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3,034,140

BATH TUB MAT WITH MAGNETIC HOLDING MEANS

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2 Sheets-Sheet 1

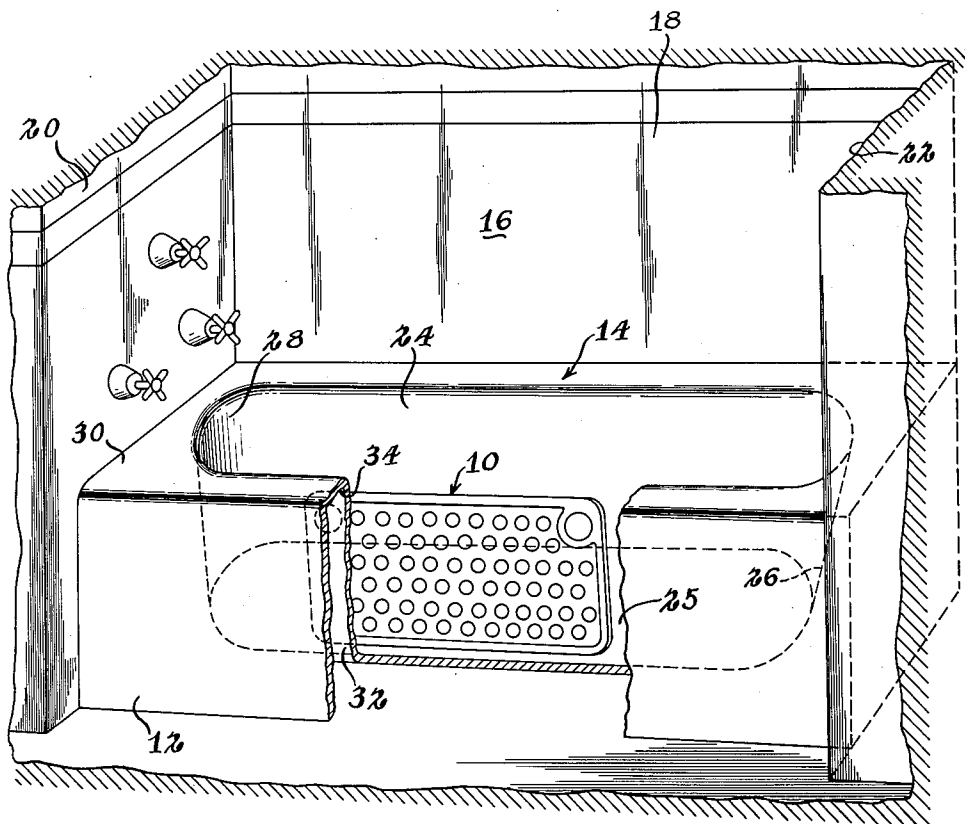


Fig. 1.

Fig. 2.

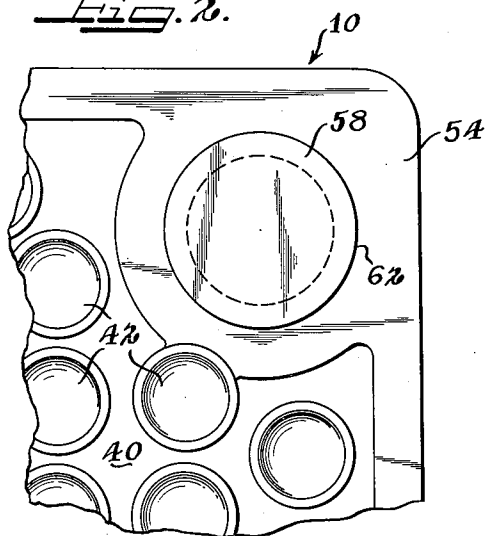
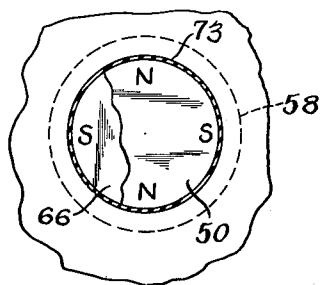


Fig. 4.

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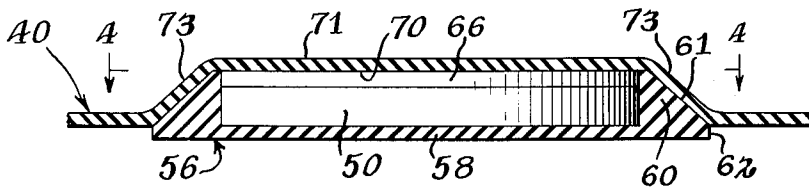
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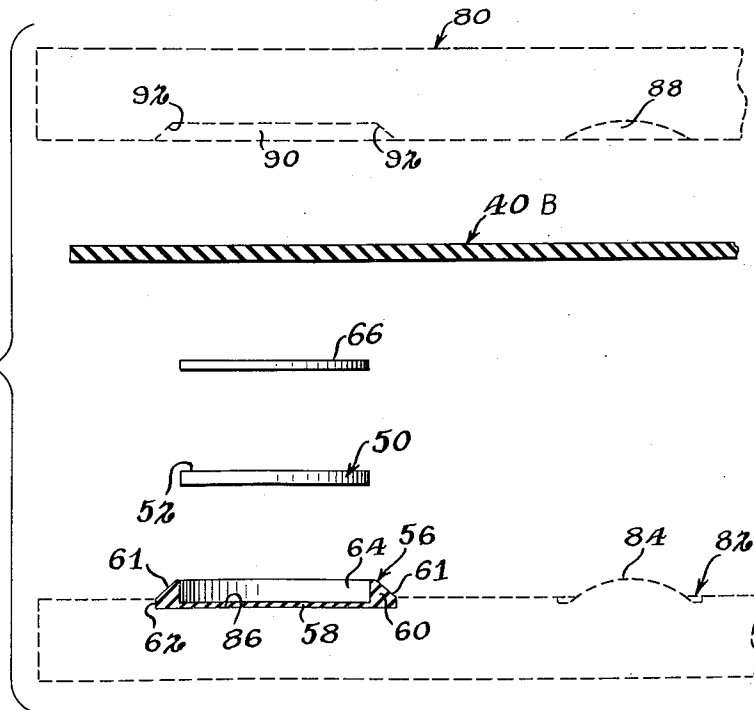
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BATH TUB MAT WITH MAGNETIC HOLDING MEANS

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3 Claims. (Cl. 4—185)

The present invention relates to bath tub mats and has particular reference to an elastomeric mat having associated therewith novel means whereby the same may be supported, when not in use, in a flat unfolded condition on the inner surface of the outside side wall of a bath tub where it will be substantially concealed from view and may be dried by a drip action.

The problem of conveniently storing a rubber or other elastomeric bath tub mat within a bathroom enclosure has long plagued the management of hotels, motels, rooming houses and other public lodging establishments, as well as home owners. The problem is aggravated by the fact that storage of a rubber bath mat is usually required immediately after the use thereof and while the same is still wet. Many such establishments, which ordinarily would like to furnish bath mats to their guests, refrain from doing so for several reasons. In the first place, rubber mats are invariably employed for anti-skid purposes with the mat resting on the bottom of the bath tub and with the user standing on the mat. After the user has stepped from the bath tub, it is customary for him or her to hang the wet mat on the edge of the tub so that the moisture on one half of the mat will return to the tub while the moisture on the other half will drip to the floor. If the bath tube is of the built-in type, there is only one available edge for such placement of the mat, and when the wet mat is placed thereon, moisture will drip from the mat onto the floor in the working area of the room. If the tube is of the detached type, there will be two straight edges available for mat-hanging purposes, and when the inside edge is selected, the moisture which falls to the floor is inaccessible for mopping-up purposes so that the inaccessible moisture accumulation frequently leads to seepage to the room below.

Secondly, placement of the wet mat over an edge of the tub in the manner outlined above presents an obstacle to the free movement of the occupant of the bathroom since there is the danger of contact with the wet mat by the clothing of the occupant.

Thirdly, such mats, in themselves, are not particularly attractive and few of them conform to the decor of a well-appointed bathroom. It is thus desirable to maintain a bath tub mat which is not in use out of sight if possible. Obviously, a mat which is hung over an edge of a bath tube does not present a pleasing effect, especially to a person of refinement.

It is for these reasons that many large hotels and similar establishments do not attempt to supply bath mats to their guests.

The present invention is designed to overcome the above-noted limitations that are attendant upon the use of conventional bath tub mats and toward this end, it contemplates the provision of a mat, two adjacent corners of which have embedded therein powerful permanent magnets so that they may be positioned in a flat condition on the inner surface of the outside side wall of a bath tub where it may discharge substantially all of its moisture into the tub and where although completely exposed it will remain out of sight during all normal movements of the occupant of the bathroom.

The provision of a bath tube mat of the character briefly outlined above being among the principal objects of the invention, it is a further object to provide such a mat wherein the permanent magnets which are associ-

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ated therewith are hermetically sealed within the body of the mat so that they will not come into contact with or be subjected to the deleterious action of moisture.

It is another object of the invention to provide a mat of this character and wherein the magnets which are associated therewith have their operative pole faces protected against the shock of impact and the consequent danger of fracture or chipping by steel pole pieces, the pole pieces serving the additional function of increasing the magnetic pulling power of the magnets as a whole.

A further object of the invention is to provide such a mat which readily lends itself to economical and simple assembly procedures, thereby resulting in an article which may be manufactured at a relatively low cost.

The provision of a bath tub mat which, although it embodies a plurality of embedded permanent magnets, is devoid of abrupt bulges or enlargements; one which is rugged and durable and is, therefore, possessed of a comparatively long life; one which is attractive in its appearance and pleasing in its design; and one which, otherwise, is well-adapted to perform the services required of it, are further desirable features which have been borne in mind in the production and development of the present invention.

Numerous other objects and advantages of the invention not at this time enumerated will become more readily apparent as the following description ensues.

In the accompanying two sheets of drawings forming a part of this specification, one illustrative embodiment of the invention has been shown.

In these drawings:

FIG. 1 is a fragmentary perspective view of a bathroom enclosure showing a bath cubicle with a bath tub mat constructed in accordance with the principles of the present invention operatively applied to a bath tub within the cubicle;

FIG. 2 is an enlarged fragmentary plan view showing one corner region of the mat;

FIG. 3 is a further enlarged sectional view taken on the line 3—3 of FIG. 2;

FIG. 4 is a sectional view taken on the line 4—4 of FIG. 3; and

FIG. 5 is a fragmentary exploded sectional view illustrating the structure of FIG. 3 with the various parts thereof juxtapositioned prior to assembly thereof and curing or vulcanization of the uncured sheet stock which in the finished mat constitutes the body portion of the mat.

Referring now to the drawings in detail and in particular to FIG. 1, a bath tub mat constructed in accordance with the principles of the present invention has been designated in its entirety by the reference numeral 10 and is shown as being operatively supported in an out-of-the-way position wherein it is substantially concealed on the inner face of the outer side side wall 12 of a conventional bath tub 14. The bath tub selected for illustration herein is of the built-in type and is shown as being disposed within a bath cubicle 16 having a back wall 18, and end walls 20 and 22. In addition to the wall 12, the bath tub is provided with an inner side wall 24, a bottom wall 25, and head and foot walls 26 and 28, the four walls 12, 24, 26 and 28 providing a generally flat rim 30.

A bath tub of the character described is universally employed in modern hotels, apartment buildings and homes. Such a bath tub comprises an inner core or body 32 of cast iron or sheet steel which is completely covered by a relatively thick layer 34 of highly glazed porcelain, the former being a magnetic material and the latter being a nonmagnetic material.

As has been stated previously, the bath tub mat 10 of the present invention has associated therewith a plurality

of permanent magnets which are maintained concealed entirely within the confines of the body of the mat and by means of which the mat as a whole may be supported in the position illustrated in FIG. 1 within the confines of the bath tub 14 by reason of the magnetic attraction offered by the magnets to the ferrous core 32 of the bath tub. Due to the relatively thick outer layer or coating 34 of nonmagnetic porcelain, it is obvious that the aims of the present invention may be accomplished only by the use of magnets which possess great attractive power since wide magnetic gaps must necessarily form a part of the magnetic circuit due not only to the thickness of the porcelain, but also to the thickness of rubber or other elastomeric material between the magnet poles and the surface to which the mat is to be applied. Additionally, the attractive power of the magnets must be applied over a relatively wide area if sufficient tractive power is to be developed to hold the relatively heavy mat in its suspended condition on the vertical bath tub surface. Since the mat 10 is relatively thin, a magnet design which itself is thin must be employed.

One magnetic material which is capable of fulfilling the aims of the present invention is available for use. This material is of the ceramic type and is known as "Indox," a development of Indiana Steel Products Company of Valparaiso, Indiana. This barium-ferrite material is characterized by the fact that it is electrically non-conductive, is extremely resistant to demagnetizing influences, evidences low eddy current losses, exhibits high coercive force and has a low incremental permeability. Because of these characteristics of this magnetic material, the magnetic length thereof need be but a fraction of that required for the ferrous alloys in attaining the same magnetic pull for a given size magnet. Where barium-ferrite ceramic materials are concerned, magnetic stability is pronounced and permanent magnets constructed of this material maintain their magnetic strength despite weakening influences such as contact with extraneous magnetic fields and frequent removal and replacement of the magnetic armatures. Additionally, such material is relatively light as compared with ferrous or other magnetic alloys.

The bath tub mat 10, except for the provision of a pair of magnets therein in a manner that will be described presently, is of more or less conventional design. It is preferably in the form of a substantially flat, generally rectangular molded article which may be formed of a suitable elastomeric material such as rubber, either natural or synthetic, or a rubber substitute. The body 40 of the mat is molded so as to provide a series of cup-shaped bulges 42 therein, the direction of extent of the bulges being the same in each instance. These bulges serve the dual purpose of affording anti-slip abutments for the feet of the user of the mat, as well as of functioning as suction cups when the mat is in use. The mat is designed to be positioned on the bottom wall 25 of the bath tub 14 with the concave sides of the bulges 42 facing downwardly so that as the user steps upon or otherwise depresses the bulges, the bulges effect a seal with the wet surface of the bottom wall 25 of the tub and prevent shifting of the mat within the tub.

The mat 10 has associated therewith two identical permanent magnet assemblies each of which includes a magnet proper 50 of the ceramic barium-ferrite type as set forth above. Each magnet is in the form of a generally flat, circular disk which is magnetized on one side only to produce a pole face 52 which exhibits poles such as have been designated at "N" and "S" in FIG. 4. Although the magnets 50 selected for illustration herein are magnetized as shown on one face only, it is within the scope of the present invention to magnetize both faces of the magnets so that the poles thereof are circular and concentric, or so that they are otherwise disposed and magnetized. A wide variety of spot magnetization patterns may be effected on either or both faces

of the magnets, the principal consideration being that the working face of the magnet has high attractive power. Irrespective, however, of the particular magnetic pattern associated with the two magnets 50, the essential features of the invention are at all times preserved.

As shown in FIGS. 1 and 2, the marginal region of the mat body 40 is formed with a thickened marginal edge region 54 which is of wider area in two of the adjacent corner regions of the mat body to accommodate embedment of the magnets 50.

The manner in which the two magnets 50 are embedded in their respective corner regions of the mat body are identical and, therefore, a description of the embedment of one magnet will suffice for the other. Each magnet 50 is seated within a rubber or other elastomeric cup 56 of circular design, the cup having a bottom wall 58 and an upstanding side wall 60 (see FIGS. 3 and 5). The side wall 60 is generally cylindrical and presents an inclined or frusto-conical outside face 61 and a narrow cylindrical base face 62. The cup 56 further provides a shallow circular recess or pocket 64 within which the magnet 50 is seated. The depth of the pocket 64 is in excess of the axial extent of the magnet 50 so that the pocket may also accommodate the positioning therein of a pole piece 66 which constitutes another part of the magnet assembly. The pole piece 66 is in the form of a flat thin circular steel disk which is positioned flush against the pole face 52 of the magnet, and when so positioned, the magnet assembly, i.e., the magnet and pole piece, substantially fills the pocket as shown in FIG. 2.

Referring now to FIG. 3, the side wall 60 of each magnet-retaining cup 56 extends into a shallow recess 70 in one face of the mat body 40, the cup and mat body being bonded to each other, preferably, by a vulcanizing or other process, as will be described presently. The recesses 70 exist by virtue of circular offset portions 71 which are displaced laterally from the general plane of the mat body and are connected to the remainder of the mat body by frusto-conical web portions 73. The narrow cylindrical faces 62 of the side walls 60 remain outside of the physical confines of the mat body 40 when the cups 56 are bonded in position within the recesses 70. With the magnets 50 and pole pieces 66 in position within the pockets 64 of the cups 56, and with the assemblies 50, 66, 56 seated within the shallow recesses 70 of the mat body 40, air is excluded from the chambers which are thus created for reception of the magnets and their pole pieces and these elements are, in effect, completely embedded within the confines of the elastomeric portions of the mat body.

As previously stated, the above described bath tub mat lends itself to economical and simple manufacturing or assembly operations. One manner of constructing the mat has been schematically illustrated in FIG. 5 wherein upper and lower mat-forming and curing mold sections are shown in dotted lines and designated by the reference numerals 80 and 82, respectively. In actual practice, the two mold sections 80 and 82 may be hingedly connected together, but in the schematic illustration thereof in FIG. 5, these sections are shown in operative opposed parallel relationship preparatory to their being closed upon the constituent parts of the mat assembly.

The lower mold section 82 is formed with upwardly extending protuberances 84 for forming the bulges 42, and also with shallow sockets 86 which are adapted to receive the base portions of the two preformed cups 56. In the formation of the mat 10, the cups 56 are seated within the sockets 86 and the magnets 50 and pole pieces 66 are installed within the cups, as previously described. The cups 56 are separately formed by a suitable molding operation and are pre-cured or pre-vulcanized prior to their disposition within the sockets 86.

With the cup, magnet and pole piece assemblies in position on the lower mold section 82, a sheet of un-

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cured mat stock, such as has been designated at 40B in FIG. 5, is positioned over the lower mold section and its contents, and thereafter, the two mold sections are closed upon each other and placed under a considerable degree of pressure. The upper die section 80 is formed with recesses 88 which are complementary to the protruberances 84, and also with recesses 90 which are complementary to the contours of the protruding portions of the cup and magnet assemblies and, as a consequence, have frusto-conical wall surfaces 92.

Upon closure of the two mold sections 80 and 82 upon each other and upon the application of heat thereto, the various constituent parts of the mat assembly become permanently assembled by reason of the vulcanization of the contacting elastomeric parts.

The above described method of assembling the bath tub mat 10 of the present invention is merely exemplary of one convenient and economical way in which the mat may be manufactured. Other methods obviously are available and suitable for use. The invention of the present application consists for the most part in the novel construction, combination and arrangement of parts of the mat as a whole as subsequently claimed.

The invention is not to be limited to the exact arrangement of parts shown in the accompanying drawings or described in this specification as various changes in the details of construction may be resorted to without departing from the spirit of the invention. Therefore, only insofar as the invention has particularly been pointed out in the accompanying claims is the same to be limited.

Having thus described the invention what I claim as new and desire to secure by Letters Patent is:

1. As a new article of manufacture, a substantially flat bath tub mat of generally rectangular design and formed of elastomeric material, said mat being formed with a marginal edge region embracing at least one adjacent pair of corner regions of the mat, said corner regions being provided with circular portions which are offset slightly from the general plane of the mat and are connected to the remainder of the mat by frusto-conical webs, thus providing a pair of shallow recesses opening onto one side of the mat, a pair of separate, shallow, magnet-retaining cups formed of elastomeric material and having portions thereof disposed within said recesses respectively, said cups including flat circular bottom walls and generally cylindrical side walls of small height, said side

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walls presenting frusto-conical outside surfaces fitting against and coextensive with said frusto-conical webs and presenting rims fitting against the offset circular portions, said bottom walls, side walls and offset circular portions defining a pair of closed internal cylindrical chambers, and a pair of circular disk-like magnet assemblies of the barium-ferrite type disposed within and filling said chambers respectively.

2. A substantially flat bath tub mat as set forth in claim 1 and wherein said magnet assemblies include magnets proper seated against the bottom walls of the cups, and pole pieces interposed between the magnet proper and said offset circular portions of the mat.

3. As a new article of manufacture, a substantially flat bath tub mat of generally rectangular design and formed of elastomeric material, said mat being formed with a marginal thickened edge region embracing at least one adjacent pair of corner regions of the mat, said corner regions being provided with circular portions which are offset slightly from the general plane of the mat and are connected to the remainder of the mat by frusto-conical webs, thus providing a pair of shallow recesses opening onto one side of the mat, a pair of separately formed, shallow, magnet-retaining cups formed of elastomeric material and having portions thereof disposed within said recesses respectively, said cups including flat circular bottom walls and generally cylindrical side walls of small height, said side walls presenting frusto-conical outside surfaces fitting against and coextensive with said frusto-conical webs and presenting rims fitting against the offset circular portions, said bottom walls, side walls and offset circular portions defining a pair of closed internal cylindrical chambers, and a pair of circular disk-like magnet assemblies of the barium-ferrite type disposed within and filling said chambers respectively, portions of said bottom walls protruding outwardly from the general plane of the mat in a direction opposite to the direction of offset of the offset circular portions.

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