United States Patent [19]

Morgan

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[45] **Dec. 9, 1975**

[54] **HUMIDITY ALTERING DEVICE**

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[52] **U.S. Cl.** **239/55**

[51] **Int. Cl.**[2] **A24F 25/00;** A61L 9/04

[58] **Field of Search** 239/53, 54, 55, 56

[56] **References Cited**

UNITED STATES PATENTS

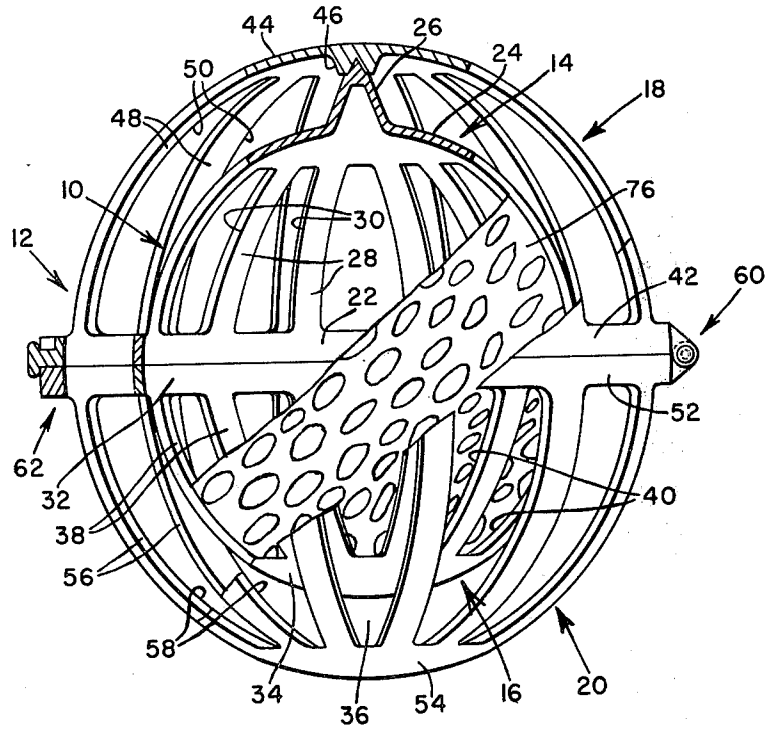
2,025,657	12/1935	Ganz	239/55
2,215,988	9/1940	Vivadou et al.	239/55
2,578,827	12/1951	Munnecke	239/55
2,830,845	4/1958	Cottle	239/56
3,134,544	5/1964	Copley	239/55
3,204,871	9/1965	Callander	239/55

Primary Examiner—Lloyd L. King

[57] **ABSTRACT**

A humidity altering device formed of a pair of spherically shaped, thin walled containers having a plurality of openings in their walls for the passage of air, one container being smaller than and concentrically supported within the other container, and a moisture absorbent element contained within the inner container and externally shaped to conform substantially with the interior thereof, the outer surface of the element being exposed to the air at the openings in the wall of the inner container and substantially flush with the outer surface of the wall.

3 Claims, 4 Drawing Figures



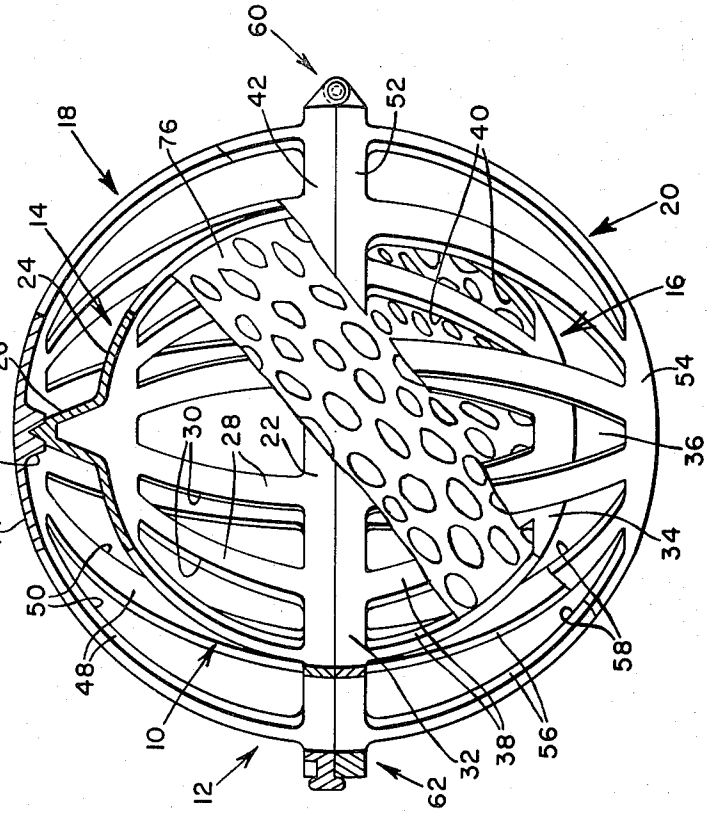


FIG. 2

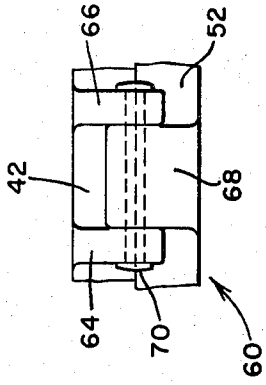


FIG. 3

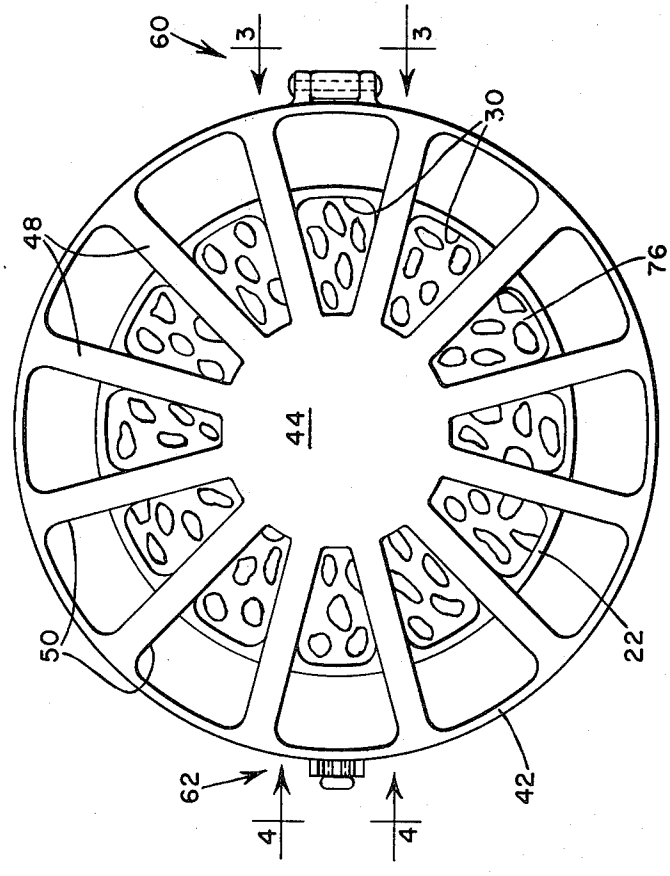


FIG. 1

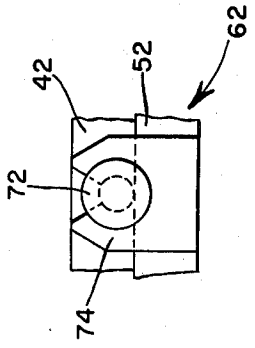


FIG. 4

HUMIDITY ALTERING DEVICE

BACKGROUND OF THE INVENTION

The present invention relates to devices for altering the degree of moisture in the air.

It is known in the art to provide, for articles such as cigars, fruits and vegetables and the like which require the maintenance of a given humidity level, a container having a humidifying device or apparatus incorporated therein as an integral part thereof. Examples of such containers are disclosed in the following U.S. Pat. Nos.: 1,434,029 issued Oct. 31, 1922 to Shover; 1,589,215 issued June 15, 1926 to Ordway; 1,938,385 issued Dec. 5, 1933 to Hauch; 2,300,041 issued Oct. 27, 1942 to Bradley; 2,958,469 issued Nov. 1, 1960 to Shuster; and 3,227,374 issued Jan. 4, 1966 to Valentine. In each of these containers the humidifying device is included as an integral element of the container, and has no utility except in combination with the container.

Also known in the art are dispensing devices which comprise a pair of containers, one within the other. Examples of such devices are shown in U.S. Pat. Nos. 2,092,728 issued Sept. 7, 1937 to Dearling; and 3,706,140 issued Dec. 19, 1972 to Brilland et al. Neither of the foregoing devices, however, are operative as humidity altering devices.

SUMMARY OF THE INVENTION

It is, accordingly, a primary object of the present invention to provide a humidity altering device that is useful with a variety of available containers. It is a further object to provide such a device that is simple in operation and construction and economical to manufacture.

In pursuance of these and other objects, the humidity altering device of the present invention comprises, generally, a pair of similarly shaped, thin walled containers having a plurality of openings in their walls for the passage of air, one container being smaller than and centrally supported within the other container, and a humidity altering element contained within the inner container and externally shaped to conform substantially with the interior thereof, the outer surface of the element being exposed to the air at the openings in the wall of the inner container and substantially flush with the outer surface of the wall. The humidity altering element may, for example, comprise a sponge or other moisture absorbent material, which can periodically be re-moistened to renew its humidifying effectiveness. To this end, the containers are preferably constructed of disconnectable portions to permit removal and replacement of the humidity altering element.

In use, the sponge is removed from the inner container, saturated with water, and replaced. The entire device is then placed in a substantially air tight container along with the object, such as fresh fruit, for example, for which it is desired to maintain a given humidity level. Since the sponge is suspended within the outer container of the device, the water in the sponge does not directly contact the fruit, but since the walls of the inner and outer containers are perforated, the moisture in the sponge will evaporate and maintain a high degree of humidity within the air tight container. When the moisture in the sponge has completely evaporated, the sponge can be removed from the device, re-saturated with water, and replaced.

In addition to functioning as a humidity-increasing device, the apparatus of the invention can function as a humidity-decreasing device, if the sponge or other moisture absorbent element is replaced with a desicant such as calcium chloride crystals. When the crystals become saturated with water, they can be removed, dried, and replaced.

BRIEF DESCRIPTION OF THE DRAWINGS

The preferred embodiment of the present invention will be described in conjunction with the accompanying drawings in which:

FIG. **1** is a top view of the humidity altering device of the invention;

FIG. **2** is a side elevational view of the device with portions broken away for the sake of clarity;

FIG. **3** is an enlarged sectional view taken along the line **3—3** of FIG. **1**; and

FIG. **4** is an enlarged sectional view taken along the line **4—4** of FIG. **1.**

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, the humidity altering device of the invention comprises a pair of inner and outer spherically shaped containers designated by the numerals **10** and **12,** respectively. The containers are concentrically disposed and the walls are radially spaced to define the inner and outer surfaces of a hollow, spherical air chamber. The inner container **10** is formed of upper and lower hemispherical sections **14** and **16,** and the outer container **12** is formed of upper and lower hemispherical sections **18** and **20.** The upper section **14** of the inner container **10,** like the other sections, may be moulded of plastic, and includes a circular band **22,** an end cap **24** with a conical projection **26** formed therein, and a plurality of bands **28** which connect the circular band **22** with the end cap **24** to form a plurality of triangular openings **30** through which the interior of the inner container **10** communicates with the air chamber. The lower section **16** is identical to the upper section **14,** and includes a circular band **32,** an end cap **34** with a conical projection **36** formed therein, and a plurality of bands **38** which connect the circular band **32** with the end cap **34** to form a plurality of triangular openings **40** through which the interior of the inner container **10** communicates with the air chamber.

The upper section **18** of the outer container **12** includes a circular band **42,** an end cap **44** with a projection **46** formed therein to receive the end of the projection **26** on the section **14,** and a plurality of bands **48** which connect the circular band **42** with the end cap **44** to form a plurality of triangular openings **50** through which the exterior of the outer container **12** communicates with the air chamber. The lower section **20** of the container **12** includes a circular band **52,** an end cap **54** with a projection formed therein to receive the end of the projection **36** on the section **16,** and a plurality of bands **56** which connect the circular band **52** with the end cap **54** to form a plurality of triangular openings **58** through which the exterior of the outer container **12** communicates with the air chamber.

The end of the conical projection **26** on the inner section **14** is glued or otherwise bonded to the projection **46** on the outer section **18,** to form an upper connecting member connecting the end caps **24** and **44** of the upper hemispherical sections **14** and **18** and the end of the conical projection **36** on the inner section **16** is

bonded to the projection on the end cap 54 of the outer section 20 to form a lower connecting member connecting the end caps 34 and 54 of the section 16 and 20. The upper sections 14 and 18 are connected to the lower sections 16 and 20 by means of a hinge 60 and clasp 62 on opposite sides of the bands 42 and 52. As shown in detail in FIG. 3, the hinge 60 comprises a pair of spaced ears 64 and 66 on the band 42, a single ear 68 on the band 52 and disposed between the ears 64 and 66, and a pin 70 which extends through aligned apertures in the three ears 64, 66 and 68. The clasp 62, as shown in detail in FIG. 4, comprises a headed projection 72 formed on the band 42, and a notched element 74 on the band 52 adapted to releasably engage the headed projection 72.

Disposed within the inner container 10 is a spherically shaped sponge 76, the outer surface of which is exposed to the air of the openings 30 and 40, and is substantially flush with the outer surface of the bands 28 and 38. In place of the sponge 76, it should be appreciated that a bag of calcium chloride crystals could be substituted, in which case the device would function to reduce rather than increase the humidity level of the surrounding air. It will be apparent that when the clasp 62 is released and the upper and lower sections of the inner and outer containers swing apart on the hinge 60, the sponge 76 will be released and may be removed from the inner container 10.

In use, the sponge 76 is removed from the inner container 10, saturated with water, and replaced. The device is then placed inside an air tight container, such as a plastic bag or the like, with the articles for which it is desired to maintain a high humidity level. Since the sponge is suspended within the outer container 12, the water in the sponge will not directly contact the articles; however, the surface of the sponge is exposed to the air at the openings 30 and 40, and the water can thus evaporate to maintain the humidity of the air at a relatively high level. When the water in the sponge has completely evaporated, the sponge can be removed from the device, re-saturated with water, and replaced.

I claim:

1. A humidifying device comprising: a pair of similarly shaped, first and second, thin walled containers, the second container being smaller than and disposed centrally within the first container, the walls of said containers being disposed in spaced relation to define the inner and outer surfaces of a hollow air chamber, the walls of said containers having a plurality of apertures formed therein through which the interior of the second container and the exterior of the first container communicate with the air chamber; upper and lower connecting members extending through the air chambers and connecting the upper portions and lower portions, respectively, of the containers for maintaining said containers in spaced relation; and a moisture abssorbent element contained within the second container and externally shaped to conform substantially with the interior thereof, the outer surface of the element being exposed to the air in the air chamber at the apertures formed in the wall of the second container.

2. A humidifying device comprising: a pair of spherical, first and second, thin walled containers, the second container being smaller than and disposed concentrically within the first container, with the walls of said containers disposed in radially spaced relation and defining the inner and outer surfaces of a hollow, spherical air chamber, the walls of said containers having a plurality of apertures formed therein through which the interior of the second container and the exterior of the first container communicate with the air chamber, each of said containers being formed of upper and lower hemispherical sections separable in a common plane; an upper connecting member extending radially through the air chamber and connecting the upper hemispherical sections of the first and second containers for maintaining said upper sections in concentric relation; a lower connecting member extending radially through the air chamber and connecting the lower hemispherical sections of the first and second containers for maintaining said lower sections in concentric relation; a spherically shaped moisture absorbent element contained within the second container, the outer surface of the element conforming substantially to the inner surface of the second container and being exposed to the air in the air chamber at the apertures formed in the wall of the second container; and means connecting the upper and lower hemispherical sections of the first container for releasably maintaining said sections in spherical relation and thereby releasably maintaining the spherical moisture absorbent element within the second container.

3. A humidifying device comprising: a pair of spherical, first and second, thin walled containers, the second container being smaller than and disposed concentrically within the first container, with the walls of said containers disposed in radially spaced relation and defining the inner and outer surfaces of a hollow, spherical air chamber, each of said containers being formed of upper and lower hemispherical sections separable in a common plane, the wall of each section including a circular band having one edge lying on said plane, a centrally disposed circular end cap, and a plurality of circumferentially spaced bands connecting the end cap to the circular band and forming a plurality of generally triangular openings in the wall through which the interior of the second container and the exterior of the first container communicate with the air chamber; an upper connecting member extending radially through the air chamber and connecting the end caps of the upper hemispherical sections of the first and second containers for maintaining said upper sections in concentric relation; a lower connecting member extending radially through the air chamber and connecting the end caps of the lower hemispherical sections of the first and second containers for maintaining said lower sections in concentric relation; a spherical moisture absorbent element contained within the second container, the outer surface of the element conforming substantially to the inner surface of the second container and being exposed to the air in the air chamber at the generally triangular openings formed in the wall of the second container; and releasable connecting means on the circular bands of the upper and lower hemispherical sections of the first container for releasably maintaining said sections in spherical relation and thereby releasably maintaining the spherical moisture absorbent element within the second container.

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