IMPLEMENT TIP ISOLATING AND RETAINING MAT

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ABSTRACT

An implement tip isolating and retaining mat manufactured of rigid material has an entirely crenellated top surface wherein a plurality of tapered apertures define a plurality of holes and peaks. A plurality of pins project from the underside of the mat to elevate and support the mat. A series of guidelines on the underside of the mat provide the user with guidance for cutting. The mat may be fitted to the inside of a holder or placed on a horizontal surface. The holes in the mat provide implement tip guidance and support for implements stored in the holder.
IMPLEMENT TIP ISOLATING AND RETAINING MAT

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of: Provisional Application for Patent No. US60/609,329 Filing Date Sep. 13, 2004

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] Not Applicable

REFERENCE TO SEQUENCE LISTING, A TABLE, OR A COMPUTER PROGRAM LISTING COMPACT DISC APPENDIX

[0003] Not Applicable

BACKGROUND OF THE INVENTION

[0004] The present invention relates generally to storage holders for hand held implements and small objects. More specifically, a rigid elevated perforated mat with a plurality of holes and standoff pins for accessibly retaining hand-held implements and small objects or the tips thereof is disclosed.

[0005] When an implement such as a pen, being of sufficient weight, is placed directly into a storage container, such as a commonly used pencil holder, the ball in the tip of the pen is depressed causing the pen to leak. The ink dries in the tip of the pen or on the ball of the pen causing the pen to skip rendering it useless. Ink may also leak from defective pens. Ink collects in the bottom of the pencil holder and mixes with dust contaminating the pencil holder. Implement tips freely move around in the pencil holder and become contaminated with ink and dust. When the need arises, an implement such as a pen or a pencil is removed from the pencil holder. With its tip contaminated with ink and dust, ink blobs are then transferred to the intended work surface thus causing smears and smudges.

[0006] Presently, materials such as paper towel and napkins are placed in the bottom of containers such as cups, cans or specifically manufactured pen and pencil holders to absorb leaking fluids from implements such as pens. This helps, but does not eliminate the problems.

[0007] Another common problem in present implement storage containers is the damaging impact to the tip of implements such as pens and pencils when they are dropped onto hard surfaces such as the inside bottom of the storage containers.

[0008] The design and physical properties of the present invention prove to be beneficial in such a way that they eliminate the damaging impact that occurs to the tip of an implement such as a pen or a pencil when the implement is dropped onto a hard surface, such as into a storage container manufactured of materials such as a hard plastic, metal, glass, ceramic or like having no implement mat. The present invention isolates the tips of implements such as pens and pencils and prevents the tips from moving around in the bottom of the storage container and from contacting the bottom of the storage container. This eliminates pressure on pen tips, eliminates ink build up on pen and pencil tips which causes ink smudges on writing surfaces or documents and eliminates cross contamination of liquid ink or water thin ink pens.

[0009] The embodiments described herein provide a very economical solution to these problems. In the past, attempts have been made to prevent pen and pencil tips from contacting the bottom of containers they are stored in. This would require purchasing a specifically designed and manufactured device or container for retaining implements such as pens and pencils. The present invention allows the end user to modify their present storage container. This eliminates the problems described herein and greatly reduces overall costs such as damaged or destroyed documents, damaged expensive pens and the need to discard their present container and purchase another which can be costly as well as damaging to the environment.

[0010] Mats or holders having a plurality of holes have been used for many years to store small objects. Apparatus for holding small implements vertically have included empty cups, specific containers, boxes, and foam blocks. Foam blocks have been used with small holes or slits into which small hand held implements such as drill bits or pens and pencils are inserted. Conventional cup type holders have the disadvantage of the weight of the pen depressing the ball in the tip causing ink to leak into the holder. Depression of the ball or roller can also cause ink to dry on parts of the ball or roller causing the pen to skip when in use. The tips of pencils are easily broken off in conventional holders.

[0011] U.S. Pat. No. 1,092,156 to Mathis on Apr. 7, 1914 disclosed a pencil holder having a top perforated surface which pencil tips pass through and a bottom perforated disinfecting tablet or pad through which pencil tips project. A considerable amount of space between the top surface of the holder and the top surface of the pad in conjunction with the space between the holes and the reasonably flat top surface of the pad provide no guidance of the pencil tip into a hole.

[0012] U.S. Pat. No. 6,202,862 B1 to Acquaviva et al. on Mar. 20, 2001 disclosed a pen holder molded in foam having six tapering cavities to engage and hold upright pens and other writing implements. The cavities are spaced a considerable distance apart and the top surface of the holder appears to be reasonably flat providing no guidance of the implement tip into the cavity. The cavities have closed bottoms resulting in difficult cleaning practices and the pooling of ink from leaking writing implements.

[0013] U.S. Pat. No. 3,603,551 to Peterson on Sep. 7, 1971 and U.S. Pat. No. 3,365,761 to Kalvig on Jan. 30, 1968 show tool or shaft holding devices having flat top surfaces. In both cases the holes are spaced apart from each other providing no guidance of implement tips into a hole.

[0014] An implement tip mat or holder providing guidance into any given hole is required which overcomes the disadvantages of the prior art, by providing a rigid mat that can support implements or implement tips in a substantially vertical position, has holes to isolate the tip of the implements, can accommodate different sized implements, has a structure which aids guidance of the implement into the mat, requires little material to manufacture the device, and is easily cleaned.
BRIEF SUMMARY OF THE INVENTION

[0015] It is an object of the present invention to provide an apparatus for an implement holder that overcomes some of the disadvantages of the prior art.

[0016] A further object of the present invention is to provide a multiple hole holder for retaining implements vertically to avoid pressure on the tips of implements.

[0017] Another object of the present invention is to provide an implement retainer which is easy to use one-handed, cheap to manufacture and durable.

[0018] In accordance with the present invention, an object retainer is disclosed having a base, a plurality of holes disposed in the base, and a plurality of pins projecting downward from the base.

[0019] Preferably the holes are arranged in a triangular or staggered grid pattern substantially close to each other.

[0020] Advantageously, the retaining device or holder is made of a rigid material.

[0021] Other variations of the invention include disposing the holes in concentric circles, an irregular pattern or in a quadrilateral pattern.

[0022] Another variation of the invention includes lines on the bottom surface of the retaining device.

[0023] Advantageously, the holder may be placed in a container or on a flat surface. Further advantages of the invention will become apparent when considering the drawings in conjunction with the detailed description.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

[0024] For a better understanding of the invention, its principles and its application, reference should be made to the following detailed description and accompanying drawings in which:

[0025] FIG. 1 is a perspective view of the present invention.

[0026] FIG. 2 is a top plan view of the present invention.

[0027] FIG. 3 is an enlarged sectional view of the present invention taken along line 4-4 in FIG. 2.

[0028] FIG. 4 is a front view of the present invention taken along line 3-3 in FIGS. 1 and 2.

[0029] FIG. 5 is a bottom plan view of the present invention.

[0030] FIG. 6 is a bottom plan view of another embodiment similar to the preferred embodiment shown in FIG. 5.

[0031] FIG. 7 shows an open end sectional view of a pen holder and a front view of the present invention, as shown in FIG. 4, in use with a pen inserted therein.

[0032] FIG. 8 illustrates a view similar to FIG. 7 showing a sectional view of another embodiment having sloped side walls in use with a pen inserted therein and a portion of a pen in phantom.

[0033] FIG. 9 illustrates a view similar to FIG. 7 showing a front view similar to the present invention as shown in FIG. 4 in use with a pen inserted therein and a sectional view of a variation of the sloped side walls shown in FIG. 8 and a portion of a pen in phantom.

[0034] FIG. 10 illustrates a sectional view of another embodiment, similar to the present invention shown in FIG. 4, in a stand alone version with a screwdriver retained therein.

DETAILED DESCRIPTION OF THE INVENTION

[0035] Referring to FIG. 1 of the drawings, the present invention described and illustrated herein as an example, an implement mat indicated generally at 10 is shown in perspective. Mat 10 is generally a quadrilateral perforated mat for use in a container such as a pen holder or on a counter top. FIGS. 1-5 illustrate the mat 10 optimally having an entirely crenellated top surface 11 perforated with holes 13 and a preferably flat bottom surface 14 perforated with holes 13. Alternatively, the bottom surface may be entirely crenellated similar to the top surface. As illustrated in FIG. 1 the mat 10 comprises a plurality of holes 13 and a series of pins 15. The holes 13 comprise annular sloped faces 12, defining the top of the holes 13 and cylindrical sections 16, defining the bottom of the holes 13.

[0036] As shown in FIG. 2 the holes 13 are optimally arranged in a staggered or equilateral triangular grid pattern and are substantially close together. The holes may be arranged in various patterns such as square, irregular or concentric circles. The equidistant spacing between the holes in conjunction with the widest diameter of the frustoconical sections will reflect on the preferred embodiment having an entirely crenellated, perforated top surface 11 consisting of multiple peaks as shown in FIGS. 1-4. (With the top surface of the mat and the peaks being one and the same, the same reference number 11 will be used). As illustrated in FIGS. 1 and 2 the center of the perimeter holes 17 must be at least to the edge of the mat 10 or beyond to maintain the entirely crenellated top surface.

[0037] FIG. 3 illustrates in detail, each hole 13 having a frustoconical section with the inner surface 12 of the frustoconical section having at least one angle starting at the top surface 11 of the mat 10 and tapering down into the mat sufficiently, at which point the smaller diameter of the frustoconical section of the hole 13 conjoins the cylindrical section 16 of hole 13. The cylindrical section 16 continues through the remainder of the mat 10 terminating at the bottom surface 14. The cylindrical section 16 of each hole 13 is at least small enough to allow only the tip of an implement such as a pen or pencil to pass through. The cylindrical section may be tapered. The degree of the angle or angles of the inner surface 12 of the frustoconical section will vary depending on the widest diameter of the frustoconical section in conjunction with the equidistant spacing between the holes 13, the thickness of the mat 10 and the diameter and length of the cylindrical section 16. The inner surface 12 of the frustoconical section may be convex or concave, smooth or of a texture.

[0038] As shown in FIG. 4 the pins 15 protrude vertically downward from the bottom surface 14 of the mat 10 providing a means of support for the mat allowing the bottom surface of the mat to be elevated or kept away from the surface that the mat is placed in or on as shown in FIG. 7. Optimally the cross-section of the pins 15 would be
cylindrical in shape and may be hollow. The cross-section of the pins 15 may be of other shapes such as square or triangular (not shown).

[0039] FIG. 5 indicates the general location of the pins 15 being positioned in accordance with the holes 13 and the perimeter of the mat 10. Depending on the size and application of the mat, pins would be added to provide and maintain proper support of the mat.

[0040] The size of the holes 13 and the size of the implement tips in conjunction with the length of the pins 15 which protrude from the bottom surface 14 of the mat 10 isolate and prevent the implement tips from contacting any surface the mat is placed in or on. By isolating and suspending the tip of an implement such as a pen or a pencil, pressure on the tip is eliminated preventing implement tip damage and tip movement is significantly reduced.

[0041] The mat 10 is preferably fabricated of a generally rigid material of sufficient mass and physical properties to prevent the mat from distortion caused by such conditions as heat or the weight of the implements placed thereon or therefrom. The mat is designed to be cut to fit different sized containers. The thickness of the mat is kept at a minimum to allow the end user to easily cut and trim the mat if necessary.

[0042] Suitable fabricating materials may include metal, fiberglass or preferably thermoplastic resins such as Acrylonitrile Butadiene Styrene (ABS), polypropylene, polystyrene and polyethylene. Optimally the mat would be fabricated of ABS. The mat can be processed in a variety of sizes and thicknesses and may be circular or of other shapes depending on the application. The preferred manufacturing process is injection molding making it economical to produce.

[0043] Similar to the preferred embodiment, mat 10, FIG. 6 illustrates another embodiment, mat 10a, having guidelines 19a. The guidelines could be of singular rows or of shapes such as circular, square, triangular or oval, could be raised or recessed and would be molded as part of the bottom surface of the mat during the molding process. Additional pins 15a which also protrude vertically downward from the bottom surface 14a of the mat 10a would be added in similar patterns in accordance with the lines depending on the size and application of the mat. This would provide the end user with reference lines should the mat require trimming.

[0044] In use, as shown in FIG. 7, the mat 10 is placed in an upright position in or on a supporting surface such as in a pen holder 40. The pen holder 40 comprises an open top, a substantially flat bottom 41 and substantially vertical side walls 42. The bottom of the pen holder may be of different shapes such as circular, square, triangular or oval. The unattached end 18 of the pins 15 rest on the supporting surface 41. With the mat 10 inserted in the pen holder 40, the edges of the mat are in substantial contact with the vertical side walls 42 of the pen holder. An implement such as a pen 50 is placed tip 51 first into the pen holder 40 in a substantially vertical downward motion. Inevitably the pen tip 51 comes in contact with a peak 11, conical face 12, or falls directly into a hole 13. In the event of the pen tip coming in contact with a peak or a conical face the pen tip would freely slide down the face dropping into the adjacent hole 13. Upon release of the pen 50 the upper portion or shaft of the pen being unsupported, would tend to fall over and come to rest against the top open edge of the pen holder 40. The pen tip would remain retained by the mat and would be suspended and isolated from the bottom surface of the pen holder.

[0045] Similar to the preferred embodiment, mat 10 shown in FIG. 7, another embodiment, mat 20 illustrated in FIG. 8 having upstanding sloped side walls 24 is described herein. The side walls 24 comprise an inner surface 24a and an outer surface 24b, apart at the base, conjoining with the mat and adjoining at the top forming a peak 24c. The walls protrude outward from the outer edges of the mat upward at an obtuse angle from the horizontal top surface of the mat. Preferably the inner and outer surfaces of the side walls would rise upward (to a height of for example 0.5 inches) from the top surface 21 of the mat 20 at slightly different angles to each other (for example the inner surface at an angle of 120 degrees and the outer surface at an angle of 110 degrees) outward from the outer edge of the mat 20 sufficiently to form a peak. The base of the side walls could be (for example) 0.06 inches thick. The inner surface and outer surface of the side walls 24 may be convex or concave, smooth or of a texture and would be molded as part of the implement mat 20 during the injection mold process. Suitable fabricating materials may include metal, fiberglass or preferably thermoplastic resins such as ABS, polypropylene, polystyrene and polyethylene. Optimally the mat would be fabricated of ABS. The mat 20 would be processed in many sizes, thicknesses and shapes depending on the application. The preferred manufacturing process is injection molding.

[0046] In use, the mat 20 is placed in an upright position in a pen holder 40 with the unattached end 28 of the pins 25 resting on the supporting surface 41. The peaks 24c of the mat's side walls 24 are in substantial contact with the vertical side walls 42 of the pen holder. This would create an uninterrupted smooth transition from the vertical side walls 42 of the pen holder 40 to the sloped side walls 24 of the mat 20. An implement, similar to pen 50, such as pen 50a, (a portion of a pen shown in phantom) is placed tip 51a first into the pen holder 40 in a substantially vertical downward motion. In the event of the pen tip 51a coming in contact with the side wall 42 of the pen holder 40 the pen tip would slide down the side wall of the pen holder coming in contact with the inner surface 24a of the mat's side wall 24. The pen tip would freely slide down the inner surface of the mat's sloped side wall dropping directly into a hole similar to hole 13 in mat 10 or onto a peak 21 or a conical face 22 of the mat 20 to be guided into a hole. This would further maintain implement tip isolation and add to the effectiveness of the mat in use. The pen 50a is released and comes to rest against the top open edge of the pen holder while the pen tip 51a remains retained by the mat.

[0047] Optionally, FIG. 9 illustrates a free standing sloped upstanding side wall 70, similar to side wall 24 of mat 20 shown in FIG. 8, and is described herein. The cross-section configuration of the side wall 70 is triangular in shape, similar to that of side wall 24, having an inner surface 70a and an outer surface 70b with both surfaces joining at the top forming a peak 70c and widening at the bottom forming the base. The outer surface and outer surface of the side wall may be convex or concave, smooth or of a texture. There are fin-like protrusions 71, perpendicular from the outer surface of the side wall 70 that support the side wall. The cross-section configuration of the fin-like protrusion 71 is (for
example) 0.06 inches thick and the overall side surface configuration of the fin is triangular in shape. Starting at a point generally at the peak 70c of the side wall 70, the attached edge of the protrusion 71 follows the outer surface 70b of the side wall down to the base of the side wall. The bottom of the protrusion 71 widens horizontally (to, for example 0.5 inches) but does not exceed past the vertical line of the peak of the side wall 70. The outside unattached edge of the protrusion would rise vertically terminating generally at the peak of the side wall. The protrusions 71 are necessary to support the side wall 70 at the desired angle as it is a standalone version. Side wall 70 would thus be placed on the top surface of the mat 10 around the edge of the mat providing the same function as described of the side wall 24. Ultimately, the side wall 70 would be used in containers having straight sides such as containers having square, rectangular or triangular bottoms. The side wall 70 could be fastened to the mat 10 using adhesive or other means. Suitable fabricating materials may include metal, fiberglass or preferably thermoplastic resins such as ABS, polypropylene, polystyrene and polyethylene. Optimally the side wall would be fabricated of ABS. The side wall 70 can be processed in various lengths, preferably one length and would be cut and trimmed to fit the desired containers depending on the application. The preferred manufacturing process is injection molding making it economical to produce.

[0048] Another variation of the side wall (not shown), similar to side wall 70 as shown in FIG. 9, is also a sloped side wall without the fin-like protrusions, molded in a substantially circular shape making it suitable for containers with circular bottoms such as coffee cups. The inner surface and outer surface of the side wall may be convex or concave, smooth or of a texture. Ultimately, this variation would be used in containers having circular or oval bottoms and would be placed on the top surface of the mat around the edge of the mat. It may be fastened to the mat using adhesive or other means and would provide the same function as side walls 24 and 70. Suitable fabricating materials may include metal, fiberglass or preferably thermoplastic resins such as ABS, polypropylene, polystyrene and polyethylene. Optimally the side wall would be fabricated of ABS and could be processed in various sized diameters or in a coil. The preferred manufacturing process is extrusion molding making it economical to produce.

[0049] FIG. 10 illustrates another embodiment, mat 30, similar to the preferred embodiment, mat 10, shown in FIG. 4, placed independently on a horizontal surface such as a counter top. Mat 30 is used to retain implements such as screwdrivers. In use, an implement such as a screwdriver 60 is directed in a considerably downward motion, tip 61 first, toward the top surface 31 of the implement mat 30. Inevitably the screwdriver tip 61 comes in contact with a peak 31, frustoconical face 32, or falls directly into a hole. In the event of the screwdriver tip coming in contact with a peak or a conical face, the screwdriver tip would freely slide down the face 32 dropping into the adjacent hole, similar to hole 13 of mat 10. The entire shaft of the screwdriver would pass through the hole, at which point the handle of the screwdriver being much larger in diameter than the hole would come to rest on the top surface 31 of the mat 30. With the increased length of the pins 35 which support the mat and more of the implement passing through the mat, lowering the center of gravity, the screwdriver 60 is sufficiently retained therein without the use of a container. Suitable fabricating materials and processing would be similar to the other embodiments and variations described herein.

[0050] The distance between the holes, the angle or angles and diameters of the frustoconical section, the length and diameter of the cylindrical section, the shape, size and length of the pins, the thickness of the mat and the material the mat is fabricated of can vary depending on the application of the mat and the size, type and or weight of the implements being stored in or on the mat.

[0051] Of the embodiments mentioned, peaks and slopes are necessary to provide guidance of the implement tips into the holes. The cylindrical section of each hole is necessary to maintain the specific size of the hole and to minimize implement tip jamming. The pins are necessary to elevate the mat from the supporting surface preventing the implement tips retained in the holes of the mat from contacting the surface the mat is placed in or on.

[0052] The embodiments described herein by no means limit the present invention to the precise forms disclosed. They have been chosen and described to best explain the principles and practical use of the present invention in its simplest form to enable others skilled in the art to make and use the same. The drawings shall be interpreted as illustrative and not in a limiting sense.

[0053] As will be apparent to those skilled in the art, in light of the foregoing disclosure, many alterations and modifications are possible in the practice of this invention without departing from the spirit or scope thereof. Accordingly, the scope of the invention is to be determined by the following claims.

What is claimed is:
1. A customizable apparatus to fit within a holder for retaining at least one implement in said holder, comprising:
   (a) a mat having an entirely crenellated top surface wherein a plurality of tapered apertures in said top surface of said mat define a plurality of holes, the highpoint of said apertures form a plurality of peaks;
   (b) a plurality of pins projecting from the underside of said mat elevate and support said mat in said holder; and
   (c) a series of guidelines on said underside of said mat adapted to provide guidance for cutting said mat to fit said holder.
2. The apparatus defined in claim 1 wherein said mat is manufactured of rigid material.
3. The apparatus defined in claim 2 wherein said material is one of: Acrylonitrile Butadiene Styrene (ABS), polypropylene, polystyrene or polyethylene.
4. The apparatus defined in claim 1 wherein said holes are equidistant from each other.
5. The apparatus defined in claim 4 wherein a plurality of said holes are aligned in a triangular staggered grid pattern.
6. The apparatus defined in claim 5 wherein a plurality of said holes are aligned in one of the following: quadrilateral, concentric circles, or an irregular pattern.
7. The apparatus defined in claim 1 wherein said holes are adapted to guide and suspend the tip of said implement.
8. The apparatus defined in claim 1 wherein said holes have a wide upper portion tapering to a narrower mid and lower portion.

9. An apparatus to fit within a holder for retaining at least one implement in said holder, comprising:
   (a) a mat having an entirely crenellated top surface wherein a plurality of tapered apertures in said top surface of said mat define a plurality of holes, the highpoint of said apertures form a plurality of peaks;
   (b) a plurality of pins projecting from the underside of said mat elevate and support said mat in said holder; and
   (c) upstanding side walls protruding at an obtuse angle from said top surface of said mat around the perimeter of said mat preventing the tip of said implement from contacting the side wall of said holder.