

[54] **ARTICLE HAVING HANDLE PORTION
WITH INTERNAL DESICCANT-
CONTAINING CARTRIDGE**

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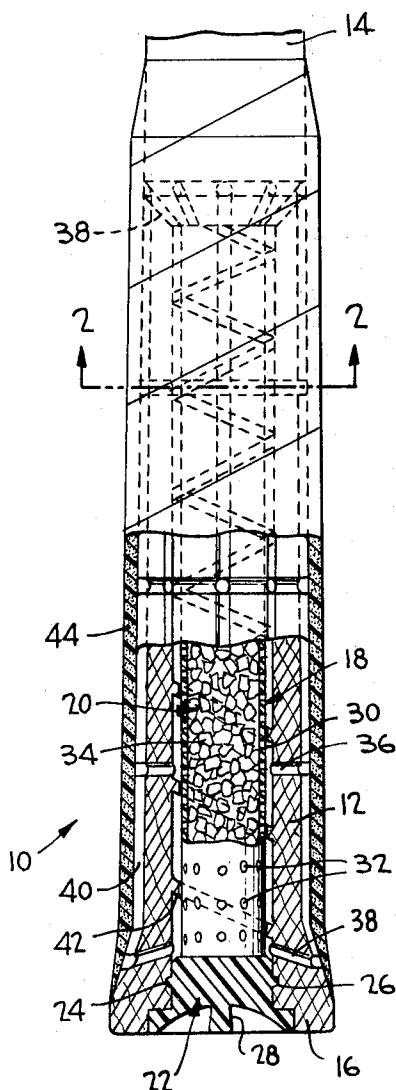
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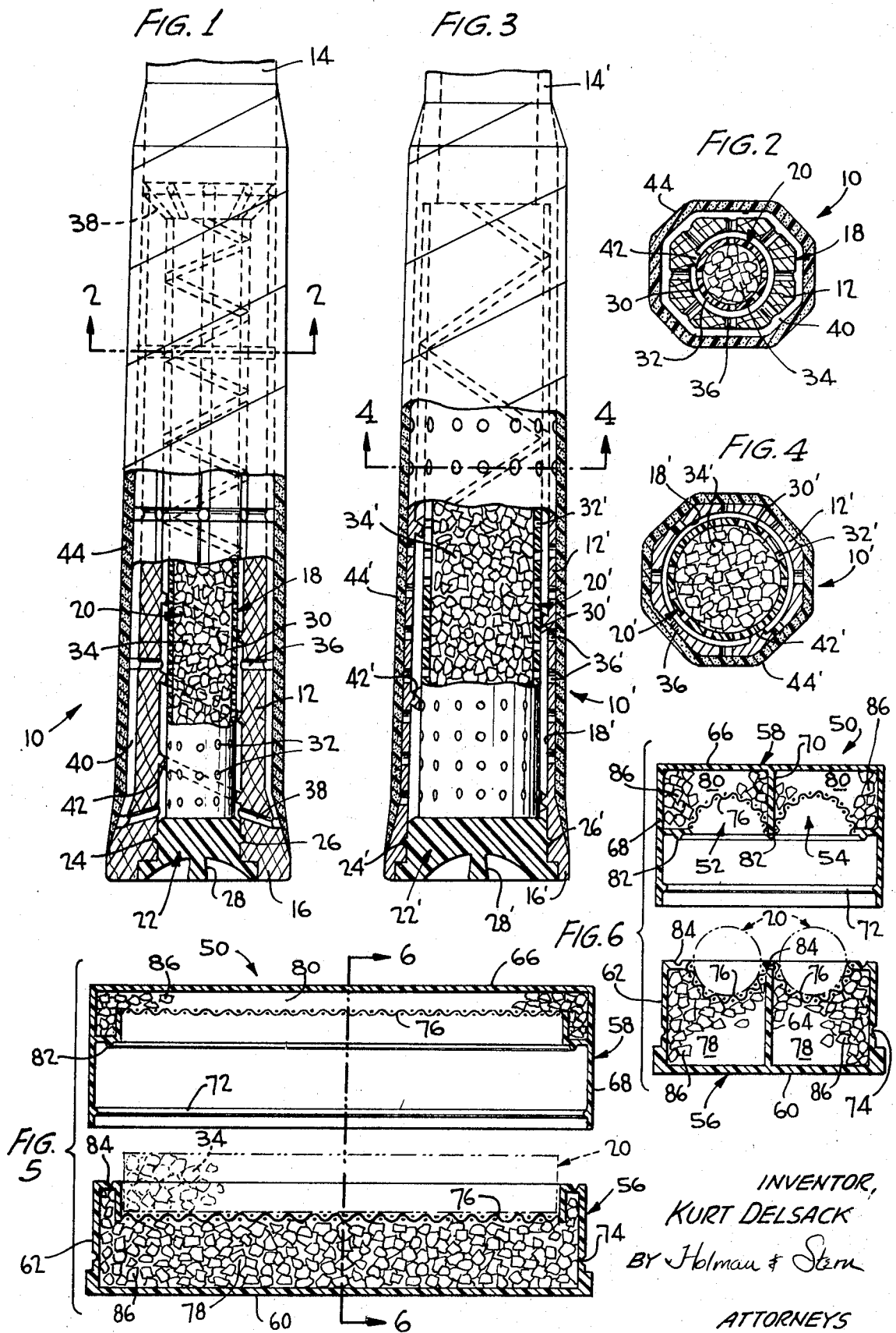
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[57] **ABSTRACT**

Means for drying handle portions of articles such as tennis rackets or the like subject to being wetted by perspiration in use, comprising desiccant-containing cartridge carried in chamber interiorly of handle portion and passageways communicating chamber with exterior surface of handle portion. A moistureproof container is shown for storing and/or drying the cartridges, the container preferably including a desiccant material having greater adsorptivity than the desiccant material of the cartridges.

9 Claims, 6 Drawing Figures





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ARTICLE HAVING HANDLE PORTION WITH INTERNAL DESICCANT-CONTAINING CARTRIDGE

This invention relates to means for drying handle portions of articles such as tennis rackets or the like which are subject to be wetted by perspiration in use and relates more particularly to a construction for such handle portions which provides an internal chamber for reception of a desiccant-containing cartridge with passageways in the handle portion communicating the chamber with the surface of the handle portion whereby the desiccant can maintain the handle portion dry as the article is used. Additionally, this application relates to a container particularly designed for storing and/or drying the desiccant-containing cartridges when not in use.

Many articles include a handle portion which is adapted to be grasped by a hand in use of the article and having an exterior surface which is wetted by perspiration from the hand. An excellent example of such an article is a tennis racket and the major portion of the following specification will be directed to the use of the instant inventive concepts in this environment. However, it should be understood that the instant inventive concepts are not in any way limited to utility in tennis rackets, but that this embodiment is set forth in detail merely as illustrative. Those skilled in the art will readily recognize that these concepts may be easily adapted to the handle portions of other articles which are subject to the same problems. For example, in addition to tennis rackets, the instant inventive concepts are obviously applicable to other sporting good implements such as, for example, golf clubs, baseball bats, other types of rackets, etc. Further, these concepts have utility in handle portions of manual and power tools, including, for example, hammers, screwdrivers, and the like as well as various types of instruments used in medical, engineering and other professions and industries. Another area of application of the basic concepts of this invention resides in the control sticks for operating equipment, or even steering wheels and the like.

With items of the type specified hereinabove, various difficulties are encountered when the handle portion becomes wet from perspiration when in use. A primary problem resides in the loss of a sure grip on the handle portion which minimizes the functional effectiveness of the article. Another problem is one of aesthetics in that a wet handle is uncomfortable to the user.

Referring now to the specific example mentioned previously, that is, a tennis racket, a poor grip will make it difficult to control the racket in use. To this end, the handle portion of a tennis racket is frequently covered with a porous wrapping material such as a napped leather, but the absorptivity of such material is quite limited.

Thus, it will be seen that there is a need for an improved means for maintaining the handle portion of an article dry when the article is being used and it is a primary object of the instant invention to provide such a means. More specifically, a basic object thereof is the provision of a simple and inexpensive construction for a handle portion of an article which maintains the exterior surface of the handle portion dry in a highly efficient manner.

More specifically, an important object of this invention is the provision of an article having a handle portion with an internal cavity adapted for reception of a desiccant-containing cartridge with passageways through the handle portion so that the handle portion can function to continuously dry the surface thereof. Advantageously according to the basic features hereof the handle portion is so designed that the desiccant-containing cartridge can be removed when the article is not in use and regenerated or stored for future use.

Consistent with the foregoing, another important object of this invention is the provision of a special container for storing and/or drying the desiccant-containing cartridges which is moistureproof and which preferably includes a desiccant material having a greater adsorptivity than the desiccant material of the cartridges themselves.

Although, as indicated previously, the instant inventive concepts are to be broadly considered as applicable to any article

having a handle portion which is subject to being wetted by perspiration in use, the preferred embodiment of the instant invention is directed to the provision of a tennis racket incorporating such an arrangement to adsorb perspiration and ambient moisture sufficiently to provide a sure grip and create a dry feeling to the hand. Other and further objects reside in the combination of elements, arrangements of parts and details of construction. Still other objects will in part be obvious and in part be pointed out as the description of the invention proceeds and as seen in the accompanying drawing wherein:

FIG. 1 is a side view, partially in elevation and partially in cross section for illustrative clarity of one embodiment of a handle portion according to the instant inventive concepts;

FIG. 2 is a transverse cross-sectional view taken substantially on lines 2—2 of FIG. 1;

FIG. 3 is a view similar to FIG. 1 of a modified embodiment of handle portion according to this invention;

FIG. 4 is a transverse cross-sectional view taken along lines 4—4 of FIG. 3;

FIG. 5 is an exploded vertical cross-sectional view of a special container for storing and/or drying desiccant-containing cartridges utilized in the handle portion of an article according to this invention; and

FIG. 6 is a transverse cross-sectional view taken substantially on lines 6—6 of FIG. 5.

Like reference characters refer to like parts throughout the set of views of the drawing.

Referring now to the drawing in general, and more particularly to FIGS. 1 and 2 thereof, one embodiment of a handle portion incorporating the instant inventive concepts of an article such as a tennis racket or the like is designated generally by the reference numeral 10. In this embodiment, the handle portion 10 is shown as comprising an elongated element 12 formed of wood and having one end 14 attached to the article such as the racket portion of a tennis racket (not shown) and a spaced free end 16. Defined within the element 12 is an elongated bore forming a chamber 18 extending over a major portion of the length of the element 12 and communicating with the end 16 to form an opening for reception of a desiccant-containing cartridge designated generally by the reference numeral 20.

A closure means 22, preferably formed of a moistureproof material such as plastic is sealingly engaged in the opening defined in the end 16 of the element 12 in a manner such as to facilitate removing and replacing the cartridge 20 as needed. The closure means 22 is preferably pliable in nature and may be held in place in any conventional manner such as by a mere pressure fit or, preferably, by means of a lip 24 engaging in a groove 26 in the element 12. Any conventional means may be incorporated to facilitate removal of the closure means 22, such as for example, the tab 28 shown in the drawing.

Although the instant inventive concepts can make use of a loose desiccant material within the chamber 18, a cartridge such as shown at 20 is preferred. The illustrated cartridge may comprise a cylindrical housing 30 formed of plastic or other similar material, having a multiplicity of apertures 32 and containing the desiccant shown as particles or pellets 34 or may be a rigid frame of cardboard (not shown) or other such material enclosing a gauze bag or the like containing the desiccant and providing passageway means communicating the chamber 18 with the desiccant.

Any desired desiccant material having sufficient adsorptivity may be used, including, for example, calcium chloride, silica gel, activated alumina or the like. However, a preferred form of desiccants are molecular sieves such as manufactured by Linde. These materials are synthetically produced crystalline metal aluminosilicates that have been activated for adsorption by removing their water of hydration. Particularly desirable are Linde Molecular Sieve Type 13X, 1/16-inch pellets which have an extremely high rate of adsorption.

A plurality of generally radially extending passageways 36 are defined through the wall portions of the element 12 to communicate the chamber 18 with the exterior surface of the

element 12. Angularly extending passageways 38 may be provided adjacent the opposite ends of the chamber 18 as shown in the drawing.

In order to improve the drying efficiency of the arrangement, the outer surface of the element 12 may be provided with a network of generally vertically and horizontally extending grooves 40, for example, approximately one-sixteenth inch deep, connecting the passageways 36, 38. Similarly, a network of such grooves may be provided on the inner surface of the element 12, but for manufacturing efficiency a helical rib 42 or a helical groove (not shown) such as the rifling inside the barrel of a firearm will function to facilitate flow of the desiccant gases within the chamber 18. Alternatively, cartridge 20 may be provided with outwardly extending peripheral flanges (not shown) at its opposite extremities to space the same from the internal surface of the element 12 defining the chamber 18.

In an article such as a tennis racket, the outer surface of the element 12 is preferably wrapped with a poromeric material, designated generally by reference numeral 44, in conventional fashion. A highly desirable material for this purpose is napped Corfam available from DuPont.

It will be recognized that the handle portion 10 incorporating the drying means of the instant invention, for all intents and purposes, would appear the same as the handle portion of an ordinary tennis racket. Yet, from a practical standpoint the use of an article modified as shown provides significant advantages in that the exterior surface of the handle portion is maintained dry due to the adsorptivity of the desiccant material 34 therewithin.

Although the instant inventive concepts are not in any way limited to particular dimensions, a convenient arrangement utilizing an ordinary wooden element 12 would be to provide a chamber 18 approximately one-half inch in diameter and 5 inches in length. The spacing of the passageways 36, 38 and the grooves 40 would be such as to preclude unduly weakening the element 12. Larger desiccant cartridges can be readily accommodated if the handle portion is formed of a material stronger than wood. For example, tennis racket handles are presently made of such materials as steel, aluminum, fiber glass, or the like. By reference to FIGS. 3 and 4, a modified embodiment of handle portion for a tennis racket or the like is shown wherein parts similar to parts of the embodiment of FIGS. 1 and 2 are designated by the same reference numeral followed by a prime (''). In this embodiment, the basic difference resides in the use of an element 12' in the form of a perforated tubular frame of steel, aluminum, plastic, or similar material. By utilizing a stronger material of this nature, the element 12' may have thinner wall portions and, accordingly, the diameter of the desiccant-containing cartridge 20' may be substantially increased thereby increasing the adsorptive characteristics of the handle portion 10'.

Reference has been made hereinabove to various desiccant materials that may be utilized according to the instant inventive concepts. The specific nature of the desiccant is not critical so long as it is capable of functioning in the manner specified under the circumstances of application of the particular article in which it is to be used. As indicated previously, Linde molecular sieves are excellent adsorbents for most applications. Such materials are available in powdered and pelleted form and, for most applications, 1/16-inch pellets are suitable. In order to facilitate use of these materials, prepackaging in permeable cartridges such as shown in the drawing, wherein the cartridge material includes perforations smaller than the particle size of the particular desiccant being utilized, is convenient. Such cartridges may be marketed in hermetically sealed containers so as to preclude adsorption of ambient moisture and, if desired, may be disposable. Alternatively, and preferably, the cartridges may be regenerated after use. Regeneration or reactivation of cartridges containing Linde Molecular Sieves Type 13X 1/16-inch pellets may be accomplished by placing such cartridges in an oven at 500° F. and holding this temperature for about 2 hours. The cartridges

should then be cooled down in a closed container so that they will not pick up moisture when cooling. The molecular sieves will retain rough 80 percent of their capacity after 500 such regenerations.

A special container for storing and/or drying the cartridges 20 is designated generally by the reference 50 in FIGS. 5 and 6. The container 50 is shown as adapted to receive two such cartridges and maintain these cartridges in individually sealed compartments 52, 54.

The container 50 is formed of a housing means which includes a base member 56 and a cover member 58 each formed of a moistureproof material resistant to high temperatures and unbreakable under normal use such as metal or plastic. The base member 56 includes an imperforate bottom 60, upstanding peripheral sidewalls 62 and an upstanding internal partition wall 64. Similarly, the cover member 58 includes an imperforate top 66, depending peripheral sidewalls 68 and a depending internal partition 70. The cover member peripheral sidewall 68 is dimensioned to be snugly received over the base member peripheral sidewall 62 with a lip 72 being provided to engage in a groove 74 to seal the container 50 against ambient moisture.

A permeable material such as perforated plastic, gauze or the like 76 extends between the peripheral sidewalls 62, 68 and their associated partitions 64, 70 respectively to define the compartments 52, 54 as well as lower and upper chambers 78, 80 respectively. Cooperating tongue and groove means 82, 84 seal the compartments 52, 54 from each other.

According to a preferred feature of this invention, a desiccant material 86 is provided in each of the chambers 78, 80, this desiccant material having greater adsorptivity than the desiccant material 34 contained within the cartridges 20 to be stored and/or dried within the container 50. Thus, the cartridges 20 may be marketed in a container such as 50 and after use the desiccant material within an individual cartridge may be regenerated by heating as indicated above and placed within the container 50 for cooling and storage and for maintaining the desiccant material within the cartridge free from ambient moisture.

It will now be seen that there is herein provided an improved construction for a handle portion of an article adapted to dry itself in use as well as a special container for storing and/or drying cartridges to be used in the handle portion which satisfy all the objectives set forth above, and others, including many advantages of great commercial importance and practical utility.

What is claimed is:

1. In an article including a handle portion adapted to be grasped by a hand in use of the article and having an exterior surface which is wetted by perspiration from the hand, the improvement which comprises means defining a chamber interiorly of said handle portion, desiccant means contained within said chamber, and passageway means communicating said chamber with said exterior surface of said handle portion to permit said desiccant means to dry said exterior surface during use of the article.

2. The improvement of claim 1 wherein said handle portion comprises an elongated element having one end secured to the article and having a spaced free end, said chamber being defined by an elongated bore extending interiorly of said handle portion, said bore extending to and through said free end of said handle portion to define an opening, and removable closure means sealingly engaged in said opening to permit replacement of said desiccant means.

3. The improvement of claim 2 wherein said desiccant means includes a permeable cartridge means containing a quantity of a desiccant, said cartridge means being replaceable through said opening on removal of said closure means.

4. The improvement of claim 1 wherein said handle portion comprises an elongated element including tubular wall portions having an interior surface defining said chamber, and a multiplicity of passageways extending through said wall portions between said interior surface and the exterior surface of said wall portions.

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5. The improvement of claim 4 further including a poromeric wrapping material covering said exterior surface of said wall portions.

6. The improvement of claim 4 further including channel means defined in said interior and said exterior surfaces of said wall portions and interconnecting said passageways.

7. The improvement of claim 4 wherein said wall portions comprise a tubular perforated frame.

8. The improvement of claim 4 wherein said desiccant

means includes a granular desiccant material, said passageways being larger than the particle size of at least a portion of said desiccant material, further including a permeable cartridge means containing said desiccant material and removably carried by said chamber.

9. The improvement of claim 1 wherein said article is a tennis racket, said handle portion being covered by a poromeric wrapping material.

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