

FIG. 3

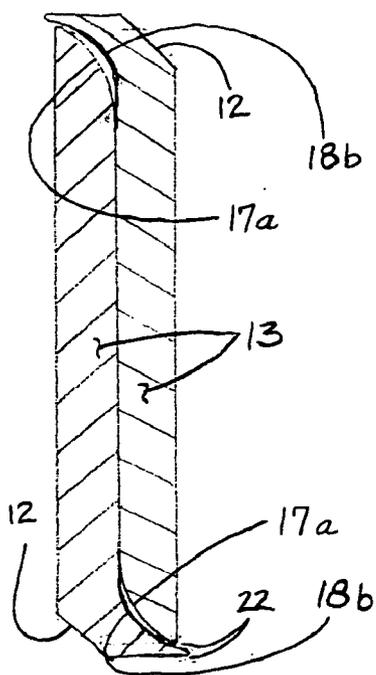


FIG. 4

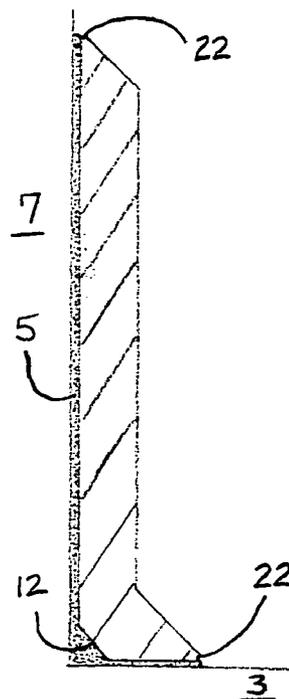


FIG. 5

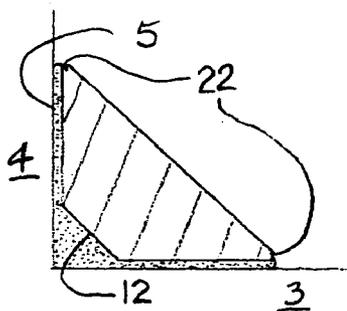


FIG. 6

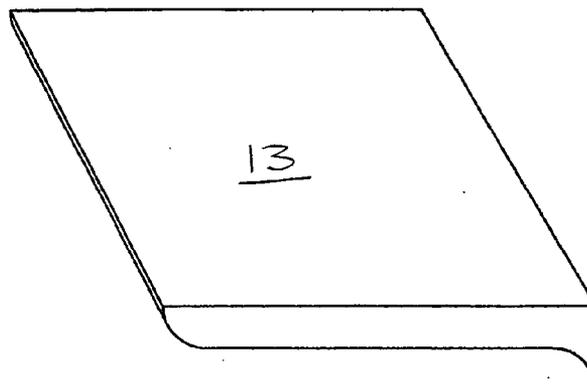


FIG. 7

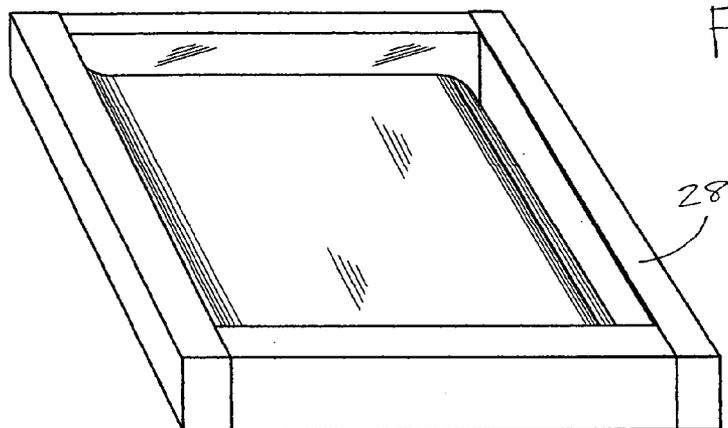


FIG. 8

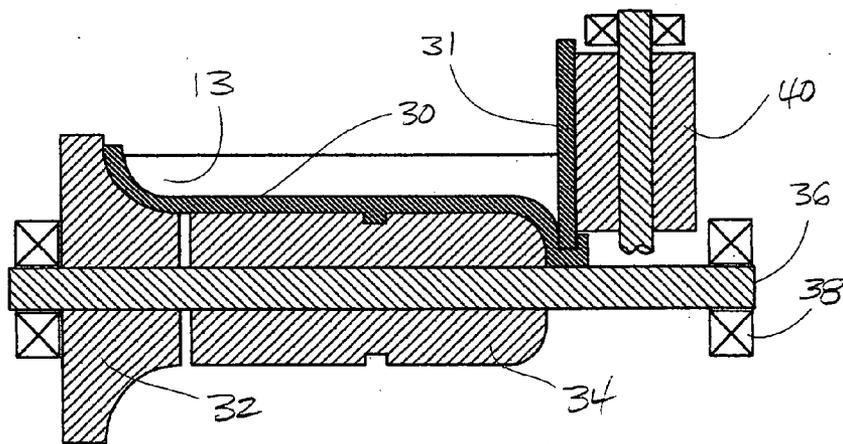


FIG. 9

COVE ELEMENTS AND FLOOR COATINGS AND METHODS FOR INSTALLING

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The instant application claims priority to U.S. Ser. No. 60/487,517 filed Jul. 14, 2003

BACKGROUND OF THE INVENTION

[0002] A. Field of the Invention

[0003] The invention relates to coving materials for use with resinous floor systems, and further relates to methods of installing such coving materials and formation of resinous floor systems coating cementitious floors and cove elements to form a monolithic flooring structure. The invention further relates to monolithic floor systems that include wall cove elements coated along with the floor with resinous flooring compositions to form a monolithic floor system.

[0004] B. Description of the Related Art

[0005] Resin based floors are becoming increasingly more popular because of their high performance in impact, abrasion, and chemical resistance. In commercial applications, such floors are rapidly becoming an industry standard, and many building codes now require such floor coatings. An advantage to resin based floor coatings is that they provide a complete seal making it easier to clean floor surfaces and keep sanitary.

[0006] A problem with such floors, in particular in commercial and industrial applications, is the difficulty associated with keeping corners clean and keeping the area where walls meet the flooring clean. Corners and the areas where floors and walls meet form 90 degree angles which provide ideal breeding grounds for bacteria and other microbial matter.

[0007] In order to make cleaning easier, the resinous flooring industry has developed a standard that includes a seamless floor-to-cove base transition in order to produce a more sanitary and easily maintained floor. Specifically, a concave transition or cove is built up along the floor along the base of the wall to form a transition therebetween.

[0008] In many municipalities, health departments have implemented regulations requiring such floor-to-cove base transitions in order to achieve sanitary standards for floors in applications such as restaurant kitchens and hospitals.

[0009] Such floor-to-cove base transitions have other applications, for instance, in industrial applications a seamless floor-to-cove system is used as a containment system in which the contents of a chemical storage tank would be contained within a predetermined area if the tank were to rupture.

[0010] Resinous floors are typically applied to a cementitious base or sub-flooring. However, the requirements regarding covings along the lower portions of a cementitious floor present problems for contractors and builders. Ideally, a monolithic floor is one where a cementitious floor includes a cementitious or cement-like cove base that will exhibit the same response to temperature, stress, expansion, and contraction as the cementitious floor in order to maintain it's seamless integrity. Another requirement is that the cove base

has a PSI (pounds per square inch) strength that is equal to or greater than the cementitious floor and the coating. Finally, it is imperative that the cove base not warp, twist, shrink, swell, or decay. It should be strong enough resist damage by impacts with heavy objects in order to prevent denting or cracking of the coating.

[0011] Currently, formation of cementitious cove extending up walls must be done manually by hand by a skilled craftsman. It is a laborious and time consuming job, and is therefore an extremely expensive component of monolithic cementitious floor systems.

[0012] As a result of the expense associated with the installation of monolithic cementitious floors, a need has been created by the industry for more rapid ways of forming coves.

[0013] Many manufacturers have been producing various types of base board-like moldings for years. There are distinct disadvantages to such moldings when used with a cementitious sub-floor system, in that they do not have the same expansion and contraction features as the cementitious sub-flooring, if wood they may rot; if vinyl they are too flexible; and further may not have the same PSI strength. For cementitious sub-flooring, expansion and contraction rates are a particular problem, making impractical to use these commercially produced moldings. Further, the shapes of such moldings do not include a radius or curved contour that is desired for ease of cleaning and in many jurisdictions, as required by recently implemented building codes and regulations.

[0014] Manufacturers have also produced pre-made molding corners in wood, MDF, plastics, foams, ceramics, and resins. However, insofar as the inventors are aware, none are made with radius or cant cove at their base or corners that would meet the resinous flooring industry standards. Finally, manufactures have been producing ceramic radius cove base tiles and corner tiles for years. However, such ceramic tiles, once installed, have grout seams; they are typically glazed making them unsuitable for coating with a resinous flooring material; and cannot provide the seamless floor required by most building codes where monolithic flooring is required.

[0015] Currently, as indicated above, the flooring industry employs trowel technicians to fabricate a rolled radius and cant cove base where the walls of a room meet the floor. First they attach a thin metal strip or just mask a determined distance up the wall from the floor level. Then an resin/sand mixture is smeared on the wall below the metal strip with a modified concrete trowel moving inch by inch. In some applications, this mixture of resin and colored quartz sand is the same material that makes up the final floor coating. This entire process has several problems: these technicians are very expensive; their process use a very slow and disruptive to the entire jobsite; such technicians are very hard to find and typically will not do small jobs such as bathrooms and small commercial kitchens; and their troweling techniques do not work well for cove bases higher than 4" because the mixture will not stay on the wall long enough to set up and harden. In so far as the inventors are aware, there are no other feasible methods to create this base coving being used by this quickly evolving sector of the industry.

SUMMARY OF THE INVENTION

[0016] The goal of this invention is to provide a cove base and stem wall cap molding system for every application of

the cementitious floor coating (both solvent and water based) industry. These systems will be faster, easier, less expensive to install, suitable for mass production, and that form or result in a monolithic floor-to-base cove system as much as is possible.

[0017] In another aspect of the invention, a flooring system include cementitious coving members fixed to either a floor or wall to form a transition therebetween and the floor and coving members are coated uniformly with a resinous coating forming a monolithic/seamless floor system.

[0018] Accordingly, there are several objects and advantages of the invention. For example, the invention may reduce or eliminate the slow and burdensome troweled base cove method; significantly reduces base cove installation time, which should lower the cost and help the general contractor to expedite the entire job.

[0019] The present invention significantly reduce base cove installation labor costs by enabling any reasonably skilled laborer to install it using the following common tools: a pencil; speed square; sheetrock rasp; carbide or diamond bladed circular saw—corded or cordless; tile saw; miter saw; caulking gun; and corded or cordless drill.

[0020] The invention also enables flooring contractors to use their own employees for base cove installation and avoid the delays and expense of having to hire additional subcontractors.

[0021] The present invention also enhances the finished appearance of all cementitious floor coatings with a more straight, streamlined and uniform base cove shape.

[0022] The present invention more closely meets the industry's requirement for a monolithic installation over the existing trowel method because the systems can have a stronger bond to the floor than to the wall by using different adhesives. This enables the base cove molding to move with the floor as a unit, thus further guaranteeing the seamless integrity of the finish coating during expansion and contraction of wall and/or floor.

[0023] The cove elements of the present invention relate to pre-cast gypsum moldings, pre-made resin corner moldings, ceramic base cove tiles, and resinous hand troweled base coving.

[0024] The invention also relates to methods of installing cove elements and covering the cove elements and cementitious flooring to produce a monolithic flooring system.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] FIG. 1 is a perspective front side view of a 4" base cove molding system fabricated in accordance with the present invention, showing an elongated cove element installed between inside and outside 90-degree corners, and further showing three alternative methods of joint alignments 14, 15 & 16 used between cove elements.

[0026] FIG. 2 is a perspective front side view of a 1" cove molding system fabricated in accordance with the present invention, showing an inside 3-way 90-degree corner cove element installed between three elongated cove elements.

[0027] FIG. 3 is a perspective front side view of an adjustable 5"×8½" stem wall cap system fabricated in accordance with the present invention, showing a straight piece

mounted over a wood ledger and covering a stem wall, and further showing an optional 1"×1" cove system.

[0028] FIG. 4 is a cross-sectional side view of two pieces of 4" base cove molding placed face to face showing interlocking shapes for shipping and handling, in accordance with the present invention.

[0029] FIG. 5 is a cross-sectional side view of a 4" base cove molding with an optional 45 degree cant cove, in accordance with the present invention.

[0030] FIG. 6 is a cross-sectional side view of a 1"×1" cove element in optional 45 degree cant cove in accordance with the present invention.

[0031] FIG. 7 is a perspective view of a cove element after molding, in accordance with the present invention.

[0032] FIG. 8 is a perspective view of a mold used for forming a cove element, in accordance with the present invention.

[0033] FIG. 9 is a sectional view of an endless belt system for forming a cove element, in accordance with the present invention.

REFERENCE NUMBERS

- [0034] stem wall cap 1
- [0035] concrete stem wall 2
- [0036] concrete floor 3
- [0037] concrete or CMU wall 4
- [0038] adhesive on back & bottom 5
- [0039] pressure treated wood ledger 6
- [0040] drywall 7
- [0041] wood framing 8
- [0042] sand-like texture 9
- [0043] convex radius edge 10
- [0044] 1"×1" cove 11
- [0045] angled relief 12
- [0046] 4" base cove 13
- [0047] alternative pin alignment 14
- [0048] alternative tongue & groove alignment 15
- [0049] alternative adhesive peel-&-stick alignment 16
- [0050] convex radius arc 17a, 17b, 17c
- [0051] concave radius cove 18a, 18b, 18c
- [0052] 90 degree inside corner 19
- [0053] 90 degree outside corner 20
- [0054] adhesive on abutted joints 21
- [0055] slightly rounded edges 22
- [0056] 3-way 90-degree inside corner 23
- [0057] fixed mold 28
- [0058] endless belt molds 30 and 31
- [0059] rollers 32, 34 and 40

[0060] shaft 38

[0061] bearings 36

DETAILED DESCRIPTION OF THE INVENTIONS

[0062] Definition of Terms

[0063] The term monolithic flooring system used herein refers to a flooring system that includes an under-layment or substrate of material that is rigid and generally uniform, such as cement, concrete or other cementitious or cement-like material (but is not limited to such materials), where the under-layment or substrate is coated with a resinous floor coating. Monolithic flooring systems may include manually formed floor-to-cove transitions along a wall at the floor, or may include the coving members of the present invention installed at the floor and wall junction, attached to either the floor or the walls, with the floor-to-cove transitions or coving members of the present invention are also coated along with the under-layment with the resinous floor coating.

[0064] The term resinous floor coating or coatings refers to any of a variety of materials for coating floors, and in particular, cementitious floors. Resinous floor coatings include epoxies, polyurethane based products, methyl methacrylate products, and other similar compositions made for coating and protecting high traffic surfaces. Examples of such materials are disclosed in, for instance, U.S. Pat. Nos. 4,296,004, 6,593,417, 6,635,341, 6,743,879 and U.S. Pat. No. 6,759,478, all of which are incorporated herein by reference in their entirety. The above listed patents disclose or describe coatings that include: epoxies, resinous materials, polyurethane based compositions, methyl methacrylate based compositions, apolycyclic polyamine based compositions, polysiloxane compositions, hydroxyl functional non-vinyl group compositions and acrylic urethane compositions.

[0065] The present invention includes one or more cove elements described herein below, that are installed as transition members between a substrate and walls abutting the substrate floor material. The substrate floor material is typically cementitious, but may alternatively be constructed of other rigid flooring and/or sub-flooring material. The cove elements of the present invention are preferably made of a cementitious material, as described herein below, but may alternatively be made of resinous materials or polyurea.

[0066] In accordance with a first embodiment of the present invention, as shown in FIG. 1, pre-cast gypsum base cove molding elements 13 with fiberglass reinforcement are installed between a floor 3 and a wall 7. The floor 3 is preferably a cementitious floor and the wall 7 may be wallboard, cementitious material, metal or other rigid material.

[0067] The cove elements of the present invention shown in FIG. 1 include a system of corner pieces 19 & 20 that are adhered to other cove elements such that edges 21 abut one another. The corner pieces 19 and 20 are adhered to the wall 7 and floor 3 using adhering material 5. Adhering material 5 may be standard construction adhesive or other similar material, applied along the base of the wall 7 and/or the floor 3. The corner piece 19 includes two perpendicular portions having a concave radius arc portion 18a formed there

between. Similarly, corner piece 20 includes two perpendicular portions having a convex radius arc portion 17b formed there between. The coving system of the present invention further includes straight cove portions 13 that may be cut to length to fit the job site.

[0068] The various cove elements are formed at their upper end with a convex radius arc 17a to form transitions between the cove elements and the wall. The lower end of each cove element is formed with a concave radius cove portion 18b.

[0069] Several embodiments of the cove elements 13, 19 and 20 are depicted in FIG. 1. Specifically, the cove elements may be formed with a variety of joining means. The above mentioned surfaces 21 may be flat and abut one another to join two cove elements, or tongue and grooves 15 may be formed in the cove elements. Alternatively, the cove elements may be formed with pins 14 and corresponding apertures to align the cove elements together. Further, peel and stick or adhered alignment members 16 may alternatively be used to align the cove elements together.

[0070] After the cove elements are installed, the floor 3 and cove elements are coated with a flooring coating material, such as resinous flooring material producing a seamless monolithic floor-to-base cove system where the cove elements and floor 3 are unitarily coated.

[0071] The height of the cove elements 13, 19 and 20 shown in FIG. 1 is approximately 4 inches (or just under 4 inches to allow for the thickness of the resinous floor coating to bring the height up to 4 inches). However, it should be understood that the overall dimensions of the cove elements is variable and may be altered to suit the needs of the usage thereof.

[0072] In accordance with another embodiment, a smaller coving system having a different profile, as shown in FIG. 2, may be used where the floor coating material is applied across the entire cementitious floor 3, continue over the coving 11 & 19, and, for instance, all the way up a cementitious wall 4, thereby forming a monolithic floor/wall system. A cove element 23 having a 3-way 90-degree inside corner 18c can be added to connect to a cove element 11 that is installed vertically up wall corners. Similarly, other cove elements 11 are installed horizontally at the junction of the wall and floor.

[0073] In a preferred embodiment, the cove elements have a sand-like grit texture 9 in order provide the resinous floor coating plenty of surface area to adhere to. Also, in a preferred embodiment, all of the leading edges of the cove elements are formed with a small slightly rounded edge 22.

[0074] In another embodiment of the present invention, another set of cove elements is provided for applications such as garage floors as shown in FIG. 3. The cove elements in FIG. 3 include an "L" shaped cap system 1 may be used to cover unsightly stem walls 2, and the concave radius base cove 11 is installed against the floor 3 and cap 1 for easier cleaning. The cove element 11, and cap 1 may include an angled relieve 12 which may be between 25 and 60 degrees, as shown in FIG. 3 (and FIG. 2 with respect to cove element 11), but is preferably about 35 degrees.

[0075] In preferred embodiments of the present invention, the cove elements are approximately 4" tall x 3/8" thick and

have an elongated length of between 24" to 48", with a concave radius cove on bottom **18b**, and a similar convex radius arc on top **17a**. Typically, the cove elements of the present invention have a ½" to 1" rolled radius cove, unless the industry or a specific design demands something different. Therefore, it should be understood that the dimensions provided above are not fixed, but may vary with the needs of the construction site. For example, the cove elements may vary in height from 1 inch to 8 inches, and may be thicker than ¼". However, it should be understood that in a design specification where an overall height of the flooring system is chosen to be 4 inches, the actual height of the 4" cove elements is approximately 3⅞", and the floor coating material approximately ⅛ inch thick, therefore installers need not trim the cove elements of the present invention.

[0076] The product dimensions are preferably anywhere from ⅛"-2" thick, ¼"-16" tall w/a ⅛"-2" radius cove at the bottom. All dimensions will depend on industry needs and application, material composition and manufacturing process. The top shape contour is preferably streamlined with a convex 1" radius arc **17a** so as not to hold dust. Optionally the top may be tapered to a flat ¼ inch width specifically where tile and/or FRP applications are to be installed on the wall above. A concave ½" to 1" rolled radius cove at the bottom **18** meets important code requirements to make corner cleaning easier. When one piece **13** is turned upside down and placed against another piece **13** that is right side up (**FIG. 4**), their top and bottom shapes **17** & **18** fit tightly together for more efficient shipping and handling. This tight fit enables more product to be condensed into a pallet/crate. Handling is improved because this tight fit allows pieces to support each other and protect thinner tapered sections from chipping or breaking.

[0077] At least 5 different size cove element systems are planned for production by the inventors for the following applications:

[0078] 1"×1" concave radius only (**FIG. 2**) for resinous floor systems that get applied across the entire floor and up the entire wall or stem wall cap (**FIG. 3**).

[0079] 4" tall×¼" thick w/½" to 1" concave radius cove for most commercial applications (**FIG. 1**).

[0080] 6" tall×¼" thick w/½" to 1" concave radius cove for restaurant applications that need to meet health department requirements.

[0081] 8" tall×¼" thick w/½" to 1" concave radius cove for various other health dept. requirements.

[0082] 8½" tall×5" wide×½" thick "L" shaped cap to cover stem walls (**FIG. 3**). This system can be made with or without a convex radius cove bottom, and cut to fit any size stem wall. The 1"×1" cove only system **11** can be added if needed. The stem wall cap **1** has a convex radius edge **10** where the horizontal top and vertical face meet. This system's dimensional range can be expanded or reduced to fit any size stem wall.

[0083] The following is a list of specific features and qualities common to all systems:

[0084] All systems with the radius cove and arc shapes can be replaced with angled cants (**FIGS. 5 & 6**) to meet special requirements. Any angle can be produced; however, the preferred angle is approximately 35-degrees.

[0085] All systems will have pre-cast inside and outside corners 45 and 90-degrees **19** & **20** that are a minimum of 1" wide×1" wide on both sides where adhered to adjacent walls. All inside corner pieces preferably have a minimum ½" concave radius cove running vertically to match horizontal cove shape, and meet code requirements for easy-clean corners. All outside corners are preferably slightly rounded.

[0086] All systems and their pieces preferably have an approximately 35-degree relief cut **12** out of the lower back portion to allow for a tighter fit into the corner where the wall meets the floor.

[0087] All systems and their pieces preferably have a slightly roughened texture on the face **9** for better adhesion of coatings.

[0088] All systems and their pieces preferably have slightly rounded edges **22** at their sharpest points to prevent chipping and improve the casting process.

[0089] All systems preferably have 4' lengths for easier shipping and handling; some may be offered in 2's, 6's, 8's, 10's, 12's, or 16's depending on material composition, shipping and handling requirements, and industry demands. The length of 48" was determined by the lower tensile strength of a ¼" piece of cementitious material. Longer lengths can be achieved by using additives such as polymers, but they are also cost prohibitive.

[0090] All systems may or may not be offered pre-tinted depending on industry demands. The preferred neutral color is a light brownish gray, because it matches most existing concrete floors, and will be the most universal. Pre-tinted product may be needed to achieve true finish color if the industry seeks to use thinner coatings that are equally as durable as their thicker predecessors.

[0091] In accordance with the present invention, one method of manufacturing the invention uses the following steps:

[0092] Fabricate mock molding pieces with wood or MDF.

[0093] Add texture by adhering #30-50 mesh sand to face of pieces.

[0094] Seal sand and wood with paint so casting rubber will not adhere to it.

[0095] Mount back of mock molding piece on flat, sturdy plywood.

[0096] Build approx. 2" high dam on the flat plywood around entire mounted piece.

[0097] Pour rubber-molding material into entire area surrounding mock molding and level to top of dam.

[0098] When mold is dry, turn over and remove original bottom plywood along with mounted molding leaving an upside down impression of the original mock molding piece.

[0099] Place the mold on a level table and moisten surface with water.

[0100] Mix dry gypsum with water to proper consistency and blend in chopped fiberglass.

[0101] Pour mixture into mold and vibrate until all air bubbles come to surface and material is level with top of mold, then screed off excess if necessary.

[0102] Pieces can be taken out of mold as soon as material sets, bundled into groups of 10, and shrink-wrapped together to support each other during shipping process.

[0103] These bundles are placed directly in boxes and pallets. Each layer should be staggered in direction, and separated by a 1/8" sheet of packing foam or cardboard to reduce the chance of chipping the thinner edges.

[0104] Casting the corner pieces is the same basic process except the mock piece is mounted upright in its installed position for the rubber mold casting, and the mold is split open each time a set piece is released. Corner pieces should be wrapped in 1/8" packing foam and shipped in boxes.

[0105] The cast cove element 13 is depicted in FIG. 7. An example of a rigid mold 28 for making a cast cove element 13 is depicted in FIG. 8.

[0106] In an alternative embodiment, it is possible to form elongated cove element using an endless belt molding system using the elements depicted in FIG. 9. For example, a first endless belt 30 is supported by rollers 32 and 34 providing a moving mold to form elongated cove elements, in concert with second endless belt 31 supported by roller 40. The rollers 32 and 34 are supported by a shaft 36 having bearings 38. The bottom surface of the elongated cove element is formed by the second endless belt 31 that moves with and is interlocked with the endless belt 30.

[0107] In an automated plant, a method for forming cementitious cove elements includes the steps of providing the endless belt 30 supported by the plurality of rollers 32 and 34, the endless belt having a flat portion, a concave portion and a convex portion to form the surfaces of the cove element. A cementitious mixture is poured onto the endless belt, and as the belt continues to move, the cementitious mixture is allowed to cure. It should be understood that curing time is dependent upon the cementitious mixture and ambient conditions. Therefore it is possible to form the cove elements on an endless belt system, and have cured product cut or taken off the endless belt as a near finished product.

[0108] Operation

[0109] The pre-cast gypsum base coving, in general, provides an extremely durable, uniform, and more attractive border for any coated concrete floor. The rolled radius cove bottom allows the finished coating to achieve a seamless base-to-floor transition. This shape is the easiest to clean and keep sanitary because it leaves no sharp corner in which debris or unsanitary matter may lodge. The streamlined shaped top radius leaves little or no flat area to collect dust, debris, or any unsanitary matter. The specific shape of this molding in general provides the end user with the most sanitary and easy to clean floor parameter available.

[0110] In accordance with the present invention, one installs the base cove molding systems (cove elements) using the following steps:

[0111] Prepare the floor by scraping and/or grinding any irregularities so the base cove molding can sit snugly on floor and against wall. Surfaces should be vacuumed free of all debris and dust. If floor is uneven enough to cause

excessive gapping or bridging, those areas should be raised or ground down for molding to fit correctly and to achieve a smoother finished floor.

[0112] Prepare the base cove by wiping and/or scraping off any dust or foreign matter.

[0113] Apply a generous amount of base cove adhesive to the back and bottom of the first inside or outside corner. Press it into the corner of wall and floor until it is entirely supported from behind and below with adhesive and stays in place. Wipe off excess adhesive from all joints.

[0114] Working in one direction from the first corner piece, install straight 48" pieces end-to-end in the same manner as described in the third step, adding a small amount of adhesive to each abutted joint. Press them tightly together before installing the next piece. All system pieces should be aligned, prior to the adhesive setting, in a way that the abutted joints are visibly uniform, and smooth to the touch. Plastic tile shims can be used to help align pieces vertically and horizontally, and pulled out as adhesive sets. Should any piece not stay in place using adhesive only, pre-drill and countersink a hole in the base cove where needed. Position molding to wall with a zinc or ceramic drywall screw until adhesive sets up. Where concrete walls exist, one can use concrete screws or lay weights against molding until adhesive sets. If floor and/or walls are crooked so that molding will not flex to fit correctly, one can either cut and form extra abutted joints at each needed transition; or, press molding into wall until it fractures enough to conform to the wall and stay in place.

[0115] Patch holes and chips with adhesive or caulking. Once adhesive sets up, masking and priming for floor coating can begin.

[0116] In accordance with another embodiment of the present invention, the stem wall cap system installs much like the base cove, but with these additions:

[0117] One would first install a scribed pressure treated wood ledger to the wall studs with wood screws. This provides a mounting for the top portion of the stem wall cap molding.

[0118] Follow steps 1-4 for base cove installation, adding adhesive also to the top and front of the wooden mounting ledger. If any system pieces need patching, a mixture of adhesive and sand can be applied to smooth transitions and maintain the roughened texture.

[0119] The product composition of the cove elements, in accordance with one embodiment of the present invention, includes gypsum cement (plaster of paris) with or without Portland cement, and blended with chopped fiberglass. This is a preferred composition because gypsum is inexpensive, easy to work with, casts very accurately, has high PSI strength of up to 15,000, is non-toxic, and environmentally friendly. Chopped fiberglass is preferable because it mixes quickly, and easily disperses throughout the casting to add tensile strength inexpensively. USG's Enduracast or Architectural Hydrocal formulas are ideal materials for use in high production casting equipment, but alternative materials may also be used. Equipment that can be used is the RimCraft Technologies Gypsum Casting System. This system blends the material with the precise amount of chopped fiberglass,

and dispenses the mixture at calibrated amounts for faster and more efficient manufacturing.

[0120] Insofar as we are aware, the composition of USG's Enduracast with chopped fiberglass is a preferred material, because it produces the best product with the least expense. However, the following compositions have been considered as alternatives:

[0121] Both FGR-95 and Architectural Hydrocal (by USG) gypsum cement w/fiberglass reinforcement and Forton™ polymer were used separately for test pieces, because they are the least expensive of the gypsum casting formulas. Arch. Hyd. is an alternative choice because it has a PSI strength of 7000. FGR-95 composite only has a PSI strength under 2000.

[0122] The cove elements of the present invention may alternatively be made of any gypsum, cement, concrete, ceramic, or plaster based compounds including or not including urethane, polymer, latex, vinyl, or any additives (w/or without fiberglass reinforcement) to give more flexibility without breaking. These additives provide the cove elements with improved water, mold and mildew resistance.

[0123] Epoxy and quartz sand mixtures w/or without fiberglass reinforcement—like currently used for “troweling” technique. This is a desirable mixture for the industry in which to pre-cast base cove moldings for quartz sand/epoxy floor coatings because it is the exact same material (the most monolithic as possible), and the finish color could be matched.

[0124] In alternative embodiments, the cove elements may be made of high-density epoxies, high-density foams, polyurethane, cellular PVC, polyurea, resins, urethanes, or polymers w/or without fiberglass reinforcement and may be extruded, made by injection molding, or used in a continuous pour process. It should be understood that the cove elements of the present invention may be made in an extrusion process using many of the materials disclosed herein.

[0125] The cove elements may alternatively be formed from fiber cement compounds (i.e. USG's Aquatuff Fiberock, or James Hardie Fiber Cement Siding & Trim). Such material compositions are desirable because: it is lighter, more flexible, more suitable for mass production, and the machinery used in the extruding process is faster than hand pouring gypsum.

[0126] Plaster or ceramic-based compounds w/or without fiberglass reinforcement may also be used to form the cove elements, although only for limited applications since such materials have a low PSI strength.

[0127] Lime based cement or concrete-based compounds w/or without fiberglass reinforcement having a high PSI may also alternatively be used in some applications, but is less flexible and more caustic to work with.

[0128] Lightweight cement or concrete-based compounds w/or without fiberglass reinforcement would have a high PSI, but be less flexible and more hazardous to work with.

[0129] Because of its permanent flexibility, silicone adhesive placed on the back between the wall and the molding, is a preferred adhesive because it allows the base cove to

move more with the floor than with the wall. This would better achieve the monolithic system of the present invention.

[0130] The resinous flooring industry in California is moving to water-based resins vs. solvent-based to meet new EPA restrictions. Further testing will show if this change affects the composition of this invention.

[0131] One could conceivably create a machine that would produce a continuously seamless troweled base cove along the wall. However, that machine would be cost prohibitive, complicated to run and maintain, and probably unable to produce the desired shape on a 90 or 45 degree turn.

[0132] Some applications specify a 45-degree cant coving rather than the more common rolled radius coving at the bottom of the base cove. The rolled radius cove shape is the preferred because it looks better, offers a smoother transition for easier cleaning, and is actually a lower profile so furniture and equipment can fit tighter against the wall. The cant cove base moldings is produced as needed.

[0133] The moldings will be produce with different colors of gypsum as needed, but the preferred color will still be a light taupe.

[0134] In an alternative embodiment, the cove elements may be formed with inlaying strips of fiberglass into the moldings instead of adding chopped fiberglass thereby adding more tensile strength and flexibility.

[0135] The “L” shaped stem wall cap system may require being cast using the hand laid fiberglass method where sheets of fiberglass are added in layers along with the gypsum resulting in higher tensile and impact strength. An optional method of installation would be to scribe and cut both top and face of “L” cap material to fit directly on top of stem wall without using the wood ledger.

[0136] Another application for the cove elements of the present invention is use for outdoor eating or swimming areas. Such applications may require the cove elements and/or coating material to include special waterproofing additives.

[0137] Another possible application is for special Acid and Chemical Resistant Flooring Systems that are the most resistant available.

[0138] The inventors also contemplate various connecting systems to help align the pieces more quickly since they would assist in the manufacturing and installation process. However, basic finish carpentry or tile setting methods are preferred for installing the molding pieces to keep the installation process as simple and inexpensive as possible. The following are alternatives for aligning joints:

[0139] Thin adhesive strips made of plastic, vinyl, resin, or metal could be adhered to the back of abutted joints.

[0140] Small rods made of metal; fiberglass, plastic, vinyl, or resin could be inserted and/or glued into pre-drilled alignment holes on the sides of abutted joints.

[0141] Interlocking male and female shapes such as tongue and groove, or shiplap could be pre-cast into the ends of each molding piece. This would be the preferred method because it is the most common, and the least expensive.

[0142] In another embodiment of the invention, the floor may be coated with a coating material, such as a resinous coating material as described above. After the coating material has cured or dried, the cove elements may be installed at the wall/floor junction as described above. In some municipalities, formation or installation of a cove structure after floor surfacing is referred to as top setting. In the practice of the present invention when top setting, the cove elements are then covered with another coat of the coating material to join the cove elements with the floor to obtain the desired monolithic floor system of the present invention. However, if local codes permit, it may not necessary to integrate the cove elements with the floor coating, but instead merely coat the cove elements separately, or have them coated prior to installation. However in the preferred embodiment, the cove elements and flooring are unitarily coated to form a continuous monolithic floor system.

[0143] Various details of the present invention may be changed without departing from its spirit or its scope. Furthermore, the foregoing description of the embodiments according to the present invention are provided for illustration only, and not for the purpose of limiting the invention as defined by the appended claims and their equivalents.

What is claimed is:

1. A flooring system comprising:
 - at least one cove element having a predetermined contoured shape, said cove element for attachment to at least one of the following: a floor adjacent to a wall, and a wall adjacent to the floor;
 - said contoured shape of said cove element providing a non-perpendicular transition between the floor and the wall;
 - a floor coating extending along the surface of the floor and further extending over an exposed surface of said cove element thereby forming a monolithic floor surface.
2. A flooring system as set forth in claim 1, wherein with the cove element installed, said contoured surface defines an angled surface that is approximately 35 degrees inclined from the wall and floor surfaces.
3. A flooring system as set forth in claim 1, wherein with the cove element installed, a portion of said contoured surface defines a curved transition between the wall and floor surfaces.
4. A flooring system as set forth in claim 3 wherein said portion of said contoured surface has a radius of between ¼ inch and 24 inches.
5. A flooring system as set forth in claim 4 wherein said portion of said contoured surface has a radius of between ⅜ inches and 12 inches.
6. A flooring system as set forth in claim 1 wherein said cove element is formed from a cementitious material.
7. A flooring system as set forth in claim 1 wherein said cove element is formed from any one of the following: gypsum, cement, concrete, ceramic, plaster based compounds, urethane, polymer, latex, vinyl, epoxy and quartz sand mixtures with fiberglass reinforcement, epoxy and quartz sand mixtures without fiberglass reinforcement, high-density epoxy, high-density foam, polyurethane, cellular PVC, polyurea and resins.

8. A flooring system as set forth in claim 1 further comprising a plurality of differing cove elements.

9. A flooring system as set forth in claim 8 wherein each of said cove elements is formed with means for alignment during installation.

10. A flooring system as set forth in claim 9 wherein said means for alignment includes one of the following: a tongue and groove, at least one pin, and, peel and stick, and adhered alignment.

11. A flooring system as set forth in claim 1, wherein said floor coating is comprised of one of the following: epoxy, resinous material, a polyurethane based composition, a methyl methacrylate based composition, apolycyclic polyamine based composition, a polysiloxane composition, a hydroxyl functional non-vinyl group composition and an acrylic urethane composition.

12. A method of forming a monolithic flooring system comprising the steps of:

installing cove elements at the transition between a floor and walls abutting the floor;

coating the cove elements and the floor uniformly to form a seamless surface.

13. A method as set forth in claim 12 further comprising: forming the cove elements of a cementitious material before said installing step.

14. A method as set forth in claim 12 further comprising: forming the cove elements before said installing step using any one of the following: gypsum, cement, concrete, ceramic, plaster based compounds, urethane, polymer, latex, vinyl, epoxy and quartz sand mixtures with fiberglass reinforcement, epoxy and quartz sand mixtures without fiberglass reinforcement, high-density epoxy, high-density foam, polyurethane, cellular PVC, polyurea and resins.

15. A method as set forth in claim 12 wherein said installing step includes installing a plurality of interlocking cove elements.

16. A method as set forth in claim 12 wherein said installing step includes installing a plurality of interlocking cove elements formed of a cementitious material

17. A method as set forth in claim 12 wherein said installing step includes installing a plurality of interlocking cove elements formed of a polyurea material

18. A method as set forth in claim 12 wherein said coating step includes coating with a floor coating comprising one of the following: epoxy, resinous material, a polyurethane based composition, a methyl methacrylate based composition, apolycyclic polyamine based composition, a polysiloxane composition, a hydroxyl functional non-vinyl group composition and an acrylic urethane composition.

19. A method for forming cove elements comprising the steps of:

providing an endless belt supported by a plurality of rollers thereby forming an endless belt mold having a flat portion, a concave portion and a convex portion;

pouring a mixture onto the endless belt; and

curing the mixture to form the cementitious cove element.

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