

A. GOETZ & P. A. JONES.

PROCESS OF PASTEURIZATION.

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902,812.

Patented Nov. 3, 1908.

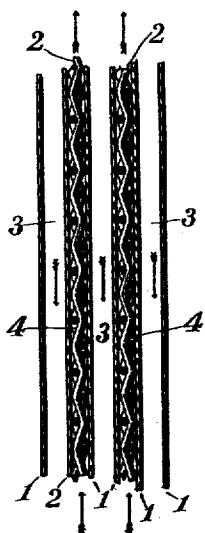


Fig. 1.

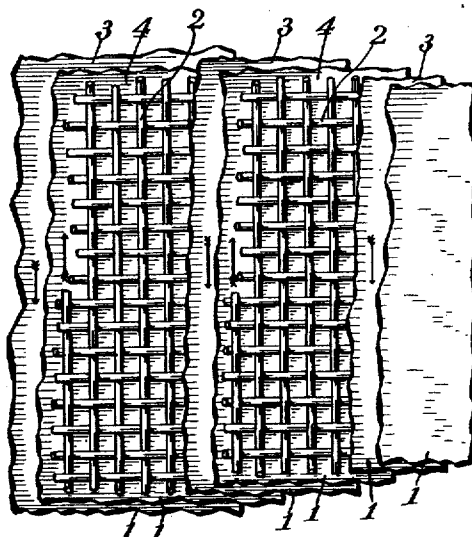


Fig. 2.

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UNITED STATES PATENT OFFICE.

ADOLPH GOETZ AND PALMER A. JONES, OF GRAND RAPIDS, MICHIGAN.

PROCESS OF PASTEURIZATION.

No. 902,812.

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Patented Nov. 3, 1908.

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To all whom it may concern:

Be it known that we, ADOLPH GOETZ and PALMER A. JONES, citizens of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Processes of Pasteurization; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improvements in processes of pasteurization; and more particularly to a process for pasteurizing beer, wine, milk and other like fluids; and its object is to provide a process whereby the heating of the fluid to be pasteurized will be substantially instantaneous, and without unduly heating any portion of the same; to provide a process that will destroy the germs in the fluid without any material change of condition in respect to flavor, or other characteristics of the fluid.

Heretofore in pasteurizing processes, the fluid has been heated either in bulk within heated containing vessels, or caused to flow in a current between walls to which heat is applied. When heated in bulk in a containing vessel, it is necessary to apply the heat to the vessel a long time in order that the heat may penetrate sufficiently through the mass of fluid to reach all parts of the same. The result is a change of flavor of the fluid, due to long exposure to heat and also overheating that portion of the fluid adjacent to the walls of the containing vessel, and in some cases coagulation of substances that should remain fluid, thus producing undesirable results, or imperfect pasteurization. In case the fluid is caused to flow between heated walls, the same difficulties arise by virtue of the adhesion of the fluid to the walls and the slower movement adjacent thereto. The more remote the fluid from the walls, the more rapidly it will move and the less heat it will receive, in consequence of which too much heat must be applied to a portion of the fluid in order to reach this more rapidly moving and more remote part of the current. This difference in temperature between the part of the current close to the hot wall and the more rapidly moving inner part of the stream, frequently results in the escape of a part of the latter without being sufficiently heated to effect pasteurization, while

at the same time the other portions are overheated and injured thereby. We have found that to avoid these undesirable results, the heat should be applied as short a time as possible, and uniformly to all parts, and to each minute portion of the fluid. We have found that the destruction of the vitality of vegetative micro-organisms, or of bacteria, is practically instantaneous when the proper temperature is reached, and that long continued heating is not necessary, if each and everyone of the same can be heated alike.

Our invention consists in treating the fluid to be pasteurized in a novel manner, to-wit: minutely subdividing a flowing stream or current of such fluid, deflecting the interior of the stream outward at frequent intervals and equalizing the flow throughout all parts of the same, by extending therethrough dividing, retarding, and deflecting means, and applying heat to the retaining walls and the said means, substantially as hereinafter described, whereby each and every part of the fluid moves with substantially uniform speed and is so divided and deflected that each and every minute subdivision is brought into intimate contact with heat transmitting material, and heated substantially instantaneously, as will more fully appear by reference to the accompanying drawings, which illustrate a mechanism adapted to perform our improved process, in which

Figure 1 shows a portion of an apparatus, in vertical section, capable of performing our improved process, and Fig. 2 a side elevation of the same with the seven walls and deflecting material broken away step by step to illustrate their respective position and relation.

That portion of the device in which the fluid to be pasteurized is heated consists of a series of any convenient number of conduits or cells, formed by a series of retaining walls 1, spaced apart and arranged substantially parallel and provided with any convenient marginal closures, and with means for circulating the respective fluids through the alternate cells.

Interposed between the plates and in the alternate cells 4 through which the fluid to be pasteurized flows, is a fluid deflecting material 2 having circuitous passages there-through preferably a woven wire fabric made of heat conducting material, whereby the fluid passing through the cell is minutely subdivided and the interior flow of the same

is retarded and deflected at frequent intervals. Said material will also absorb heat from the walls and distribute the same throughout the current of fluid flowing through the cell. To heat these walls and the material therebetween, each alternate cell 3 is supplied with a suitable heating fluid, such as hot water, the other alternate cells 4 being supplied with the fluid to be pasteurized, the result being that the heat from the heating fluid is transmitted to the walls and material therebetween, and from these to the fluid to be pasteurized, which fluid, being so minutely subdivided is repeatedly deflected against the walls, and the flow thereof rendered uniform throughout, and is heated uniformly and practically instantaneously, every minute subdivision receiving an equal amount of heat in the same short space of time. By this process we are thus able to thoroughly pasteurize a fluid by subjecting it to heat for but the fraction of a second of time, and without any of the objectionable results of overheating, or long continued treatment.

What we claim is:

1. The method of pasteurizing a fluid, consisting of passing a current of the same between heated walls, and deflecting the interior portion of the current toward said walls at frequent intervals, to simultane-

ously and quickly heat all parts of the current.

2. The method of pasteurizing a fluid, consisting of passing a current of the same through a heated conduit, and equalizing the action of heat upon all parts of the said current by dividing and deflecting the current at frequent intervals.

3. The method of pasteurizing a fluid, consisting of passing a current of the same between heated walls, retarding the flow of the interior portion of the current, dividing the current at frequent intervals, and deflecting the divided portions of the current toward the heated walls.

4. The method of pasteurizing a fluid consisting of passing a current of the fluid between heated walls, interposing between the walls and in said current deflecting, dividing, retarding and heat conducting material, and applying heat to said walls and material, whereby the fluid is quickly and uniformly heated throughout.

In testimony whereof we affix our signatures in presence of two witnesses.

ADOLPH GOETZ.
PALMER A. JONES.

Witnesses:

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GEORGIANA CHACE.