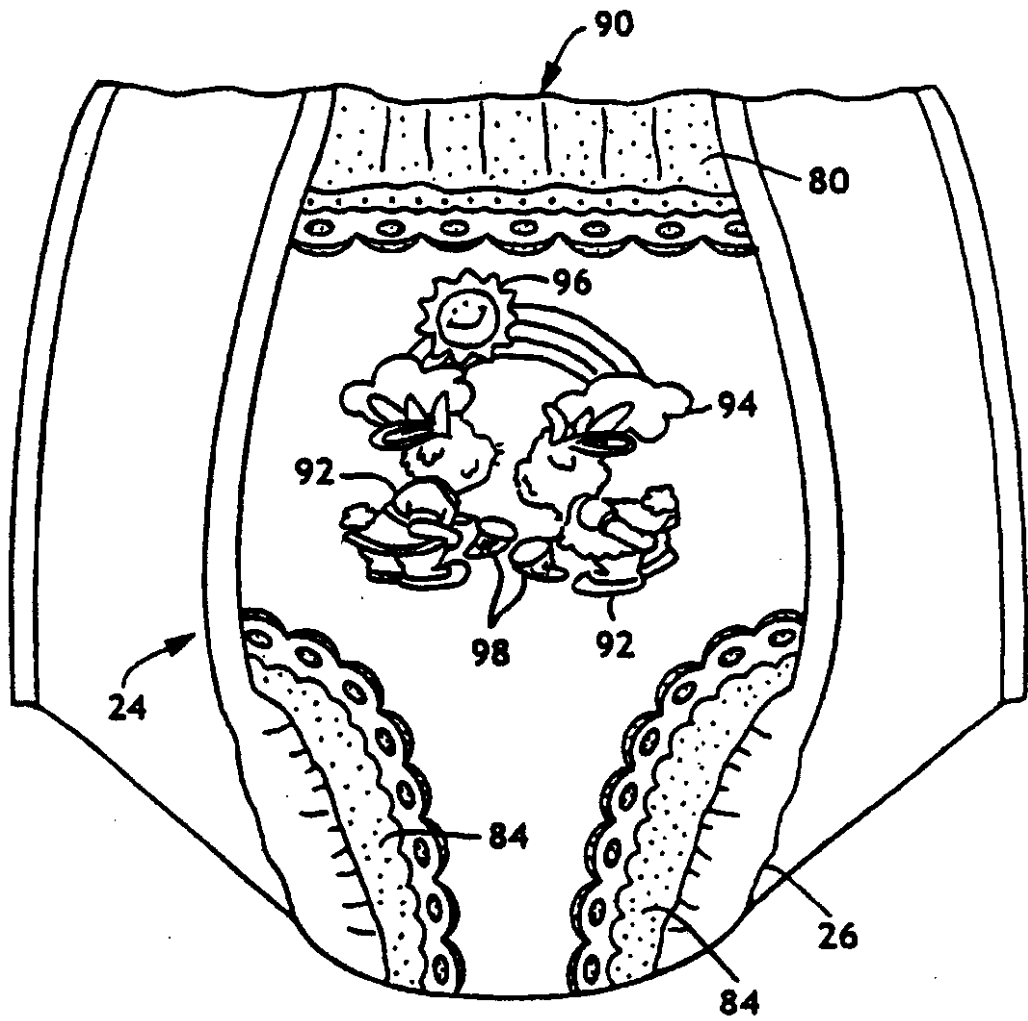


图 6

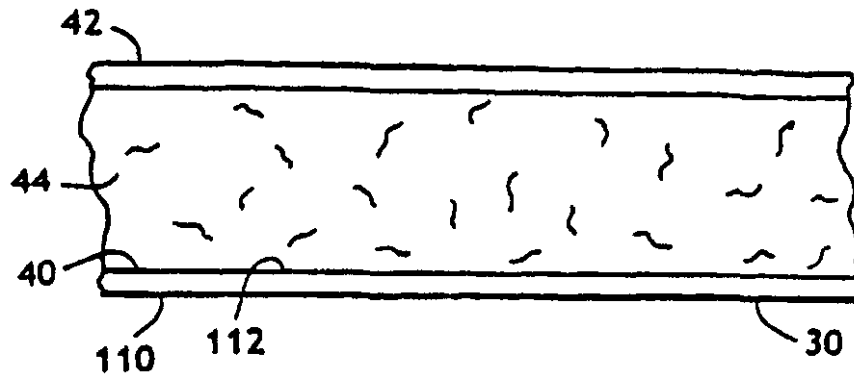


图 7A

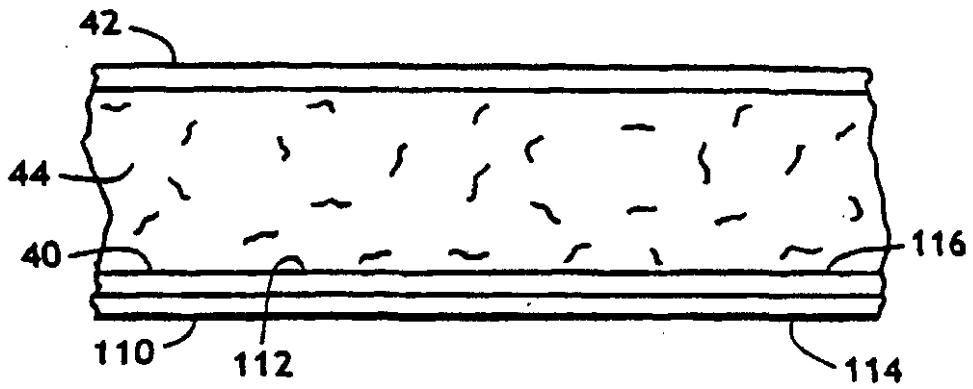


图 7B

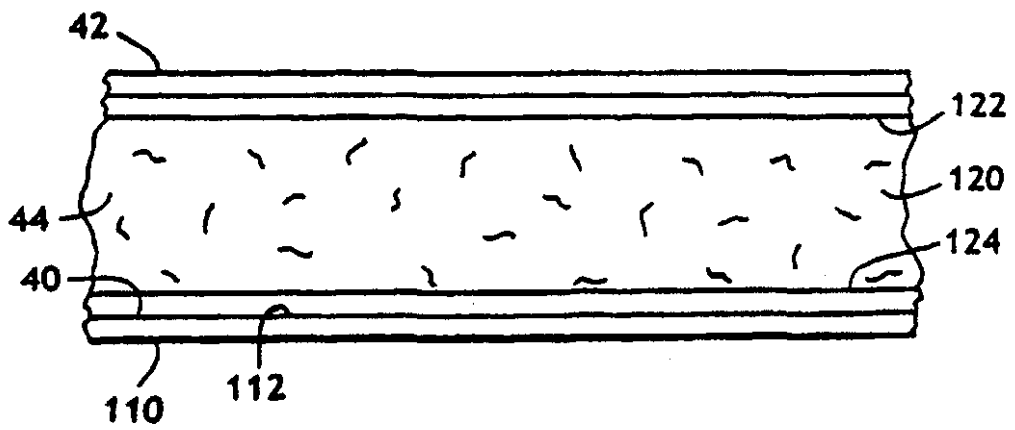


图 7C

HKP0122095

Abstract:

5 **ABSORBENT ARTICLES HAVING WETNESS INDICATING
 GRAPHICS PROVIDING AN INTERACTIVE AID**

10 A disposable absorbent article such as a training pant includes wetness
indicating graphics that provide an interactive training aid. The interactive
graphics can include a permanent character graphic and one or more active
object graphics, which "appear," or "disappear" from view in response to
exposure to urine or the environment. The interactive graphics can also
15 include a story line in which the permanent character graphic is illustrated
performing an activity involving the active object graphic. The wetness
indicating feature and the graphic story line allow the caregiver to interact
with the child in an educational and motivational manner to enhance the toilet
training process.