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(54) CLEANING WIPE COMPRISING INTEGRAL, SHAPED TAB PORTIONS

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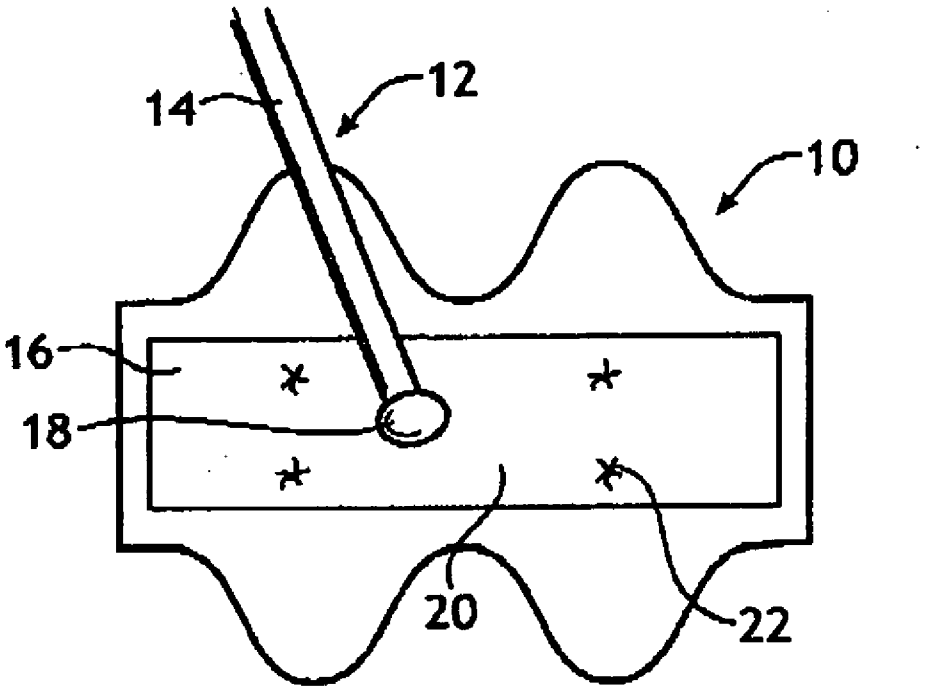
(57) **ABSTRACT**

A cleaning wipe comprising integral, shaped tab portions adapted to engage the fastening devices of a cleaning tool is disclosed. Such wipes are generally more efficient, in that a greater percentage of the total surface area of the wipe is used for its intended purpose: cleaning and wiping. Furthermore, such wipes generally may more tenaciously engage certain kinds of fastening devices, thereby making these wipes potentially more effective. Processes for making said wipes, and packages and marketing methods for presenting said wipes to consumers, are also disclosed.



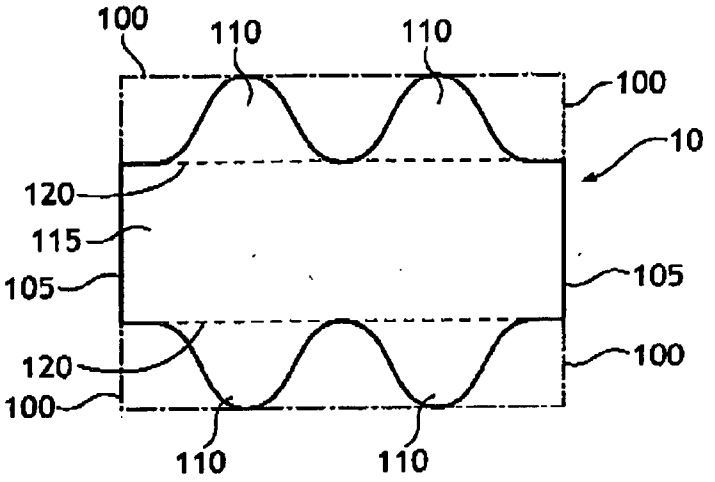


FIG. 1A

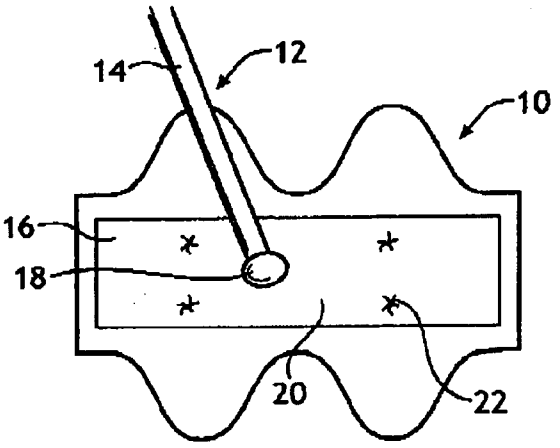


FIG. 1B

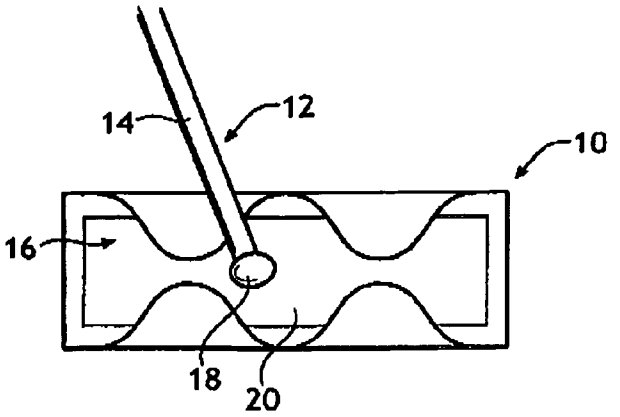


FIG. 1C

FIG. 2A

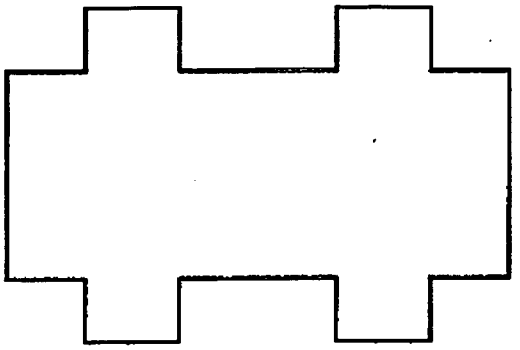


FIG. 2B

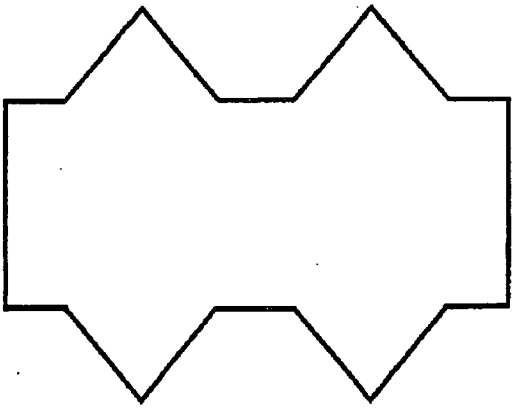


FIG. 2C

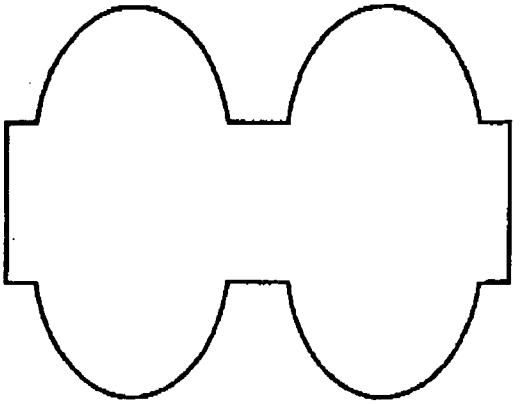


FIG. 3A

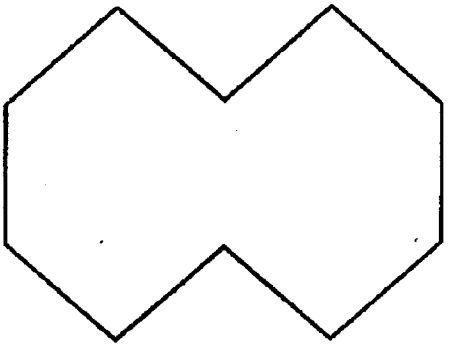
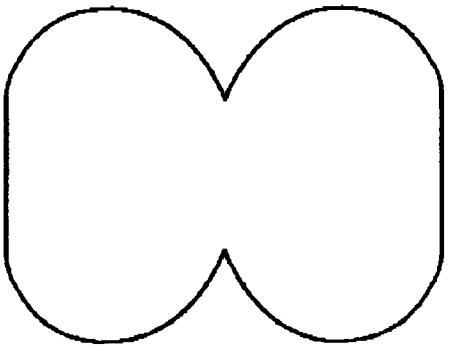


FIG. 3B



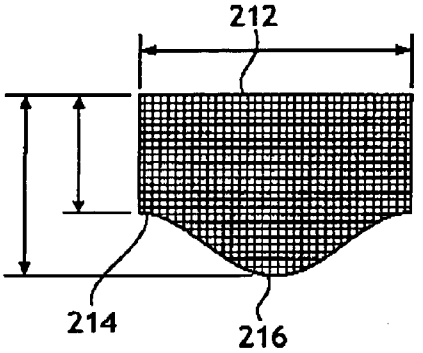


FIG. 4A

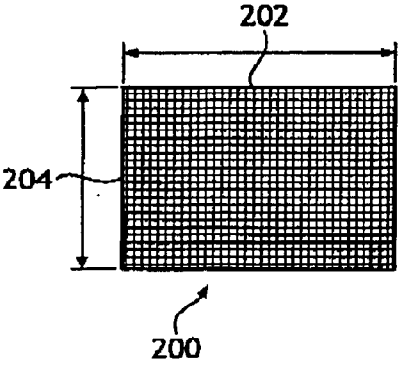


FIG. 4B

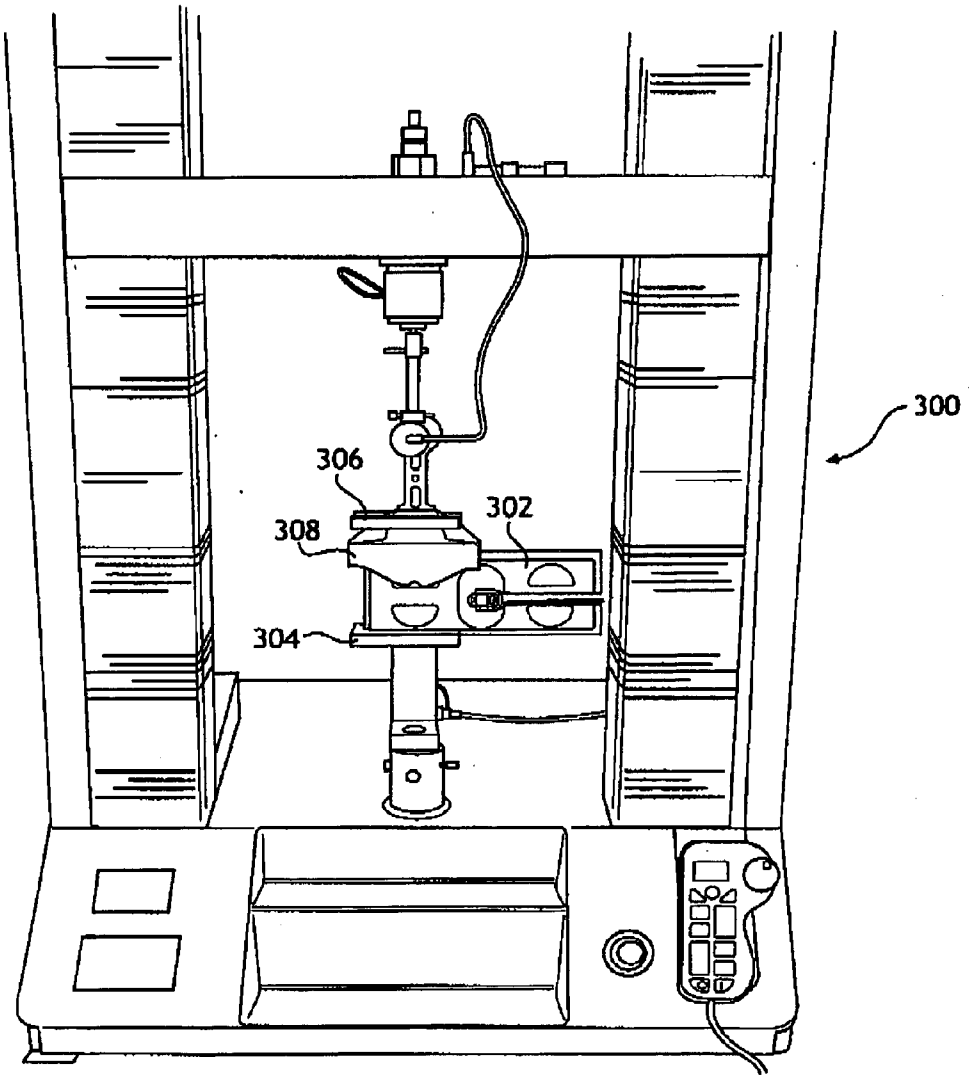


FIG. 5

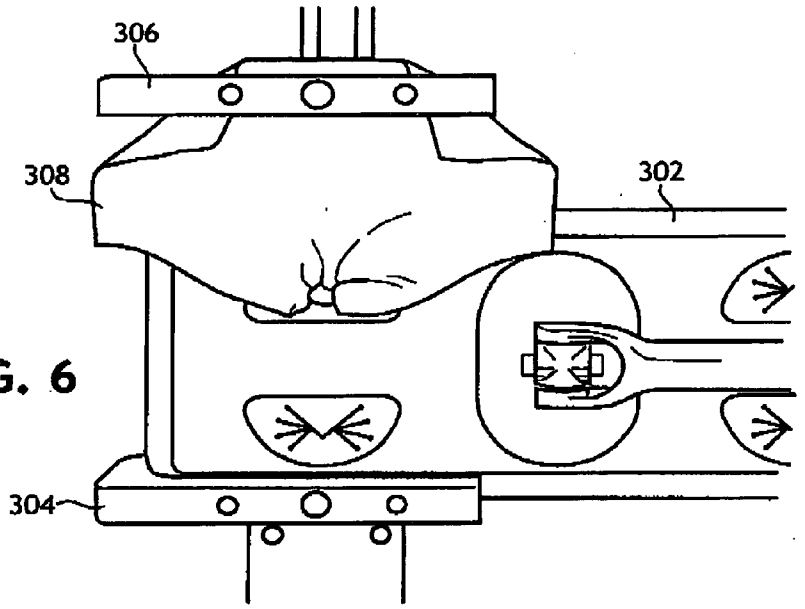


FIG. 6

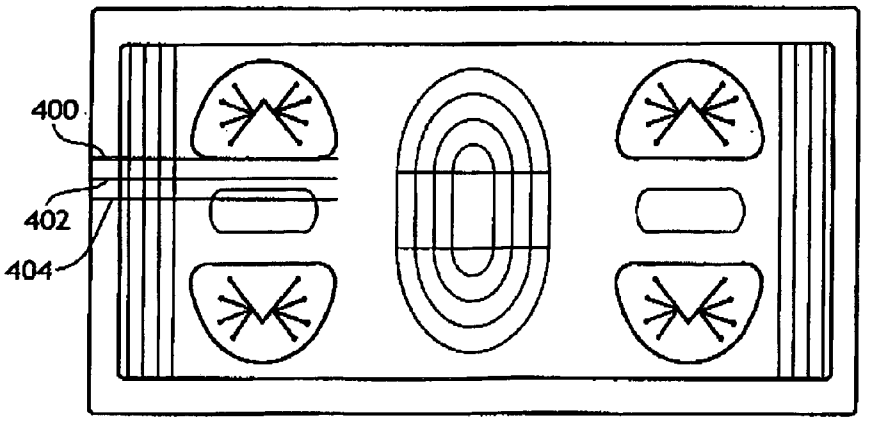


FIG. 7

FIG. 8A

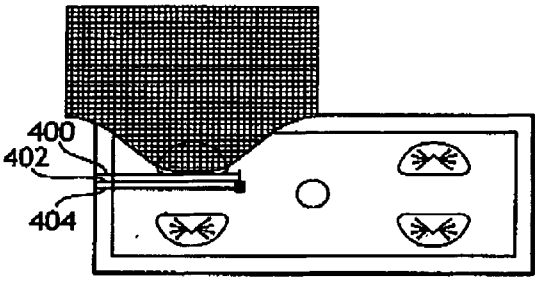
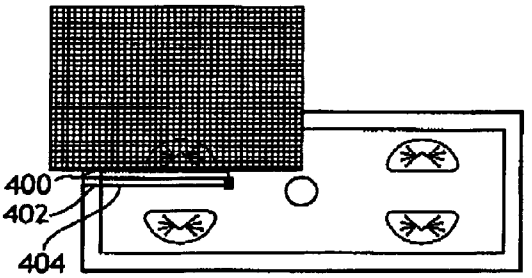


FIG. 8B



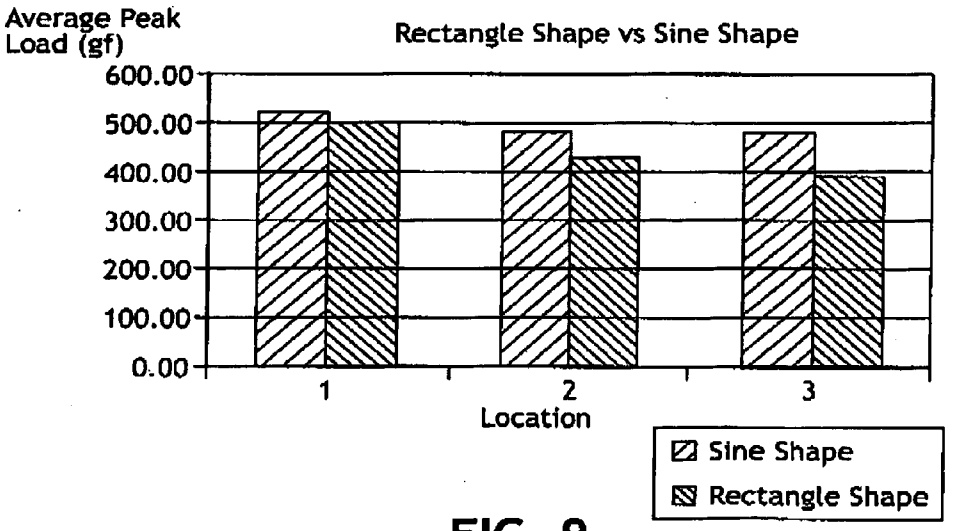


FIG. 9

CLEANING WIPE COMPRISING INTEGRAL, SHAPED TAB PORTIONS

BACKGROUND

[0001] Cleaning tools, such as mops, are commonly used in order to clean surfaces and other objects found in industry and residential settings. Mops typically include an elongated handle with a mop head attached to the handle. Various types of disposable cleaning wipes are well known in the art as stand-alone products or for attachment to any manner of cleaning tool, such as a mop, hand-held scrubbing device, and so forth. A disposable wipe or pad component may be attached to the mop head, with the wipe configured to pick up dirt, lint, fluid, and other material from a surface when the mop head is moved over the surface. The disposable wipe may be designed to pick up these materials in a dry or wet state. Once the disposable wipe reaches the end of its design life, the user may remove the wipe from the mop head and subsequently dispose of the wipe. At such time, a new disposable wipe may be applied to the mop head in order to resume or start cleaning.

[0002] The bottom surface of a conventional mop head, or other type of cleaning tool, is generally flat and the attached disposable wipe is pressed flat against the surface to be cleaned, which typically is also a substantially uniform flat surface. Various configurations have been used in the art to removably attach the disposable wipes to the mop head or other cleaning implement. For example, one conventional method utilizes fastening devices provided on the top side of the mop head, such as slits, clips, or other mechanical devices formed into, or attached to, the mop head. Such wipes have lateral, linear edges that are pulled by the user so as to extend over and onto the top side of the mop head to be tucked into retaining slits or otherwise engaged by clips or other devices on the top side of the mop head. That portion of the disposable wipe contiguous with the lateral edges attached to the top side of the mop is generally not available for the wipe's intended cleaning purpose. I.e., only that portion of the wipe adjacent to the bottom side of the mop used to wipe or otherwise clean surfaces is actually used for this purpose. Accordingly, conventional, rectangular wipes result in waste when used with such mops.

[0003] What is needed is a cleaning wipe that may be used with conventional mops or other such devices, including hand-held scrubbing devices, but which allow for convenient attachment to any top-side fastening elements while minimizing waste associated with some portion of the wipe being unavailable to contact surfaces that are being cleaned or wiped.

SUMMARY

[0004] We have determined that a wipe comprising shaped, integral tab portions may be adapted to engage the top-side fastening devices of a mop or other hand-held scrubbing device, while simultaneously reducing or minimizing the amount of wipe material required to fold up and around the mop head or scrubbing device for attachment purposes. Such novel configurations reduce waste and provide for an increased percentage of the total wipe surface area being made available for its intended purpose: cleaning and wiping surfaces. Furthermore, we have surprisingly found that such integral, shaped tab portions may engage certain fastening devices on a mop head or hand-held scrubbing device more tenaciously, thereby allowing for more vigorous cleaning and wiping without accidental release of the wipe from one or more fastening devices.

[0005] A variety of shapes may be used. For example, a wipe can be die cut, stamped, or otherwise formed such that the wipe has a shape analogous to the letter "H". I.e., the horizontal line or bar of the letter "H" corresponds to a substantially rectangular shape and size adapted to be disposed next to a rectangular bottom side of a mop head or other scrubbing device (if such mop or scrubbing device had a rectangular bottom side). This part of the wipe may be thought of as the primary cleaning surface or substrate of the wipe, as this is the part or surface that will be used for cleaning and/or wiping purposes. Each of the vertical lines of the letter "H" correspond to rectangular tabs extending outward from, and integrally connected to, said primary cleaning substrate. These tabs have a width, extend outward for a length, and are located such that the tabs can engage the fastening devices on the top-side of the mop head or scrubbing device. So, for example, if the top side of a rectangular mop head had fastening devices, one in each corner of the mop head, each of the four tabs of the wipe would extend up and around the mop head so that each tab would engage each of the four corresponding fastening devices. The number, location, and shape of the tabs may be varied, so long as the corresponding wipe is adapted to be affixed or attached to a mop head or other cleaning devices, such as a hand-held scrubbing device, while simultaneously reducing waste by increasing the percentage of wipe surface area available for cleaning (compared to the wipe surface area available for cleaning in a conventional rectangular wipe). Furthermore, as will be discussed in more detail below, the primary cleaning surface or substrate may have different shapes to correspond to the shape of the mop head or other support on a cleaning device. For example, if the mop head did not have a rectangular shape, but instead had a shape similar to a triangle with two curvilinear edges and one linear edge (akin to the shape found on the ironing surface on many hand-held irons), then the primary cleaning substrate or surface of the wipe could be shaped similarly, with tabs extending outward from, and integrally connected to, the primary cleaning substrate to engage the top-side fastening devices of the mop head.

[0006] In another version of the invention, the wipe has an hourglass-like shape. I.e., two of the opposing edges are linear—those edges that would lie along the ends of a rectangular mop head. And two of the opposing edges would define a serpentine shape (again, for purposes of the discussion here, each serpentine edge, taken together, define an hourglass shape). As a result, the distance between these two serpentine-shaped edges varies, with a minimum distance at the central portion of the hourglass shape, and a maximum distance at each of the ends of the hourglass shape. Generally the location of the maximum distance between these two opposing edges will correspond to the ends of the wipe, at a location proximate to the location of the top-side fastening elements of the corresponding mop head or other cleaning device (again, this version assumes that the fastening devices on the top side of the mop head or other cleaning device will be proximate to the four corners of a rectangularly-shaped mop head or cleaning device—but, as is discussed above, the wipe and any corresponding tab elements may be shaped to correspond to other geometries). In effect,

the wider ends of the hour-glass-shaped wipe define shaped tabs that may be wrapped up and around the mop head to engage the corresponding fastening elements. Many other shapes comprising curvilinear edges are possible. One such shape comprises opposing, sine-wave-shaped edges.

[0007] Another version of the invention encompasses processes directed to producing the various shaped wipes of the present invention (i.e., wipes comprising integral, shaped tab portions). In one embodiment, the design of the integral, shaped tab portions (i.e., the design of the perimeter traced out by the overall wipe) is selected to meet two criteria: (1) a shape that is adapted to engage and be used with a mop head or other cleaning device, such as a hand-held scrubbing device, while reducing waste and increasing effectiveness of the wipe (i.e., making more of the total surface area of the wipe available for its intended purpose); and (2) a shape that reduces or eliminates waste during production of said shape (e.g., by selecting a shape such that the resulting cleaning wipes are nested during production; so, for example, if a wipe has opposing, sine-wave-shaped edges, then the sine-wave-shaped edges of this first wipe will be adjacent to the sine-wave-shaped edges of the first wipe's immediate neighbors, except for those wipes located adjacent to the linear edge of a fibrous web from which the wipes are being cut).

[0008] Other versions of the invention encompass the packaging and/or marketing of the shaped wipes of the present invention, including the associating of a cleaning wipe of the present invention with brand names or logos of cleaning wipes or cleaning formulations or agents.

[0009] Still other versions of the invention encompass kits comprising the shaped wipes of the present invention.

[0010] Other versions of the invention encompass wipes in which at least about 45% of the total surface area of a side of the wipe is used for its intended purpose of cleaning or wiping; suitably at least about 50% of the total surface area of a side of the wipe is used for its intended purpose of cleaning or wiping; suitably at least about 55% of the total surface area of a side of the wipe is used for its intended purpose of cleaning or wiping; and suitably at least about 60% of the total surface area of a side of the wipe is used for its intended purpose.

[0011] Various features and advantages of the invention, as well as other versions and embodiments, will be set forth in part in the following description, or may be obvious from the description, or may be learned through practice of the invention.

DRAWINGS

[0012] FIG. **1**A representatively illustrates a top view of a laid-flat, shaped wipe of the present invention, in this case a wipe having sine-wave-shaped edges.

[0013] FIG. **1**B representatively illustrates a top view of a mop head (pivotally attached to a mop handle, a part of which is displayed in the figure) placed over the shaped wipe depicted in FIG. **1**A.

[0014] FIG. **1**C representatively illustrates a top view of the mop head and shaped wipe depicted in FIG. **1**B, with the difference being that the tab portions of the wipe (defined by the sine-waved-shaped edges) have been flipped up and over the top side of the mop head. These tab portions are in a position to engage any fastening device adapted to engage a wipe (e.g., slits in the top side of the mop head, into which the tab portions of the wipe may be depressed).

[0015] FIGS. **2**A, **2**B, and **2**C representatively illustrate top-side views of other versions of a laid-flat, shaped wipe of the present invention.

[0016] FIGS. **3**A and **3**B representatively illustrate top-side views of other versions of a laid-flat, shaped wipe of the present invention.

[0017] FIGS. **4**A and **4**B depict the shape of samples prepared for testing the tenacity with which a cleaning wipe of the present invention and a conventional cleaning wipe engaged the fastening device of a cleaning tool.

[0018] FIG. **5** depicts the tensile tester used to test the tenacity with which a cleaning wipe of the present invention and a conventional cleaning wipe engaged the fastening device of a cleaning tool.

[0019] FIG. **6** depicts a close-up view of the tester and sample depicted in FIG. **5**.

[0020] FIG. **7** depicts the top side of a mop head of a cleaning tool, including four fastening devices located on said top side, as well as the locations at which various samples were positioned prior to being inserted in to a fastening device for testing purposes.

[0021] FIGS. **8**A and **8**B depict the position of a sample relative to three pre-determined testing locations marked on the top of a mop head of a cleaning tool.

[0022] FIG. **9** displays a bar chart comparing the average maximum peak load at disengagement for samples having shaped, integral tabs and the average maximum peak load at disengagement for conventional rectangular samples.

DEFINITIONS

[0023] Within the context of this specification, each term or phrase below includes the following meaning or meanings:

[0024] "Attach" and its derivatives refer to the joining, adhering, connecting, bonding, sewing together, depositing on, associating with, or the like, of two elements. Two elements will be considered to be attached together when they are integral with one another or attached directly to one another or indirectly to one another, such as when each is directly attached to intermediate elements. "Attach" and its derivatives include permanent, releasable, or refastenable attachment. In addition, the attachment can be completed either during the manufacturing process or by the end user.

[0025] "Bond,""interbond," and their derivatives refer to the joining, adhering, connecting, attaching, sewing together, or the like, of two elements. Two elements will be considered to be bonded or interbonded together when they are bonded directly to one another or indirectly to one another, such as when each is directly bonded to intermediate elements. "Bond" and its derivatives include permanent, releasable, or refastenable bonding.

[0026] "Coform" refers to a blend of meltblown fibers and absorbent fibers such as cellulosic fibers that can be formed by air forming a meltblown polymer material while simultaneously blowing air-suspended fibers into the stream of

meltblown fibers. The coform material may also include other materials, such as superabsorbent materials. The meltblown fibers and absorbent fibers are collected on a forming surface, such as provided by a belt. The forming surface may include a gas-pervious material that has been placed onto the forming surface.

[0027] "Cleaning composition", "cleaning formulation-","agent,""cleaning agent," or their derivatives refer to personal care or cleaning compositions for use with a cleaning wipe of the present invention.

[0028] "Connect" and its derivatives refer to the joining, adhering, bonding, attaching, sewing together, or the like, of two elements. Two elements will be considered to be connected together when they are connected directly to one another or indirectly to one another, such as when each is directly connected to intermediate elements. "Connect" and its derivatives include permanent, releasable, or refastenable connection. In addition, the connecting can be completed either during the manufacturing process or by the end user.

[0029] "Disposable" refers to articles which are designed to be discarded after a limited use rather than being laundered or otherwise restored for reuse.

[0030] The terms "disposed on,""disposed along,""disposed with," or "disposed toward" 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.

[0031] "Fiber" refers to a continuous or discontinuous member having a high ratio of length to diameter or width. Thus, a fiber may be a filament, a thread, a strand, a yarn, or any other member or combination of these members.

[0032] "Hydrophilic" describes fibers or the surfaces of fibers which are wetted by aqueous liquids in contact with the fibers. The degree of wetting of the materials can, in turn, be described in terms of the contact angles and the surface tensions of the liquids and materials involved. Equipment and techniques suitable for measuring the wettability of particular fiber materials or blends of fiber materials can be provided by a Cahn SFA-222 Surface Force Analyzer System, or a substantially equivalent system. When measured with this system, fibers having contact angles less than 90 degrees are designated "wettable" or hydrophilic, and fibers having contact angles greater than 90 degrees are designated "nonwettable" or hydrophobic.

[0033] "Layer" when used in the singular can have the dual meaning of a single element or a plurality of elements.

[0034] "Liquid impermeable," when used in describing a layer or multi-layer laminate means that liquid 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.

[0035] "Liquid permeable" refers to any material that is not liquid impermeable.

[0036] "Meltblown" refers to fibers formed by extruding a molten thermoplastic material through a plurality of fine, usually circular, die capillaries as molten threads or filaments into converging high velocity gas (e.g., air) streams, generally heated, which attenuate the filaments of molten thermoplastic material to reduce their diameters. Thereafter, the meltblown fibers are carried by the high velocity gas stream and are deposited on a collecting surface or support to form a web of randomly dispersed meltblown fibers. Such a process is disclosed, for example, in U.S. Pat. No. 3,849,241 to Butin et al. Meltblowing processes can be used to make fibers of various dimensions, including macrofibers (with average diameters from about 40 to about 100 microns), textile-type fibers (with average diameters between about 10 and 40 microns), and microfibers (with average diameters less than about 10 microns). Meltblowing processes are particularly suited to making microfibers, including ultra-fine microfibers (with an average diameter of about 3 microns or less). A description of an exemplary process of making ultra-fine microfibers may be found in, for example, U.S. Pat. No. 5,213,881 to Timmons, et al. Meltblown fibers may be continuous or discontinuous and are generally self bonding when deposited onto a collecting surface.

[0037] "Member" when used in the singular can have the dual meaning of a single element or a plurality of elements.

[0038] "Nonwoven" and "nonwoven web" refer to materials and webs of material that are formed without the aid of a textile weaving or knitting process. For example, nonwoven materials, fabrics or webs have been formed from many processes such as, for example, meltblowing processes, spunbonding processes, air laying processes, coform processes, and bonded carded web processes.

[0039] "Z-direction" refers to fibers disposed outside of the plane of orientation of a web. A web will be considered to have an x-axis in the machine direction, a y-axis in the cross machine direction and a z-axis in the loft direction, with its major planes, or surfaces, lying parallel with the x-y plane. The term "as formed z-direction fibers" may be used herein to refer to fibers that become oriented in the z-direction during forming of the nonwoven web as distinguished from fibers having a z-direction component resulting from post-forming processing of the nonwoven web, such as in the case of mechanically crimped or creped or otherwise disrupted nonwoven webs.

[0040] "Substantially continuous fibers" refers to fibers which are not cut from their original length prior to being formed into a nonwoven web or fabric. Substantially continuous fibers may have average lengths ranging from greater than about 15 centimeters to more than one meter, and up to the length of the web or fabric being formed. The definition of "substantially continuous fibers" includes fibers which are not cut prior to being formed into a nonwoven web or fabric, but which are later cut when the nonwoven web or fabric is cut, and fibers which are substantially linear or crimped.

[0041] "Tenacity" refers to the strength of the attachment between a cleaning wipe and a fastening device on a cleaning tool (e.g., slits located proximate to the four corners of the top side of a mop head). The Examples section below provides one procedure by which tenacity may be quantified.

[0042] "Through-air bonding" or "TAB" means the process of bonding a nonwoven, for example a bicomponent fiber web, in which air which is sufficiently hot to melt one of the polymers of which the fibers of the web are made is forced through the web.

[0043] "Side by side fibers" belong to the class of bicomponent or conjugate fibers. The term "bicomponent fibers" refers to fibers which have been formed from at least two polymers extruded from separate extruders but spun together to form one fiber. Bicomponent fibers are also sometimes referred to as conjugate fibers or multicomponent fibers. Bicomponent fibers are taught, e.g., by U.S. Pat. No. 5,382,400 to Pike et al. The polymers of conjugate fibers are usually different from each other though some conjugate fibers may be monocomponent fibers. Conjugate fibers are taught in U.S. Pat. No. 5,108,820 to Kaneko et al., U.S. Pat. No. 4,795,668 to Krueger et al. and U.S. Pat. No. 5,336,552 to Strack et al. Conjugate fibers maybe used to produce crimp in the fibers by using the differential rates of expansion and contraction of the two (or more) polymers.

[0044] "Low machine direction orientation" and "high machine direction orientation" as used herein refers to the degree to which the fibers of a nonwoven web are allowed to disperse over the cross direction of the forming surface, e.g. a belt or other support; or a foraminous wire. Low machine direction orientation fibers are dispersed across the cross direction to a higher degree than a collection of fibers exhibiting a higher machine direction orientation which have less dispersion over the cross direction of the forming surface during the formation of a web.

[0045] Words of degree, such as "about", "substantially", and the like are used herein in the sense of "at, or nearly at, when given the manufacturing and material tolerances inherent in the stated circumstances" are used to prevent the unscrupulous infringer from unfairly taking advantage of the invention disclosure where exact or absolute figures are stated as an aid to understanding the invention.

[0046] "Machine direction" or MD means the length of a fabric in the direction in which it is produced. The term "cross machine direction" or CD means the width of fabric, i.e. a direction generally perpendicular to the MD.

[0047] "Particle,""particles,""particulate,""particulates" and the like, refer to a material that is generally in the form of discrete units. The particles can include granules, pulverulents, powders or spheres. Thus, the particles can have any desired shape such as, for example, cubic, rod-like, polyhedral, spherical or semi-spherical, rounded or semi-rounded, angular, irregular, etc. Shapes having a large greatest dimension/smallest dimension ratio, like needles, flakes and fibers, are also contemplated for use herein. The use of "particle" or "particulate" may also describe an agglomeration including more than one particle, particulate or the like.

DETAILED DESCRIPTION

[0048] Reference will now be made in detail to embodiments of the invention, one or more examples of which are illustrated in the drawings. Each example is provided by way of explanation of the invention, and not meant as a limitation of the invention. For example, features illustrated or described as part of one embodiment can be used with another embodiment to yield still a third embodiment. It is intended that the present invention include these and other modifications and variations.

[0049] The present invention provides for a cleaning wipe **10** that may be used with a cleaning tool **12** intended for cleaning any manner of surfaces (see generally FIGS. **1**A, **1**B, and **1**C; in FIG. **1**A, the solid black line traces the perimeter of the cleaning wipe, including the opposing, linear ends of the cleaning wipe and the opposing, curvilinear sides—in this case sine-wave-shaped sides—of the cleaning wipe; the line **100** having alternating dots and dashes, coupled with the solid black lines defining the opposing ends **105** of the wipe, define a counterpart rectangular wipe, which is herein defined as a conventional, rectangular wipe one would have without the integral, shaped tab portions **110**; the shaped tab portions **110** extend outward from, are integral to, and are contiguous with the primary cleaning portion **115**; the perimeter of the primary cleaning portion is defined by the opposing ends **105** of the wipe and the lines **120** having dashes). In the illustrated embodiments, the tool **12** is illustrated as a mop. Various constructions of mops are well known in the art and need not be described in detail herein for an appreciation or understanding of the present invention. It should also be appreciated that the cleaning tool **12** is not limited to a mop embodiment, and encompasses any manner of cleaning instrument that incorporates the novel aspects of the invention, such as a hand-held implement, machine mounted implement (e.g., a buffer pad), and so forth.

[0050] Referring to FIGS. **1**B and **1**C, the cleaning tool **12** is embodied as a mop wherein the handle **14** is pivotally attached to a cleaning head **16** (mop head) by way of any manner of conventional pivotal mechanism **18**. The cleaning head **16** includes a top-side surface **20** comprising fastening devices **22** (one proximate to each of the four corners of the mop head), and an opposite face (not seen in this top view) that is placed on top of, and adjacent to, the cleaning wipe **10**. The cleaning head **16** may be made of any conventional rigid material, such as a molded plastic, and the like. In this particular version, the top-side surface of the mop head includes slits that serve as the fastening devices **22**. A user of the cleaning wipe **10** and cleaning tool **12** can take each tab portion **110**, wrap the tab portion up and around the mop head **16**, and then press some of each tab portion **110** into the slits defining the fastening device **22**, resulting in a cleaning wipe **10** engaged to a cleaning tool **12**, as depicted in FIG. **1**C.

[0051] Other shapes may be selected, so long as the corresponding cleaning wipe comprises, integral, shaped tabs adapted to engage top-side fastening devices on a mop or other cleaning tool, including any hand-held tools. Representative examples of such shapes are depicted in FIGS. **2**A (a cleaning wipe comprising integral, rectangular tabs), **2**B (a cleaning wipe comprising integral, triangular tabs), and **2**C (a cleaning wipe comprising integral tabs having the shape of a half-circle). Additional representative embodiments are depicted in FIGS. **3**A and **3**B.

[0052] Such shapes may be obtained by converting any manner of fibrous substrates (representative examples of which are discussed below) into the desired cleaning wipe. For example, the cleaning wipe can be die cut from a fibrous substrate. Or a fibrous web may be slit or cut in some fashion to form cleaning wipes of the present invention. One advantage in choosing a cleaning wipe having integral, shaped tabs defined by a perimeter that may be nested with the perimeters of adjacent wipes is a reduction in waste during production (e.g., by selecting a sine-wave-shaped perimeter, shaped, integral tab portions of the present invention are formed, and waste during production is minimized).

[0053] One particular method by which a cleaning wipe of the present invention may be formed is disclosed herein. The particular method and sequence of steps described herein is not a limitation to the present invention, but is disclosed only as one method of producing a cleaning wipe comprising integral, shaped tabs. A roll or reel of a fibrous web having a certain width may be systematically unwound and slit to subdivide the reel into multiple ribbons having a certain width. Initially, a supply roll of the material being converted into the cleaning wipe **10** is unwound to provide a continuously moving web of material which has generally linear edges. The web may optionally be saturated or otherwise impregnated with a liquid, as is discussed in more detail below with respect to cleaning agents or other ingredients that may be associated with the wipe, by any suitable means such as spraying, dipping, or the like as are well known to those skilled in the art.

[0054] As stated above, a web of material is slit in the machine direction into multiple ribbons, each of which may be folded into the type of fold desired for the individual cleaning wipe **10** (e.g., the tab portions may be folded over one face of the primary cleaning portion of the cleaning wipe—resulting in a C-fold and providing for ease in stacking multiple cleaning wipes for placement in a container, or bag, transport, and sale). The web of material is slit using a cutter which configures at least a portion of one of the edges of each of the multiple ribbons of material in a non-linear pattern, such as a sine-wave pattern or zig-zag pattern. For example, the web of material can be slit into eight ribbons which have edges configured in a sine-wave pattern. The ribbons of material may then be folded into a folded configuration. For example, each ribbon of material may define a central portion (i.e., a primary cleaning portion) and integral, shaped tab portions which are connected to and folded over upon the central portion along corresponding fold lines.

[0055] Each folded ribbon may then be combined, one ribbon on top of the other, with the other seven folded ribbons from the same web of material to form a continuous "sausage." The sausage is then cut into "clips" of eight cleaning wipes apiece and the clips of wipes are arranged in a stacked configuration to form at least one stack of cleaning wipes. The number of clips in a stack depends on the desired number of stacks and the number of cleaning wipes in the final package. For example, for an 80-count package having one stack, ten clips of eight cleaning wipes apiece would be required to form a single stack of 80 cleaning wipes.

[0056] After the stack of cleaning wipes is properly configured, at least one stack of cleaning wipes may be placed in the interior of a container, such as a plastic tub, to provide a package of cleaning wipes. For additional detail on one example of a process that may be adapted for use in producing cleaning wipes comprising integral, shaped tab portions, see U.S. Pat. No. 5,540,332, entitled "Wet Wipes Having Improved Dispensability," to Thomas J. Kopacz, et al., which is hereby incorporated by reference in its entirety in a manner consistent herewith.

[0057] The cleaning wipe **10** may comprise a fibrous substrate, nonwoven, or foam material, including various characteristics for providing any desired cleaning functionality, such as absorbency, abrasiveness, and so forth. Furthermore, various optional ingredients may be coated, sprayed, incorporated into, or otherwise be employed with the cleaning wipe **10**. Also, the cleaning wipe may be layered or laminated, so long as the shaped tab portions are integral with at least one of said layers in the cleaning wipe.

[0058] The cleaning wipe **10** may provide various functionalities in addition to presenting a surface having a desired cleaning functionality. For example, the wipe **10** may be configured to deliver any manner of agent to the surface to be cleaned. In a particular embodiment, the agent is a cleaning agent, such as a disinfectant, bleach, or other cleaning compound, that is contained within the wipe and released upon engagement of the wipe **10** with a surface to be cleaned. This may be accomplished in various ways. For example, the agent may be a liquid, powder, or granular composition associated with the cleaning wipe **10**. Alternatively, such agents may be delivered by the cleaning tool, e.g., by conducting the agent from a reservoir in the tool to a location proximate to the cleaning wipe, with the agent being delivered before and/or concurrent to use of the cleaning tool to wipe a surface with the associated cleaning wipe.

[0059] It should be appreciated that the embodiments for releasing an agent contained within the cleaning wipe **10** and/or cleaning tool **12** are non-limiting examples of any number of arrangements for releasing an agent for use with the cleaning wipe **10**. All such variations are within the scope and spirit of the invention. For example, the agent may be in a granular or powder or particle form dispersed homogeneously throughout the cleaning wipe **10** such that at least a portion of the agent is forced or pushed out of the wipe **10** upon engagement of the wipe with a surface to be cleaned or wiped. The agent may be contained in capsules that are broken to release the agent upon attachment of the wipe **10** with the cleaning tool **12**, or upon compression of the wipe **10** against a surface to be cleaned.

[0060] The cleaning wipe **10** may be electrostatically charged either uniformly, or in a pattern, in order to assist in the capture and retention of the generally smaller size particles thereon. Methods for providing electrostatic charge (e.g., electrets) in a nonwoven web are well known. Examples include U.S. Pat. No. 6,365,088, issued Apr. 2, 2003 to Knight et al., and in U.S. Pat. No. 5,401,446 issued Mar. 28, 1995 to Tsai et al, both of which are herein incorporated by reference.

[0061] As described above, the cleaning wipe **10** may comprise an open-cell foam material, such as an aminoplast foam (e.g., foams made from urea-formaldehyde resins or melamine-formaldehyde resins) or a phenolic foam such as a foam made from phenol-formaldehyde resins, wherein the foam has mechanical properties suitable for the cleaning wipe **10** to engage the cleaning head **16**, as well as for contacting and cleaning a surface. Melamine-based foam has been recognized in the art as an effective cleaning agent. A detailed description of foams made of aminoplasts, i.e., for example, formaldehyde condensation products based on urea, melamine, dicyanodiamide and/or derivatives thereof, are found, for example in *Kunststoff-Handbuch*, Vol. X, Vieweg-Becker "Duroplaste", Karl Hanser Verlag, Munich, 1968, pp. 135 et seq., especially 466-475, including the bibliography cited therein. Corresponding information on foams of phenoplasts is found, for example, in Ullmann,

Encyklopadie dertechnischen Chemie, 3rd ed., Vol. 15 (1964), pp. 190-1 including the bibliography mentioned therein.

[0062] In other embodiments, the cleaning wipe **10** may comprise a material formed into an open, porous structure that is adapted to engage a cleaning tool such as that depicted in FIGS. **1**B and **1**C, and hardness to form a rough, scratchy surface for use in cleaning or wiping. Suitable materials are abundant and may be either natural or synthetic materials. Possible exemplary materials may include any known abrasive materials formed into the desired open structure. Possible synthetic materials may be polymeric materials, such as, for instance, meltspun nonwoven webs formed of molten or uncured polymer which may then harden to form the desired abrasive layer.

[0063] Other materials used as abrasives in known commercial scrubbing products could also be used, such as apertured nylon covers, nylon networks, and materials similar to those found in other abrasive products such as, for instance, SCOTCHBRITE pads of 3M Corp. (Minneapolis, Minn.).

[0064] In one embodiment, the cleaning wipe **10** comprises a meltspun web, such as may be formed using a thermoplastic polymer material. Generally, any suitable thermoplastic polymer that may be used to form meltblown nonwoven webs may be used for the abrasive layer of the scrubbing pads. For instance, in one embodiment, the material may include meltblown nonwoven webs formed with a polyethylene or a polypropylene thermoplastic polymer. Polymer alloys may also be used, including, for example, in any abrasive layer, such as alloy fibers of polypropylene and other polymers such as PET. Compatibilizers may be needed for some polymer combinations to provide an effective blend.

[0065] Thermosetting polymers may also be used, as well as photocurable polymers and other curable polymers.

[0066] The cleaning wipe **10** may be a web comprising fibers of any suitable cross-section. For example, the fibers of the abrasive layer may include coarse fibers with circular or non-circular cross-sections. Moreover, non-circular cross-sectional fibers may include grooved fibers or multi-lobal fibers such as, for example, "4DG" fibers (specialty PET deep grooved fibers, with an eight-legged cross-section shape). Additionally, the fibers may be single component fibers, formed of a single polymer or copolymer, or may be multi-component fibers.

[0067] In an effort to produce a cleaning wipe having desirable combinations of physical properties, in one embodiment, nonwoven polymeric fabrics made from multi-component or bicomponent filaments and fibers may be used. Bicomponent or multi-component polymeric fibers or filaments include two or more polymeric components which remain distinct. The various components of multi-component filaments are arranged in substantially distinct zones across the cross-section of the filaments and extend continuously along the length of the filaments. For example, bicomponent filaments may have a side-by-side or core and sheath arrangement. Typically, one component exhibits different properties than the other so that the filaments exhibit properties of the two components. For example, one component may be polypropylene which is relatively strong and the other component may be polyethylene which is relatively soft. The end result is a strong yet soft nonwoven fabric.

[0068] In one embodiment, the cleaning wipe comprises metallocene polypropylene or "single site" polyolefins. Exemplary single-site materials are available from H.B. Fuller Company, Vadnais Heights, Minn.

[0069] In another embodiment, the cleaning wipe may include a web comprising a planar nonwoven substrate having a distribution of attenuated meltable thermoplastic fibers such as polypropylene fibers thereon. The web may be heated to cause the thermoplastic fibers to shrink and form nodulated fiber remnants that impart an abrasive character to the resultant web material. The nodulated fiber remnants may comprise between about 10% and about 50% by weight of the total fiber content of the web and may have an average particle size of about 100 micrometers or greater. In addition to the fibers that are used to form nodulated remnants, the web may contain cellulosic fibers and synthetic fibers having at least one component with a higher melting point than polypropylene to provide strength. The web may be wet laid, air laid, or made by other methods. In one embodiment, the web is substantially free of papermaking fibers. For example, the web may be a fibrous nylon web containing polypropylene fibers (e.g., a bonded carded web comprising both nylon fibers and polypropylene fibers).

[0070] The material used to form the cleaning wipe **10** may also contain various additives as desired. For example, various stabilizers may be added to a polymer, such as light stabilizers, heat stabilizers, processing aides, and additives that increase the thermal aging stability of the polymer. Further, auxiliary wetting agents, such as hexanol, antistatic agents such as a potassium alkyl phosphate, and alcohol repellants such as various fluoropolymers (e.g., DuPont Repellent 9356H) may also be present.

[0071] As described, the cleaning wipe **10** may be any conventional nonwoven "soft" web capable of buffing or polishing a surface. Alternatively, the web may be made of a coarse material.

[0072] As discussed generally herein, the cleaning wipe **10** may be made with numerous materials including, but are not limited to, nonwoven webs, knitted and/or woven fabrics, porous foams and films, reticulated foams and films, and so forth. Exemplary nonwoven webs include, but are not limited to, spunbond fabrics, bonded carded webs, and laminates thereof. Methods of making the materials are well known in the art. However, by way of example only, exemplary materials are described in U.S. Pat. No. 3,727,615 to Duchane; U.S. Pat. No. 3,802,817 to Matsuki et al.; U.S. Pat. No. 3,849,241 to Butin et al.; U.S. Pat. No. 4,041,203 to Brock et al.; U.S. Pat. No. 4,100,324 to Anderson et al.; U.S. Pat. No. 4,720,415 to VanderWielen; U.S. Pat. No. 4,781,962 to Zamarripa et al.; U.S. Pat. No. 4,965,122 to Morman; U.S. Pat. No. 5,284,703 to Everhart et al.; U.S. Pat. No. 5,382,400 to Pike et al.; U.S. Pat. No. 5,385,775 to Wright; U.S. Pat. No. 5,707,707 to Burnes et al.; U.S. Pat. No. 5,714,107 to Levy et al.; U.S. Pat. No. 5,858,515 to Stokes et al.; U.S. Pat. No. 6,315,864 to Anderson et al. and so forth.

[0073] The cleaning wipe **10** may be made using suitable elastomeric fiber-forming resins or blends. For example, the cleaning wipe **10** may include fiber made from block

copolymers having the general formula A-B-A' where A and A' are each a thermoplastic polymer endblock which contains a styrenic moiety such as a poly (vinyl arene) and where B is an elastomeric polymer midblock such as a conjugated diene or a lower alkene polymer. The block copolymers may be, for example, (polystyrene/poly(ethylene-butylene)/polystyrene) block copolymers available from the Shell Chemical Company under the trademark KRATON G. One such block copolymer may be, for example, KRATON G-1657.

[0074] Other exemplary materials which may be used include polyurethane materials such as, for example, those available under the trademark ESTANE from B. F. Goodrich & Co., polyamide materials such as, for example, those available under the trademark PEBAX from the Rilsan Company, and polyester materials such as, for example, those available under the trade designation Hytrel from E. I. DuPont De Nemours & Company. Formation of meltblown fibers from polyester materials is disclosed in, for example, U.S. Pat. No. 4,741,949 to Morman et al., which is hereby incorporated by reference in its entirety in a manner consistent herewith. Useful polymers also include, for example, copolymers of ethylene and at least one vinyl monomer such as, for example, vinyl acetates, unsaturated aliphatic monocarboxylic acids, and esters of such monocarboxylic acids. The copolymers and formation of meltblown fibers from those copolymers are disclosed in, for example, U.S. Pat. No. 4,803,117.

[0075] Processing aids may be added to the polymer. For example, a polyolefin may be blended with the polymer (e.g., the A-B-A elastomeric block copolymer) to improve the processability of the composition. The polyolefin must be one which, when so blended and subjected to an appropriate combination elevated pressure and elevated temperature conditions, extrudable, in blended form, with the polymer. Useful blending polyolefin materials include, for example, polyethylene, polypropylene and polybutene, including ethylene copolymers, propylene copolymers and butene copolymers. A particularly useful polyethylene may be obtained from the U.S.I. Chemical Company under the trade designation Petrothene NA 601 (also referred to herein as PE NA 601 or polyethylene NA 601). Two or more of the polyolefins may be utilized. Extrudable blends of polymers and polyolefins are disclosed in, for example, previously referenced U.S. Pat. No. 4,663,220.

[0076] The materials used to make the cleaning wipe **10** may have some tackiness adhesiveness to enhance autogenous bonding. For example, the polymer itself may be tacky when formed into fibers and/or strands or, alternatively, a compatible tackifying resin may be added to the extrudable compositions described above to provide tackified fibers and/or strands that autogenously bond. In regard to the tackifying resins and tackified extrudable compositions, note the resins and compositions as disclosed in U.S. Pat. No. 4,787,699, hereby incorporated by reference in its entirety in a manner consistent herewith.

[0077] Any tackifier resin can be used which is compatible with the polymer and can withstand the processing (e.g., extrusion) temperatures. If the polymer (e.g., A-B-A elastomeric block copolymer) is blended with processing aids such as, for example, polyolefins or extending oils, the tackifier resin should also be compatible with those processing aids. Generally, hydrogenated hydrocarbon resins are preferred tackifying resins, because of their better temperature stability. REGALREZ and ARKON series tackifiers are examples of hydrogenated hydrocarbon resins. ZONATAK 501 lite is an example of a terpene hydrocarbon. REGALREZ hydrocarbon resins are available from Hercules incorporated. ARKON series resins are available from Arakawa Chemical (U.S.A.) Incorporated. Of course, the present invention is not limited to use of such three tackifying resins, and other tackifying resins which are compatible with the other components of the composition and can withstand the processing temperatures, can also be used.

[0078] The cleaning wipe **10** may comprise a mixture of elastic and nonelastic fibers or particulates. For an example of such a mixture, reference is made to U.S. Pat. No. 4,209,563, which is hereby incorporated by reference in its entirety in a manner consistent herewith, in which elastomeric and non-elastomeric fibers are commingled to form a single coherent web of randomly dispersed fibers. Another example of such an composite web would be one made by a technique such as disclosed in previously referenced U.S. Pat. No. 4,741,949. That patent discloses an elastic nonwoven material which includes a mixture of meltblown thermoplastic fibers and other materials. The fibers and other materials are combined in the gas stream in which the meltblown fibers are borne so that an intimate entangled commingling of meltblown fibers and other materials, e.g., wood pulp, staple fibers or particulates such as, for example, activated charcoal, clays, starches, or hydrocolloid (hydrogel) particulates commonly referred to as super-absorbents occurs prior to collection of the fibers upon a collecting device to form a coherent web of randomly dispersed fibers.

[0079] A cleaning wipe **10** of the present invention my include a web comprising polyolefins using single site catalysts, sometimes referred to as metallocene catalysts, may also be used to make the interbonded fibrous layer and/or the reinforcing strands. Many polyolefins are available for fiber production, for example polyethylenes such as Dow Chemical's ASPUN7 6811A linear low density polyethylene, 2553 LLDPE and 25355 and 12350 high density polyethylene are such suitable polymers. The polyethylenes have melt flow rates, respectively, of about 26, 40, 25 and 12. Fiber forming polypropylenes include Exxon Chemical Company's **3155** polypropylene and Montell Chemical Co.'s PF-304 and/or PF-015. Many other polyolefins are commercially available.

[0080] Biodegradable polymers are also available for making a cleaning wipe **10** and suitable polymers include polylactic acid (PLA) and a blend of BIONOLLE, adipic acid and UNITHOX (BAU). PLA is not a blend but a pure polymer like polypropylene. BAU represents a blend of BIONOLLE, adipic acid, and UNITHOX at different percentages. Typically, the blend for staple fiber is 44.1 percent BIONOLLE 1020, 44.1 percent BIONOLLE 3020, 9.8 percent adipic acid and 2 percent UNITHOX 480, though spunbond BAU fibers typically use about 15 percent adipic acid. BIONOLLE 1020 is polybutylene succinate, BIONOLLE 3020 is polybutylene succinate adipate copolymer, and UNITHOX 480 is an ethoxylated alcohol. BIONOLLE is a trademark of Showa Highpolymer Co. of Japan. UNITHOX is a trademark of Baker Petrolite which is a subsidiary of Baker Hughes International.

Representative Package(s) for Cleaning Wipes of the Present Invention

[0081] The manufacturer or distributor of a cleaning wipe of the present invention may fashion messages, statements, or copy to be transmitted to a purchaser, consumer, or user of said cleaning wipe. Such messages, statements, or copy may be fashioned to help facilitate or establish an association in the mind of a user of the wipe between a cleaning wipe of the present invention, or use thereof, and one or more mental states, psychological states, or states of well being. The communication, statements, or copy may include various alphanumeric strings, including, for example: clean, fresh, mountain, country, zest, sea, sky, health, hygiene, water, waterfall, moisture, moisturize, scent, convenient, single, child, environment, disposable, derivatives or combinations thereof, or other such words or states. In one embodiment, the communication, statements, or copy associate a cleaning wipe of the present invention and less waste, increased efficiency, increased effectiveness, or some combination thereof. In another embodiment, the communication, statements, or copy associate a cleaning wipe of the present invention and disposability. In another embodiment, the communication, statements, or copy associate a cleaning wipe of the present invention and a registered or common-law trademark of the seller, manufacturer, and/or distributor of the appliance. For example, a statement could be disposed in or on a container containing a cleaning wipe of the present invention that associates the cleaning wipe with the logo or brand name of Mr. Clean®, Pledge®, Mr. Proper®, Flash®, AJAX®, Fabuloso®, Cif®, Clorox®, Pine-Sol®, Lysol®, Scrubbing Bubbles®, Fantastic®), 409®, Tilex®, Scrubby®, Comet®, Swiffer™, Viva®, Kleenex®, Scott®, Febreze®, and combinations thereof. The statement could associate a cleaning wipe of the present invention with other cleaning formulations or cleaning substrates like those referenced in the preceding sentence.

[0082] Messages, copy, statements, and/or alphanumeric strings like those referred to above may be used either alone, adjacent to, or in combination with, other alphanumeric strings. The communication, statements, message, or copy could take the form of (i.e., be embodied in a tangible medium such as) a newspaper advertisement, a television advertisement, a radio or other audio advertisement, items mailed directly to addressees, items emailed to addresses, Internet Web pages or other such postings, free standing inserts, coupons, various promotions (e.g., trade promotions), co-promotions with other companies, copy and the like, boxes and packages containing the product (in this case an appliance of the present invention), and other such forms of disseminating information to consumers or potential consumers. Other exemplary versions of such communications, statements, messages, and/or copy may be found in, for example, U.S. Pat. Nos. 6,612,846 and 6,896,521, both entitled "Method for Displaying Toilet Training Materials and Display Kiosk Using Same"; co-pending U.S. application Ser. No. 10/831,476, entitled "Method of Enunciating a Pre-Recorded Message Related to Toilet Training in Response to a Contact"; co-pending U.S. application Ser. No. 10/956,763, entitled "Method of Manufacturing and Method of Marketing Gender-Specific Absorbent Articles Having Liquid-Handling Properties Tailored to Each Gender"; each of which is incorporated by reference in their entirety in a manner consistent herewith. For example, a message embodied in a tangible medium could associate a cleaning wipe of the present invention with the logo or brand name of Mr. Clean®, Pledge®, Mr. Proper®, Flash®, AJAX®, Fabuloso®, Cif®, Clorox®, Pine-Sol®, Lysol®, Scrubbing Bubbles®, Fantastic®, 409®, Tilex®, Scrubby®, Comet®, Swiffer™, Viva®, Kleenex®, Scott®, Febreze®, and combinations thereof. A message embodied in a tangible medium could associate a cleaning wipe of the present invention with other cleaning formulations or cleaning substrates like those referenced in the preceding sentence.

[0083] It should be noted that when associating statements, copy, messages, or other communications with a package (e.g., by printing text, images, symbols, graphics, color(s), or the like on the package; or by placing printed instructions in the package; or by associating or attaching such instructions, a coupon, or other materials to the package; or the like) containing cleaning wipes of the present invention, the materials of construction of said package may be selected to reduce, impede, or eliminate the passage of water or water vapor through at least a portion of the package. Furthermore, the materials of construction of said package may be selected to minimize or impede the passage of light through said package, including minimizing or impeding the passage of electromagnetic waves of a selected wavelength or wavelengths.

[0084] As noted above, some embodiments of the present invention comprise a cleaning composition, moisturizing composition, agent, some combination thereof, and the like. Such compositions may contain water. Therefore packages, containers, envelopes, bags, and the like that reduce, minimize, or eliminate the evaporation or transmission of water or water vapor from cleaning wipes contained therein may be beneficial. Furthermore, cleaning wipes may be individually wrapped in containers, packets, envelopes, bags, wrappers, or the like that inhibit, reduce, or eliminate the passage or transmission of water or water vapor from cleaning wipes contained therein. For purposes of this application, "packages,""containers,""envelopes,""bags,""packets," and the like are interchangeable in the sense that they refer to any material adapted to enclose and hold either individual cleaning wipes (as in, for example, an individual packet containing a single cleaning wipe), or a plurality of cleaning wipes (as in a flexible bag made of film or plastic container containing a plurality of cleaning wipes, whether or not each of the individual cleaning wipes are enclosed and held in a separate material—such as individual packets).

[0085] In some embodiments of the present invention, a package will contain not only one or more cleaning wipes of the present invention, but other health-and-hygiene products. In one embodiment, a cleaning wipe of the present invention is sold, transferred, distributed, or marketed with a cleaning tool. It should be noted that such combinations may be marketed and packaged as described in the preceding paragraphs. It should also be noted that statements on packages, messages embodied in tangible media, and packages like those described in this paragraph may be associated with the brand name or logo of a private-label brand (meaning that a product or article of manufacture, like a cleaning wipe of the present invention, is made by one company for sale under the logo or brand name of another company—often the logo or brand name of a retailer or distributor).

[0086] Reference now will be made to various embodiments of the invention, examples of which are set forth

below. Each example is provided by way of explanation of the invention, not as a limitation of the invention. In fact, it will be apparent to those skilled in the art that various modifications and variations can be made of this invention without departing from the scope or spirit of the invention.

EXAMPLE 1

[0087] Rolls of nonwoven material were obtained from NBond, China. The material had a basis weight of 65 grams per square meter, a thickness of about 0.5 mm, and was made from a 70%:30% (by weight) blend of rayon (70%) and polyethylene tetra-phthalate (PET; 30%). Samples of this material were converted in to a cleaning wipe comprising shaped, integral tab portions in one of two ways. In one approach a pattern was placed over the material and hand saws were used to cut out the cleaning wipes with integral tab portions. In another approach, die-press equipment, in this case a FIPL/Hudson Auto Die Press Model SB20, was used to form the cleaning wipes with integral tabbed portions. A nested, tabbed design was prepared by mounting metal having a curvilinear edge to a plexi-glass backing. This prepared die was then attached to the die press, which was then used to form cleaning wipes having shaped, integral tab portions from the material obtained from NBond.

[0088] Samples prepared in accordance with the above procedures were made. The samples had sine-wave-shaped opposing edges as depicted generally in FIGS. **1**A, **1**B, and **1**C; and as discussed generally in Example 2 below. These samples were adapted to engage the fastening devices on a Swiffe™-brand cleaning tool. When mounted on a Swiffer™-brand cleaning tool, approximately 51% of the total surface area of one side of a cleaning wipe of the present invention was available for cleaning or wiping (in this case a wipe having opposing, sine-wave-shaped sides), whereas 42% of the total surface area of the conventional, rectangular Swiffer™-brand cleaning wipe was available for cleaning.

EXAMPLE 2

[0089] Samples of portions of a Swiffer™-brand cleaning wipe were tested on how well these samples engaged fastening devices found on the top-side of a Swiffer™-brand cleaning tool. First Swiffer™-brand disposable cloths were obtained. A sample **200**, depicted in FIG. **4**B, representing a portion of a conventional rectangular cleaning wipe (i.e., lacking integral, shaped tabs of the present invention) was prepared by cutting a first side **202**, having a length 142 mm, and a second side **204**, having a length of 106 mm, to form a rectangle from the Swiffer™-brand disposable cloth. A second sample **210**, depicted in FIG. **4**A, was prepared by cutting a sample that, in effect, had the same initial dimension of the first sample (i.e., a first side **212** having a length of 142 mm and a second side having a length of 106 mm,), but which, along one edge, was cut so that its perimeter corresponded to a sine wave (with one peak centrally located along the length of this perimeter; with the base **214** of the sine wave located 70 mm from the opposing, linear edge; and the peak **216** of the sine wave extending 36 mm from the base of the sine wave, and 106 mm from the opposing, linear edge). These sample portions are depicted in FIGS. **4**A and **4**B. We prepared thirty of each of these samples.

[0090] The testing was conducted using an Instron tensile tester **300**, as depicted in FIG. **5**. First, a 50 Newton load cell was attached to the tensile tester. Then the head **302** of a Swiffer™-brand cleaning tool was inserted into a jaw **304** such that the foam/rubber portion of the head was clamped by the jaw. The mop head was positioned so that a fastening device, in this case a series of slits for engaging a wipe or cloth, was centered with respect to the upper jaw **306**. In FIG. **5**, a sample **308**, in this case a sample having an integral, shaped tab portion of the present invention was attached to the fastening device at the top of the mop head and upper jaw **306**. The method by which the sample was attached to the upper jaw and mop-head fastening device is discussed in the paragraphs that follow. The edge of the rigid plastic portion of the mop head **302** closest to the upper jaw was 4 cm from the upper jaw. The upper jaw was zeroed at a gauge length corresponding to 4 cm measured as stated in the preceding sentence. FIG. **6** depicts a close up of the arrangement shown in FIG. **5**. Testing of these samples was done in a room kept at a relative humidity of 50%+/−2% and a temperature of 73.4° F.+/−1.8° F.

[0091] FIG. **7** depicts the top side of a mop head of a Swiffer™-brand cleaning tool. The mop head was marked so that the end of a sample, prior to being depressed into the slits serving as a fastening device, was at one of three locations: Location **1** (designated **400** in FIG. **7**); Location **2** (designated as **402** in FIG. **7**), which is 5 mm from Location **1**; and Location **3** (designated as **404** in FIG. **7**), which is 5 mm from Location **2**.

[0092] FIGS. **8**A and **8**B depict a portion of a cleaning wipe of the present invention, and a conventional rectangular wipe, with a peak or edge aligned with Location **1** (designated as **400** in FIGS. **8**A and **8**B). For any tests beginning at Location **2**, the peak or edge depicted as aligned with Location **1** in FIGS. **8**A and **8**B was simply moved inward 5 mm so that, prior to a test beginning, the peak or edge was aligned with Location **2** (i.e., **402** in FIGS. **8**A and **8**B). For any tests beginning at Location **3**, the peak or edge depicted as aligned with Location **1** in FIGS. **8**A and **8**B was simply moved inward 10 mm so that, prior to the start of a test, the peak or edge was aligned with Location **3** (i.e., **404** in FIGS. **8**A and **8**B).

[0093] To insert either a rectangular sample or a sine-wave shaped sample into the Swiffer™-brand cleaning tool, a pen, positioned so that it was centrally located over the corresponding fastening device, was used to push the sample into the slits of the fastening device until the pen could not be inserted further. The pen was held in this position for 3 seconds and then removed. After this portion of the sample had been inserted into the fastening device, as depicted in FIG. **6**, the opposing edge of the sample was clamped in place using the upper jaw. Each corner of the sample corresponding to this opposing edge was folded inward, as depicted in FIG. **6**, so that the sample could be clamped in place. The test was then started, with the jaws separating at a speed of 10 inches per minute. The test was run until the sample disengaged from the fastening device. A peak load was then recorded.

[0094] The results of the experiment are depicted in FIG. **9**. At locations **1**, **2**, and **3**, respectively, the sine-wave shaped samples disengaged at average measured values of 524 (standard deviation of 141); 485 (standard deviation of 124); and **481** (standard deviation of 145). At locations **1**, **2**, and **3**, respectively, the rectangular-shaped samples disen-

gaged at average measured values of 494 (standard deviation of 163); 430 (standard deviation of 125); and **393** (standard deviation of 155). Again, as noted above, these averages and standard deviations were computed from ten individual measurements.

[**0095**] As can be seen in FIG. **9**, the sample corresponding to a cleaning wipe of the present invention, in this case a sample corresponding to a cleaning wipe having an integral, sine-wave shaped perimeter, appears to have a higher, average maximum peak load at release than the corresponding average maximum peak load at release for the rectangular sample.

What is claimed is:

1. A cleaning wipe comprising integral, shaped, tab portions adapted to engage a plurality of top-side fastening devices on a cleaning tool.

2. The wipe of claim 1 wherein the perimeter of each shaped tab portion is curvilinear.

3. The wipe of claim 1 wherein the perimeter of each shaped tab portion defines a triangle.

4. The wipe of claim 1 wherein the perimeter of each shaped tab portion defines a rectangle.

5. The wipe of claim 1 wherein the wipe comprises a cleaning composition.

6. The wipe of claim 1 wherein the wipe comprises electrets.

7. The wipe of claim 1 wherein the wipe defines a total surface area corresponding to one side of the wipe, and wherein the percentage of the total surface area used for cleaning when the wipe is attached to a cleaning tool is greater than the corresponding percentage obtained for a conventional rectangular wipe attached to the same cleaning tool.

8. The wipe of claim 1 wherein the wipe is adapted to engage the fastening devices of a Swiffer™-brand cleaning tool.

9. The wipe of claim 1 wherein the wipe is adapted to engage the fastening devices of a Pledge®-brand cleaning tool.

10. The wipe of claim 1 wherein the wipe is adapted to engage the fastening devices of a private-label brand cleaning tool.

11. The cleaning wipe of claim 7 wherein at least about 45% of the total surface area of the wipe is used for its intended purpose of cleaning.

12. The cleaning wipe of claim 7 wherein at least about 50% of the total surface area of the wipe is used for its intended purpose of cleaning.

13. A process for making a cleaning wipe comprising integral, shaped tab portions, the process comprising the steps of:

providing a fibrous substrate; and

cutting the fibrous substrate into separate wipes comprising integral, shaped tab portions.

14. The process of claim 13 wherein some portion of the perimeter of the cleaning wipe nests with some portion of the perimeter of one or more adjacent cleaning wipes, thereby reducing or minimizing the amount of waste produced during cutting.

15. A package comprising:

a container, and

a cleaning wipe of claim 1 contained in said container.

16. The package of claim 15 wherein the package comprises a liquid-impermeable material.

17. The package of claim 15 further comprising a statement disposed in or on said container, and wherein the statement associates the cleaning wipe with improved effectiveness, reduced waste, or both.

18. The package of claim 15 further comprising a cleaning tool comprising fastening devices, wherein the cleaning wipe is adapted to engage the fastening devices of the cleaning tool.

19. The package of claim 15 further comprising a statement disposed in or on said package, and wherein the statement associates the cleaning wipe with a logo and/or brand name of a cleaning formulation, cleaning substrate, or both.

20. The package of claim 19 further comprising a statement disposed in or on said package, and wherein the statement associates the cleaning wipe with a logo and/or brand name selected from the group consisting of Mr. Clean®, Pledge®, Mr. Proper®, Flash®, AJAX®, Fabuloso®, Cif®, Clorox®, Pine-Sol®, Lysol®, Scrubbing Bubbles®; Fantastic®, 409®, Tilex®, Scrubby®, Comet®, Swiffer™, Viva®, Kleenex®, Scott®, Febreze®, and combinations thereof.

21. A message embodied in a tangible medium and adapted to be transmitted to consumers, wherein the message refers to a cleaning wipe of claim 1 and a logo and/or brand name selected from the group consisting of Mr. Clean®, Pledge®, Mr. Proper®, Flash®, AJAX®, Fabuloso®, Cif®, Clorox®, Pine-Sol®, Lysol®, Scrubbing Bubbles®, Fantastic®, 409®, Tilex®, Scrubby®, Comet®, Swiffer™, Viva®, Kleenex®, Scott®, Febreze®, and combinations thereof.

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