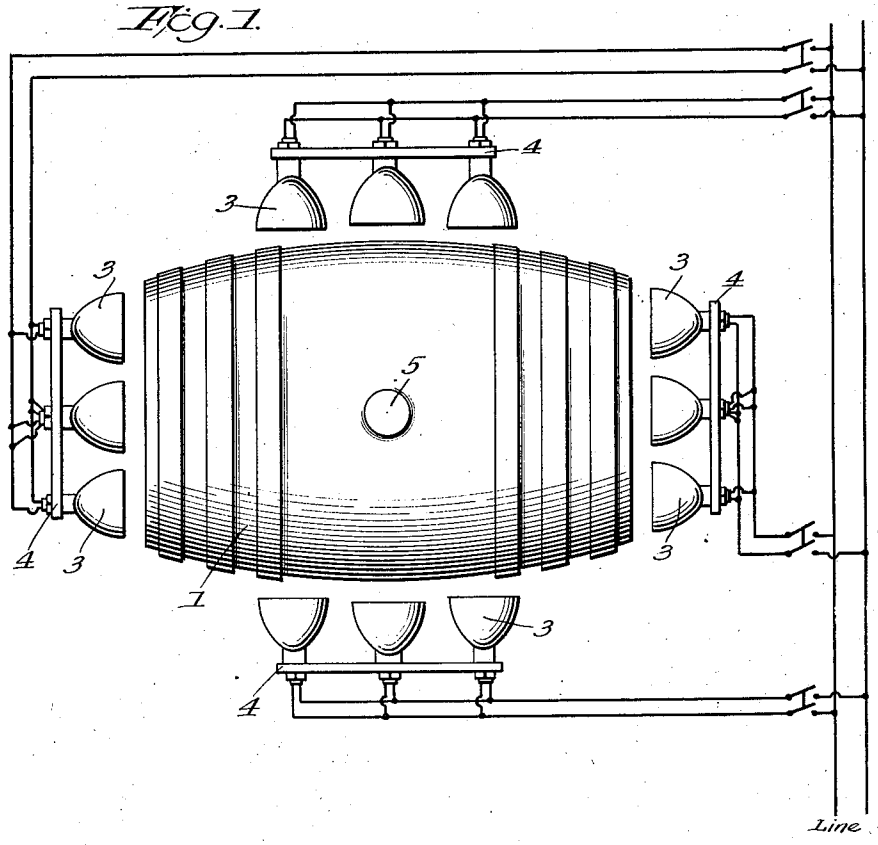
Nov. 21, 1939. L. F. LITTLE 2,180,685

PROCESS FOR THE ARTIFICIAL MATURING OF ALCOHOLIC LIQUORS

Filed Oct. 23, 1934

Fig. 1.



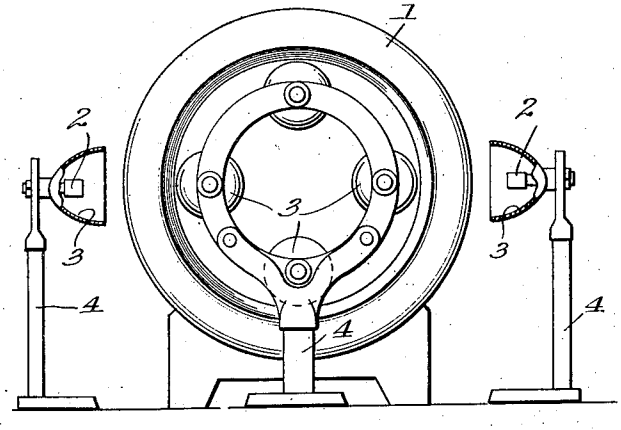


Fig. 2.

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PROCESS FOR THE ARTIFICIAL MATURING OF ALCOHOLIC LIQUORS

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7 Claims. (Cl. 99—48)

This invention relates to a process for maturing or aging alcoholic liquors, and as disclosed herein the process and apparatus is described in connection with the aging of spiritous liquors, such as whiskey.

One convenient form of apparatus which may be used in carrying out the process is illustrated in the accompanying drawing, but it will be understood that since the apparatus for practicing the process may take different forms, and, further, such apparatus may be varied within the range of mechanical skill and is not confined to the specific form shown, the type here shown is merely illustrative and in no sense restrictive.

In the drawing:

Figure 1 is a plan view, and

Figure 2 is an end elevation, partly shown in section.

Referring to the drawing, 1 indicates a container of any suitable form and dimensions in which the whiskey is aged, and preferably, and as here shown, a wooden barrel, having a capacity of approximately fifty (50) gallons is usually adopted, this barrel being made preferably of white oak and charred on the inside, since this gives a convenient volume for handling and good results are obtained. The method will, therefore, be described, and the operation of the apparatus set forth in connection with this form of container.

The container 1 will be substantially filled with new whiskey, and adjacent the container 1 will be arranged the elements 2 of a type to produce, under the action of suitable current, the circuits for supplying current being conveniently shown, infra-red rays. In the example here disclosed, four (4) of the infra-red elements are preferably arranged as a group, as shown, at each end of the container 1, and on each side of the container 1 a group of three (3) infra-red ray elements are disposed, although it will be understood that this is merely illustrative, and the number of the infra-red ray elements may be increased or diminished or differently disposed with respect to the container 1, as may be desired.

These infra-red ray elements may be of any suitable or approved type, and I have found that elements having the capacity of about five hundred (500) watts are feasible, the elements being supported, as shown, upon stands 4, so that they may be conveniently set up and handled, the stands 4 being supported in any suitable manner, but, preferably, as best shown in Figure 2, upon bases, so that they may be readily moved, and the distance of the elements 2 may be varied with respect to the container 1. The elements 2 will be provided preferably with reflectors 3, here shown as parabolic, so as suitably to direct the rays emitted by the elements 2.

I have discovered that with the apparatus described and following the steps of my new method, the whiskey may be aged in a relatively short time, and under such aging, is given the color, body, mellowness, and bouquet of whiskey aged over a long period, and I believe that the process has advantages over the maturing of whiskeys by the old and well-known method of storing for years in a charred oak cask, for the reason that the process which I have invented admits of very close control of the product.

It is known that new whiskey is practically colorless, and I have found that by following the steps of my method and subjecting such new whiskey to the action of the infra-red rays, the whiskey will, in a relatively short time, take on the color and the other desirable characteristics of whiskey aged in the wood over a period of years.

The action of the infra-red rays, while not entirely clear, gives results which are clear and exact, analyses having shown that there is a material increase in the solids, volatile and fixed acids, the esters, furfural, and fusel oil, as amyl alcohol.

While the solids show an increase, they are not excessive, as it sometimes happens in connection with whiskeys aged by quick aging processes, and the increase in the other elements is material and satisfactory.

When the elements 2 are energized by current in the usual way, the infra-red rays will, of course, penetrate the walls of the container and the whiskey, and while results vary, of course, with the strength of the rays and the length of time the container is subjected to the action of the rays, and, to some extent, to the distance of the elements 2 from the container, I have found that the following treatment in applying my method gives satisfactory results.

New whiskey subjected to the action of infra-red ray elements of the capacity of five hundred (500) watts for a period of approximately seventy two (72) hours, with the elements so disposed relative to the container as to maintain the temperature, which is, of course, increased by the action of the infra-red rays, to approximately 136° F., is of the red orange color desired, has the mellowness characteristic of aged whiskeys, the bouquet or aroma desired, and, as stated, analysis of whiskeys so treated shows a desirable proportion of the various ingredients found in whiskey aged over a long period.

While the length of time to which the whiskey is subjected to the action of the infra-red rays may be varied over a considerable period and good results obtained, in fact, whiskey subjected to the action of the rays for a period if forty eight (48) hours having shown marked and desirable changes, my practice has shown that the period of approximately seventy two (72) hours

gives satisfactory results. Further, while the temperature range may vary, care should be taken not to have it too high, as that might result in a darker color and possible a slightly acrid taste, and if too low, a slowness in the process which would be undesirable, and I have determined with reasonable accuracy that a temperature of substantially 136° F. is productive of highly satisfactory results.

Of course, the period of time may be easily regulated, and the intensity of the current or the proximity of the infra-red ray elements to the container be varied to control the aging in accordance with the particular needs of the situation.

The treatment, if found desirable, may be varied by subjecting the new liquor to an intensive action, either by increasing the power of the infra-red ray elements or placing them closer to the container for a short time, and thereafter stepped down by decreasing the strength of the infra-red rays or moving the infra-red ray elements farther from the container, so that the process will proceed more slowly through the final stages.

It is preferable during the application of the process to the aging of whiskey, to vent the container 1 in any suitable manner, the barrel here shown conventionally being provided in this illustration of the apparatus with the ordinary bung 5, which may be removed or loosened, so as to release pressure and permit certain undesirable volatile substances which will be thrown off to escape, and this venting of the container may, of course, be differently controlled.

The exact chemical reactions of the infra-red rays is not entirely clear, but I have determined, as a result of my experimentation, that it is essential to obtain the results sought for, to apply the rays to the whiskey in an oak container, and preferably a charred oak container. My present theory is that the action of the rays upon the container and the whiskey in the container are comparable to the long aging process which it has been customary to follow, and that the results are the same, although accomplished in a very much shorter time.

Apparently, the desirable constituents of the charred oak cask which produce color, bouquet, and other sought-for qualities in the liquor, are properly freed and blended with the liquor under the influence of these rays, and, furthermore, in the liquor itself is set up the necessary and desirable chemical reactions to give the condition and quality which come from the old aging method. My experiments have shown that whiskey subjected to infra-red rays in containers not having the characteristics of the charred oak container which I use, do not have the matured qualities that are obtainable following my process and using my apparatus.

I have discovered further that after subjecting the whiskey to the treatment given above, it will be further improved by the additional step of permitting it to age for a period of from thirty (30) to ninety (90) days in the cask in which it has been treated by the infra-red rays. Its body, mellowness, color, and bouquet, while satisfactory at the end of the infra-red ray treatment described, are very considerably enhanced by the additional step of permitting it to age under usual conditions in the cask in which it has been before treated by the infra-red ray treatment.

The reason for this improved condition, by aging in the cask in which it is treated, after the infra-red ray aging has been completed, is, according to my present theory, probably due to the fact that the cask and the contents still react to the treatment to which they have been subjected, and a continuing reaction is set up with the charred cask and the liquor in the cask still responding to the aging conditions set up during the infra-red ray treatment.

While I have shown and described the method as applied to a charred oak wood container, and this is, of course, the preferable form, it will be understood that the invention would be followed if the contact between the oak wood or charred oak wood were accomplished in some other way, it being essential only that the wood and the liquor be in contact when subjected to the infra-red rays, and, obviously, it may be done by putting the liquor in any suitable container made of material other than wood and suspending or placing in the liquor, wood, oak wood, or charred oak wood elements, and the same results secured, and the form of the wood can, of course, be varied, and charred pieces of wood, oak shavings, or charred shavings used.

Since reasonable latitude in respect of temperatures and times in the practice of my process and the use of my products may be indulged in without departing from the range of my invention, it will be understood that such departures as are within the skill of the processer may be made from the specific example here shown and still be within the purview of my development.

I claim:

1. The process of treating whiskey which comprises subjecting the whiskey, while in a charred wooden chamber, to the action of infra-red rays.

2. The process of treating whiskey which comprises subjecting the whiskey to the action of infra-red rays, while in contact with charred wood, and maintaining the temperature of the liquor approximately within the range of 110° to 150° F.

3. The process of treating whiskey which comprises subjecting the whiskey to the action of infra-red rays, while in contact with charred wood, for a period of from forty eight to one hundred and seventy hours.

4. The process of treating whiskey which comprises subjecting the whiskey to the action of infra-red rays, while in contact with charred wood, for a period of from forty eight to one hundred and seventy hours at temperatures approximately within the range of 110° to 150° F.

5. The process of treating whiskey which comprises subjecting the whiskey while in a charred wooden container to the action of infra-red rays and thereafter suspending the action of the infra-red rays and permitting the whiskey to age in said container under usual conditions for an appreciable period of time.

6. The process of treating whiskey which comprises subjecting the whiskey while in a charred wooden container to the action of infra-red rays and thereafter suspending the action of the infra-red rays and permitting the whiskey to age in said container under usual conditions for a period of from about thirty to about ninety days.

7. The process of treating whiskey which consists in subjecting the whiskey while in contact with charred wood to the action of infra-red rays.

LUCIUS FREEMAN LITTLE.