CLAIMS AS FILED

1. An absorbent core composite for incorporation into a disposable absorbent article, the absorbent core composite comprising:

a first material layer;

a second material layer at least partially secured to the first material layer by bond sites to define a plurality of pockets therebetween, each pocket having a fixed initial volume, wherein said first material layer is flat relative to the second material layer and said pocket, and, in each pocket, said second material layer is spaced vertically from the first material layer; and

an aggregate of absorbent particles disposed in the pocket and on the flat first material, wherein the absorbent particles are characterized by a dry volume associated with a dry state and a swell volume associated with a liquid saturation state, and wherein, the aggregate is characterized by a collective dry volume and a collective swell volume, wherein said pocket has an initial configuration that defines said fixed initial volume and retains said aggregate; and means for altering said initial pocket configuration during use to accommodate the collective swell volume of said aggregate; and

wherein the bond sites define a bond pattern of the pockets wherein the bond sites define a flat periphery of each pocket and material of the second material layer rise above the flat periphery and over the aggregate encased in the pocket; and

wherein said bond sides are permanent bond sites, such that said first and second material layers are bonded at the bond sites in an expanded configuration of the pockets.

2. The absorbent core composite of claim 1, wherein said absorbent particles are SAP and said altering means includes said pocket being expandable from said initial configuration toward an expanded configuration under which an increased pocket volume accommodates the collective swell volume, the collective swell volume being greater than the collective dry volume.

3. The absorbent core composite of claim 2, wherein said altering means includes at least one of said first and second material layers being elongatable or extendible in response to swelling of said SAP aggregate in said pocket.

4. The absorbent core composite of claim 3, wherein said material layer has a corrugated outside surface that is extendible.

5. The absorbent core composite of claim 3, wherein said elongatable material layer is a nonwoven layer having a plurality of folds therein extending in the longitudinal direction and laterally extendible.

6. An absorbent core composite for incorporation into a disposable absorbent article, the absorbent core composite comprising:

a first material layer;

a second material layer at least partially secured to the first material layer by embossing bond sites to define a plurality of pockets therebetween, each pocket having a fixed initial volume, wherein said first material layer is flat relative to the second material layer and said pocket, and, in each pocket, said second material layer is spaced vertically from the first material layer; and

an aggregate of absorbent particles disposed in the pocket on said first material layer; and

wherein the absorbent particles are characterized by a dry volume associated with a dry state and a swell volume associated with a liquid saturation state, and wherein, for each pocket, the aggregate is characterized by a collective dry volume and a collective swell volume, the collective swell volume being greater than the initial pocket volume; and

wherein each pocket is expandable from an initial configuration defining the initial volume toward an expanded configuration; and

wherein the bond sites define a bond pattern of the pockets and material of the second material layer rise from and above the bond sites and over the aggregate encased in the pocket; and

wherein said bond sites are permanent bond sites bonding the first and second material layers in said initial and expanded configurations of said pocket, including an expanded configuration accommodating a collective swell volume associated with a liquid saturation state.

7. The absorbent core composite of claim 6, wherein said absorbent particles are SAP particles; and

wherein said expandable configuration of said pocket is responsive to SAP aggregate swell within said pocket.

8. The absorbent core composite of claim 7, wherein said at least one of said first and second material layers is elongatable to an elongated configuration, said expanded configuration being defined at least partly by said one material layer in said elongated configuration.

9. The absorbent core composite of claim 8, wherein said elongatable material layer features a corrugated surface having laterally spaced apart corrugations.

10. The absorbent core composite of claim 8, wherein said elongatable material layer features a plurality of folds.

11. An absorbent core composite for incorporation into a disposable absorbent article, the absorbent core composite comprising:

a first material layer;

a second material layer at least partially secured to the first material layer by embossing bond sites to define a plurality of pockets, each of the pockets having a fixed initial volume, wherein said first material layer is flat relative to the second material layer and said pocket, and, in each pocket, said second material layer is spaced vertically from the first material layer; and

absorbent particles provided in aggregates each disposed in one of the pockets and on the first material layer; and

wherein the absorbent particles are characterized by a dry volume associated with a dry state and swell volume associated with a liquid saturation state, and wherein, for each pocket, the aggregate is characterized by a collective dry volume and a collective swell volume, the collective swell volume being greater than the initial pocket volume; and

wherein each pocket is expandable from an initial configuration partially defining the initial volume toward an expanded configuration under which an increased pocket volume accommodates the collective swell volume; and

wherein for each pocket, the first material layer has a pressure sensitive configuration, such that pressure generated by the aggregate transforming into the collective swell volume initiates expansion of the first material layer from an initial configuration partially defining the

initial volume toward an expanded configuration under which an increased pocket volume accommodates the collective swell volume.

12. The absorbent core composite of claim 11, wherein the first material layer has a corrugated surface, such that a plurality of corrugations is present in the initial configuration and substantially absent in the second configuration, and wherein the corrugations are directed generally in a longitudinal direction of the core composite.

13. A disposable absorbent article, comprising:

a chassis body defined by a first end margin and a second end margin longitudinally spaced from the first end margin, the end margins partially defining front and back waist regions that are positioned about a wait of a user during wear of the absorbent article;

a topsheet;

a backsheet; and

an absorbent core composite disposed between the topsheet and backsheet, said composite including,

a first nonwoven layer;

a second nonwoven layer at least partially secured to the first nonwoven layer by embossing bond sites to define a plurality of pockets therebetween, each pocket having a fixed initial volume, wherein said first material layer is flat relative to the second material layer and said pocket, and, in each pocket, said second material layer is spaced vertically from the first material layer; and

an aggregate of SAP particles disposed in the pocket to occupy a portion of the fixed initial volume, wherein the SAP particles are characterized by a dry volume associated with a dry state and a swell volume associated with a liquid saturation state, and wherein, for the pocket, the aggregate is characterized by a collective dry volume and a collective swell volume, wherein said pocket has an initial configuration that retains said aggregate; and

wherein an outside surface of said first nonwoven layer exhibit surface discontinuities in said initial configuration of said pocket, said outside surface being extendible to substantially remove said discontinuities and place said pocket in an expanded configuration defining an increased pocket volume.

~~14. The disposable absorbent article of claim 13, wherein said discontinuities include folds that are removable upon extension of said outside surface.~~

~~15. The disposable absorbent article of claim 14, wherein said discontinuities include pleats that are extendible upon extension of said outer surface.~~

~~The disposable absorbent article of claim 14, wherein said discontinuities include corrugations that are extendible upon extension of said outer surface.~~

1. An absorbent core composite for incorporation into a disposable absorbent article, the absorbent core composite comprising:

a first material layer having an outside surface forming a bodyside outer surface of the absorbent core composite;

a second material layer having an outside surface forming an opposite outer surface of said absorbent core composite; and

a first layer of absorbent particles disposed between said outer surfaces of the absorbent composite and having an average size dimension;

a second layer of absorbent particles disposed between said outer surfaces of the absorbent composite, said absorbent particles of said second layer having an average size dimension less than the average size dimension of said absorbent particles of said ~~the~~ first layer; and

wherein said first layer of absorbent particles are situated substantially in the first material layer and the second layer of absorbent particles are situated substantially in the second material layer; and

wherein said first material layer is a low density nonwoven and said second material layer is a nonwoven having a higher density than the low density nonwoven.

2. The absorbent composite of claim 1~~7~~, wherein said average size dimension of said absorbent particles of the first layer is greater than 300 microns and said average size dimension of said absorbent particles of the second layer is between 0 and ~~-~~300 microns.

3. The absorbent composite of claim 1~~7~~, wherein said first material layer has ~~is~~ a low density of from 0.01 to 0.03 g/cc.~~nonwoven and said second material layer is a nonwoven having a higher density than the low density nonwoven.~~

4. The absorbent composite of claim 1~~7~~, further comprising an intermediate layer of absorbent particles situated between said first and second layer of absorbent particles, wherein said absorbent particles are SAP particles.

5. The absorbent composite of claim ~~2~~04, wherein an average size dimension of SAP particles, in microns, in each of the first, second, and intermediate layer of absorbent particles are 0 and ~~-~~300, between 300 and~~-~~ 600, and between 600 and ~~-~~850, respectively.

6. The absorbent composite of claim ~~21~~5, wherein said first, intermediate, and second material~~s~~ layers have densities ~~a density~~ of from 0.01 to 0.03 g/cc, from 0.03 to 0.08 g/cc, and from 0.09 to 0.12 g/cc, respectively.

~~A method of forming an absorbent composite for incorporation into a disposable absorbent article, said method comprising:~~

~~providing a first material layer;~~

~~positioning a second material layer beneath the second material layer;~~

~~providing a supply of absorbent particles composed of a population of a first absorbent particles having a first average size dimension and a second population of absorbent particles having a second average size dimension less than the first average size dimension; and~~

~~depositing the first and second populations of absorbent particles onto the first to material layer such that absorbent particles of the first population are maintained in the first material layer and absorbent particles of the second population filter through the first material layer and settle in the second material layer; and~~

~~supplying an intermediate population of absorbent particles having an average size dimension intermediate that of the first and second populations; and~~

~~wherein said depositing includes depositing said second population of absorbent particles prior to depositing said intermediate population of absorbent particles and depositing said first population after depositing said intermediate population of absorbent particles such that the second population of absorbent particles filters through the first an intermediate material layers to the second material layer, said intermediate population of absorbent particles filters through the first material layer and settle in the intermediate material layer, and said first population of absorbent particles settles in the first material layer.~~

~~The method of claim 23, wherein the first material layer is a low density nonwoven having a density between 0.01 to 0.03 g/cc and the second material layer is a higher density nonwoven.~~

~~The method of claim 23, further comprising conveying the first and second material layers to an area of travel wherein said depositing of said absorbent particles onto the first material layer occurs.~~

~~The method of claim 23, wherein said first and second material layers are moved past said area of travel such that said second population of absorbent particles filters through the first material layer as said first and second material layers are conveyed after said depositing.~~

~~The method of claim 23, further comprising energizing the first and second material layers after depositing to promote said filtering.~~

~~The method of claim 27, wherein said energizing includes vibrating said first and second material layers.~~

~~The method of claim 23, further comprising:~~

~~positioning an intermediate material layer intermediate said first and second material layers, wherein said first, intermediate, and second material layers have a density of 0.01 to 0.03 g/cc, 0.03 to .08 g/cc, and 0.09 to 0.12 g/cc, respectively.~~

~~The method of claim 29, further comprising supplying an intermediate population of absorbent particles, wherein the average size dimension of said first, intermediate, and second populations, in microns, are 0-300, 300-600, and 600-850, respectively; and wherein said depositing includes simultaneously depositing said first, second, and intermediate populations of absorbent particles such that said second population of absorbent particle filters through the first and intermediate material layers to the second material layer and said intermediate population of absorbent particles filter through the first material layer and settle in the intermediate material layer.~~

~~The method of claim 23, further comprising energizing the first, second, and intermediate material layers after depositing to promote said filtering of second and third populations of absorbent particles.~~

~~A method of making an absorbent composite for incorporation into a disposable absorbent garment, said method comprising:~~

~~conveying a first sheet of a first nonwoven layer;~~

~~depositing absorbent particles on said first sheet;~~

~~applying a second sheet of a second nonwoven layer over the deposited absorbent particles and first sheet, thereby forming a composite including said two material layers sandwiching absorbent particles therebetween; and~~

~~bonding said first and second material layers to secure, at least partially, said absorbent particles therebetween.~~

~~The method of claim 32, further comprising, prior to said conveying said first sheet, deforming a surface of said first sheet to form laterally elongatable surface discontinuities.~~

~~The method of claim 33, wherein said discontinuities are corrugations.~~

~~A method of making an absorbent composite for incorporation into a disposable absorbent garment, said method comprising:~~

~~conveying a first sheet of a first nonwoven layer;~~

~~depositing absorbent particles on said first sheet;~~

~~applying a second sheet of a second nonwoven layer over the deposited absorbent particles and first sheet, thereby forming a composite including said two material layers sandwiching absorbent particles therebetween; and~~

~~bonding said first and 'second material layers to secure, at least partially, said absorbent particles therebetween, further comprising, prior to said conveying said first sheet or said second sheet, folding one or more sections of a surface of said first sheet to form laterally elongatable folds thereon.~~

~~The method of claim 35, wherein said conveying said first sheet is preceded by providing folded sections in said first sheet; and~~

~~wherein, after applying said second sheet, unfolding said folded sections to reveal lanes free of absorbent particles.~~

~~The method of claim 35, wherein said folded sections are pleats.~~

~~The method of claim 32, further comprising:~~

~~selecting a non-SAP particle from the group of non-SAP particles consisting of: ion exchange particles; inert particles smaller than the SAP particles; hotmelt particles;~~

volatile particles; water-soluble particles smaller than the SAP particles; and combinations thereof; and

wherein said depositing includes depositing SAP and said selected non-SAP particle.

The method of claim 32, further comprising:

depositing ion-exchange particles on selected areas of the first sheet; and

severing an absorbent core from the absorbent core composite, said absorbent core having end zones spaced away from a central region corresponding to a crotch region of the disposable absorbent article, said end zones corresponding to said selected areas of the core, whereby said end zones include ion-exchange particles and said absorbent particles.

The method of claim 32, wherein said depositing includes depositing SAP in laterally spaced apart lanes, such that one or more longitudinally extending SAP-free lanes is situated between a pair of SAP-containing lanes.

The method of claim 40, wherein said depositing includes depositing SAP of different absorbent properties in each of said SAP containing lanes.

The method of claim 40, further comprising, after applying said second sheet, slitting the composite along one or more of said SAP-free lanes to produce multiple absorbent core composites of reduced width.

A method of making an absorbent composite for incorporation into a disposable absorbent garment, said method comprising:

conveying a first sheet of a first nonwoven layer;

depositing absorbent particles on said first sheet;

applying a second sheet of a second nonwoven layer over the deposited absorbent particles and first sheet, thereby forming a composite including said two material layers sandwiching absorbent particles therebetween; and

bonding said first and second material layers to secure, at least partially, said absorbent particles therebetween, further comprising folding said absorbent composite to form a two-layer absorbent composite.

The method of claim 43, wherein said folding includes folding two flaps toward one another to form a top layer above a bottom layer.

~~The method of claim 43, wherein said bonding defines a plurality of pockets of absorbent particles, such that each layer of said two-layer absorbent composite has said pockets thereon.~~

~~The method of claim 32, wherein said bonding includes applying a bonding pattern of intermittent bonds.~~

~~The method of claim 32, wherein said bonding applies a pattern of diamond shaped pockets.~~

~~The method of claim 46, further comprising applying a hotmelt particle onto said absorbent particles after depositing on said first sheet.~~

~~The method of claim 48, further comprising applying heat to melt the hotmelt particles in said absorbent particles.~~

~~The method of claim 32, further comprising applying a hotmelt fiber over the absorbent particles after depositing, whereby said hotmelt fibers, after bonding, are disposed between said second sheet and a layer of said absorbent particles.~~

~~The method of claim 50, wherein said hotmelt fiber is extruded during said applying over the absorbent particles.~~

~~The method of claim 32, further comprising spraying a hotmelt adhesive over said absorbent particles prior to applying said second sheet.~~

~~The method of claim 32, wherein said second sheet is an open nonwoven material, said method further comprising bonding said outer surface of said second sheet.~~

~~The method of claim 53, wherein said bonding said outer surface includes applying hotmelt adhesive thereon.~~

7. An absorbent core composite for incorporation into a disposable absorbent article, the absorbent core composite comprising:

a bodyside first material layer; and

a second material layer;

wherein said first and second material layers define a space therebetween, said space containing particles; and

wherein said particles include a population of SAP particles and a population of non-SAP spacing particles that are smaller than said SAP particles and generally positioned between two or more of said SAP particles, thereby spacing said two or more SAP particles from one another.

8. The absorbent core composite of claim 7, wherein said non-SAP spacing particles comprise inert particles; water-soluble particles; volatile particles; ion-exchange particles; or combinations thereof.

9. The absorbent core composite of claim 7, wherein said particles include hotmelt binder particles.

10. The absorbent core composite of claim 9, wherein a ratio of a number of said SAP particles to a number of said hotmelt binder particles is about 1:1.

11. The absorbent core composite of claim 10, wherein said hotmelt binder particles are water sensitive hotmelt particles.

12. The absorbent core composite of claim 7, wherein the SAP particles comprise spherical SAP; flake form SAP; superabsorbent fiber SAP; or combinations thereof.

13. The absorbent core composite of claim 7, wherein said non-SAP spacing particles are hotmelt particles that melt upon application of heat.

14. A disposable absorbent article, comprising:

a chassis body defined by a first end margin and a second end margin longitudinally spaced from the first end margin, the end margins partially defining front and back waist regions that are positioned about a wait of a user during wear of the disposable absorbent article;

a topsheet;

a backsheet; and

an absorbent composite disposed between the topsheet and the backsheet, the absorbent composite including:

a first material layer having an outside surface;

a second material layer having an outside surface;

a first layer of absorbent particles provided between said outside surfaces; and

a second layer of absorbent particles provided between said outside surfaces, said second layer of absorbent particles having absorbent properties different from said first layer of absorbent particles;

wherein said first layer of absorbent particles, said second layer of absorbent particles, and said first and second material layers together form an absorbent body, said absorbent body

being folded such that said first layer of absorbent particles is folded onto the second layer of absorbent particles.

15. The disposable absorbent article of claim 14, wherein said second layer of absorbent particles is situated in said second material layer, said absorbent particles of said second layer of absorbent particles being generally smaller than said absorbent particles of said first layer of absorbent particles, and wherein said second material layer is positioned beneath the first material layer and has a lower density than the first material layer, said absorbent composite further comprising an intermediate material layer situated between said first and second material layers and having a density intermediate that of the first and second material layers.

16. The disposable absorbent article of claim 15, wherein said absorbent particles are SAP particles, said first and second material layers being bonded at a plurality of bond sites to define a plurality of pockets each containing said SAP particles.

17. The disposable absorbent article of claim 14, wherein said absorbent body is folded along two fold lines such that two flaps come together to form the first layer of absorbent particles adjacent the second layer of absorbent particles.

18. A disposable absorbent article, comprising:

a chassis body defined by a first end margin and a second end margin longitudinally spaced from the first end margin, the end margins partially defining front and back waist regions that are positioned about a wait of a user during wear of the disposable absorbent article;

a topsheet;

a backsheet; and

an absorbent composite disposed between the topsheet and the backsheet, the absorbent composite including:

a first material layer having an outside surface;

a second material layer having an outside surface;

a first layer of absorbent particles provided between said outside surfaces; and

a second layer of absorbent particles provided between said outside surfaces, said second layer of absorbent particles having absorbent properties different from said first layer of absorbent particles;

wherein said first and second material layers are bonded at a plurality of bond sites to define a plurality of spaced apart pockets each containing SAP aggregates.

19. The disposable absorbent article of claim 18, wherein said absorbent particles are SAP particles, said first layer of absorbent particles being laterally spaced from the second layer of absorbent particles by a longitudinally extending SAP-free zone.

20. A disposable absorbent article, comprising:

a chassis body defined by a first end margin and a second end margin longitudinally spaced from the first end margin, the end margins partially defining front and back waist regions that are positioned about a wait of a user during wear of the disposable absorbent article;

a topsheet;

a backsheet, and

an absorbent composite disposed between the topsheet and the backsheet, the absorbent composite including:

a first material layer having an outside surface;

a second material layer having an outside surface;

a first layer of absorbent particles provided between said outside surfaces; and

a second layer of absorbent particles provided between said outside surfaces, said second layer of absorbent particles having absorbent properties different from said first layer of absorbent particles;

wherein said at least one of said layers of absorbent particles is divided into two outer zones and a central zone therebetween, said central zone having a SAP composition different from SAP compositions in each of the outer zones and having SAP an absorption property different from absorption properties of each of the outer zones.

21. The disposable absorbent article of claim 20, wherein said SAP composition of said central zone is characterized as slow absorbing with high absorption underload and high permeability, and said SAP composition of said outside zones is characterized as slow absorbing with low absorption underload and low permeability.

22. The disposable absorbent article of claim 20, wherein said outside zones include a mixture of SAP particles and ion-exchange materials.