A combined dock seal and shelter structure for a truck loading dock includes a vehicle-engaging seal member that is removably or replaceably attached to a compressible side pad. A backer can be used to help mount the side pad to a wall, adjacent to a doorway. The side pad preferably comprises a resiliently compressible foam core within a pliable cover, while the seal member comprises a pliable curtain or semi-rigid panel that are flexible but less compressible than the foam core.
FIG. 2
FIG. 34

FIG. 35
COMBINATION DOCK SHELTER AND DOCK SEAL WITH REPLACEABLE SEAL MEMBERS

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

The present invention relates generally to a combined dock seal and shelter for sheltering the rear of a truck or other vehicle at a loading dock, and more particularly relates to the structure that connects a seal member to a compressible side pad.

[0002] 2. Description of Related Art

Trucks having open rear cargo bays are typically backed into alignment with a loading dock or other doorway of a building to facilitate loading and unloading of the vehicle. A significant gap is usually created between the rear of the truck and the face of the building, which exposes the interiors of the building and the truck to the outside environment during loading and unloading. Such gaps can be at least partially sealed by installing either a loading dock shelter or a loading dock seal around the perimeter of the doorway.

[0005] Conventional loading dock seals comprise resilient, compressible pads that are attached to the building along the lateral and top edges of the doorway. The pads usually include a foam core, which is covered with a coated fabric, vinyl or other similar covering for protection and appearance. The pad compliantly conforms to the rear contour of the truck as the truck presses up against the pad, which helps seal the gap between the face of the building and the rear of the truck. Although dock seals provide excellent sealing, they are often subject to significant compressive forces that can shorten the life of the seal. Dock shelters, on the other hand, use a different method of sealing that usually does not involve such high compressive forces.

[0006] Dock shelters typically have rigid side members, rather than compressible pads, installed along the sides of the doorway. The side members usually protrude one to three feet from the outside face of the building. To avoid being struck and damaged by a truck backing into the dock, side members are spaced farther away from the doorway than are the compressible pads of dock seals. Seal members, such as flexible panels or pliable curtains, are usually attached to the protruding face of the side members. The seal members (sometimes referred to as “side curtains”) lie generally parallel to the face of the building, and inner edges of the side members extend into the anticipated path of a truck backing into the dock. As a truck backs into the dock, the inner edges of seal members sweep across the side of the truck to provide sealing between the building and the rear side portion of the truck.

[0007] Even though the rigid side members of dock shelters are spaced farther apart than the compressible pads of dock seals, the rigid side members are still subject to impact damage from trucks. Attempts to provide dock shelters with hinged or collapsible frames have not been entirely satisfactory, because such frames are still subject to damage, are relatively difficult to maintain and increase manufacturing costs. Metal bumpers can be added to protect the side members, but such bumpers can be expensive and cumbersome to install. Since many loading docks have inclined driveway grades, many loading dock shelters must be custom-built to accommodate such grades and to maintain the proper perpendicular orientation between the truck walls and the seal members, which also increases their manufacturing costs.

[0008] To achieve the benefits of both dock seals and dock shelters while avoiding their disadvantages, combined dock shelters and seals have been developed, as disclosed in U.S. Pat. Nos. 5,953,868 and 6,311,435. Combined systems are somewhat of a hybrid in that they have a dock shelter seal member (i.e., a side curtain) attached to a dock seal compressible pad. For sealing, the side curtain brushes against the rear side of the truck or engages the truck’s rear edge. The compressible pad provides impact tolerance when necessary.

[0009] Although combined shelter/seal systems can be an excellent product, it can be challenging to attach a seal member or side curtain to a support member that is not only compressible but is also covered with a pliable fabric, which is the case with typical side pads. For side pads without any solid base or substance for supporting a common fastener, seals can be permanently attached to the pad’s pliable cover by sewing or gluing. However, such permanent means of attachment make it very difficult to replace a worn seal member without having to replace the entire shelter/seal system, so seal members are preferably designed to be removable. Moreover, the ability to easily remove the seal member when favorable weather conditions make its use unnecessary makes a removable connection desirable.

[0010] Currently, touch-and-hold fasteners, such as Velcro, are perhaps the best way of removably attaching a seal member to a compressible side pad. Unfortunately, Velcro fasteners can be expensive, as they need to be several feet long if they are to extend the full length of a typical side pad. And each side pad may require several Velcro strips of such length. Moreover, each strip has a mating half, and all the strips need to be sewn, bonded or otherwise attached to its respective side pad or seal member. Adhesive-backed Velcro strips bond to some materials better than others, which limits the choice of materials for the seal member and the pad’s covering. The ’868 patent mentions that known devices such as snap fasteners and zippers may be possible means for attachment, but the patent fails to illustrate, explain, or even suggest just how such devices can be applied. Current proven methods of attaching a pliable or flexible seal member to a compressible side pad appear to be primarily limited to sewing, gluing, and touch-and-hold fastening. Consequently, there appears to be a need for additional ways of replaceably attaching a seal member to a compressible pad.

SUMMARY OF THE INVENTION

[0011] In some embodiments, a compressible side pad includes an anchor block that allows a seal member to be removably attached to the pad.

[0012] In some embodiments, a compressible side pad includes a plurality of anchor blocks that are distributed vertically along a pad.

[0013] In some embodiments, a magnet removably connects a seal member to a side pad.

[0014] In some embodiments, a relatively short strip of spring material removably connects a seal member to a side pad.
In some embodiments, a pliable elongate member is pressed into a groove to removably connect a seal member to a side pad.

In some embodiments, mating extruded members provide a sliding connection that removably connects a seal member to a side pad.

In some embodiments, vertically spaced buttons removably connect a seal member to a side pad.

In some embodiments, vertically spaced straps, buckles, and/or hooks removably connect a seal member to a side pad.

In some embodiments, vertically spaced anchors extend entirely through a side pad to removably connect a seal member to the pad.

In some embodiments, vertical pins couple vertically offset loops to removably connect a seal member to a side pad.

In some embodiments, a side pad and/or seal member includes pockets or slits for removably connecting the seal member to the side pad.

In some embodiments, the pockets or slits are vertically spaced apart from each other.

In some embodiments, the pocket or slit extends substantially the full height of the side pad.

In some embodiments, a seal member includes a plurality of stays or curtain stiffeners that extend into a corresponding plurality of slits or pockets for removably connecting the seal member to the side pad.

In some embodiments, a zipper extends substantially the full length of a side pad to removably connect a seal member to the pad.

In some embodiments, a top flap extending from a seal member and overlaying a side pad helps support the weight of the seal member.

In some embodiments, a strap or other type of pliable elongate member constricts around a side pad to removably connect a seal member to the pad.

In some embodiments, an anchor protrudes into a side pad to grip an interior surface of the pad for removably connecting a seal member to the pad.

In some embodiments, a side pad includes a flap to which a seal member is removably attached.

FIG. 4 is a cross-sectional view taken along line 4-4 of FIG. 2.

FIG. 5 is a top view of a combination dock seal and shelter structure that could be used in the loading dock of FIG. 1.

FIG. 6 is a top view of another combination dock seal and shelter structure that could be used in the loading dock of FIG. 1.

FIG. 7 is a top view of another combination dock seal and shelter structure that could be used in the loading dock of FIG. 1.

FIG. 8 is a schematic perspective view of a seal member attached to a side pad.

FIG. 9 is a cross-sectional view taken along line 9-9 of FIG. 10.

FIG. 10 is a cutaway front view of one embodiment of a seal member attached to a side pad.

FIG. 11 is a cross-sectional view taken along line 11-11 of FIG. 12.

FIG. 12 is similar to FIG. 10, but of another embodiment.

FIG. 13 is similar to FIG. 9, but of another embodiment.

FIG. 14 is similar to FIG. 9, but of another embodiment.

FIG. 15 is similar to FIG. 14, but showing a vehicle engaging the seal member.

FIG. 16 is a cross-sectional top view of another seal member about to be attached to a side pad.

FIG. 17 is similar to FIG. 16, but showing the seal member attached to the side pad.

FIG. 18 is a cross-sectional top view of another seal member about to be attached to a side pad.

FIG. 19 is similar to FIG. 18, but showing the seal member attached to the side pad.

FIG. 20 is a cross-sectional view taken along line 20-20 of FIG. 21.

FIG. 21 is a cutaway front view of another embodiment of a seal member attached to a side pad.

FIG. 22 is a cross-sectional view taken along line 22-22 of FIG. 23.

FIG. 23 is a cutaway front view of another embodiment of a seal member attached to a side pad.

FIG. 24 is a cross-sectional view taken along line 24-24 of FIG. 25.

FIG. 25 is a cutaway front view of another embodiment of a seal member attached to a side pad, wherein two flexible elongate members are shown being installed.

FIG. 26 is a cross-sectional top view of another seal member about to be attached to a side pad.

FIG. 27 is similar to FIG. 26, but showing the seal member attached to the side pad.
FIG. 28 is a cross-sectional top view of another seal member about to be attached to a side pad.

FIG. 29 is similar to FIG. 28, but showing the seal member attached to the side pad.

FIG. 30 is a cross-sectional view taken along line 30-30 of FIG. 31.

FIG. 31 is a cutaway front view of another embodiment of a seal member attached to a side pad.

FIG. 32 is a cross-sectional view taken along line 32-32 of FIG. 33.

FIG. 33 is a side view of another embodiment of a seal member attached to a side pad.

FIG. 34 is a cross-sectional view taken along line 34-34 of FIG. 35.

FIG. 35 is a side view of another embodiment of a seal member attached to a side pad.

FIG. 36 is a cross-sectional view taken along line 36-36 of FIG. 37.

FIG. 37 is a side view of another embodiment of a seal member attached to a side pad.

FIG. 38 is a cross-sectional view taken along line 38-38 of FIG. 39.

FIG. 39 is a side view of another embodiment of a seal member attached to a side pad.

FIG. 40 is a cross-sectional view taken along line 40-40 of FIG. 41.

FIG. 41 is a side view of another embodiment of a seal member attached to a side pad.

FIG. 42 is a cross-sectional similar to FIG. 43, but showing the seal member in the process of being installed.

FIG. 43 is a cross-sectional view taken along line 43-43 of FIG. 44.

FIG. 44 is a side view of another embodiment of a seal member attached to a side pad.

FIG. 45 is a perspective view of another seal member attached to a side pad.

FIG. 46 is a perspective view of a seal member being inserted into a slit or pocket of a side member.

FIG. 47 is a perspective view similar to FIG. 46, but showing the seal member attached to the side pad.

FIG. 48 is a perspective view showing a seal member in the process of being attached to a side pad.

FIG. 49 is a cross-sectional top view of a seal member about to be attached to a side pad.

FIG. 50 is similar to FIG. 49, but showing the seal member attached to the side pad.

FIG. 51 is a cross-sectional top view of another seal member about to be attached to a side pad.

FIG. 52 is similar to FIG. 51, but showing the seal member attached to the side pad.

FIG. 53 is a perspective view showing another seal member in the process of being attached to another side pad.

FIG. 54 is a cross-sectional view taken along line 54-54 of FIG. 55.

FIG. 55 is a perspective view of the seal member and side pad of FIG. 53, but showing the seal member attached to the side pad.

FIG. 56 is a cutaway perspective view similar to FIG. 53, but of another embodiment.

FIG. 57 is a perspective view of another seal member attached to a side pad.

FIG. 58 is a perspective view showing a seal member about to be attached to a side pad.

FIG. 59 is a perspective view similar to FIG. 58, but showing the seal member attached to the side pad.

FIG. 60 is a perspective view of another seal member attached to a side pad.

FIG. 61 is a perspective view of another seal member attached to a side pad.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIGS. 1-4 illustrate a loading dock 10 with a combined dock seal and shelter structure 12 that is attached to a wall 14 having a doorway 16. A vehicle 18, such as a truck, is shown backing into structure 12, which helps seal out weather as shipping materials are transferred between vehicle 18 and a building 20. In this example, dock 10 includes a conventional dock leveler 22 that provides an adjustable height bridge or path between an elevated floor 24 in building 20 and a truck bed 26 of vehicle 18. Dock 10 may also include bumpers 28 for absorbing vehicle impacts and providing dock leveler 22 with sufficient clearance to operate. FIGS. 1 and 3 show vehicle 18 approaching structure 12. And FIGS. 2 and 4 show vehicle 18 having already backed into structure 12 with the rear of vehicle 18 adjacent to doorway 16, whereby vehicle 18 can be to loaded or unloaded.

To seal along the upper and side edges of the rear portion of vehicle 18, structure 12 includes a header 30 and two side members 32 and 34. Header 30 can be any structure that helps seal or shelter the upper rear portion of vehicle 18. Examples of header 30 include, but are not limited to, a compressible foam pad, pliable curtain, semi-rigid panel, roller, rigid frame, and various combinations thereof. A sealing edge 36 of header 30 may lie in front of or behind side members 32 and 34. Side members 32 and 34 are right-hand and left-hand versions of each other, so any description of one can apply to the other. For simplicity, various side member embodiments will be described and illustrated with reference to a left-hand side member, such as side member 32.

Side member 32 basically comprises a seal member 38 that is removably or replaceably attached to a side pad 40. The term, “removably” refers to being able to repeatedly connect and separate an assembly without having to discard, exchange, or permanently alter any parts of the assembly. The term, “replaceably” refers to being able to repeatedly connect and separate two components of an assembly, without having to discard, exchange, or permanently alter either of the two components; however, some connecting
parts of the assembly may be discarded or exchanged. Side pad 32 is compressible to avoid being damaged by the impact of vehicle 18 and/or to provide seal member 38 with more compliance for responding to vehicle 18 backing into seal member 38. In some embodiments, side pad 40 includes a resiliently compressible foam core 42 (e.g., polyurethane foam) protected by a pliable cover 44. Cover 44 can be made of various materials or fabrics including, but are not limited to, HYDAPOL (a product of DuPont, of Wilmington, Del.), vinyl, neoprene, coated woven fabrics, etc. Conventional fasteners 46, such as nails, screws, adhesive, stiches, staples, etc. can fasten cover 44 to a backer 48, which in turn facilitates the mounting of side pad 40 to wall 14. Backer 48 can simply be the back surface of pad 40 (i.e., the surface facing wall 14) or can be an actual structural member made of lumber, metal, extruded plastic, or any other material suitable for mounting to wall 14. Side pad 40 also includes a front face 50 that faces away from backer 48, an outer side surface 52 that faces away from opening 16 and extends between backer 48 and front face 50, and an inner side surface 54 that faces away from outer side surface 52 and extends between backer 48 and front face 50.

[0094] Seal member 38 is schematically illustrated to represent any member that can move in response to sealing engagement with vehicle 18. Seal member 38 can be a pliable curtain, resiliently flexible sheet of material, semi-rigid panel, or even a rigid panel with a movable attachment to a side member. Seal member 38 is preferably flexible and less compressible than foam core 42. Examples of seal member materials include, but are not limited to, polyolefin (polyethylene, polypropylene, etc.), HYDAPOL, coated woven fabrics, vinyl, etc.

[0095] The actual shape of seal member 38 can vary widely. In addition to the seal shape shown in FIG. 3, a few other shapes are illustrated in FIGS. 5, 6 and 7. In FIG. 5, the seal member has a sealing edge 56 that curves inward to avoid catching the side of a vehicle as the vehicle departs the loading dock. In FIG. 6, a sealing edge 58 curves inward to engage the rear edge of a truck as disclosed in U.S. Pat. No. 5,953,868. In FIG. 7, a sealing edge 60 is created by wrapping a fabric curtain 62 about a cylindrical foam bead 64 that provides curtain 62 with some rigidity along edge 60.

[0096] Referring to FIG. 8, a seal member 66 can also be provided with additional rigidity by attaching a series of resilient stays 68 to seal member 66. Stays 68 can be strips made of spring steel, fiberglass, or any other appropriately resilient material. Stays 68 can be attached to seal member 66 in various ways, including but not limited to, sewing, gluing, riveting, screwing, stapling, and/or inserting the stays in pockets or loops that may be attached to seal member 66.

[0097] In FIGS. 3-7, an attaching structure 70 is schematically illustrated to represent any structure that replaceably attaches a seal member to a side pad. Specific examples of attaching structure 70 are illustrated in FIGS. 9-60.

[0098] In FIGS. 9 and 10, a combined dock seal and shelter structure 72 includes a seal member 74 replaceably attached to a side pad 76. Side pad 76 comprises a compressible foam core 78 within a pliable cover 80. At least one anchor base 82 is glued, sewn or otherwise attached adjacent to a front face 84 of side pad 76. In this example, anchor base 82 is installed outside of cover 80. Anchor base 82 allows an anchor 86 (e.g., a conventional fastener such as a screw, rivet, nail, staple, adhesive tape, etc.) to fasten seal member 74 to anchor base 82, and thus fasten seal member 74 to side pad 76. To provide holding strength, anchor base 82 is preferably more rigid than cover 80 and less compressible than foam core 78, and in some cases more rigid than seal member 74 and thicker than cover 80. Anchor base 82 can be made of various materials including, but not limited to, metal and plastic. When more than one anchor base 82 is used to provide a series of anchor base segments, the segments can be vertically spaced apart to accommodate differences in thermal expansion between the anchor bases and the rest of structure 72.

[0099] FIGS. 11 and 12 show a combined dock seal and shelter structure 72 that is similar to structure 72, however, one full length anchor base 82 is used instead of multiple segments of anchor base 82.

[0100] FIG. 13 shows a combined dock seal and shelter structure 88 that is similar to structure 72 with a side pad 90, a seal member 92, an anchor base 94, a cover 96 and a foam core 98 being nearly identical to corresponding components of structure 72. Anchor base 94, however, is installed in between cover 96 and foam core 98 as a way of attaching base 94 to pad 90.

[0101] FIGS. 14 and 15 show a combined dock seal and shelter structure 100 that vehicle 18 can deflect from a normal, disengaged position (FIG. 14) to a vehicle-engaged position (FIG. 15). Structure 100 is similar to structure 88; however, a side pad 102 includes an anchor base 104 comprising a plurality of segments 106 that are pivotally interconnected. A pivotal connection 108 between adjacent segments 106 allows anchor base 104 to curve with a front face 110 of pad 102 as vehicle 18 deforms the pad. In some embodiments, segments 106 are extrusions with mating vertical edges that pivotally interlock with adjacent segments 106. Anchor base 104 can be installed underneath a cover 112 and directly against a foam core 114 as shown, or can be installed in between cover 112 and seal member 114.

[0102] In FIGS. 16 and 17, a combined dock seal and shelter structure 524 includes a seal member 526 replaceably attached to a side pad 528. Side pad 528 preferably comprises a compressible foam core 530 within a pliable cover 532. In addition to protecting core 530, cover 532 provides a flap 534 that can selectively overlay a front face 536 of pad 528. Flap 534 has a pivotal edge 538 and a distal edge 540 such that pivotal edge 538 enables distal edge 540 to be selectively swung toward and away from front face 536. Swinging flap 534 away from front face 536 provides access to both sides of flap 534, thereby enabling seal member 526 to be readily attached to flap 534 by way of a conventional fastener 542. Fastener 542 is schematically illustrated to represent any type of fastener that can attach seal member 526 to flap 534. Examples of fastener 542 include, but are not limited to, a threaded screw and nut, rivet, snap, button, touch-and-hold fastener, etc. Once seal member 526 is attached to flap 534, a second fastener 544 can engage distal edge 540 to hold flap 534 up against front face 536. Fastener 544 represents any type of fastener that holds seal member 526 adjacent to front face 536. Examples of fastener 544 include, but are not limited to, a strap, chain, rope, nylon cable tie, wire, cable, elastic cord, buckle, snap, button, touch-and-hold fastener, hook, zipper, laces, etc.
FIGS. 18 and 19 show a combined dock seal and shelter structure 546 that is similar to structure 524; however, a pivotal edge 548 is adjacent to an outer side surface 550 rather than adjacent to an inner side surface 552.

Structures 524 and 546 may offer different advantages. Structure 546 may provide greater holding strength near an outer edge 552 of seal member 526. However, structure 524 may provide seal member 526 with more freedom to move in response being engaged by vehicle 18. This is particularly true if fastener 544 of structure 524 is an elastic cord that stretches to permit outer edge 540 to swing partially away from front face 536 in response to vehicle 18 pushing against an inner edge 554 of seal member 526.

FIGS. 20 and 21 show a combined dock seal and shelter structure 116 where an anchor 118 is magnetically attracted to an anchor base 120 for removably attaching a seal member 122 to a side pad 124. Side pad 124 preferably includes a foam core 126 within a pliable cover 128 attached to a backer 130. Anchor base 120 can be attached to side pad 124 and anchor 118 can be attached to seal member 122. Either anchor 118 or base 120 is magnetic while the other is a ferrous metal attached to it or they could both be magnets of opposite polarity. The actual sizes and shapes of anchor 118 and anchor base 120 may vary from what is shown in the drawings.

FIGS. 22 and 23 show a combined dock seal and shelter structure 132 that includes a seal member 134 removably attached to a side pad 136 by virtue of one or more anchors 136 having sufficient resilient flexibility to releasably engage an anchor base 140. Various devices can accomplish this; however, in some embodiments, anchor base 140 can be an extruded channel attached to side pad 136, and anchor 138 can be a strip of spring steel attached to seal member 134. To releasably couple seal member 134 to side pad 136, anchor 138 can be forcibly bowed to slip opposite ends of the anchor underneath inwardly pointing flanges 142 of channel 144. The opposite can be done to separate seal member 134 from pad 136. Side pad 136 preferably includes a foam core 146 within a pliable cover 148 attached to a backer 150.

FIGS. 24 and 25 show a combined dock seal and shelter structure 152 where an anchor 152 can be pressed into engagement with an anchor base 154 that is attached to a side pad 156. Side pad 156 preferably includes a foam core 158 within a pliable cover 160 attached to a backer 162. The actual designs of anchor 152 and anchor base 154 may vary; however, in some embodiments anchor 152 is a flexible elongate member that can be pressed into a groove 162 of anchor base 154. Anchor 152 removably attaches a seal member 164 to side pad 156 by holding a portion of seal member 164 pinched between anchor 152 and groove 162 in a manner similar to the way common window screen material is often attached to a window frame. Anchor 152 and anchor base 154 can be extruded members.

FIGS. 26 and 27 show a combined dock seal and shelter structure 472 that is similar to structure 448. A connector 474 releasably connects a seal member 476 to a side pad 478. Side pad 478 preferably includes a foam core 480 within a pliable cover 482 attached to a backer 484. In this embodiment, connector 474 protrudes through seal member 476, and a barb 486 helps hold connector 474 in a crevice 488 in side pad 478. More than one connector 474 can be used to connect seal member 476 to pad 478. Connector 474 engaging a crevice in a front face 490, an outer side surface 492, or an inner side surface 494 are all well within the scope of invention.

FIGS. 28 and 29 show a combined dock seal and shelter structure 496 that is similar to structure 472; however, a seal member 498 includes a flange 500 that allows connector 474 to be inserted into a crevice 502 in an outer side surface 504 of a side pad 506.

FIGS. 30 and 31 show a combined dock seal and shelter structure 166 where an interlocking sliding connection exists between an anchor 168 and an anchor base 170, wherein anchor 168 is attached to a seal member 172 and anchor base 170 is attached to a side pad 174. Side pad 174 preferably includes a foam core 176 within a pliable cover 178 attached to a backer 180. The actual way of attaching anchor 168 to seal member 172 and the way of attaching anchor base 170 to side pad 174 may vary; however, in some embodiments flanges 182 and 184 connect anchor 168 to seal member 172, and anchor base 170 is bonded to side pad 174. The interlocking sliding connection between anchor 168 and anchor base 170 permit their separation, which renders seal member 172 removable attachable to side pad 174. Anchor 168 and anchor base 170 preferably have extrudeable cross-sections (i.e., their cross-sectional shapes are substantially uniform along their lengths so that they can be extruded), although other shapes are well within the scope of the invention.

FIGS. 32 and 33 show a combined dock seal and shelter structure 186 where a plurality of vertically spaced apart connectors disposed along an inner side surface 188 and/or an outer side surface 190 releasably connect a seal member 192 to a side pad 194. Side pad 194 preferably includes a foam core 196 within a pliable cover 198 attached to a backer 200. The connectors can assume various forms including, but not limited to, buttons 202 that fit through buttonholes 204. In this example, buttons 202 are sewn or otherwise attached to both the inner and outer side surfaces of side pad 194, and buttonholes 204 are in flanges 206 and 208 that extend from seal member 192. Flange 208 extends from an outer edge 210 of seal member 192, and flange 206 is at an intermediate point 212 of seal member 192, wherein point 212 is between outer edge 210 and an inner edge 214 that is adapted to engage vehicle 18.

FIGS. 34 and 35 show a combined dock seal and shelter structure 216 where a plurality of vertically spaced apart connectors disposed along an inner side surface 218 and/or an outer side surface 220 releasably connect a seal member 222 to a side pad 224. Side pad 224 preferably includes a foam core 226 within a pliable cover 228 attached to a backer 230. In this example, the connectors are snap-in buckles 232. The term, “snap-in buckle” refers to a coupling with at least two mating parts, wherein at least one of the mating parts resiliently deflects upon the engagement or disengagement with the other mating part. Buckles 232 can be attached to seal member 222 and pad 224 by way of straps 234 and 236 respectively. Straps 236 can be attached to backer 230 as shown, or can be sewn, glued or otherwise attached to cover 228 along sides surfaces 218 and 220 (i.e., attached to cover 228 at a point closer to seal member 222 than to backer 230). It should be noted that straps 234 and 236 are just one example of a pliable elongate member, and
other types of pliable elongate members are well within the scope of the invention. Other examples of pliable elongate members include, but are not limited to, chain, rope, nylon cable tie, wire, cable, elastic cord, etc.

[0113] FIGS. 36 and 37 show a combined dock seal and shelter structure 238 that is similar to structure 216, except that a binding buckle 240 is used instead of snap-in buckle 232. The term, “binding buckle” refers to a connector through which a strap (or other type of pliable elongate member) is looped in such a way that increasing tension in the strap increases the connector’s grip on the strap.

[0114] FIGS. 38 and 39 show a combined dock seal and shelter structure 242 that is similar to structures 216 and 238, except that a resiliently stretchable elongate member 244 is used instead of a buckle. Tension in stretchable member 244 holds a seal member 246 up against a side pad 248. The actual way of attaching stretchable member 244 may vary. In some embodiments, stretchable member 244 includes a hook at each end. One hook 250 can attach to an eyebolt 252 that is screwed into a backer 254, and another hook 256 can hook into a hole 258 or grommet in flanges 260 and 262 that extend from seal member 246. Instead of hooking into eyebolt 252, hook 250 could also hook into a hole or grommet in a pliable cover 264. To help support the weight of seal member 246, a top flap 251 extending from seal member 246 can overlay an upper surface of pad 248 and attach to backer 254 or another part of pad 248. Various fasteners for attaching top flap 251 include, but are not limited to, touch-and-hold fasteners, snaps, buttons, laces, tags, nails, staples, screws, buckles, hooks, etc.

[0115] FIGS. 40 and 41 show a combined dock seal and shelter structure 266 where a plurality of vertically spaced apart connectors 280 extend completely through a side pad 268 from an inner side surface 270 to an outer side surface 272. Side pad 268 preferably includes a foam core 274 within a pliable cover 276 attached to a backer 278. The connectors can assume various forms including, but not limited to, rods, pins, wire, cable, rope, etc. In some embodiments, connectors 280 are threaded rods 282 with a nut 284 at each end.

[0116] FIGS. 42, 43 and 44 show a combined dock seal and shelter structure 286 where a plurality of vertically spaced apart connectors disposed along an inner side surface 288 and an outer side surface 290 releasably connect a seal member 292 to a side pad 294. Side pad 294 preferably includes a foam core 296 within a pliable cover 298 attached to a backer 300. The connectors adjacent to outer side surface 290 comprise a hook 302 attached to seal member 292 and pivotally engaging a hook-receiving member 304 that is attached to pad 294. The connectors adjacent to inner side surface 288 are pliable elongate members 306, which extend from seal member 292 and are connectable to backer 300 or some other portion of side pad 294. Examples of pliable elongate member 306 include, but are not limited to, a strap, chain, rope, nylon cable tie, wire, cable, elastic cord, etc. To help support the weight of seal member 292, a top flap 308 extending from seal member 292 can overlay an upper surface 310 of pad 294. Various fasteners for holding top flap 308 to pad 294 include, but are not limited to, touch-and-hold fasteners, snaps, buttons, laces, buckles, hooks, etc.

[0117] FIG. 45 shows a combined dock seal and shelter structure 312 where a plurality of vertically spaced apart connectors disposed along an inner side surface and/or an outer side surface 314 releasably connect a seal member 316 to a side pad 318. Side pad 318 preferably includes a foam core within a pliable cover 320 attached to a backer 322. In this example, each connector comprises a conventional nylon cable tie 324 that couples a loop member 326 on side pad 318 to a flange 328 extending from seal member 316.

[0118] FIGS. 46 and 47 show a combined dock seal and shelter structure 328 where a seal member 330 is removably attached to a side pad 332 by virtue of side pad 332 having a vertical slit 334 into which a protrusion 336 extending horizontally from seal member 330 can be removably inserted. In this case, slit 334 is the open end of a pocket disposed across a front face of pad 332, and protrusion 336 is simply an integral extension of seal member 330. Slit 334 extends vertically over most of a height 338 of pad 332. Protrusion 336 can be held within slit 334 by friction alone or supplemented with various devices including, but not limited to, touch-and-hold fasteners, threaded fasteners, hooks, snaps, buttons, laces, buckles, etc.

[0119] In FIG. 48, a combined dock seal and shelter structure 340 includes a seal member 342 replaceably attached to a side pad 342. Side pad 342 comprises a compressible foam core within a pliable cover 344. Seal member 342 includes a series of flaps or protrusions 346 that can extend downward to be inserted into a corresponding series of slits 348, each of which extend horizontally across a front face of cover 344. Protrusions 346 can be rigid or pliable. A top flap 350, similar to top flap 308 of FIG. 44, can extend over a top surface 352 of pad 342 to help support the weight of seal member 342. Protrusions 346 can be held within slits 348 in various ways including, but not limited to, friction, touch-and-hold fasteners, threaded fasteners, hooks, snaps, buttons, laces, buckles, etc.

[0120] FIGS. 49 and 50 show a combined dock seal and shelter structure 448 where a releasable connector 450 on a seal member 452 protrudes into and releasably engages a crevice 454 in a side pad 456. Side pad 456 preferably includes a foam core 458 within a pliable cover 460 attached to a backer 462. Connector 450 can be connected to seal member 452 in various ways including, but not limited to, gluing, sewing, and fastening with conventional fasteners. Connector 450 can releasably grip an interior surface 464 of crevice 450 in various ways including, but not limited to friction, touch-and-hold fasteners, barbs, etc. More than one connector 450 can be used to connect seal member 452 to pad 456. Connector 450 engaging a crevice in a front face, an outer side surface 468, or an inner side surface 470 are all well within the scope of invention.

[0121] FIGS. 51 and 52 show a combined dock seal and shelter structure 508 where a releasable connector 510 integrally extending from a seal member 512 protrudes into and releasably engages a crevice 514 in a side pad 516. Side pad 516 preferably includes a foam core 518 within a pliable cover 520 attached to a backer 522. Connector 510 can releasably grip an interior surface of crevice 514 in various ways, including but not limited to friction, touch-and-hold fasteners, barbs, etc.

[0122] FIGS. 53-55 show a combined dock seal and shelter structure 354 where a seal member 356 is removably attached to a side pad 358 by a set of stays 360, which also provide seal member 356 with some rigidity. Side pad 358
preferably includes a foam core 376 within a pliable cover 362 attached to a backer 374. Stays 360 have protrusions 364 (i.e., the longer leg of each L-shaped stay) that couple a series of loops 366 on a front face 368 of pad 358 to a corresponding series of pockets or loops 370 on seal member 356. The open ends of loops 366 and 370 can be referred to as slits. A shorter retaining leg 372 at one end of each stay 360 can be tucked into a pocket or flap 378 along an outer edge 380 of seal member 356. Flap 378 can be pulled over retaining leg 372 in a manner similar to pulling a fitted sheet underneath the end of a mattress. With the inner support of leg 372, flap 378 engaging an outer surface 382 of pad 358 helps keep seal member 356 from moving in a first direction 384 off of pad 358. And loop 370 abutting loop 366 prevents seal member 356 from moving in an opposite direction 386 off of pad 358. So flap 378, stay 360, loop 362 and loop 370 together help hold seal member 356 to pad 358. Stays 360 can be made of spring steel, fiberglass, or any other material that provides an appropriate balance of resilient flexibility and rigidity.

[0123] FIG. 56 show a combined dock seal and shelter structure 388 that is quite similar to structure 354, except for a few changes. The changes permit the use of stays 390 having an extra long retaining leg 392 that can be tucked into an extra deep pocket or flap 394, whereby leg 392 and flap 394 stay together in a more positive manner. To do this, a loop 396 is pivotally attached to a side pad 398, and a loop 400 is pivotally attached to a seal member 402. The pivotal mounting of loops 396 and 400 allow a main leg 404 of stay 390 to be temporarily rotated 90-degrees downward so a distal end 406 of leg 392 can be slipped in underneath flap 394. Once end 406 is partially under flap 394, leg 392 can be rotated back up so leg 392 is completely underneath flap 394.

[0124] FIG. 57 shows a combined dock seal and shelter structure 408 where a first zipper 410 and a second zipper 412 removably connect a seal member 414 to a side pad 416. Side pad 416 preferably includes a foam core within a pliable cover 418 attached to a backer 420. Zipper 410 connects an outer surface 422 of pad 416 to an outer edge 424 of seal member 414. And zipper 412 connects an inner surface 426 of pad 416 to an intermediate point 428 of seal member 414, where intermediate point 428 is between outer edge 424 and an inner edge 430 of seal member 430.

[0125] FIGS. 58 and 59 show a combined dock seal and shelter structure 432 where a constrictor 434 can be used to removably connect a seal member 436 to a side pad 438. Side pad 438 preferably includes a foam core within a pliable cover 440 attached to a backer 442. In some embodiments, a pliable flange 444 extending from seal member 436 overlaps a groove 446 in side pad 438. Tightening constrictor 434 can force flange 444 into groove 446. Constrictor 434 is schematically illustrated to represent any pliable elongate member that can constrict to hold seal member 436 to side pad 438. Examples of constrictor 434 include, but are not limited to, a strap, belt, cable, chain, rope, wire, cable, elastic cord, nylon cable tie, buckle, snap, hook, and various combinations thereof.

[0126] FIG. 60 shows a combined dock seal and shelter structure 556 where laces 558 are threaded through a series of holes or grommets to removably connect a seal member 560 to a side pad 562. Side pad 562 preferably includes a foam core within a pliable cover 564 attached to a backer 566. Laces 558 connect an outer surface 568 of pad 562 to an outer edge 568 of seal member 560. A similar set of laces can connect an inner surface 570 of pad 562 to an intermediate point 572 of seal member 560, where an intermediate point 572 is between outer edge 576 and an inner edge 574 of seal member 560.

[0127] FIG. 61 shows a combined dock seal and shelter structure 578 where a seal member 580 is removably connected to a side pad 582. Side pad 582 preferably includes a foam core within a pliable cover 584 attached to a backer 586. A first loop 588 is sewn or otherwise attached to seal member 580, and a second loop 590 vertically offset to loop 588 is attached to side pad 582. A pin 592 extending through loops 588 and 590 holds the loops together, which thus holds seal member 580 to side pad 582. Structure 578 may include a plurality of first loops 588 and a plurality of second loops 590, and the loops can be on any surface or corner of pad 582. A top flap 594 extending between seal member 580 and a top surface 596 of pad 582 can help support the weight of seal member 580.

[0128] Although the invention is described with reference to presently preferred embodiments, it should be appreciated by those skilled in the art that various modifications are well within the scope of the invention. For example, the various members used for removably or replaceably attaching various seal members to various side pads can be mixed, matched, and/or combined among the various embodiments of a combined seal and shelter structure. Therefore, the scope of the invention is to be determined by reference to the claims that follow.

We claim:
1. A combined dock seal and shelter adapted to help seal between a vehicle and a wall, wherein the wall defines a doorway of a building, the combined dock seal and shelter comprising:
a side pad being vertically elongate, being attachable to the wall adjacent to the dock opening, and having a pad width that runs horizontally and parallel to the wall when attached thereto, wherein the side pad includes a compressible foam core within a pliable cover;
a seal member having an outer edge adjacent to the side pad and an inner edge adapted to engage the vehicle, wherein the outer edge and the inner edge define a seal width that is greater than the pad width, and the seal member is flexible but less compressible than the compressible foam core;
an anchor base attached to the side pad, wherein the anchor base is more rigid than the pliable cover and is less compressible than the compressible foam core; and
an anchor attached to the seal member and releasably coupled to the anchor base, whereby the seal member is releasably attached to the side pad.
2. The combined dock seal and shelter of claim 1, wherein the anchor is a threaded fastener.
3. The combined dock seal and shelter of claim 1, wherein the anchor base is installed between the compressible foam core and the pliable cover.
4. The combined dock seal and shelter of claim 1, wherein the anchor base comprises a plurality of vertically spaced apart segments.
5. The combined dock seal and shelter of claim 1, wherein the anchor base comprises a plurality of segments that are pivotally interconnected.

6. The combined dock seal and shelter of claim 1, wherein the anchor is coupled to the anchor base through magnetic attraction.

7. The combined dock seal and shelter of claim 1, wherein the anchor is releasably coupled to the anchor base by virtue of the anchor being resiliently flexible.

8. The combined dock seal and shelter of claim 7, wherein the anchor is a strip of spring steel.

9. The combined dock seal and shelter of claim 1, wherein an interlocking sliding connection exists between the anchor and the anchor base.

10. The combined dock seal and shelter of claim 1, wherein the anchor and the anchor base each have an extrudeable cross-section.

11. The combined dock seal and shelter of claim 1, wherein the anchor is an elongate member that fits into a groove defined by the anchor base, and a portion of the seal member is held pinched between the elongate member and the anchor base.

12. A combined dock seal and shelter adapted to help seal between a vehicle and a wall, wherein the wall defines a doorway of a building, the combined dock seal and shelter comprising:

   a side pad that includes a compressible foam core within a pliable cover, a backer that is attachable to the wall adjacent to the dock opening, a front face that faces away from the backer, an outer side surface that extends between the backer and the front face and faces away from the doorway when the side pad is attached to the wall, and an inner side surface that faces away from the outer side surface and extends between the backer and the front face;

   a seal member having an outer edge adjacent to the outer side surface, an inner edge adapted to engage the vehicle, and an intermediate point adjacent to the inner side surface, wherein the seal member is flexible but less compressible than the compressible foam core; and

   a plurality of releasable connectors that releasably connect the seal member to the side pad, wherein the plurality of releasable connectors are vertically spaced apart from each other and are disposed along at least one of the outer side surface and the inner side surface.

13. The combined dock seal and shelter of claim 12, wherein the plurality of releasable connectors are disposed along at least one of the outer side surface and the inner side surface.

14. The combined dock seal and shelter of claim 12, wherein the plurality of releasable connectors are buttons.

15. The combined dock seal and shelter of claim 12, wherein the plurality of releasable connectors includes a pliable elongate member.

16. The combined dock seal and shelter of claim 12, wherein the plurality of releasable connectors extend completely through the side pad from the inner side surface to the outer side surface.

17. The combined dock seal and shelter of claim 12, further comprising a first loop on the seal member, a second loop on the side pad, and a pin coupling the first loop to the second loop.

18. The combined dock seal and shelter of claim 12, further comprising a flange connected to the seal member and overlapping at least one of the inner side surface and the outer side surface of the side pad, wherein the backer is closer to the plurality of releasable connectors than to the flange.

19. The combined dock seal and shelter of claim 12, wherein the plurality of releasable connectors includes a snap-in buckle.

20. The combined dock seal and shelter of claim 12, wherein the plurality of releasable connectors includes a binding buckle.

21. The combined dock seal and shelter of claim 12, wherein the plurality of releasable connectors includes a hook.

22. A combined dock seal and shelter adapted to help seal between a vehicle and a wall, wherein the wall defines a doorway of a building, the combined dock seal and shelter comprising:

   a side pad that includes a compressible foam core within a pliable cover, a backer that is attachable to the wall adjacent to the dock opening, and a front face that faces away from the backer, wherein the side pad defines a slit;

   a seal member having an outer edge adjacent to the front face, an inner edge adapted to engage the vehicle, wherein the seal member is flexible but less compressible than the compressible foam core; and

   a protrusion attached to the seal member and extending into the slit to help hold the seal member to the side pad.

23. The combined dock seal and shelter of claim 22, wherein the slit runs horizontally, and the protrusion extends downward.

24. The combined dock seal and shelter of claim 22, wherein the slit runs vertically and the protrusion extends sideways.

25. The combined dock seal and shelter of claim 22, wherein the slit is one of a plurality of vertically spaced apart slits, and the protrusion is one of a plurality of vertically spaced apart protrusions.

26. The combined dock seal and shelter of claim 25, further comprising a plurality of stays attached to the seal member, wherein the plurality of stays are resiliently flexible to help support the seal member, and the plurality of vertically spaced apart protrusions are an integral extension of the plurality of stays, whereby the plurality of stays protrude into the plurality of vertically spaced apart slits.

27. The combined dock seal and shelter of claim 22, wherein the side pad has a pad height and the slit runs for most of the pad height.

28. The combined dock seal and shelter of claim 22, wherein the side pad includes a loop that defines the slit.

29. The combined dock seal and shelter of claim 22, wherein the side pad includes a pocket and the slit is an opening of the pocket.

30. A combined dock seal and shelter adapted to help seal between a vehicle and a wall, wherein the wall defines a doorway of a building, the combined dock seal and shelter comprising:

   a side pad that includes a compressible foam core within a pliable cover, a backer that is attachable to the wall
adjacent to the dock opening, a front face that faces away from the backer, an outer side surface that extends between the backer and the front face and faces away from the doorway when the side pad is attached to the wall, and an inner side surface that faces away from the outer side surface and extends between the backer and the front face;

a seal member having an outer edge adjacent to the outer side surface, an inner edge adapted to engage the vehicle, and an intermediate point adjacent to the inner side surface, wherein the seal member is flexible but less compressible than the compressible foam core;

a first zipper that runs vertically and connects the outer edge to the outer side surface; and

a second zipper that runs vertically and connects the intermediate point to the inner side surface.

31. A combined dock seal and shelter adapted to help seal between a vehicle and a wall, wherein the wall defines a doorway of a building, the combined dock seal and shelter comprising:

a side pad that includes a compressible foam core within a pliable cover, a backer that is attachable to the wall adjacent to the dock opening, a front face that faces away from the backer, an upper surface that extends from the backer to the front face;

a seal member having an outer edge adjacent to the front face and an inner edge adapted to engage the vehicle, wherein the seal member is flexible but less compressible than the compressible foam core; and

a top flap attached to the seal member and overlaying the upper surface of the side pad.

32. The combined dock seal and shelter of claim 31, wherein the top flap is made of a pliable material.

33. The combined dock seal and shelter of claim 31, wherein the top flap is attached to the backer.

34. The combined dock seal and shelter of claim 31, further comprising a touch-and-hold fastener that releasably connects the top flap to the upper surface.

35. The combined dock seal and shelter of claim 31, wherein the top flap engages the upper surface to help support the weight of the seal member.

36. A combined dock seal and shelter adapted to help seal between a vehicle and a wall, wherein the wall defines a doorway of a building, the combined dock seal and shelter comprising:

a side pad that includes a compressible foam core within a pliable cover, a backer that is attachable to the wall adjacent to the dock opening and a front face that faces away from the backer;

a seal member having an outer edge adjacent to the front face and an inner edge adapted to engage the vehicle, wherein the seal member is flexible but less compressible than the compressible foam core;

a flange extending from the seal member and overlapping the side pad; and

a constrictor overlapping the flange and wrapped in tension around the side pad to help hold the seal member to the side pad.

37. A combined dock seal and shelter adapted to help seal between a vehicle and a wall, wherein the wall defines a doorway of a building, the combined dock seal and shelter comprising:

a side pad that includes a compressible foam core within a pliable cover, a backer that is attachable to the wall adjacent to the dock opening, a front face that faces away from the backer, an outer side surface that extends between the backer and the front face and faces away from the doorway when the side pad is attached to the wall, and an inner side surface that faces away from the outer side surface and extends between the backer and the front face, wherein the side pad defines a crevice that extends into the compressible foam core;

a seal member having an outer edge adjacent to the side pad and an inner edge adapted to engage the vehicle, wherein the seal member is flexible but less compressible than the compressible foam core; and

a releasable connector engaging the seal member and protruding into the crevice, wherein the releasable connector releasably grips the side pad.

38. The combined dock seal and shelter of claim 37, wherein the crevice extends through the front face.

39. The combined dock seal and shelter of claim 37, wherein the crevice extends through the inner side surface.

40. The combined dock seal and shelter of claim 37, wherein the crevice extends through the outer side surface.

41. The combined dock seal and shelter of claim 37, further comprising a touch-and-hold fastener disposed on the releasable connector and in the crevice.

42. The combined dock seal and shelter of claim 37, further comprising a barb disposed on the releasable connector.

43. The combined dock seal and shelter of claim 37, wherein the pliable cover lines an interior of the crevice.

44. A combined dock seal and shelter adapted to help seal between a vehicle and a wall, wherein the wall defines a doorway of a building, the combined dock seal and shelter comprising:

a side pad that includes a compressible foam core within a pliable cover, a backer that is attachable to the wall adjacent to the dock opening, a front face that faces away from the backer, an outer side surface that extends between the backer and the front face and faces away from the doorway when the side pad is attached to the wall, and an inner side surface that faces away from the outer side surface and extends between the backer and the front face;

a flap extending from the pliable cover and selectively overlaying the front face, wherein the flap has a pivotal edge and a distal edge such that the pivotal edge enables the distal edge to be selectively swung toward and away from the front face;

a seal member connected to the flap and having an outer edge adjacent to the flap and an inner edge adapted to engage the vehicle, wherein the seal member is flexible but less compressible than the compressible foam core;

a first fastener releasably connecting the seal member to the flap, and
a second fastener releasably holding the distal edge adjacent to the side pad.

45. The combined dock seal and shelter of claim 44, wherein the flap and the pliable cover are made of the same material.

46. The combined dock seal and shelter of claim 44, wherein the pivotal edge of the flap is sewn to the pliable cover.

47. The combined dock seal and shelter of claim 44, wherein the first fastener is a threaded fastener.

48. The combined dock seal and shelter of claim 44, wherein the flap is sandwiched between the seal member and the front face of the side pad when the second fastener is holding the distal edge adjacent to the side pad.

49. The combined dock seal and shelter of claim 44, wherein the second fastener is a touch-and-hold fastener.

50. The combined dock seal and shelter of claim 44, wherein the second fastener includes a button.

51. The combined dock seal and shelter of claim 44, wherein the second fastener includes a snap-in buckle.

52. The combined dock seal and shelter of claim 44, wherein the second fastener is resiliently flexible.

53. The combined dock seal and shelter of claim 44, wherein the second fastener includes a binding buckle.

54. The combined dock seal and shelter of claim 44, wherein the distal edge is adjacent the inner side surface of the side pad.

55. The combined dock seal and shelter of claim 44, wherein the distal edge is adjacent the outer side surface of the side pad.

56. A combined dock seal and shelter adapted to help seal between a vehicle and a wall, wherein the wall defines a doorway of a building, the combined dock seal and shelter comprising:

a side pad that includes a compressible foam core within a pliable cover, a backer that is attachable to the wall adjacent to the dock opening, a front face that faces away from the backer, an outer side surface that extends between the backer and the front face and faces away from the doorway when the side pad is attached to the wall, and an inner side surface that faces away from the outer side surface and extends between the backer and the front face;

a seal member having an outer edge adjacent to the outer side surface, an inner edge adapted to engage the vehicle, and an intermediate point adjacent to the inner side surface, wherein the seal member is flexible but less compressible than the compressible foam core; and

a set of laces releasably connecting the seal member to the side pad.

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