ABSTRACT

A lightweight, flexible, impact-cushioning, scuff- and dent-shielding bumper is easily applied to and reversibly retained on peripheral and upward facing surfaces of an appliance such as an upright vacuum cleaner, vacuum suction head, canister vacuum cleaner, or similar appliance. In the bumper, elasticity and stiffness cooperate to conform the bumper to the appliance exterior, facilitating efficient installation and allowing the position of the bumper to be easily adjusted in a manner that would purposefully envelop portions of the appliance prone to causing damage to surrounding surfaces and the appliance itself. Contact adhesive is employed in combination with the hook component of a hook-and-loop fastener interacting directly with the body material of the bumper, permitting repeated easy removal, washing and reinstallation of the bumper or transfer thereof to another appliance not necessarily of the same design make and model.
BUMPER FOR A VACUUM CLEANER

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

The present invention relates to floor-treating and floor-vacuuming equipment, to vacuum cleaners, to suction head attachments for vacuum cleaners, and more particularly to the goal of preventing or reducing damage of the type that may be expected if said equipment strikes or scrubs a surface of an article of furniture or a surface of a building interior.

[0002] 2. General Background and State of the Art

Almost as soon as portable floor treating and cleaning equipment and portable vacuum cleaners were adopted in the mid 20th century, their makers faced the problem of destructive contact between such equipment and users' furniture, baseboards, walls and other interior surfaces. Furniture, interiors and the equipment itself were being scuffed, dented and broken. Accordingly, manufacturers began designing protective structures such as bumpers, beads, cushions and the like to be carried on exterior surfaces of the equipment for shielding and cushioning.

[0003] Such protective structures are exemplified by U.S. Pat. Nos. 7,480,960, 6,341,403, 5,687,450, 5,136,747, 3,270, 365, 2,846,711, 2,648,090, 2,330,684, 2,241,862, 2,226,371, 2,153,481, and 1,695,246. These patents describe various protective structures, usually specifically designed to fit the contours of a particular vacuum cleaner, usually formed of rubber or another moldable material and usually relatively permanently attached to the vacuum cleaner via such means as press-fit, screws, wire, or adhesive.

[0004] Such protective structures are also exemplified by U.S. Pat. Nos. 5,271,119 and 5,179,756, which describe a magnet-equipped impact-absorbing or shielding structure attachable to a front surface of a vacuum cleaner or incorporated into a bonnet which fits over the top and front of the vacuum cleaner. These structures are described as being removable and as being retained by a strap or by a VELCRO® brand fastener.

[0005] Such protective structures are also exemplified by U.S. Pat. Nos. 4,831,682 and 4,797,968, which describe protective structures which are removable securably via VELCRO® brand fasteners or elastic and which incorporate fabric structures wrapping around the front and periphery of a vacuum cleaner.

INVENTION SUMMARY

In accordance with the present invention, an exemplary embodiment of a bumper, suited for an appliance such as an upright vacuum cleaner, vacuum suction head, canister vacuum cleaner or the like, has a flexible body having size, shape and pliability to conform to a surface of the appliance. Preferably, the body is readily washable and dryable. An appliance-facing surface of the body is capable of reversible attachment to the surface of the appliance. A layer of the body has protective properties relative to impingement between the appliance and environmental objects. As a result, a user can efficiently upgrade any of a great variety of these appliances with protection against scuffing and denting—whether inflicted on the appliance by walls or furniture or inflicted on furniture, baseboards, walls and the like by the appliance. The bumper is quickly installed, quickly removed, washed and dried, and quickly reinstalled or transferred to another appliance—and the two appliances need not be the same design, make or model, but need be only approximately the same size and type. The appliance need not have been designed with the bumper in mind. The bumper fits, stays attached and functions equally well on a wide variety of appliances.

[0009] An exemplary embodiment of the bumper, adapted for efficient attachment to a wide range of designs, makes and models of appliances such as an upright vacuum cleaner or a vacuum cleaner suction head, is elastically biased to assume a conformation facilitating installation on the appliance. A user can easily position the bumper on the front of the appliance, whereupon the side portions of the bumper embrace the appliance, making it easy to adjust the position of the bumper on the appliance and then press the bumper into place on the appliance. The position of the bumper can easily be adjusted in a manner to purposefully cover portions of the appliance which are prone to causing damage to the appliance itself and surrounding surfaces. An exemplary embodiment of the bumper has an elastic member cooperating with the body to bias the body in this conformation. With the present invention, the elastic member is easily and inexpensively incorporated.

[0010] In an exemplary embodiment of the bumper, the elastic member is located within the body and is so anchored to the body as to bias at least a portion of the body in an arcuate conformation. In the present invention, the arcuate conformation is well suited to embracing the front of a vacuum cleaner or vacuum suction head, facilitating installation.

[0011] In an exemplary embodiment of the bumper, the elastic member is anchored proximate the top edge of the body and biases the top edge in the arcuate conformation. Selectively biasing the top edge places the bumper in contact with the front, side and top surfaces of the appliance without gathering the bumper around the underside, thereby keeping the bumper clear of the suction and beating structures of the appliance.

[0012] In an exemplary embodiment of the bumper, the elastic member has a first end and a second end both stitched to a first layer of the body of the bumper. Stitching is thus quickly and inexpensively accomplished on a fully exposed surface of the body of the bumper. That surface later becomes internal to the body after the material is folded and sewn closed.

[0013] In an exemplary embodiment of the bumper, the body has, in combination, sufficient stiffness to retain a gentler arcuate curvature at a bottom edge of the body than at the top edge thereof, and sufficient flexibility nevertheless to be biased in the arcuate conformation—more pronouncedly at the top edge of the body, enabling the bumper to effectively fit onto a variety of appliances having somewhat different shapes.

[0014] In an exemplary embodiment of the bumper, the body comprises a layer of foam bonded to a layer of woven textile. This composite material provides a flexible, somewhat stiff, mildly elastic shell which is bent into the desired conformation under the influence of an elastic member having a tensile relationship to the shell.

[0015] An exemplary embodiment of the bumper has at least one member having high elasticity and at least one member having low elasticity and moderate stiffness. This cooperation between members having different properties provides the shape that makes the bumper in accordance with the present invention very convenient to install on the appliance.
In an exemplary embodiment of the bumper, the elastic member exerts sufficient tension upon the body to pucker and gather a portion of the body proximate the elastic member and the body has sufficient stiffness that portions thereof not proximate the elastic member form and maintain a smooth curve when the proximate portions are pukered and gathered to the fullest extent. Puckering and gathering at the top corner edges under the stronger influence of the elastic member produces a tighter curvature, while gentler and wider curvature results at the bottom edge, where the properties of the body material dominate.

An exemplary embodiment of the bumper, adapted for efficient attachment to an appliance such as an upright vacuum cleaner or a vacuum cleaner suction head, has an end portion and further has a bottom edge tapering upward proximate the end portion. This tapering helps keep the end portion from being snagged, entrained in a wheel, stepped on, or dragged on the floor.

In an exemplary embodiment of the bumper, adapted for efficient attachment to an appliance such as an upright vacuum cleaner or a vacuum cleaner suction head, has an end portion and further has at least one reinforcement defining a discrete segment proximate the end portion, the reinforcement having sufficient integrity to prevent the fabric body from gaping, fraying, and running proximal to the reinforcement if the body is severed distal thereto. The end can be trimmed to remove excess length. The remaining reinforcement stops any gaping, fraying, or running. In an exemplary embodiment of the bumper, the reinforcement is a stitch sewn vertically in the body from the top edge to the bottom edge.

In an exemplary embodiment of the bumper, adapted for efficient attachment to an appliance such as a canister vacuum cleaner having a tapered front-end, the body has a central portion intermediate two end portions and the body also has a top edge which tapers downward in the central portion. The lowered top edge in the central portion accommodates the tapered profile of many canister vacuum cleaners.

In an exemplary embodiment of the bumper, adapted for efficient attachment to an appliance such as a canister vacuum cleaner having a tapered front-end, the body has a central portion intermediate two end portions, the central portion has one and, optionally, two centrally located reinforcements circumscribing discrete areas of the central portion, and the reinforcements have sufficient structural integrity to prevent the fabric from gaping, fraying, and running outside the reinforcements if an opening is cut in the body within the discrete areas. The user can make a horizontal cut in the body within an area bounded by the rectangular stitching. The opening will accommodate a discharge orifice or suction hose of the appliance. The body will not gap, fray, or run outside the stitching. The user cuts an opening either at the upper reinforcement area or at the lower reinforcement area, depending on whether the canister's vacuum hose is located higher or lower on the front-end portion of the appliance.

In an exemplary embodiment of the bumper, adapted for efficient attachment to an appliance such as a canister vacuum cleaner having a tapered front-end, the body has an end portion and further has at least one reinforcement defining a discrete segment proximate the end portion, the reinforcement having sufficient integrity to prevent the fabric from gaping, fraying, and running proximal to the reinforce-

ment if the body is severed distal thereto. The end can be trimmed to remove excess length without gaping, fraying, or running.

In an exemplary embodiment of the bumper, adapted for efficient attachment to an appliance such as a canister vacuum cleaner having a tapered front-end, the body comprising a layer of foam bonded to a layer of fabric. This material renders the bumper in accordance with the present invention not only protective and versatile, but easily installed and removed and easily washed and dried.

In an exemplary embodiment of the bumper, the reversible attachment to the surface of the appliance is effected by a contact-adhesive-backed hook component of a hook-and-loop fastener system cooperating with a hook-engaging fabric layer of the body. The contact adhesive holds the fastener hook component patch securely and semi-permanently on a surface of the appliance, while the body is conveniently and reversibly secured to the hook component of the fastener as many times as a user desires. The hook component of the hook-and-loop fastener strongly engages the fabric layer of the bumper, which is formed of a textile having a fibrous surface structure that is open and loopy. This choice of textile material accomplishes the function of the loop component of a hook-and-loop fastener; therefore, the present invention eliminates the need to sew patches or strips of the loop component of such a fastener onto the bumper. Because any portion of the fabric surface strongly engages the hook component, a secure attachment between the bumper and the fastener is achieved without requiring the user to accurately align a hook component with a discrete loop component attached to the bumper.

In an exemplary embodiment of the bumper, the body comprises a fabric layer having dust-trapping properties, enabling the bumper to collect dust and loose fiber, which can then be wiped off and discarded or vacuumed off. A preferred embodiment of the bumper utilizes a fabric which tends to hold dust and loose fiber electrostatically during use.

In an exemplary embodiment of the bumper, the body comprises installation guide stitching visible to a user for locating and aligning the center of the bumper with the vacuum.

In an exemplary embodiment of the bumper, the installation guide stitching comprises a horizontal equatorial stitch and a vertical centerline stitch.

Another exemplary embodiment of the bumper has a peripheral bead cooperating with the body to bias the body in the arcuate conformation. Where the bumper includes an elastic member, the peripheral bead cooperates with the body and with the elastic member to bias the body in the arcuate conformation, producing a close fit between the bumper and the appliance. The peripheral bead also blocks dust and debris from falling behind the bumper and collecting on the adhesive component of the hook fastener. Debris can prevent adhesive from adhering to the surface of an appliance.

Another exemplary embodiment of the bumper is adapted for efficient attachment to an appliance such as an upright vacuum cleaner or a vacuum cleaner suction head and is elastically biased to assume the arcuate conformation in engaging relationship to the appliance. Preferably, the body is readily washable and dryable.

BRIEF DESCRIPTION OF THE DRAWINGS

For a further understanding of the objects and advantages of the present invention, reference should be had
to the following detailed description, taken in conjunction with the accompanying drawing, in which like parts are given like reference numbers and wherein:

[0030] FIG. 1 is a front elevational view of a first exemplary embodiment of a bumper for a vacuum cleaner or the like in accordance with the present invention;

[0031] FIG. 2 is a partial front elevational view thereof magnified showing approximately one half of the embodiment of FIG. 1;

[0032] FIG. 3 is a cross-sectional view of the embodiment of FIG. 1;

[0033] FIGS. 4 and 5 are perspective views of the embodiment of FIG. 1 in gathered and curved conformations, respectively;

[0034] FIG. 6 is a front elevational view of a second exemplary embodiment of a bumper for a vacuum cleaner or the like in accordance with the present invention;

[0035] FIG. 7 is a perspective view of fastener hook components attached to an upright vacuum cleaner with a laterally extended bumper portion and outboard rear wheels in accordance with the first exemplary embodiment of the present invention;

[0036] FIG. 8 is a perspective view of the bumper retained by the fastener hook components on the upright vacuum cleaner of FIG. 7 after installation in accordance with the first exemplary embodiment of the present invention;

[0037] FIG. 9 is a perspective view of fastener hook components attached to an upright vacuum cleaner having a rectangular footprint and inboard rear wheels in accordance with the first exemplary embodiment of the present invention;

[0038] FIG. 10 is a perspective view of an early stage of the installation of the bumper with the aid of the fastener hook components on the upright vacuum cleaner of FIG. 9 in accordance with the first exemplary embodiment of the present invention;

[0039] FIG. 11 is a perspective view of a late stage of the installation of the bumper with the aid of the fastener hook components on the upright vacuum cleaner of FIG. 9 in accordance with the first exemplary embodiment of the present invention;

[0040] FIG. 12 is a perspective view of the bumper retained by the fastener hook components on two different-shaped small vacuum suction heads in accordance with the first exemplary embodiment of the present invention;

[0041] FIG. 13 is a perspective view of the bumper retained by the fastener hook components on an upright vacuum cleaner with a Dyson-type ball carriage and an asymmetric beater portion in accordance with the first exemplary embodiment of the present invention;

[0042] FIG. 14 is a perspective view of the bumper shown by FIG. 13 after a user has trimmed an end portion in accordance with the first exemplary embodiment of the present invention;

[0043] FIG. 15 is a perspective view of the bumper retained by the fastener hook components on a standard size vacuum suction head after a user has trimmed an end portion to expose a vent of the vacuum appliance in accordance with the first exemplary embodiment of the present invention;

[0044] FIG. 16 is a perspective view of the bumper retained by the fastener hook components on an upright vacuum cleaner after a user has trimmed an end portion to expose an outboard rear wheel of the vacuum cleaner in accordance with the first exemplary embodiment of the present invention;

[0045] FIGS. 17-19 are perspective views of early, middle and late stages of installing the bumper with the aid of the fastener hook components on a canister vacuum cleaner in accordance with the second exemplary embodiment of the present invention;

[0046] FIG. 20 is a perspective view of the bumper retained by the fastener hook components on a canister vacuum cleaner with a vacuum hose extending through the upper reinforcement area of the bumper in accordance with the second exemplary embodiment of the present invention;

[0047] FIG. 21 is a perspective view of three exemplary bumpers (standard, medium, and small) for an upright vacuum cleaner or vacuum cleaner suction head in accordance with the first exemplary embodiment of the present invention; and

[0048] FIG. 22 is a perspective view of two exemplary bumpers (larger and smaller) for a canister vacuum cleaner in accordance with the second exemplary embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0049] The invention will now be described with reference to FIG. 1, which illustrates in front elevational view a preferred embodiment of a bumper for a vacuum cleaner or the like in accordance with the present invention, shown generally at 40, having a flat, roughly rectangular, mildly elastic, stitched, compressible multi-layer fabric body 42 of width approximately 0.91 m (36 inches), a height approximately 89 mm (3.5 inches) and thickness approximately 38 mm (0.5 inch). The body 42 has a bottom edge 43, left and right side edges 45, and an upper edge 47. A bead stitch 44 sewn in the body 42 forms a continuous peripheral bead 46. A horizontal equatorial stitch 48 and a vertical centerline stitch 50 add integrity and strength to the body 42. The horizontal equatorial stitch 48 and the vertical centerline stitch 50 also serve as an installation guide by helping the user quickly locate and align the center of the bumper 40 with the vacuum. Vertical left and right first lateral stitch 52 runs upward from the equatorial stitch 48 to the bead stitch 44 about 127 mm (5.0 inches) lateral of the centerline stitch 50. Vertical left and right second lateral stitch 54 runs upward from the equatorial stitch 48 to the bead stitch 44 about 305 mm (12 inches) lateral of the centerline stitch 50. Vertical left and right third lateral stitch 56, fourth lateral stitch 58 and fifth lateral stitch 60 traverse the body 42 from the uppermost, top edge 47 to the lowermost, bottom edge 43 at approximately 76 mm (3.0 inches), 51 mm (2.0 inches), and 25.4 mm (1.0 inch), respectively, from the bead stitch 44 at the lateral edge 45. The body 42 has a width of approximately 362 mm (14.25 inches) from the centerline stitch 50 to the third lateral stitch 56. From the third lateral stitch 56 to the fourth lateral stitch 58, the bottom edge 43 tapers upward such that the height of the body 42 decreases to approximately 70 mm (2.75 inches) at the fourth lateral stitch 58; a height of 70 mm (2.75 inches) is maintained through the fifth lateral stitch 60 to the bead stitch 44 at the lateral edge 45.

[0050] FIG. 2, a magnified partial front elevational view showing approximately one half of the embodiment of FIG. 1 generally at 40, shows the body 42 with bottom edge 43, right side edge 45, top edge 47, bead stitch 44, peripheral bead 46, equatorial stitch 48, centerline stitch 50, right first lateral stitch 52, right second lateral stitch 54, right third lateral stitch 56, fourth lateral stitch 58, and fifth lateral stitch 60. A braided elastic band 62, illustrated with dotted lines, having a width of
about 9.5 mm (0.375 inch), is located within the body 42 between 12.7 mm (0.5 inch) and 24.5 mm (1 inch) from the top edge 47 and is oriented horizontally. Elastic band ends 63 are fixed within the body 42 by anchor stitches 64.

[0051] FIG. 3, a cross-sectional view of the embodiment of FIG. 1, shows the body 42 being formed of mutually facing foam layers 68 each bonded to a fabric layer 66. The anchor stitches 64 fix the ribbon ends 63 of the braided elastic band 62 to at least one fabric layer 66 and one foam layer 68.

[0052] A preferred material for the body 42 is automotive headliner fabric, which includes foam and woven portions bonded together in an easily manipulated, mildly elastic composite which is flexible enough to conform to many different appliance designs, makes and models, yet holds its shape enough to be efficiently handled during installation on an appliance. The foam component absorbs impact, while the fabric component resists puncture. This choice of textile material is fibrous, fuzzy or loopy enough to strongly engage a hook component of a hook-and-loop fastener system thus eliminating the need for the loop component. Additionally, the fabric tends to attract and retain loose fibers and dust, thereby assisting in a user’s cleaning activities. Retained fibers and dust are easily and efficiently harvested from the body 42 by rubbing circularly with a rubber glove or by cleaning with a vacuum or with a lint roller. The automotive headliner material enables the user to easily remove the bumper 40 and wash and dry it. Another preferred fabric for the body 42 is VELTEX® brand fabric sold by the Velmet Corporation of Chicago, Ill. The VELTEX® fabric has a fibrous outer layer bonded with foam. The fibrous layer attaches to the hook component of a hook-and-loop fastener system. It is also possible to utilize an outer fabric layer which retains dust and loose fiber electrostatically. Some users may prefer such a feature, while others may find it counterproductive.

[0053] The bumper 40 is made by cutting the body 42 according to a pattern and folding the headliner material in half with its foam layer 68 exposed. A braided elastic band 62 having a relaxed length of approximately 133 mm (5.25 inches) is laid on a single side of the foam layer 68 and an anchored stitch 64 is sewn to fix elastic band end 63 of the braided elastic band 62 onto one of the fabric layers 66 at the first lateral stitch 52. The same procedure is performed to incorporate another braided elastic band 62 into the opposite side of the body 42.

[0054] With the bumper’s foam layer 68 exposed, the lateral edges 45 and bottom edge 43 are sewn connecting the folded half layers together leaving a 1.0 to 2.0 inch unstitched opening centered at the bottom centerline stitch 50 of the bumper 40 or at a side edge. The entire body 42 is then pulled through the 25 mm to 51 mm (1.0 to 2.0 inch) unstitched opening exposing the fabric layer 66.

[0055] According to the pattern, the peripheral bead 46 is sewn around the perimeter of the body 42 closing the 25 mm to 51 mm (1.0 to 2.0 inch) opening at the centerline stitch 50 or side edge 45. The centerline stitch 50 is then sewn between the top and bottom bead stitch 44 of the body 42.

[0056] The left and right fifth lateral stitch 60 is sewn 25.4 mm (1.0 inch) from the bead stitch 44 proximate the left and right lateral edges 45. The left and right fourth lateral stitch 58 are sewn 1 inch from the fifth lateral stitch 60, and the left and right third lateral stitch 56 are sewn 25.4 mm (1.0 inch) from the fourth lateral stitch 58. The lateral stitches 56, 58, and 60 begin at the top edge 47, intersect the bead stitch 44, and end at the bottom edge 43.

[0057] The equatorial stitch 48 is vertically centered between the top and bottom bead stitches 44 and sewn horizontally between the left and right third lateral stitch 56. The left and right first lateral stitches 52 are sewn 5.0 inches from the centerline stitch 50 and between the top bead stitch 44 and the equatorial stitch 48. The left and right first lateral stitches 52 reinforce the anchor stitch 64 for the elastic band end 63.

[0058] 178 mm (7.0 inches) endward from the left and right first lateral stitch 52, a 19 mm (0.75 inch) slit is made proximate the anchor stitch 64 and the second lateral stitch 54. The headliner material is held flat under tension. Approximately 46.3 inch braided elastic band 62 is pulled horizontally approximately 178 mm (7.0 inches), placing the elastic band end 63 at the second lateral stitch 54, whereupon it is fixed to the fabric layer 66 by another anchor stitch 64. The anchor stitches 64 penetrate the fabric layer 66 to access the foam layer 68. The left and right second lateral stitches 54 are sewn between the top bead stitch 44 and the equatorial stitch 48 reinforcing the anchor stitch 64 for the elastic band end 63.

[0059] The elastic band ends 63, which are 16 mm (0.63 inches) wide, are fixed to a single fabric layer 66 and a single foam layer 68 by the anchor stitches 64 and then reinforcement is provided (through two foam and fabric layers 68 and 66) by the first and second lateral stitches 52 and 54. A 102 mm (4.0 inch) length of relaxed braided elastic band 62 is stretched between the anchor stitches 64 as well as the first and second lateral stitches 52 and 54, which are approximately 178 mm (7.0 inches) apart. As a result, when the completed body 42 is stretched out and held in a flat, straight, extended configuration, as shown in FIGS. 1 and 2, the braided elastic band 62 is stretched between the first and second lateral stitches 52 and 54 and is therefore under tension, rendering the flat, straight, extended configuration of the body 42 unstable and in an oblong shape as illustrated in FIG. 5.

[0060] FIGS. 4 and 5, perspective views of the embodiment of FIG. 1 in gathered conformations, show the body 42 with bottom edge 43, left and right side edges 45, top edge 47, bead stitch 44, peripheral bead 46, equatorial stitch 48, centerline stitch 50, left and right first lateral stitch 52, left and right second lateral stitch 54, left and right third lateral stitch 56, fourth lateral stitch 58 and fifth lateral stitch 60. In FIG. 4, the body 42 is shown in a U-shaped configuration which results as soon as the body 42 is no longer being held in the flat, straight extended configuration shown in FIGS. 1 and 2. This conformational change results because, as the braided elastic body (62 in FIG. 2) is allowed to contract within the less elastic body 42, the elastic band ends 63 move closer together, shortening and gathering the body 42 at the top edge 47.

[0061] FIG. 4 also shows a front (hook component) fastener patch 67 and side (hook component) fastener patches 69 (illustrated with dotted lines to signify their location on the surface opposite side of that shown in the view). The fastener patches 67 and 69 are of the type having a contact adhesive on one surface and the hook component of a hook-and-loop fastener system [such as that sold under the brand name VELCRO®] on the opposite surface. The contact adhesive is supplied with a protective cover layer which a user may easily peel off. The fabric layer (66 in FIG. 3) of the body 42 is formed of a textile having a fibrous surface structure which is open and loopy enough to strongly engage the hook compo-
ment of the hook-and-loop fastener. This choice of textile material eliminates the need to sew a patch of the loop component onto the body 42 and also permits any portion of the body 42 to fully engage the hook component, rather than requiring a user of the product to accurately align a hook component with a loop component. In practice, the hook fastener patches 67 and 69 can be pre-positioned on the vacuum cleaner or other such appliance and the bumper 40 can then be approximated to the appliance and pressed firmly into engagement with the hook fastener patches 67 and 69. The position of the hook fastener patches 67 and 69 and the bumper 40 can easily be adjusted in a manner to purposefully cover portions of the appliance that are prone to causing damage to the appliance itself and surrounding surfaces.

In FIG. 5, the body 42 is shown in an oblong-shaped conformation which results after continued contraction of the braided elastic band (62 in FIG. 3). The body 42 is gathered and puckered at the top edge 47 between the first lateral stitch 52 and the second lateral stitch 54.

With reference to the embodiment of FIGS. 1-5 in accordance with the present invention, a user exposes the contact adhesive surfaces of the hook component fastener patches 67 and 69 and applies the hook component fastener patches 67 and 69 to the front and sides of an upright vacuum cleaner, vacuum suction head or the like as shown in FIGS. 7-16. The user then approximates the first exemplary embodiment of the bumper 40 to the upright or suction head vacuum and presses the body 42 of the bumper 40 against the fastener patches 67 and 69, wherein the hook components engage the fabric layer 66 of the body 42, thereby retaining the bumper 40 on the appliance, as shown in FIGS. 9, 10 and 11.

With particular reference to FIGS. 4 and 5, it should be appreciated that the braided elastic band 62 gently urges the body 42 into an oblong-shaped conformation which is convenient for approximating the body 42 to the appliance, thereby saving time and frustration. Additionally, the tension exerted by the braided elastic band 62 conforms and encases the body 42 to the appliance surface, reducing the likelihood that the top edge 47 might protrude away from or gap at the top portion of a vacuum cleaner, suction head or the like, which is especially prone to causing damage; a protruding or gaping edge might expose surfaces to impact or scraping, or expose the body 42 to being snagged and pulled away from the appliance.

The bottom edge 43 of the body 42 tapers upward between the third and fourth lateral stitches 56 and 58 as previously described. This reduces the likelihood that the body 42 will have excess material which might drag on the floor or interfere with a wheel of a vacuum cleaner (see, e.g., FIG. 8).

The horizontal equatorial stitch 48 and the centerline stitch 50 also perform usefully as guiding stitches—they facilitate installation by helping the user quickly center the bumper on a vacuum.

The peripheral bead 46 blocks dust and debris from falling behind the bumper 40 and collecting on the adhesive component of the hook fastener 67 and 69. Debris can prevent the adhesive from adhering well to the surface of a vacuum appliance.

The inventor discovered that the peripheral bead 46 of the body 42 enhances the ability of the body 42, which comprises the fabric layers 66 and the foam layers 68, to effectively fold and pleat. Moreover, the peripheral bead 46 cooperates with the braided elastic band 62 to create pleating, puckering and gathering at strategic locations in the body 42, creating a wide range of flexibility and a close fit between the body 42 and a vacuum appliance. As a result, the bumper 40 was able to fit effectively on a far greater range of vacuum cleaner designs, makes and models.

The inventor discovered that without the braided elastic band 62, the body 42 having the peripheral bead 46 folded and pleated only to a small degree. As a result, such a bumper 40 was able to fit relatively few designs, makes and models of vacuum appliances. Additionally, the effective attachment of the bumper 40 to a vacuum required hook component fastener patches 67 and 69 covering a substantial portion of a vacuum appliance's surface. Moreover, the activity of attaching the bumper 40 to the appliance was cumbersome.

The inventor also discovered that the bumper 40 made with the braided elastic band 62 but without the peripheral bead 46 offered an inferior fit. Additionally, without the peripheral bead 46, dust and debris more easily fell behind the bumper 40 impeding the adhesive component of the hook fastener 67 and 69 from adhering well to the surface of a vacuum appliance.

Overall, the use of the body 42 (which has an appropriate degree of stiffness, as well as an ability to naturally create smooth curves, bends, folds, and pleats in strategic locations), in combination with the elastic band 62 and the peripheral bead 46, produced superior performance. It required far less hook component adhesive strip for attachment to a vacuum. The user can attach the bumper 40 to a vacuum more conveniently and with less care, with hook component adhesive strip only at strategic locations on the vacuum (because the bumper 40 puckers/gathers properly due to the elastic band 62). The bumper can be installed quickly, conveniently, and precisely. The elastic band 62 and the peripheral bead 46 cooperate to enable the bumper 40 to effectively cover the impact-prone surfaces of the appliance.

The third lateral stitch 56, fourth lateral stitch 58 and fifth lateral stitch 60 subdivide the body 42 into segments which a user may trim off to reduce any excess length of the body 42 as shown by FIGS. 13, 15 and 16, without worrying that the fabric layers 66 and the foam layers 68 will gap, fray or separate at the end portions of the body 42. Excess length is to be avoided, because it may expose the body 42 to being snagged and pulled away from the appliance or entrained in the wheels or other parts of the appliance.

As demonstrated by FIGS. 7-11, 13, 14 and 16, upright vacuum cleaners vary in dimension, contour and equipment: they may be symmetrical or asymmetrical, have wheels inboard or outboard or no wheels at all, have a narrow rear, be wide and short, or be taller in some places than in others. In accordance with the present invention, the flexible fabric body 42 easily conforms to these various appliances without interfering with their suction mechanism, undersides or wheels.

As demonstrated by FIGS. 12 and 15, suction heads tend to be narrower, shorter and flatter than upright vacuum cleaners. Nevertheless, it is seen that the bumper 40 in accordance with the present invention easily conforms to these appliances, too.

With reference to the embodiment of FIGS. 1-5 and also to FIG. 21, the bumper 40 is supplied in small (40C), medium (40B) and standard (40A) sizes, thereby accommodating an even greater variety of vacuum cleaners, suction heads and similar appliances. The standard size bumper, hav-
ing an overall width of approximately 36.0 inches and an overall height of approximately 89 mm (3.5 inches) tapering to 70 mm (2.75 inches) at the lateral edges 45, fits many standard-size upright vacuum cleaners. The medium size, having an overall width of approximately 0.81 m (32.0 inches) and an overall height of approximately 76 mm (3 inches) tapering to 57 mm (2.25 inches) at the lateral edges 45, fits many medium and smaller upright vacuum cleaners and standard vacuum suction heads. The small size, having an overall width of approximately 0.71 m (28.0 inches) and an overall height of approximately 63 mm (2.5 inches) fits small upright vacuum cleaners and smaller vacuum suction heads, as shown by FIGS. 12, 13, 14 and 21. The small size bumper 40 does not taper in height near the lateral edges 45, and the fifth lateral stitch is omitted.

[0076] The inventor discovered that despite the length discrepancy between the small, medium, and standard size bumpers 40, the body 42 of each size functions more effectively when they employ a braided elastic band 62 having a relaxed length of approximately 102 mm (4.0 inches) and a stretched length of approximately 178 mm (7.0 inches) (i.e., although the overall lengths of the standard, medium, and small size bumpers 40 vary, the distance between the first lateral stitch 52 and the second lateral stitch 54 is consistent between the different size bumpers 40 at approximately 178 mm (7.0 inches).

[0077] FIG. 6, a front elevational view of a second exemplary embodiment of a bumper, shown generally at 70, for a canister vacuum cleaner or the like in accordance with the present invention, shows a body 72, bottom edge 73, head stitch 74, lateral edge 75, peripheral bead 78, top edge 77, centerline stitch 80, first segmenting stitch 86, second segmenting stitch 88, third segmenting stitch 90, cut-down 92, lower fastener patch 94, and upper fastener patches 96. The body 72 has a height of approximately 6.0 inches overall, with the top edge 77 tapering centrally to form the cut-down 92 having a height of approximately 3.0 inches at the centerline stitch 80. The first segmenting stitch 86, second segmenting stitch 88 and third segmenting stitch 90 establish convenient segments which a user may trim off to remove unwanted or excessive length without causing the body 72 to gap, fray or separate as described above for the first exemplary embodiment. The body 72 is preferably formed of a fabric-f/oam composite automotive headliner material or of VELTEX® brand fabric as described above for the first exemplary embodiment.

[0078] As shown by FIGS. 17-20, the cut-down 92 of the top edge 77 matches the low profile of the tapered, curved front-end of a modern yet common type of canister vacuum cleaner. The cut-down 92 also accommodates the handle or protruding vacuum hose that is often incorporated into these canister vacuums with tapered, curved, low-profile front ends. These features enable the bumper 70 to fit the contours of a variety of designs, makes and models of canister style vacuum cleaners and reduces the likelihood that excess material of the body 72 would be snagged on furniture or would interfere with a user grasping such a handle on this variety of canister vacuum cleaner. FIGS. 17-19 demonstrate both of these aspects of the present invention in use on a canister vacuum cleaner.

[0079] The body 72 includes an upper and lower rectangular stitches 98. The upper rectangular stitch having a height of about 63.5 mm (0.25 inch) and a width of about 127 mm (5.0 inches), is located approximately 19 mm (0.75 inch) below the top edge 77 and centered laterally about the centerline stitch 80. The lower rectangular stitch 98 also having a height of about 63.5 mm (0.25 inch) and width of about 127 mm (5.0 inches), is located approximately 19 mm (0.75 inches) above the bottom edge 73 and centered laterally about the centerline stitch 80. As illustrated in FIG. 20, the rectangular stitches 98 allow a user the option of cutting the body 72 horizontally if an opening is required for some types of canister vacuum cleaners having a vacuum hose or discharge orifice at a corresponding location on the canister instead of a handle as described in the above paragraph. The rectangular stitch 98 will confine any subsequent gapping or fraying of fabric or enlargement of the opening, thereby preserving the integrity of the body 72. Alternatively, the bumper 70 is supplied with the opening already made and finished to prevent gapping, fraying and running. Two rectangular stitches 98 are provided—upper and lower—to accommodate a vacuum hose or discharge orifice positioned higher or lower depending on the model of canister.

[0080] With reference to FIG. 6 and also with reference to FIGS. 17-19, the second exemplary embodiment of the bumper 70 in accordance with the present invention is approximated to a canister vacuum cleaner after the lower fastener patch 94 and upper fastener patch 96 have been installed on the canister vacuum cleaner by means of the contact adhesive. The locations and orientations of the fastener patches 94 and 96 relative to the body 72 of the bumper 70 as shown in FIG. 6 are exemplary and may be changed to fit the surface of the vacuum cleaner (see FIG. 17).

[0081] With continued reference to the second exemplary embodiment shown in FIG. 6 and also with reference to FIG. 22, the second exemplary embodiment of the bumper 70 is cut according to a pattern and sewn in a manner comparable to that described with reference to the first exemplary embodiment. Automotive headliner material or VELTEX® brand fabric is also preferred for this embodiment of the bumper 70. The bumper 70 is supplied in sizes large (70A in FIG. 22) and small (70B in FIG. 22). The larger size has an overall width of approximately 1.07 m (42.0 inches) and an overall height of 140 mm (5.5 inches) tapering to 76 mm (3.0 inches) at the centerline stitch 80. The smaller size has an overall width of approximately 0.89 m (35.0 inches) and an overall height of 133 mm (5.25 inches) tapering to 76 mm (3.0 inches) at the centerline stitch 80.

[0082] As can be seen from the drawing figures and from the description, each embodiment of the bumper in accordance with the present invention solves a problem by addressing the need for a bumper which is easily and efficiently adaptable to most vacuum cleaners, suction heads and canister vacuum cleaners, which is removable, washable and reusable, which collects dust and loose fiber, and which is easily made from inexpensive materials with no exotic equipment and few steps.

[0083] While the specification describes particular embodiments of the present invention, those of ordinary skill can devise variations of the present invention without departing from the inventive concept.

[0084] Although specific embodiments have been illustrated and described herein, those of ordinary skill in the art will appreciate that any arrangement calculated to achieve same purposes can be substituted for the specific embodiments shown. This disclosure is intended to cover any and all adaptations or variations of various embodiments of the invention. It is to be understood that the above description has
been made in an illustrative fashion, and not a restrictive one. Combinations of the above embodiments, and other embodiments not specifically described herein will be apparent to those of skill in the art upon reviewing the above description. The scope of various embodiments of the invention includes any other applications in which the above structures and methods are used. Therefore, the scope of various embodiments of the invention should be determined with reference to the appended claims, along with the full range of equivalents to which such claims are entitled.

[0085] In the foregoing description, if various features are grouped together in a single embodiment for the purpose of streamlining the disclosure, this method of disclosure is not to be interpreted as reflecting an intention that the claimed embodiments of the invention require more features than are expressly recited in each claim. Rather, as the following claims reflect, inventive subject matter lies in less than all features of a single disclosed embodiment. Thus the claims exemplifying the present invention, and such other claims as may later be added, are hereby incorporated into the description of the embodiments of the invention, with each claim standing on its own as a separate preferred embodiment.

I claim:

1. A bumper for an appliance such as an upright vacuum cleaner, vacuum suction head, canister vacuum cleaner or the like, comprising:
   a flexible body having size, shape and pliability to conform to a surface of the appliance;
   a layer of said body having protective properties relative to impingement between the appliance and environmental objects;
   an appliance-facing surface of said body being capable of reversible attachment to the surface of the appliance.

2. A bumper as set forth in claim 1, adapted for efficient attachment to an appliance such as an upright vacuum cleaner or a vacuum cleaner suction head, being elastically biased to assume a conformation facilitating installation on the appliance.

3. A bumper as set forth in claim 2, comprising an elastic member cooperating with said body to bias said body in said conformation.

4. A bumper as set forth in claim 3, wherein said elastic member is located within said body and is so anchored to said body as to bias at least a portion of said body in an arcuate conformation.

5. A bumper as set forth in claim 4, wherein said elastic member is anchored to said body proximate a top edge of said body and biases said top edge in said arcuate conformation.

6. A bumper as set forth in claim 4, wherein said elastic member has a first end and a second end both stitched to said body.

7. A bumper as set forth in claim 4, wherein said body has in combination sufficient stiffness to retain a gentle curvature at a bottom edge of said body and sufficient flexibility nevertheless to be biased in said arcuate conformation at said top edge of said body.

8. A bumper as set forth in claim 7, wherein said body comprises a layer of foam bonded to a layer of woven textile.

9. A bumper as set forth in claim 2, comprising at least one member having high elasticity and at least one member having low elasticity and moderate stiffness.

10. A bumper as set forth in claim 9, wherein said elastic member exerts sufficient tension upon said body to pucker and gather a portion of said body proximate said elastic member and said body has sufficient stiffness that portions thereof not proximate said elastic member form and maintain a smooth curve when said proximate portions are puckered and gathered to the fullest extent.

11. A bumper as set forth in claim 1, adapted for efficient attachment to an appliance such as an upright vacuum cleaner or a vacuum cleaner suction head, comprising an end portion and further comprising a bottom edge tapering upward proximate said end portion.

12. A bumper as set forth in claim 1, adapted for efficient attachment to an appliance such as an upright vacuum cleaner or a vacuum cleaner suction head, comprising an end portion and further comprising at least one reinforcement defining a discrete segment proximate said end portion, said reinforcement having sufficient integrity to prevent gaping, fraying and running proximal to said reinforcement if said body is severed distal thereto.

13. A bumper as set forth in claim 12, wherein said reinforcement comprises a stitch.

14. A bumper as set forth in claim 1, adapted for efficient attachment to an appliance such as a canister vacuum cleaner having a tapered front end, said body comprising a central portion intermediate two end portions, said body comprising a top edge tapering downward in said central portion.

15. A bumper as set forth in claim 1, adapted for efficient attachment to an appliance such as a canister vacuum cleaner having a tapered front end, said body comprising a central portion intermediate two end portions, said central portion comprising at least one centrally located reinforcement circumscribing a discrete area of said central portion, said reinforcement having sufficient structural integrity to prevent gaping, fraying and running proximal to said reinforcement if an opening is cut in said body within said discrete area.

16. A bumper as set forth in claim 1, adapted for efficient attachment to an appliance such as a canister vacuum cleaner having a tapered front end, said body comprising an end portion and further comprising at least one reinforcement defining a discrete segment proximate said end portion, said reinforcement having sufficient integrity to prevent gaping, fraying and running proximal to said reinforcement if said body is severed distal thereto.

17. A bumper as set forth in claim 1, adapted for efficient attachment to an appliance such as a canister vacuum cleaner having a tapered front end, said body comprising a layer of foam bonded to a layer of fabric.

18. A bumper as set forth in claim 1, wherein said reversible attachment to the surface of the appliance is mediated by a contact-adhesive-backed hook component of a hook-and-loop fastener system cooperating with a hook-engaging fabric layer of said body.

19. A bumper as set forth in claim 1, wherein said body comprises a fabric layer having dust-trapping properties.

20. A bumper as set forth in claim 1, wherein said body comprises installation guide stitching visible to a user for locating and aligning the center of the bumper with the vacuum.

21. A bumper as set forth in claim 1, wherein said installation guide stitching comprises a horizontal equatorial stitch and a vertical centerline stitch.
22. A bumper as set forth in claim 2, comprising a peripheral bead cooperating with said body to bias said body in said conformation.

23. A bumper as set forth in claim 3, comprising a peripheral bead cooperating with said body and with said elastic member to bias said body in said conformation.

24. A bumper as set forth in claim 1, comprising a peripheral bead cooperating with said body to block debris from collecting on said contact-adhesive-backed hook component of a hook-and-loop fastener system.

25. A bumper as set forth in claim 1, wherein said body comprises a material selected from the group consisting of VELTEX® Brand fabric and automotive headliner fabric.

26. A bumper as set forth in claim 3, adapted for efficient attachment to an appliance such as an upright vacuum cleaner or a vacuum cleaner suction head, being elastically biased to assume said arcuate conformation in engaging relationship to said appliance, said body being readily washable and dryable.