A method of utilizing an expanded polyvinylchloride (PVC) foam having cohesive and high static-friction properties to attach, hang, display, hold or adhere one or more lightweight objects, decorative items and/or works of art, in a selectively positionable and re-positionable fashion. The methods of the present invention are particularly useful as toys and craft materials, as well as for use in hanging objects, documents, and decorative items as an alternative to the use of magnets, glue, adhesives or other means known in the art.
METHODS UTILIZING COHESIVE MATERIALS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] Not Applicable

STATEMENT RE: FEDERALLY SPONSORED RESEARCH/DEVELOPMENT

[0002] Not Applicable

BACKGROUND OF THE INVENTION

[0003] A wide variety of products to facilitate the attachment of lightweight items, such as pieces of paper, printed matter, child art projects and the like, to walls and other smooth surfaces are well-known in the art. Exemplary of such products include magnets, magnets having clips attached thereto, suction cups, tape, and other adhesive products. Essentially, such products are operative to form a simple attachment arrangement, whether it be by magnetic attraction, vacuum, or adhesive forces, that are strong enough to support one or more lightweight items. Such items find particularly wide spread use in attaching papers, grocery lists, child artwork, stickers, signs, emblems, labels, and the like to refrigerators, windows, plastic message boards and other smooth surfaces.

[0004] Despite the low cost and wide spread availability of such products, however, each of the aforementioned types of attachment means suffer from distinct drawbacks. With respect to the use of magnets, the same can only be utilized with magnetic receptive surfaces. For example, magnets are ineffective to work on stainless steel, and thus cannot be utilized on appliances and other surfaces that are made from stainless steel. The use of adhesives, such as tape and the like, can produce sticky adhesive residues that become unsightly, are difficult to remove, and, in the case of woodwork, can potentially damage the finish of the woodwork. Other devices, such as suction cups and the like, have limited holding power and to the extent the vacuum seal is broken, such devices are ineffective for their intended purpose.

[0005] Accordingly, there is a substantial need in the art for a simple mechanism, and in particular a method that is operative to secure and hold one or more light weight items, and which can be removed without residue, which is also relatively great enough in thickness, dimension, and density that even a toddler or small child can easily grasp and peel away with their fingers or fingertips, then re-attach and re-use repeatedly. There is additionally a need in the art for such a method that utilizes existing materials that are readily available, low cost, safe and easy to use, non-toxic, and capable of being reused indefinitely. There is still further a need in the art for such a mechanism that can find widespread application in arts and crafts, and in particular for use as toys, frames, teaching aides and a variety of other related uses.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] The present invention specifically addresses and alleviates the above-identified deficiencies in the art. In this regard, the present invention is directed towards methods of utilizing an expanded polyvinylchloride (PVC) foam material to attach one or more lightweight items to a non-porous surface, as well as utilize such material to prevent such foam material and/or items secured thereby from slipping, sliding, moving or falling away from a non-porous surface. Such expanded PVC material can operatively be positioned vertically, horizontally, in inclined or declined angles, and even upside down. Among the applications contemplated for use of such PVC foam material include mouse pad fabrication, signs, flexible frames for use in framing artwork, attachment means for securing one or more lightweight items, such as pieces of paper and the like, to non-porous surfaces, as a teaching aid for use in positioning and re-positioning items such as letters, numbers, figurines, and related shapes and sizes. Further, such expanded PVC material can, as is commonly used and found readily available in art and craft industry, where one can then display and affix to a non-porous surface, with the ability to remove, re-affix and reposition effortlessly.

[0007] According to a preferred embodiment, the expanded PVC foam will preferably be formed to have a density ranging between 5-25 pounds per cubic foot. In a most preferred embodiment, the expanded PVC foam will have a density ranging between 8 to 15 pounds per cubic foot, as well as a coefficient of friction of approximately 0.86. The foam will preferably be formed as a cast (i.e., hot molten state) and expanded soft PVC cohesive cellular foam that may be formed upon casting paper, such as silicone or melamine treated paper, well known to those skilled in the art. One commercial product that is particularly well-suited for practice of the present invention is Cling Foam™ produced by Gaska Tape, Inc. of Elkhart, Ill.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] These as well as other features of the present invention will become more apparent upon reference to the drawings.

[0009] FIG. 1 is a perspective view of a flexible frame formed of an expanded PVC foam material utilized to hang a piece of paper upon a non-porous surface.

[0010] FIG. 2 is a perspective view of letters formed from the expanded PVC foam material of the present invention shown adhering to a non-porous surface.

DETAILED DESCRIPTION OF THE INVENTION

[0011] The detailed description set forth below is intended as a description of the presently preferred embodiment of the invention, and is not intended to represent the only form in which the present invention may be constructed or utilized. The description sets forth the functions and sequences of steps for constructing and operating the invention. It is to be understood, however, that the same or equivalent functions and sequences may be accomplished by different embodiments and that they are also intended to be encompassed within the scope of the invention.

[0012] The present invention is directed to novel uses of an expanded PVC foam material to adhere to a non-porous surface. In particular, it is contemplated that the expanded PVC foam will be useful as arts and crafts materials that can likewise function as either a teaching aid, toy or as means for hanging or securing objects and decorative items to a non-porous surface, which surface may be glass, metal,
plastic and plastic films, including coated glossy papers and laminates, such as dry erase surfaces. It is contemplated that the use of the expanded PVC foam material of the present invention can be utilized to replace conventional refrigerator magnets, tapes, adhesives, suction cups and other like mechanisms known in the art to facilitate the hanging of lightweight objects. It is likewise contemplated that the use of the expanded PVC foam material of the present invention can be utilized in other related applications where it is desired to provide a non-skid placement of a foam material upon a non-porous surface. Further, such expanded PVC foam material can also be utilized in such a fashion as to create a desirable 3D, or three-dimensional visual effects, while hanging and securing objects and other decorative items to a non-porous surface.

As discussed above, the cohesive properties possessed by such foam enable the same to be advantageously utilized in a variety of applications, and in particular arts and crafts. Referring now to the Figures, and initially to FIG. 1, there is shown an example of a first application whereby the expanded PVC foam is formed as a simple flexible rectangular frame 10 that is utilized to secure a document therein, such as a piece of paper or artwork 12, upon a non-porous surface 14. As illustrated, the piece of paper need only be generally centered within such frame with the parameter of such frame coming into contact with the non-porous surface. By virtue of the cohesive attraction between the PVC frame and the non-porous surface, such frame is thus caused to be retained and secured into position to thus hold the piece of paper centered therein in place. To the extent it is desired to move such frame, such flexible frame need only be peeled away from the non-porous surface, as indicated by the letter “A”.

Advantageously, the materials of the present invention can be repeatedly utilized and not lose its effectiveness to adhere to a non-porous surface. As will be appreciated, however, to preserve such ability will generally require that the surfaces of the PVC material and non-porous surface to which the PVC material is engaged be kept clean and smooth.

In addition, the expanded PVC materials of the present invention need not rely upon a metal or magnetic receptive surface, as do magnets, and likewise do not leave any residue, as can occur with the use of tapes and adhesives. Moreover, once the cohesive forces are established between the PVC material and the non-porous substrate, the material will thus remain in position indefinitely, and the ability by which the expanded PVC foam remains secure will not diminish over time.

In addition to the foregoing, given the high coefficient of friction possessed by such materials, it is contemplated that the expanded PVC foam materials can be placed in any of a variety of orientations, whether it be on an incline, decline, vertical, or even any upside down orientation. With respect to the latter, it should be understood that due to gravitational restraints, the ability of the expanded PVC foam materials to retain and support an object may be less than if such material were maintained in a vertical or inclined orientation.

It is also contemplated that such expanded PVC foam materials can be utilized in combination with other such attachment mechanisms, such as magnets, adhesives, and the like to thus provide a more enhanced ability to remain more securely in position. Likewise, it is contemplated that the expanded PVC foam may include clips or hook to facilitate the ability of the foam to attach common lightweight items, such as documents, keys and the like. Moreover, the foam of the present invention can be utilized in non-hanging applications, and may be ideally suited for items such as mouse pads and the like that must necessarily be made of a foam material, but at the same time ideally possess a high enough coefficient of friction to enable such foam material to remain in stationery position.

Referring now to FIG. 2, there is shown a second application of the expanded PVC foam methods of the present invention. As illustrated, the expanded PVC foam materials may be formed as letters 20, 22, 24 (as shown),
numbers, figurines, and other objects for placement upon a non-porous surface. Along these lines, it is contemplated that the methodology of the present invention can be utilized as a teaching aid, and may be particularly well suited for use with dry-erase surfaces that are extensively utilized and well-known in the art. It is likewise contemplated that the expanded PVC foam may be utilized as toys and include decorative designs, as per common felt boards using felt characters and the like, to create play scenes or art projects that can also be configured to be layered or stacked upon itself or one another. It is also contemplated that such expanded PVC foam can be utilized in conjunction with printed or written literary works or books that possess non-porous surfaces, as a teaching aid or game to position and hold in place shapes including animals, letters, numbers, designs, figures, and other decorative items, which can then be removed and repositioned upon various pages or sections of the book or printed or written literary work. Likewise, the expanded PVC foam can also be painted, directly printed upon, and/or over-laminated or decorated with a wide variety and combination of printed graphics, stickers, materials, glue, paint markers, pigments, glitter, and other craft items.

[0022] Additional modifications and improvements of the present invention may also be apparent to those of ordinary skill in the art. Thus, the particular combination of parts and steps described and illustrated herein is intended to represent only certain embodiments of the present invention, and is not intended to serve as limitations of alternative devices and methods within the spirit and scope of the invention.

1. A method for framing and releasably securing a document to a non-porous surface comprising the steps:
   a) providing a frame member formed from a single layer expanded PVC foam material;
   b) interposing said document between said frame member and said non-porous surface; and
   c) cohesively securing said frame to said non-porous surface with said document being disposed therebetween.

2. The method of claim 1 wherein said document comprises a piece of paper.

3. The method of claim 1 wherein said document comprises a picture.

4. The method of claim 1 wherein in step a) said expanded PVC foam has a density between 5-25 pounds per cubic foot.

5. The method of claim 1 wherein said expanded PVC foam has a density from between 7-15 pounds per cubic foot.

6. The method of claim 1 wherein in step a), said expanded PVC foam has a coefficient of friction of 0.86.

7. The method of claim 1 wherein said non-porous surface comprises a non-porous surface selected from the group consisting of glass, metal, plastic, plastic films, glossy coated papers and laminates.

8. A method of displaying a plurality of objects and decorative items upon a non-porous surface comprising the steps:
   a) providing a multiplicity of objects formed from a single layer expanded PVC foam material, each respective one of said plurality of objects having a planar surface for engaging with said non-porous surface; and
   b) compressively placing said planar surface of said multiplicity of objects on said non-porous surface.

9. The method of claim 8 wherein said non-porous surface comprises a non-porous surface selected from the group consisting of glass, metal, plastic, plastic films, glossy coated papers and laminates.

10. The method of claim 8 wherein said PVC foam material has a density ranging from 5-25 pounds per cubic foot.

11. The method of claim 10 wherein said PVC foam material has a density ranging from 7-15 pounds per cubic foot.

12. The method of claim 8 wherein said expanded PVC foam material has a coefficient of friction of 0.86.

13. A method of hanging an object from a non-porous surface comprising the steps:
   a) providing a single layer expanded PVC foam material having at least one planar surface formed thereon for cohesively engaging with said non-porous surface, said expanded PVC foam material further being operative to attach said object thereto;
   b) attaching said at least one planar surface of said expanded PVC foam material against said non-porous surface; and
   c) attaching said object to said expanded PVC foam material secured in step b).

14. The method of claim 13 wherein in step a), said PVC foam material possesses a density ranging from 5-25 pounds per cubic foot, said PVC foam material further having a coefficient of friction of approximately 0.86.

15. The method of claim 14 wherein said PVC foam further has an attachment mechanism formed thereon said attachment mechanism comprising a clip.

16. The method of claim 14 wherein said expanded PVC foam material is formed as a frame member.

17. The method of claim 13 wherein said expanded PVC foam material is formed to have a decorative design.

18. The method of claim 13 wherein said object to be held comprises a document.

19. The method of claim 18 wherein said document is selected from the group consisting of a piece of paper and a picture.