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(54) **FOOD STORAGE SYSTEM**

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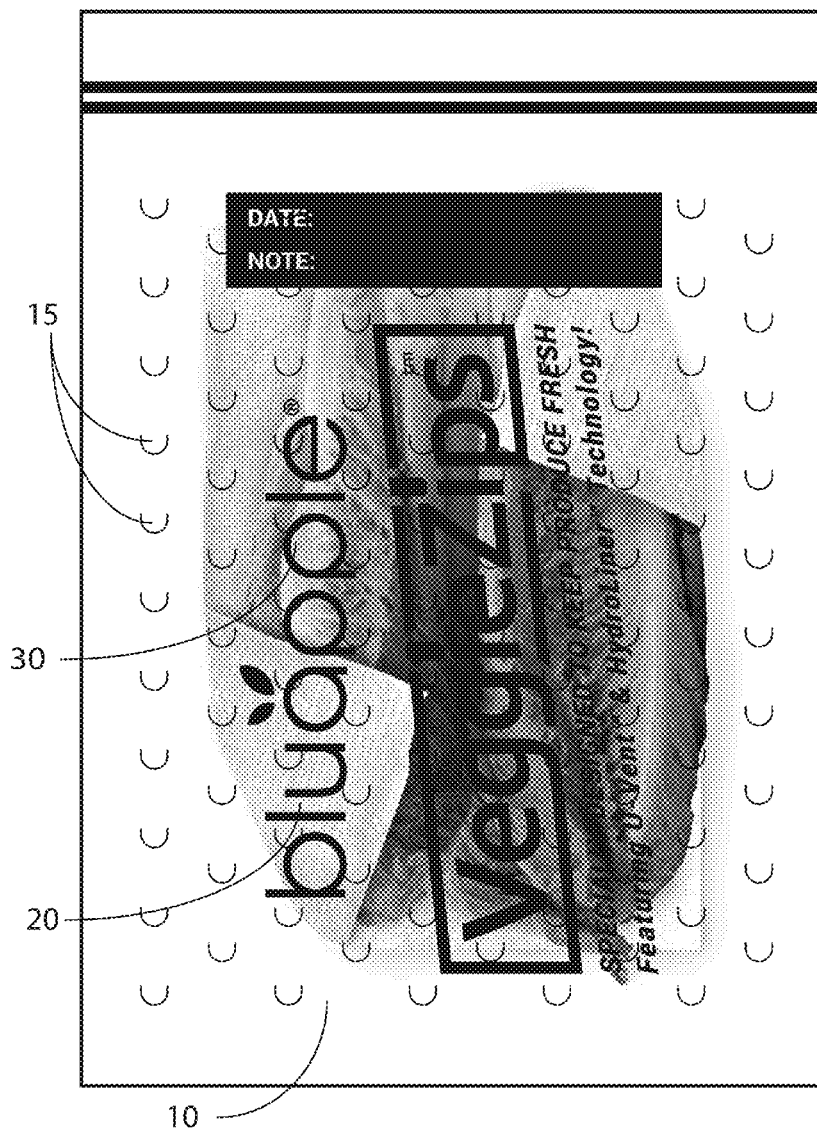
(57) **ABSTRACT**

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A vented polymer bag may keep an ideal environment for produce preservation. Closable vents respond to air pressure inside the bag and in particular vent the accumulation of ethylene emitted by the produce. A fibrous liner may also be added to maintain a desired level of humidity. Placing a wet liner increases humidity while a dry liner removes moisture from the environment inside the bag.

**Related U.S. Application Data**

(60) Provisional application No. 62/396,666, filed on Sep. 19, 2016.



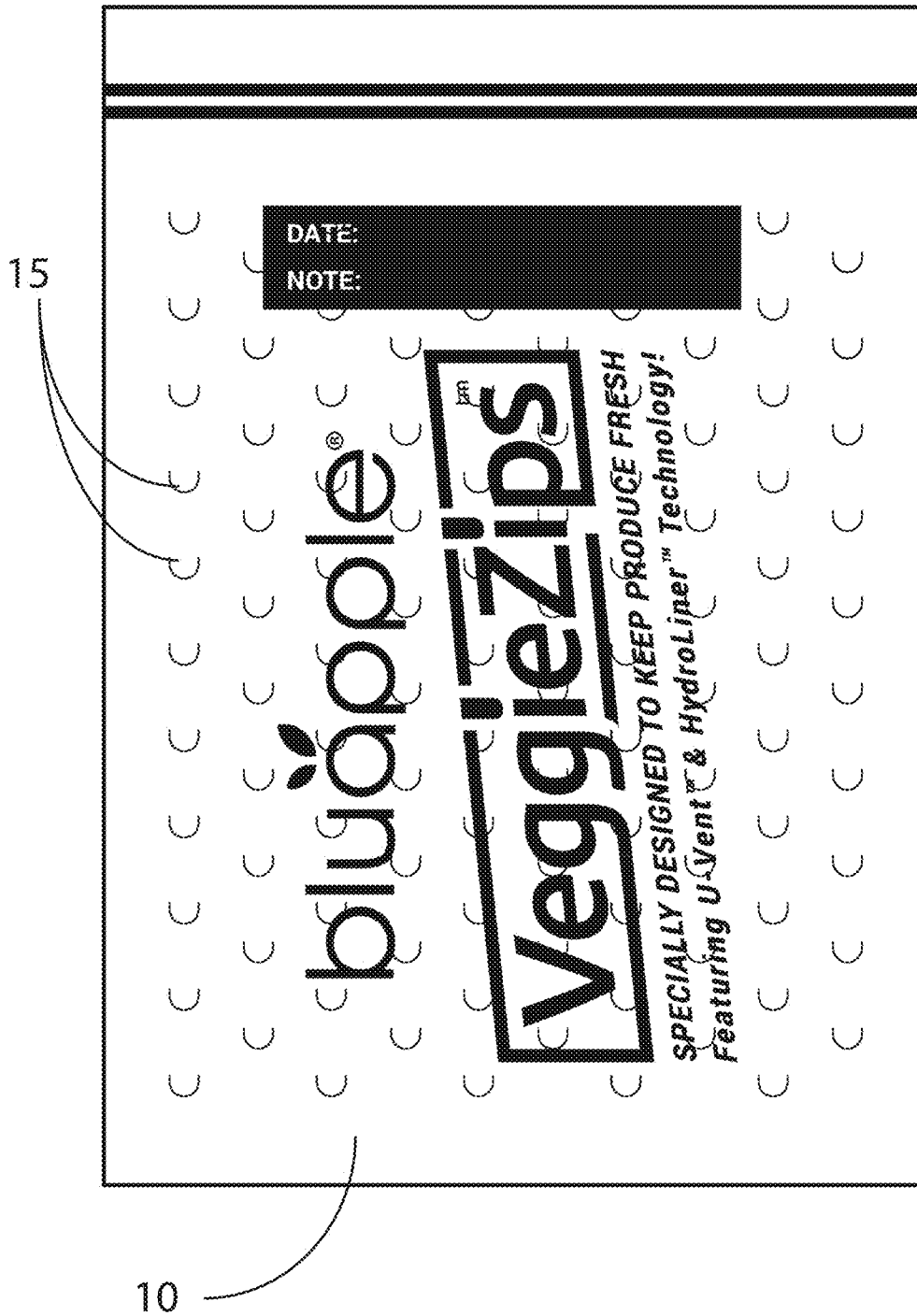


FIG. 1

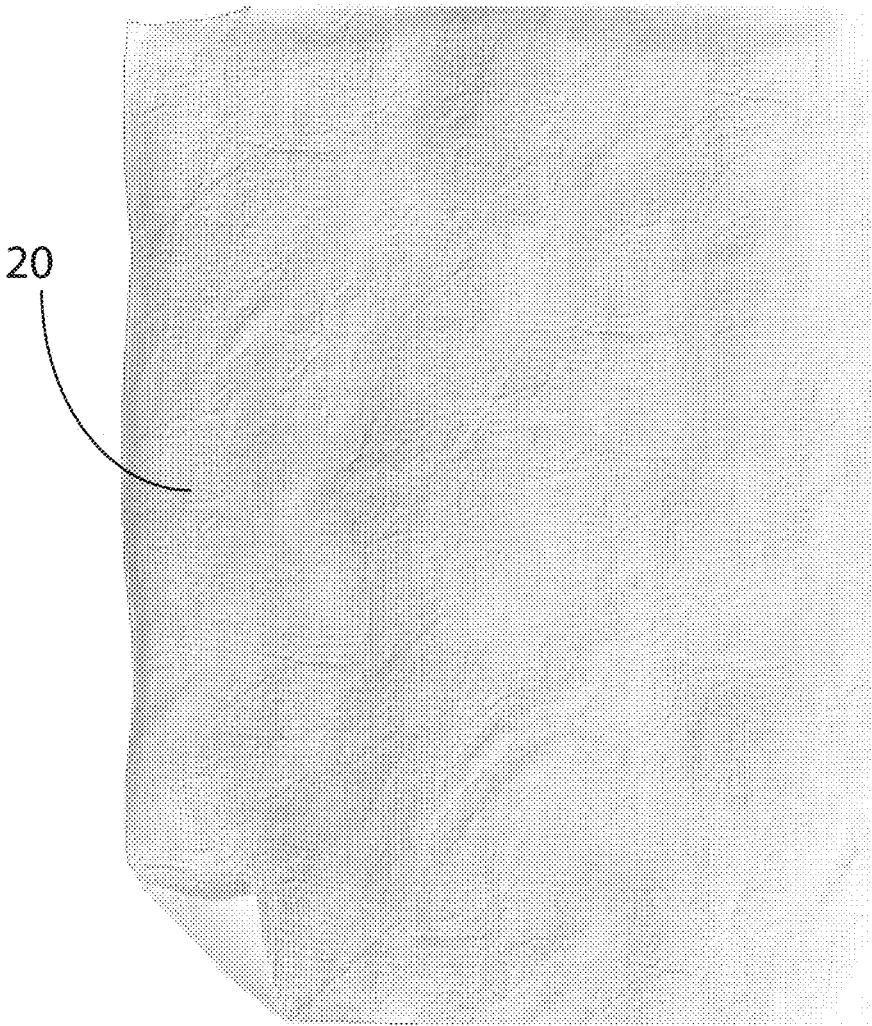
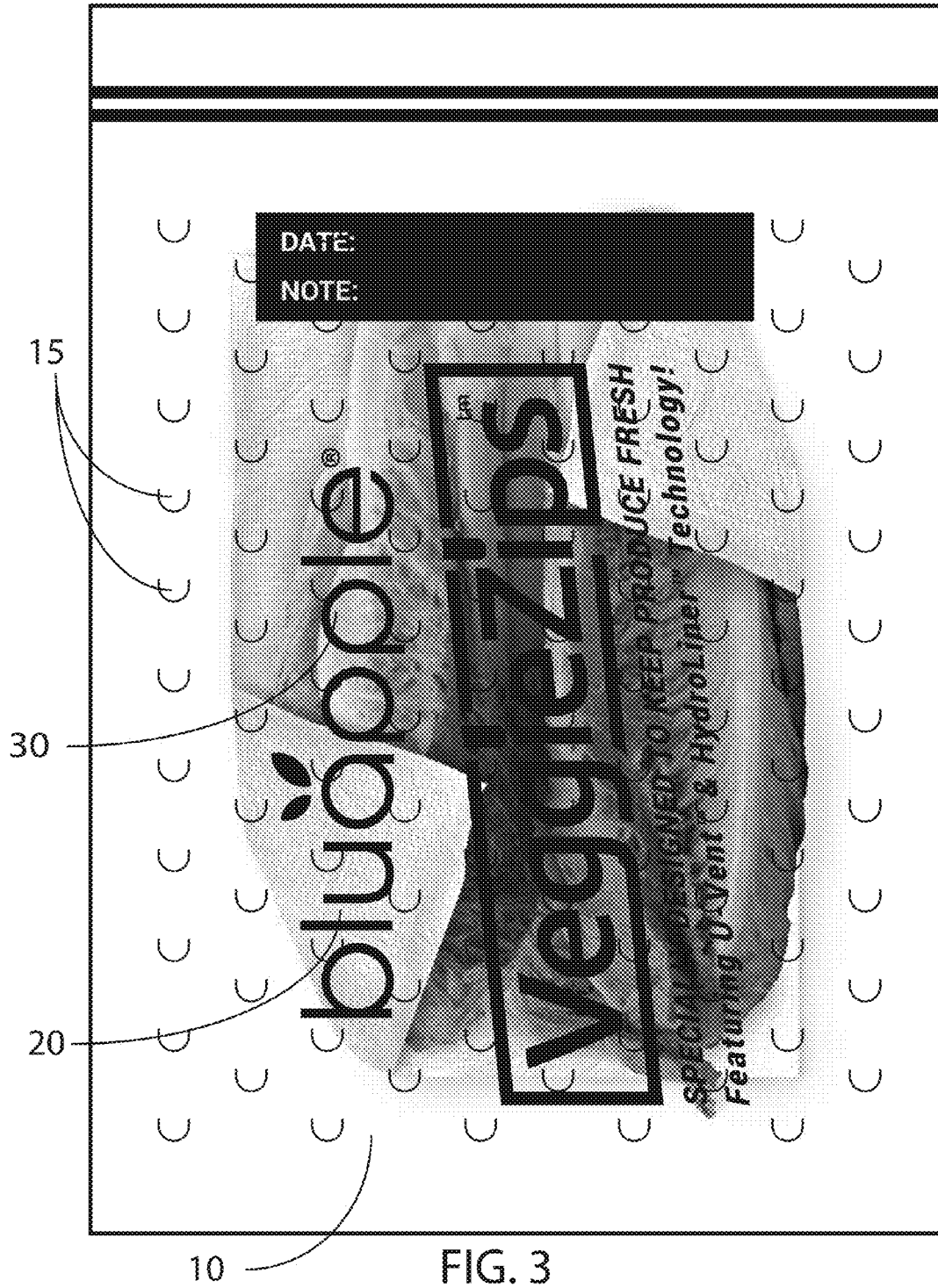


FIG. 2



## FOOD STORAGE SYSTEM

### CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] The present Application claims priority as a non-provisional perfection of prior filed U.S. Application No. 62/396,666, filed Sep. 19, 2016, and incorporates the same by reference in its entirety.

### FIELD OF THE INVENTION

[0002] The present invention relates to the field of food storage and more particularly relates to a flaccid container that allows for the escape of ethylene from inside the bag while also promoting desired humidity levels.

### BACKGROUND OF THE INVENTION

[0003] Food storage and preservation is an ancient practice that has become a modern science. However, basic principles still apply. Proper preservation required the arresting of ripening and/or decaying processes that spoil food. In produce, the ripening process not only makes produce suitable for eating, but also, if unchecked, can lead to the over-ripening and spoilage of the very same produce.

[0004] Three principles used by industry are key to maximizing the storage life of produce throughout the supply chain from farm to store is: temperature control, ethylene gas control, and humidity management. Non-existent or inadequate attention to any of these principles will sabotage and destroy the ability to manage the speed of the ripening process and make it impossible to maintain produce freshness. Because ripening is a cumulative process that can only be slowed, but never halted, ideal freshness depends on keeping the ripening process as slow as possible for as long as possible.

[0005] As produce ripens, it produces ethylene, which in turn promotes further ripening of the produce and other produce in close proximity to it, which then produces more ethylene and the cycle continues until the produce is over ripe and more susceptible to decay and other agents like mold. Controlling ethylene is one way to moderate the ripening process and keep produce fresher longer.

[0006] One method of controlling ethylene is to neutralize it. Special compounds are known which bind to ethylene so that it will not contribute to over-ripening. Another method is to expel ethylene from an environment, or at least allow its escape so that it does not concentrate. However, care must be taken so that produce does not dehydrate or otherwise be exposed to storage environment. The present invention takes the latter approach by allowing ethylene to escape from around produce while still maintaining adequate humidity to maintain freshness.

[0007] Likewise, it is also true that while ideal freshness requires that a great deal of harvested produce be refrigerated. However, it is also true that refrigeration also contributes severely to moisture loss in produce, and therefore the industry must counter the drying effects of refrigerated air to not violate the principle of adequate moisture and humidity for many varieties of stored produce.

[0008] While industry has employed specialized tools and equipment to provide ideal conditions, consumers meanwhile have few tools designed to translate ideal conditions from warehouses to homes.

[0009] The present invention represents a departure from the prior art in that the system of the present invention provides a novel and unique product that extends the management of both ethylene gas and humidity beyond the store and into the hands of consumers. The unique vented container not only allows ethylene gas to escape from around the produce but the woven paper hydroliner also maintains ideal humidity level, either providing moisture to the plant tissues, much like the frequent misting common in stores; or, acting as a wick, absorbing and removing excess moisture when needed for specific varieties of produce. By providing a method to manage these elements, consumers are able continue to retard ripening as long as possible, maximizing freshness and shelf life.

[0010] The present invention represents a departure from the prior art in that the system of the present invention provides a vented container with humidity control in an effort to not only allow ethylene to escape from around the produce but also maintain an ideal humidity level.

### SUMMARY OF THE INVENTION

[0011] In view of the foregoing disadvantages inherent in the known types of storage systems, this invention provides a system with a vented polymer storage bag with a woven fibrous moisture control liner. The vents allow respiration from the inside of the bag to the outside, while closing when air pressures are equalized. In this manner, moisture from the moisture control liner is not needlessly vented into the surrounding environment.

[0012] The more important features of the invention have thus been outlined in order that the more detailed description that follows may be better understood and in order that the present contribution to the art may better be appreciated. Additional features of the invention will be described hereinafter and will form the subject matter of the claims that follow.

[0013] Many objects of this invention will appear from the following description and appended claims, reference being made to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

[0014] Before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting.

[0015] As such, those skilled in the art will appreciate that the conception, upon which this disclosure is based, may readily be utilized as a basis for the designing of other structures, methods and systems for carrying out the several purposes of the present invention. It is important, therefore, that the claims be regarded as including such equivalent constructions insofar as they do not depart from the spirit and scope of the present invention.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0016] FIG. 1 is a front elevation of one embodiment of a vented bag for use in the system.

**[0017]** FIG. 2 is a front elevation of a fibrous liner for use in the system.

**[0018]** FIG. 3 is a front elevation of the vented bag of FIG. 1 and fibrous liner of FIG. 2, in use.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

**[0019]** With reference now to the drawings, the preferred embodiment of the food storage system is herein described. It should be noted that the articles “a”, “an”, and “the”, as used in this specification, include plural referents unless the content clearly dictates otherwise.

**[0020]** With reference to FIG. 1, a polymer bag **10**, or other flexible outer container, is provided with a plurality of vents **15** along its surface. This bag **10** then forms the first containment defense of the produce against the exterior environment. Vents **15** may be formed by creating slits in the bag walls. Any shape may be used, but the preference is for a slit which will leave a flap anchored to the bag **10** as this flap may then rest in either an open or closed configuration. A semi-circle or “U” shape tends to be ideal as the rounded part of the flap will have less of a chance to catch on objects and is easily produced. The flap will then open as pressures increase inside the bag with ethylene production and/or vapor pressure. As ethylene is expelled, the pressure releases, normalizing with the ambient atmosphere, and the vents close and seal the contents from the ambient environment. The polymer bag **10** may have its main opening sealed by any means, including but not limited to ties and zipper closures, as is shown.

**[0021]** A woven fibrous liner **20** may also be placed in the bag (FIG. 2). The liner **20** may be placed in the bag with any level of humidity, whether dry or moist, in order to maintain a desired level of humidity inside the bag **10**. Certain

vegetables, such as leafy greens and herbs, tend to require a greater humidity in their environment while others, like cucumbers and zucchinis, tend to do better in a dryer environment, and possibly one that actually absorbs moisture. As such, the user may simply put a measured amount of water (or no water at all) on the liner **20** and place the liner **20** in the bag **10** with the produce **30**. As the vents **15** are opened or closed, moisture levels in the bag **10** remain stable due to the presence of the fibrous liner **20**, and an ideal environment for the produce **30** contained therein (FIG. 3).

**[0022]** Although the present invention has been described with reference to preferred embodiments, numerous modifications and variations can be made and still the result will come within the scope of the invention. No limitation with respect to the specific embodiments disclosed herein is intended or should be inferred.

What is claimed is:

1. A food storage system comprising:
  - a. a flexible outer container featuring a plurality of closable vents on a surface; and
  - b. a fibrous moisture control liner, insertable within the outer container.
2. The food storage system of claim 1, the outer container being a polymer bag.
3. The food storage system of claim 1, the plurality of closable vents each further comprising a flap anchored on the outer container.
4. A food storage system comprising a flexible outer container featuring a plurality of closable vents on a surface.
5. The food storage system of claim 4, the outer container being a polymer bag.
6. The food storage system of claim 4, the plurality of closable vents each further comprising a flap anchored on the outer container.

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