ABSTRACT

This application relates to improved whiskey barrel construction having the attribute of accelerating the maturing of the whiskey to be aged. This is accomplished by providing at least a portion of the internal surfaces and particularly that of the staves with cuts or grooves or other suitable contours to increase the internal surface area to which the whiskey is exposed. Therefore, for a given size of barrel or volume of whiskey, it is possible to significantly increase the area of char and of the underlying layer or red caramel in order to enhance the breathing of whiskey through the walls of the barrels and consequently the maturing of the whiskey.

14 Claims, 5 Drawing Figures
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WHISKEY BARREL

This invention generally relates to an improved whiskey barrel and more particularly to a whiskey barrel construction for increasing the maturation rate of whiskey so that aging of whiskey contained therein is materially accelerated.

The aging of whiskey in wooden barrels is an age old art steeped in tradition and custom which has experienced relatively few and minor changes with time. Through the years and particularly on a domestic front, government regulations play an important part on the practice and technique of whiskey aging. The current practice followed by domestic distillers in aging whiskey is to put the new or unaged whiskey in internally charred barrels made of new virgin white oak. Thereafter, the filled barrels are placed in warehouses for a period of from two to eight years or more. During this period, the stored whiskey “breathes” by being subjected to repeated cycles of heating and cooling. The nature, degree and extent of heating and cooling cycles may vary from warehouse to warehouse, depending on the physical conditions of storage and on whether the warehouse is operated under temperature-control conditions or under conditions of natural temperature changes brought on by seasonal or other weather variations.

The aging process is continued until the contained whiskey has become fully and properly aged which is generally determined by sampling. Experience and experimentation has shown that aging or maturing of whiskey is a function of the internal surface area of the charred wood to which the whiskey is exposed along with the element of time. Under ordinary circumstances, warehousing operations require the use of a large number of barrels and, consequently, storage space for inventory is always a principal concern. Obviously, this inventory is forever changing and in a state of flux with matured whiskey being removed and new whiskey being warehoused. This situation is further complicated by regulations which require domestic distillers to use barrels only once. Therefore, the replacement requirements for new inventory becomes an ever-increasingly important economic factor.

Thus, there is created a need to provide a way of improving upon the use of construction of new white oak whiskey barrels whereby new whiskey stored therein can be more rapidly brought to a fully or truly aged or matured condition. This would have the advantage of substantial monetary savings through reduced warehousing costs through reduction in maturing time and consequently storage time per barrel, reduction in the number of barrels needed for warehousing and a possible reduction in ullage or evaporation losses.

It should be understood that emphasis is placed herein on new oak whiskey barrels because only such barrels can be legally used for aging of many types of whiskies, and then only on a one-time basis, although the principles of this invention are equally applicable to re-used barrels where permissible.

Many efforts and proposals have been made in the past to increase the area of charred wood to which the whiskey is exposed. However, such attempts were not successful for many reasons the principal one of which being the inability to promote or accelerate the full or true aging of whiskey because the “breathing” function of the barrel remained unchanged. As will be appreciated by those skilled in the art, the “breathing” function is essential to the aging of whiskey in barrels.

In this connection, outward breathing takes place during the heating phases of the aging cycles in which the whiskey soaks through the charred inner surfaces of the barrel, then permeates through the underlying red caramel layer, which aids in the reaction of the congeners, and then into the uncharred body portions of the barrel. Congeners are chemical compounds, such as aldehydes, higher alcohols and esters, among others, that are retained in the whiskey and have a significant effect on its ultimate characteristics. Some evaporation takes place during each heating phase as is evidenced by ullage during aging. Inasmuch as the water molecule is smaller than the alcohol molecule, the heating phase facilitates the evaporation loss together with increase proof of the contained whiskey. Inward breathing takes placed during the cooling phase of the aging cycle in which the whiskey is drawn back from the uncharred body portions of the barrel through the red caramel layer to further aid in the reaction of the congeners and then through the charred inner surface of the barrel into the whiskey.

Whiskey barrels constructed in accordance with this invention enable the accelerated production or maturation of fully aged or truly aged whiskies by enhancing the breathing of the whiskey through the barrel walls during aging.

Therefore, an object of this invention is to provide a whiskey barrel of the character in which the inner surface thereof is provided with contours defining a multiplicity of spaced lands and grooves prior to being charred to provide greatly increased areas of char to which the whiskey is exposed during breathing.

Another object of this invention is to provide a whiskey barrel of the character stated in which the uncharred outer surface thereof may be provided with contours defining a multiplicity of spaced lands and grooves to further enhance the breathing of whiskey through the walls thereof.

A further object of this invention is to provide a whiskey barrel of the character stated that is constructed from new or virgin oak, preferably of the white variety.

With these and other objects in mind, the nature of which will be apparent, the invention will be more fully understood by reference to the drawings, the accompanying detailed description and the appended claims.

IN THE DRAWINGS:

FIG. 1 is an elevation of a completely formed whiskey barrel construction in accordance with this invention;

FIG. 2 is a horizontal section taken along the line 2—2 of FIG. 1;

FIG. 3 is an enlarged horizontal section of one of the staves of FIG. 2;

FIG. 4 is an enlarged fragmentary sectional view taken along the line 4—4 of FIG. 1 showing the association of this stave with an end closure head; and

FIG. 5 is a view similar to FIG. 3 showing modification of stave in which the internal surface contouring is accompanied by external stave contouring.

Referring to the drawings in detail, the invention as illustrated is embodied in a whiskey barrel 10 formed from a plurality of new oak staves 12 which are secured around end heads 14 by the usual end hoops 16 and central or belly hoops 18 fitting tightly therearound.
The cooperage, naturally, is of the highest quality in order to avoid "leakers" since the whiskey will be stored therein from two to eight years or more.

In one form of this invention (see FIGS. 2, 3 and 4) the inner surfaces of the staves 12 are contoured to define a series of spaced longitudinal corrugations 20 which may be of any suitable height and width, although they should not extend so deeply into the body of the stave that its strength is materially decreased. The proportions and dimensions of the corrugations 20 should be so selected as to define an exposed surface having an area from about 10 percent to at least 50 percent and greater than the uncountoured inner surface of the stave would have.

In the disclosed form of the invention, the corrugations 20 are in the form of lands 20a and grooves 20b, the latter of which may be suitably formed by means of a saw and produced in such a fashion that the saw-cut would extend essentially from the inner end of the hollow 22 interiorly of the croze 24 which is located at each of the stave ends.

In general, during the formation of a wooden barrel, a group of contoured staves 12 are assembled through the deployment of end and belly truss hoops and machinery well known in the art. An open ended barrel body is thus formed, and thereafter, the open ended barrel body is internally charred. This may be accomplished by means of techniques well known in the art whereby a high temperature gas flame is passed from the bottom upwardly to the top of the body. The result of this operation is the creation of an exposed layer 26 of charred wood, beneath which is a layer 28 of the red caramel believed by many to be the condensation of volatiles between the char 26 and the solid wood 30. The ends of the barrel body are then trimmed and the croze 24 and hollow 22 are cut around the inner periphery at each end of the trimmed barrel body.

The inner faces of the heads 14 may also be charred and, following the removal of the temporary truss hoops, are applied to the barrel body ends with the circumferentially extending periphery of reduced thickness disposed in the croze 24 in a manner depicted by FIG. 2. Following the application of the closure heads 14, the permanent end hoops 16 are applied. The two remaining temporary belly truss hoops are removed and substituted with two permanent belly hoops 18. A bung hole 32 is formed in one of the staves to facilitate loading of the barrel with the selected whiskey at the distillery following which a bung 34 is used to seal this opening.

The breathing effect of the whiskey barrel can be further increased by contouring the outer surface of the staves as shown in FIG. 5. Thus, the stave 36, otherwise similar to stave 12, is provided with internal contours 38 consisting of a series of saw-cut grooves together with external contours 40 which also may be in the form of cut grooves. The increased area of char may be similar to the previous embodiment.

It will thus be appreciated by those skilled in the art that this invention can be most effectively attained through the use and employment of other contour shapes and arrangements, both internally and externally, of the barrel for purposes of increasing the breathability of the ultimately formed whiskey barrel and the area of barrel surface to which the whiskey is exposed during aging and maturation.

Although several somewhat preferred embodiments of the invention have been disclosed and described in detail herein, it should be understood that this invention is in no sense limited thereby and its scope is to be determined by that of the appended claims.

1 claim:

1. In an internally charred wooden barrel including a plurality of staves and heads combined to form a substantially leakproof container for containing now alcoholic liquor and aging same to a fully aged or truly aged condition through prolonged exposure to repeated heating and cooling cycles, a series of spaced contours formed over at least a portion of the inner surface of said barrel and containing alternating raised and depressed areas whereby to increase the area of the red caramel layer beneath said char and to increase the breathing effectiveness of said barrel for liquid aging purposes.

2. The barrel of claim 1 in which said contours are spaced parallel corrugations.

3. The barrel of claim 1 in which said contours are alternate lands and grooves.

4. The barrel of claim 1 in which said staves are formed from new or virgin oak.

5. The barrel of claim 4 in which said contours are spaced parallel corrugations.

6. The barrel of claim 4 in which said contours are alternate lands and grooves.

7. The barrel of claim 1 in which said contours are proportioned and dimensioned to effect an increase of the surface area of the red caramel layer of between about 50 percent and 200 percent compared to the same area when uncountoured.

8. The barrel of claim 7 in which at least a portion of the outer surface of the stave-formed body is provided with a series of contours containing alternating raised and depressed areas.

9. The barrel of claim 8 in which said contours are spaced parallel corrugations.

10. The barrel of claim 8 in which said contours are alternate lands and grooves.

11. The barrel of claim 8 in which said staves are formed from new or virgin oak.

12. The barrel of claim 7 in which said contours are spaced parallel corrugations.

13. The barrel of claim 7 in which said contours are alternate lands and grooves.

14. The barrel of claim 7 in which said staves are formed from new or virgin oak.