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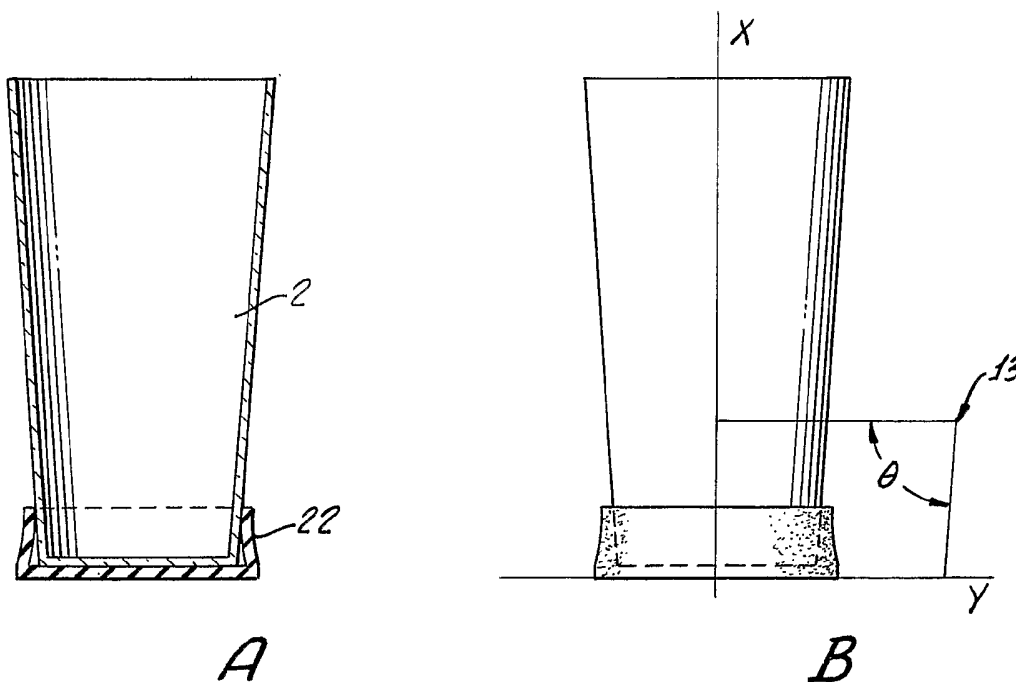
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(54) Title: PROCESS FOR MANUFACTURING A FLEX GRIP CUP-LIKE COASTER APPARATUS



(57) Abstract: A process for making a low profile cup-like coaster apparatus (22) includes steps to generate an article (22) having a flexible grip, absorbent materials and a reusable or disposable and environmentally friendly cup-like coaster apparatus having memory absorbency and low cost.

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PROCESS FOR MANUFACTURING A FLEX GRIP CUP-LIKE COASTER APPARATUS

BACKGROUND OF THE INVENTION

5

The present invention relates generally to an improved process to create a means for preventing dripping from outer surfaces of vessels designed to house liquids, onto other surfaces. More specifically, the present invention relates to a process for making a novel enhanced apparatus, working as a system for precluding undesired leakage, dripping, or the like liquid transmissions from the external surfaces of articles, including vessels (on to areas which are not intended to be wetted preventing damages thereto), particularly those used to house, transport and enable potable liquids to be consumed.

15 Commercial success has yet to be achieved for use of a unitary absorptive strip means issuing and placed over a lower section of desired cup, in spite of the long history of failed attempts. Likewise, the instant teachings mitigate or completely control the unaddressed problem of condensate and the like dripping from drinking vessel onto users. Done in a user friendly and environmentally beneficial way, the elegant simplicity of the instant teachings speak for themselves, in combination with providing a unique mode for displaying a logo or symbol by economically efficient means.

25 Attention is called to the following United States Letters Patents and foreign publications, each of which has been examined and found to be inventively different than the instant teachings:

5,425,497;	5,645,196;	NL 6611523;
DT 1429226;	5,273,182;	FR 1377535;
5,065,589;	4,681,239;	4,540,611;
30 3,103,295;	5,925,466;	5,693,714;

5,415,499; 4,948,443; 4,756,337;
2,617,549; 2,731,056; 2,570,954;
2,568,623; and 1,683,205.

5 An exemplary United States Letters Patent is No. 5,425,497 (the
'497 patent) which issued for the JAVA JACKET®, an insulating sleeve
for hot beverage containers that shields a user's hands from the same.
Simply made from pressed and pleated paper products with two slitted
attachment means disposed on the ends, this product encircles coffee
10 cups.

The '497 patent is important because, as in at least half of the art
reviewed in conjunction with the instant filing, it relates to insulating
means that circle cups. It shows that invention is still available even
within the narrowed and highly patented field of art defined by the
15 instant teachings. In contradistinction to the instant subject matter,
however, the materials are not shown to include open-celled and
otherwise plastic or rubber based compounds, in addition to the paper
used with the present invention.

At least two separate issues relating to the containment of liquids
20 in vessels are addressed by the teachings of this invention. The first
problem is that of spillage. It is well known that a liquid in a nearly full
open vessel can spill over the edges if the vessel is placed in certain
positions. This is so because a liquid contained in a vessel will assume
the shape of the vessel except for the upper surface of the liquid, which
25 will assume the form of a plane parallel to the plane of the surface of the
earth.

Thus, if the vessel is oriented or tipped in such a manner that it
does not completely enclose the aforesaid upper surface of the liquid, the
liquid will spill out of the vessel. Such tipping can occur in an instant of

time, so that spillage is a common problem particularly in the use of drinking vessels such as cups, beakers, glasses and the like.

The second problem experienced by users of vessels containing liquids is the problem of condensation, or dew formation. As used in this discussion, the term dew includes any kind of condensation of water on a surface. Dew is a thin film of water that has condensed on surface of objects, formed based on temperature gradients. The term condensation refers to a change from the gaseous state of a substance to the liquid state. In the present case, the condensation occurs because the capacity of air to hold water vapor decreases as the air is cooled. The temperature at which condensation begins, for a sample of air with a given water vapor content, is termed the dew point. In general, rooms in which many people are present will have a relatively high dew point because of the high content of water vapor in exhaled breath. Likewise, outdoors on a warm day on which cold drinks are particularly desirable, the dew point will be relatively high. From this brief discussion it will be clear that both the problems of spillage and dew formation as discussed above can be ameliorated in related ways. Small amounts of liquid that are spilled over the rim of a vessel, and small amounts of dew can be absorbed by a suitable medium. This absorption occurs by several physical processes, including capillary action and adsorption. These processes can be explained by considering the effects of two opposing forces: adhesion, the attractive force between the molecules of fluid and the material, and cohesion, the attractive force between the molecules of the fluid. Thus, provision of a suitable structure and medium for absorbing spillage and dew is one mechanism underlying the teachings of this invention.

In addition, on the basis of the mechanism of dew formation on the surface of a vessel containing a differentially heated liquid described above, dew formation can be inhibited by insulation means for decreasing

the transfer of heat to the vessel surface from the layer of overlying air in contact with that surface.

What has been discovered is that in combining a flexible grip, the right materials and a reusable and environmentally friendly molded, injected, sprayed, layered or painted coating an ultimately consumer friendly apparatus, having memory, absorbency and low cost can be offered for consideration. The FLEX GRIP MIMPI™ brand of coaster (which is defined for the purposes of the instant specification to include all of those aspects of the instant apparatus as defined in the claims which are appended hereto, and those aspects of the process of making and using that are set forth) allow a user to remain free from the spillage and artifacts of the same that those who attend business meals in light colored clothing have come to dread, it also provides a marginally priced item that can be used to sport a logo for those who wish each user or consumer having a drink to have a proximately located visual reminder.

In short, despite the numerous attempts to innovate within this area, as shown by the many patents asserted to be related to these ideas, a longstanding need to protect both precious surfaces and users' clothing from the ravages of dripping liquids remains ineffectively addressed prior to the advent of the instant teachings. Conventional napkins are a major cost of waste, ineffectively utilized and only marginally effective, likewise known 'coasters' fall apart, stick to the bottoms of glassware selectively (and then fall making embarrassing marks) or simply do not absorb.

SUMMARY AND OBJECTIVES OF THE PRESENT INVENTION

A process is taught for making a selectively absorbent apparatus that is attached to another device and absorbs undesired liquid. According to a particularly preferred embodiment, the other device is a

drinking vessel and the teachings of the present invention comprise a flexible assembly form fitted to the bottom of the vessel, which stops condensation from, for example, drinking glasses from dripping onto any undesired surface, including liquid and oil sensitive surfaces and the
5 clothing of a user.

The apparatus of the invention is advantageously constructed of paper, neoprene or foamed plastic, wherein said foamed plastic is a synthetic resin converted into a flexible sponge-like mass with an open-cell structure. Under known appropriate conditions, certain thermosetting
10 or thermoplastic resin can be converted into a flexible sponge-like foam. Such plastics include, vinyls, polyethylene, silicones, cellulose acetate, and urethanes. Appropriate conditions for producing open cell plastics comprise incorporating an inert gas into the resin under pressure and then releasing the mixture to atmospheric pressure, followed by curing the
15 resultant foam.

Alternatively, the apparatus of the invention may be made of foam rubber, also called sponge rubber or latex foam, wherein said foam rubber is a flexible, porous substance made from a natural or synthetic latex compounded with various well known ingredients and whipped into a
20 foam. The resulting product contains roughly about 85 percent air and 15 percent rubber and can be molded and vulcanized.

Alternatively, the apparatus of the invention may be made of a member selected from the group known as sanitary papers or sanitary grades, whereby a disposable product is produced. Sanitary papers
25 include paper toweling of various thicknesses and are made from various proportions of sulfite and bleached kraft pulps with relatively little refining of the stock to preserve a soft, bulky absorbent sheet, folded, crimped layers, creped or otherwise treated. Because of the bulky texture of sanitary papers, the paper is advantageously treated with resins to

provide an embodiment of the invention with a smooth, printable outer surface having a highly absorbent core and good thermal insulating properties.

Briefly stated, the process makes low-profile coaster type of
5 articles including any and all beverage containers to mitigate and/or
preclude undesired transmission of liquids by selectively absorbing the
same in an open celled medium bordered by a waterproofed layer. In a
particularly preferred embodiment dimensional sizing is featured to
lockingly or matingly engage, and completely cover a bottom portion and
10 selected side portions of at least about three standardly radiused sizes,
for example a pint glass, soft drink or adult beverage container and a
conventional beer bottle. Likewise, environmentally-friendly aspects
include use of recyclables, saving on wasted paper, and use for example,
15 of old wetsuit material to make an industrially and economically efficient
means for preventing drippage, condensate and the like liquid based
insults to clothes and surface materials.

According to one embodiment, the process makes available at a
low cost a device to mitigate dripping from a vessel made up of a single
strip of elastic deformable absorbing material shaped as a low profile
20 round cup where the cup has inner and out surfaces defining a
substantially flat bottom portion having sides extending from it and being
elastically deformable to snugly engage the contours of the vessel.

Likewise, the process for the manufacture of flexible coaster-like
cupping apparatus comprises providing a blank of absorbent material,
25 creating a plurality of unitary rectangular strips having first and second
ends and a round shaped sub-unit separated from the blank, bonding the
first and second ends in abutting relationship disposed about the round
shaped sub-unit to form a cup shaped article.

Similarly, a process for mitigating damage from spilling and/or dripping while displaying an image comprises the steps of providing an elastically deformable cup-shaped coaster attachment having a low profile and size to conform, at an expanded position, with at least about one of
5 three sizes of standardly radiused vessel bottoms, by emplacing the chosen cup-shaped coaster attachment on an appropriately sized bottom whereby a visual surface is provided about the peripheral portion of the vessel by the outer surface of the vessel.

Finally, the process makes an article of manufacture defined as a
10 low profile cup shaped coaster means for deformably conforming to the contours of a vessel made up of at least a layer of material where the means stretches from a first unconformed position to a second conformed position when placed on the bottom of the vessel and the means further comprises inner and outer surfaces defining a substantially flat bottom
15 portion connected to side walls which extend therefrom and whereby the vessel is maintained in substantially orthogonal relationship to a planar surface upon which it rests, when the articles in is the second conformed position of the bottom of the vessel.

The above described and many other features and attendant
20 advantages of the present invention will become apparent by reference to the following detailed description when considered in conjunction with the accompanying drawings, in which related reference designators bare common, or identical numbers.

25 **BRIEF DESCRIPTION OF THE DRAWINGS**

Detailed descriptions of preferred embodiments of the invention will be made with reference to the accompanying drawings, in which like reference designators represent common elements, mindful that multiple

alternate embodiments of the present invention are both illustrated and contemplated.

FIG. 1 is a schematic of partial perspective view of a generalized conception of one embodiment of the device, according to the teachings
5 of the present invention;

FIG. 2 is an embodiment used with a conventional pint glass and an additional view of the instant teachings as shown in one embodiment of the device, according to the teachings of the present invention;

FIG. 3 is an embodiment used with a conventional coffee cup and
10 an additional view of the instant teachings as shown in one embodiment of the device, according to the teachings of the present invention;

FIG. 4 is a view of an alternate embodiment of the apparatus shown in FIG. 1;

FIG. 5A is a schematic view of an embodiment used with a
15 conventional wine bottle;

Fig. 5B is a view of the instant teachings as shown in one embodiment of the device, according to the teachings of the present invention;

FIG. 7A shows an embodiment used with a conventional beer
20 bottle;

FIG. 7B shows a view of the instant teachings as shown in an embodiment of the device, according to the teachings of the present invention;

FIG. 8 is another alternate embodiment crafted from a used piece
25 of neoprene, effective for use with any conventional wine glass;

FIG. 9 is yet another alternate preferred embodiment wherein a substantially translucent material and a logo display zone complement the teachings of the present invention;

FIG. 10 – 13 show currently prototyped devices made up of neoprene (Fig. 10-12) and paper (Fig. 13) which embody the instant teachings.

5 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present inventor has discovered that he can BOTH prevent unwanted liquids from damaging the top surfaces of, for example, tables, desks (and any other desired substrate) and stop dripping onto clothing of
10 the user drinking from or pouring from a vessel. Since there is clearly a longstanding need to solve the problems associated with each of these issues, the instant subject matter merits consideration in virtue of its inherent novelty, inventive step and the non-obvious nature of its teachings.

15 The instant specification is a detailed description of the best presently known mode of carrying out the invention. This description is not to be taken in a limiting sense, but is made merely for the purpose of illustrating the general principles of the invention. The section titles and overall organization of the present detailed description are for the purpose
20 of convenience only and are not intended to limit the present invention. Likewise, although the instant teachings have proven to be effective with currently available materials, it is contemplated that newly discovered compounds and constituents having the properties claimed herein are readily exchangeable by a person having reasonable skill in the art.

25 The physics of water creates untoward challenges which impinge upon many of the conveniences that have been developed in modern society. Following myriads of testing situations, the present inventor has discovered that he can prevent most condensation aliquots from being driven by gravity onto a user's clothes and any number of given surfaces

functioning as 'tables'. This is crucially important given the possible damage to surfaces which are not designed to receive water, such as certain finished or unfinished woods, types of high-end tiles, and further includes all of those articles objects, papers and the like which may be
5 damaged or destroyed through contact with liquids at all.

Since condensation of liquid occurs whenever either gas changes to liquid, or when water-based (compounds, mixtures, admixtures, combinations, drinks, potions) liquids are formed directly by catabolic or anabolic changes – a serious issues arises with glassine and plastic
10 drinking vessels. This is because these reactions are temperature driven, and most users prefer to have their drinks decanted into vessels at temperatures different then the vessels themselves, or there are other protocol-based or aesthetic-based reasons, in addition to the individuated and personalized or subjective bases involved.

15 Each time that someone is served from a container of liquid stored or designed to be stored at a temperature different from the vessel, there is the potential for the generation and gravity-based travel of condensate. Likewise, when a glass, for example, is placed on a surface by a human, unless perfect placement is achieved, minor amounts of the liquid are
20 spilled, and offensive noise (for example the 'clanking' of glasses). Each of these problems is both addressed and ameliorated by the advent of the instant teachings.

Similarly, the inherent stability provided by a cushioned means for matingly engaging the bottom of a glass in and of itself mitigates the
25 volume of aliquots which escape 'over the top' of drinking vessels. By being both price efficient, washable and recyclable, the present invention necessarily has a positive impact on environmental concerns and issues by precluding the wasting of other materials, as discussed below.

FIG. 1 shows a schematized article, in this case a vessel for housing liquids at 2. Vessel 2 is generally glassine, plastic based, or crafted from a marginally pliable or stiffened material (as defined by its respective Young's Modulus) such that it can support the weight of a volume of liquid disposed therein. The present invention likewise works well to stabilize and prevent dripping from 'waxed cardboard' and/or styrene disposable cups which abound in the fast-food industry, as a promotional item.

Bottom surface 10, of vessel 2 is completely covered by FLEX® GRIP apparatus 4, whereby inner surface 8, abuts bottom surface 10. Inner wall 12 fittingly embraces the outer surface of vessel 2's bottom region, whereby transmission of liquid therethrough is precluded, or substantially mitigated and stability is maintained by keeping the angle substantially orthogonal. See Fig. 3.

FLEX GRIP MIMPI™ apparatus 4 is composed of any number of flexible materials, including neoprene (available as shown in Fig. 9, and Fig.s' 10 -13 from the KOLDER Corporation, Edinburg, Texas, USA), sponge foam, conventional plastics, known rubbers, PTFE compounds made from any of the same, urethanes, polysiloxanes, and the like synthetics and the like unknown materials which share the characteristic of having an open-celled aspect, and a waterproofed aspect (imperviousness to liquids).

Facultative fin or stabilizer 6 provide the ability to stand on a substantially level surface, and is optional within the context of the instant teachings. However, it may be extended, textured, shortened, stiffened or otherwise customized for enhanced stability, for example when travel is within the car of a train, a boat or an airplane, or any other surface wherein a substantially planar surface is subject to vertical or transverse forces.

Referring now to FIG. 2, the article/workpiece/vessel 2 is a conventional pint glass, such as used to hold any number of drinks from beer to water. FLEX GRIP MIMPI™ apparatus 22 is shown in an attached posture relative to vessel 2, whereby FLEX GRIP MIMPI™ apparatus 22 matingly engages a bottom portion of vessel 2, and remains attached to the same when vessel 2 is lifted (for example, by a user to take a drink). Likewise, when vessel 2, bracingly engaged to FLEX GRIP apparatus 22 is replaced on a substantially planar surface (as indicated by ordinate y) the entire assembly is maintained in a substantially orthogonal angle theta 13, relative to the substantially planar surface.

The instant apparatus 22 may be a unitary neoprene construction neoprene (available from the KOLDER Corporation, Edinburgh, Texas, USA), may be EVA, or any number of related plastic or rubberized petroleum distillate products. Similarly, depending on the porosity of the material, those skilled in the art may substitute inherently similar materials.

Likewise, the instant apparatus 22 may be composed of a plurality of strips of mill ends, remnants, or 'scraps' of, for example, neoprene, with or without an outer coating layer that is waterproofed. Conventional (from at least about .83 mm to about 5.5 mm) wetsuit material has been used, with the outermost waterproofed coating layer, and comprises a preferred embodiment of the instant teachings.

The present inventor has discovered that salvage value of 'used' wetsuits may be enhanced by parsing the same and rejoining at least two, or as many as several pieces, using standardized cementing material (BLOCK/SURF of Chatsworth, CA).

FLEX GRIP apparatus 22 in this way serves at least three important functions for the preservation of the environment. First, it prevents waste of natural resources by recycling used articles having appropriate plastic or rubber characteristics (including wetsuits, tires,

etc...) and second it prevents the needless waste of paper-based supplies like napkins, paper towels, cardboard coasters, and third it obviates the need for dry-cleaning which saves precious resources and likewise stops the dumping of noxious chemicals into drains and thus into the water
5 table.

Rubbers, plastics and the like materials may be sprayed on, melted, cured, baked, laser trimmed and otherwise subject to manipulations based upon desired porosity and 'hand'. Owing to the memory of such materials, minimization of the size and shape of FLEX
10 GRIP apparatus 22 is further contemplated based upon the particular application as issue.

By way of further example, FLEX GRIP apparatus 22 is further composed of translucent or transparent open-celled material and has been crafted with an extremely low profile for use with wine glasses,
15 sniffers for brandy and the like stem-using vessels.

Likewise, surface characteristics according to the instant teachings are malleable and may be tailored to be hardened, clear, subject to logos being disposed therein, mounted thereupon, embossed, engraved, electronically displayed and the like.

20 Referring now to FIG.'s 3 – 9 it will be appreciated how the dimensional variation encompassed by the instant teachings allows the present invention to be varied to fit all known beverage containers.

FIG. 3 and 8-9 each shows pre-formed cupping means 22, housing a conventional coffee cup 2. It is noted that according to this
25 embodiment, pre-formed cupping means 22, further comprises peripheral/outer layer 38. As discussed above and described below, the nature of the materials as absorbent functions in complementary fashion with the waterproofed nature of at least on aspect of the same.

For example, according to an embodiment with outer layer 38, the surface may be a smoothed and sheened rubberized coating, over principal body 22 of neoprene neoprene (available as shown in Fig. 9, and Fig.s' 10 -13 from the KOLDER Corporation, Edinburgh, Texas, USA).
5 As discussed, for example, since the salvage value of 'used' wetsuits may be enhanced by parsing the same and rejoining at least two, or as many as several pieces, using standardized cementing material (BLOCK/SURF of Chatsworth, CA), FIG. 3 can include either originally reclaimed wetsuit material (at any known thickness, for example, 5 mm in this model) or the
10 same enhanced by melting, gluing, embossing or adhesion of other surface modalities, elements, pieces, finishing or adhesions.

Since outer layer 38 is waterproofed, when condensation forms on vessel 2, it is pulled downward by gravity until lodged in absorbent layer(s) 22 and then held in by outer layer 38. Those having a modicum of skill
15 will readily apply the instant teachings to bottles, cans, wine glasses, pint glasses, alternately shaped vessels, plastic cups, child-proof cups, pitchers and the like.

Likewise it is known that those of skill can understand readily the remaining figures and further understand the many and varied industrial,
20 chemical, laboratory based usages of the instant teachings. For example, incorporation of a neutralizing agent, or the like chemical equilibration means in the open-celled portion when dealing with acids or the like specialty chemicals.

Similarly, incorporation of additional elements, such as a girth, or
25 cinching means for tightening around the desired diameter is incorporated within the instant teachings. Such devices allow for on-site custom fitting or variations of the 'one-side fits all' versions of the present invention and are clearly contemplated by the scope of the instant teachings.

Referring now specifically only to Fig. 8 and FIG.9, there are shown two particularly preferred embodiments, substantially flexible jacket 22 having at least an inner surface and an outer surface, wherein said jacket is adapted to fittingly cover and cuppingly engage an area comprising substantially the entire bottom and a predetermined portion of the lower sides of a vessel for containing a liquid below ambient temperature, wherein said jacket is constructed of material that impedes heat transfer from said outer surface to said liquid, and wherein said jacket is capable of absorbing said liquid.

Those having a modicum of skill in the art understand that this can be either a plastic based or paper based assembly, and the present invention likewise includes a kit for sales, comprising substantially flexible jacket 22 having at least an inner surface and an outer surface, packaging materials and, at least one instructional device for explaining the use of said device. For example, used pieces or recycled pieces of wetsuits and recycled paper products can be offered for users to assemble their own FLEX® GRIP mimpì apparatus.

Likewise, in FIG. 9 a translucent or transparent version 22 is shown having an embossed, tattooed, engraved, stickered, pressed, melted, scored or otherwise emplaced logo ["MIMPI™"] disposed whererby a users can view the same.

Although the present invention has been described in terms of the preferred embodiments above, numerous modifications and/or additions to the above-described preferred embodiments would be readily apparent to one skilled in the art. It is intended that the scope of the present invention extends to all such modifications and/or additions and that the scope of the present invention is limited solely by the claims set forth below.

What is Claimed:

1. A process for the manufacture of flexible coaster-like cupping apparatus comprises:

5 providing a blank of absorbent material, creating a plurality of unitary rectangular strips having first and second ends and a round shaped sub-unit separated from the blank, bonding the first and second ends in abutting relationship disposed about the round shaped sub-unit to form a cup shaped article.

10 2. A product produced by the process of claim 1, where the product is neoprene.

3. A product produced by the process of claim 1, where the product is paper.4.

15 4. A process for making an article of manufacture defined as a low profile cup shaped coaster means for deformably conforming to the contours of a vessel made up of at least a layer of material where the means stretches from a first unconformed position to a second conformed position when placed on the bottom of the vessel and the means further comprises inner and outer surfaces defining a substantially flat bottom portion connected to side walls which extend therefrom and whereby the vessel is maintained in substantially orthogonal relationship to a planar surface upon which it rests, when the articles in is the second conformed position of the bottom of the vessel, comprising the steps of:

25 providing a sheet of absorbent material;

forming a low-profile cup-like article.

5. A product produced by the process of claim 4, where the product is neoprene.

6. A product produced by the process of claim 4, where the product is paper.
7. The process of claim 4, further comprising a bonding step, using a least one of glue and stitching.
- 5 8. A method for preventing undesired transmission of liquids, comprising the steps of:
providing an absorbent female means having a coated outer surface for matingly engaging a ventral surface and selected portions defining an adjacent peripheral zone of an article;
10 permitting said absorbent female means to selectively absorb liquid; and
selectively removing, rinsing or washing and replacing said absorbent female means, as needed.
- 15 9. Method of claim 8, wherein said absorbent female means further comprises at least one open-celled material, compound mixture, admixture, combination, amalgam or constituent selected from the group consisting of neoprene, sponge, foam, ethyl-vinyl acetate, ePTFE, vinyls, polyethylene, silicones, cellulose acetate, paper, urethanes, foam rubber
20 and the like rubber and plastic materials.
10. The method of claim 9, wherein said absorbent female means consists at least
in part of recycled materials, and further comprises an outer peripheral
25 surface having a prominent area or space for displaying at least one symbol, logo, character set, string, color, texture or the like means for identifying a source of origin or a good, product or service.

1/4

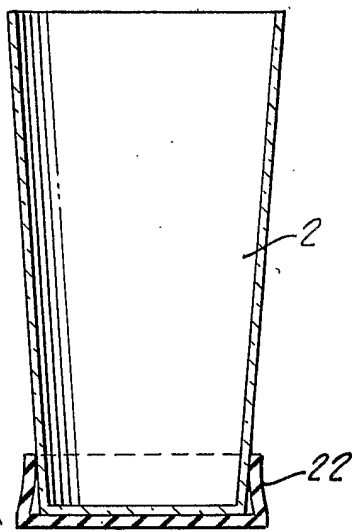
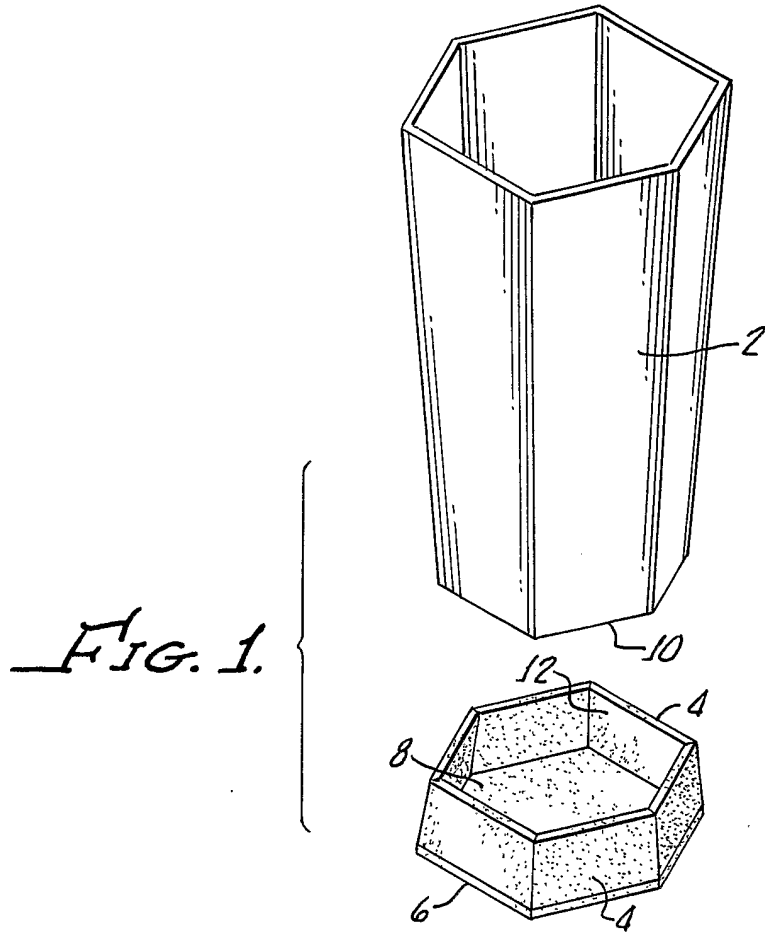


FIG. 2A.

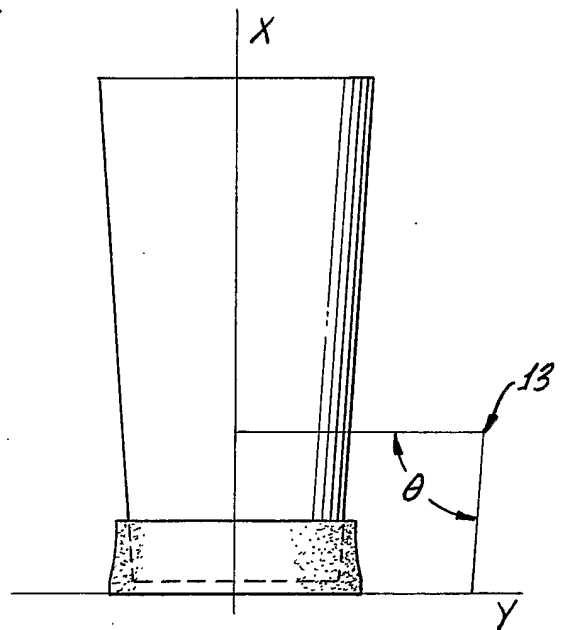


FIG. 2B.

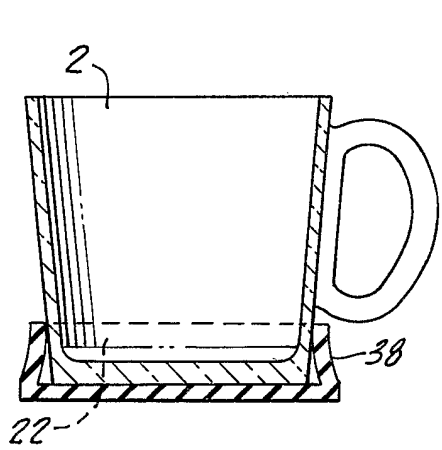


FIG. 3A.

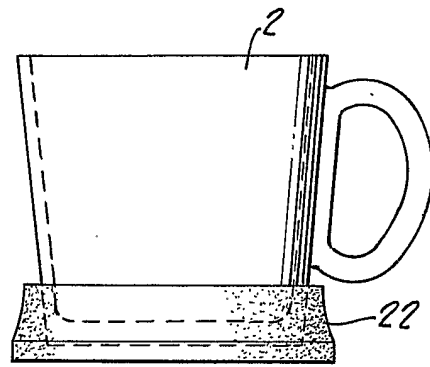


FIG. 3B.

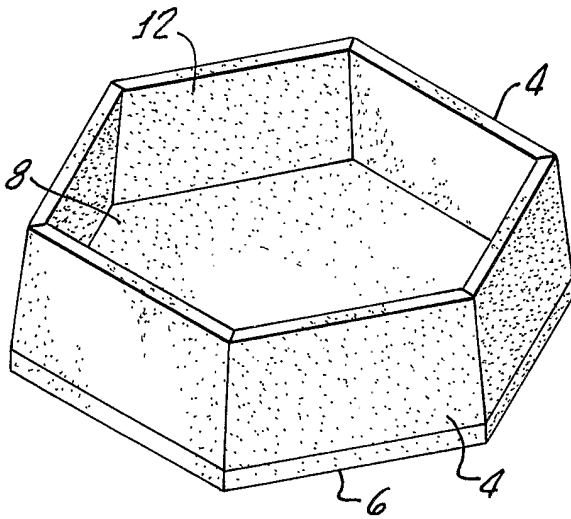


FIG. 4.

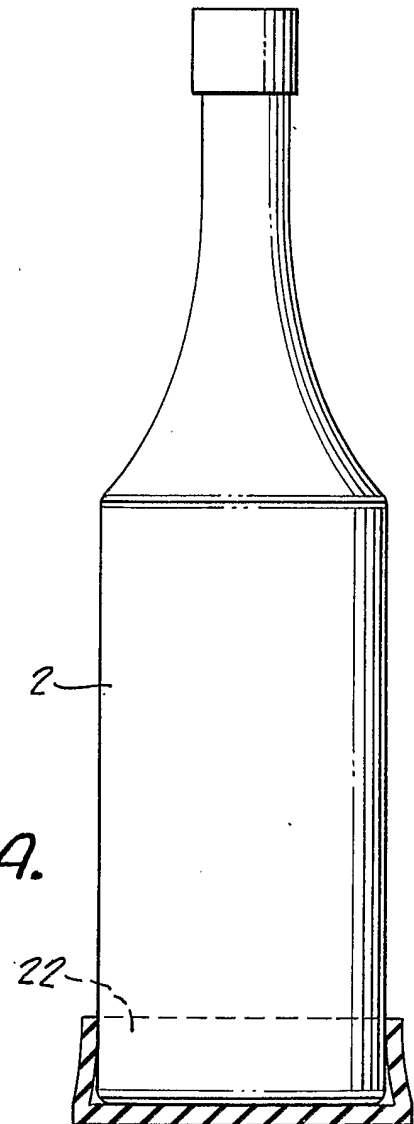


FIG. 5A.

3/4

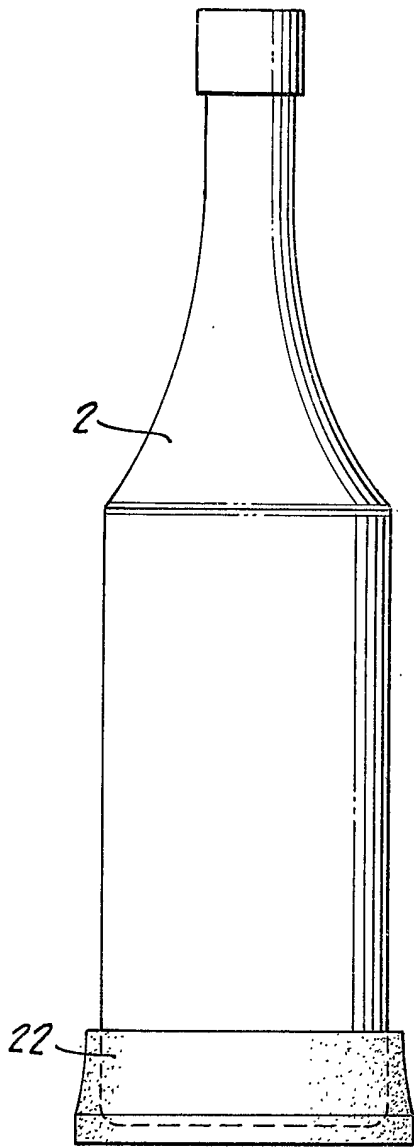


FIG. 5B.

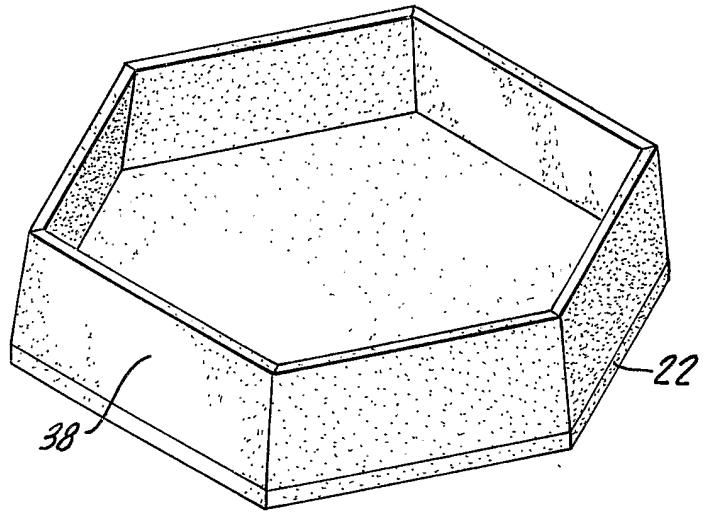


FIG. 6.

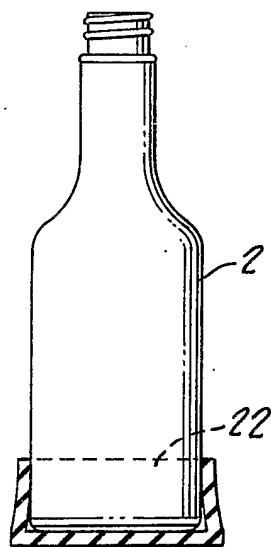


FIG. 7A.

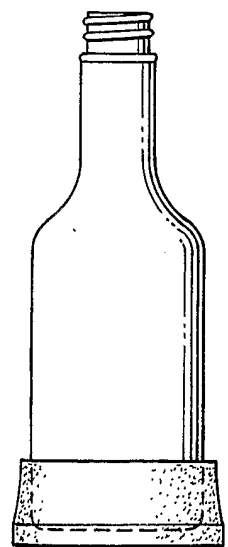


FIG. 7B.

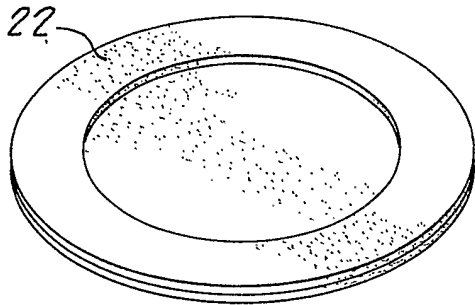


FIG. 8.

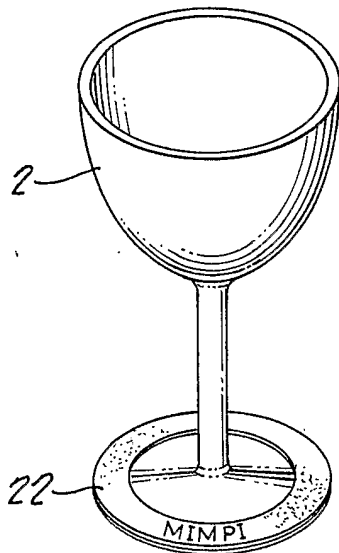


FIG. 9.

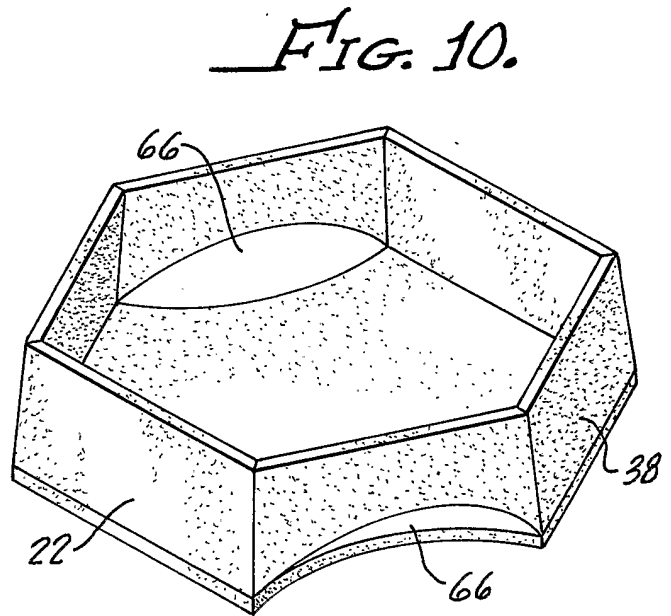


FIG. 10.

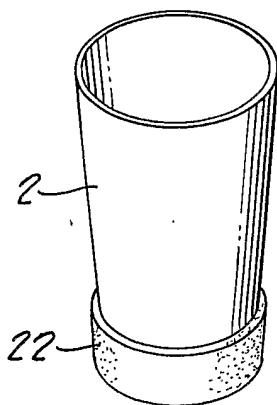


FIG. 11.

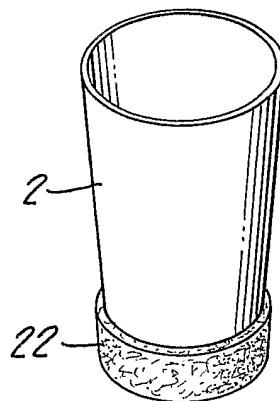


FIG. 12.

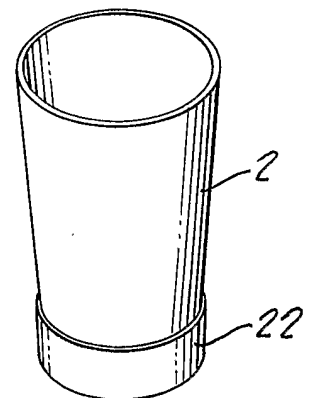


FIG. 13.

INTERNATIONAL SEARCH REPORT

Internatioanal Application No
PCT/US 03/10353

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A47G23/032

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A47G B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2 071 399 A (GAMBELL JOHN C) 23 February 1937 (1937-02-23) page 1, column 1, line 41 -column 2, line 51; figures ---	1-10
X	US 6 290 091 B1 (BELL ALLEN RAY) 18 September 2001 (2001-09-18) column 2, line 65 -column 3, line 67; figures ---	1-10
X	US 2 343 563 A (MCCABE JOHN E) 7 March 1944 (1944-03-07) page 1, column 2, line 22 -page 2, column 1, line 54; figures ---	1-10
	-/--	

Further documents are listed in the continuation of box C. Patent family members are listed in annex.

° Special categories of cited documents :

<p>*A* document defining the general state of the art which is not considered to be of particular relevance</p> <p>*E* earlier document but published on or after the international filing date</p> <p>*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>*O* document referring to an oral disclosure, use, exhibition or other means</p> <p>*P* document published prior to the international filing date but later than the priority date claimed</p>	<p>*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>*&* document member of the same patent family</p>
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Date of the actual completion of the international search <p style="text-align: center;">7 October 2003</p>	Date of mailing of the international search report <p style="text-align: center;">23/10/2003</p>
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Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer <p style="text-align: center;">Vistisen, L</p>
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INTERNATIONAL SEARCH REPORT

Internatioanal Application No
PCT/US 03/10353

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 248 366 A (CHRISTIANSEN JAMES S) 3 February 1981 (1981-02-03) column 3, line 5 -column 5, line 63; figures	4,5,8-10
A	column 2, line 36 - line 53 ----	2
X	US 2 731 056 A (ANSON ARTHUR H) 17 January 1956 (1956-01-17) column 1, line 53 -column 4, line 6; figures	4,5,8-10
A	JP 58 019210 A (MIYAZAKI SANGYO KK) 4 February 1983 (1983-02-04) the whole document -----	1

INTERNATIONAL SEARCH REPORT

Internatioanal Application No
PCT/US 03/10353

Information on patent family members

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US 6290091	B1	18-09-2001	CA 2356030 A1 28-02-2002 EP 1184299 A1 06-03-2002
US 2343563	A	07-03-1944	NONE
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JP 58019210	A	04-02-1983	NONE