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## 3,231,394 METHOD OF PROTECTING WATER DURING STORAGE

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This invention relates to a method of protecting water against contamination during long storage periods.

In a great many parts of the world there is a great need for water stored in sealed containers which may be kept for long periods of time without the water becoming contaminated. For example, hunters and mining prospectors often have to go into country where water is scarce or where there is doubt as to whether the available water is potable. The drinking water in tropical areas is often doubtful, and is often dangerous to persons not accustomed to it. A comparatively recent danger is that of fallout from an atomic or similar explosion. Efforts are being made to get people to buy or build fallout shelters and to keep these stocked with food sufficient for at least a week or two. However, the great problem is water. When water is left for any length of time, it becomes unsuitable for drinking purposes.

The main object of the present invention is the provision of water in containers, usually, in containers commonly known as "tins" or "cans," and which may be kept for long periods of time without contamination. This is not as simple as it seems since water stagnates even if left in the open for any length of time. It is well known that water in confined places stagnates very rapidly.

Another object is the provision of a process for treating and packing water so that it will remain potable for a very long time.

Water that has been put away for emergencies and for use in places where drinking water is not available must of necessity be foolproof, that is, it must be in proper condition for drinking whenever required. To be practical, large quantities of water have to be processed and packed at a time. This water must be able to stand up to a long shelf life, and to long periods after its purchase since there is no way of telling when the purchaser may want to use it under different circumstances. If a person is going out on a hunting or prospecting trip, there would not be much of a problem since he would have the water only for a certain period, and the only doubtful period would be the shelf time. Danger here could be reduced by dating the cans or containers. On the other hand, there are many situations when purchased water would be stored for unknown periods. Water placed in fallout shelters must always be ready for use. Even if it were changed every two or three weeks, it would be very difficult for a family if it had to go into a shelter on short notice if the water therein was just due for a change.

The present invention eliminates these difficulties by providing water in containers or cans which may be stored for months or even years and still be ready to drink when the containers are opened.

The method according to the present invention of protecting water comprises mixing into water from about 180 to about 240 parts per million of disodium phosphate, heating the water at 212° F., directing the hot water into a sterilized container, such as an unlacquered can, and sealing said container under vacuum. The boiling of the water sterilizes it, while the disodium phosphate protects it from contamination from sources, such as the material of the container. By sealing the container under vacuum, you eliminate air from the containers which, in itself, might be a source of contamination.

The water should be heated to at least 212° F. and not over 300° F. for a period sufficient to sterilize it. If the water were heated over 300° F., it would affect the disodium phosphate to such an extent that it would not be able to perform its required function.

The actual loading of the containers and the sealing thereof under vacuum can be done in accordance with standard practice and does not require any description herein.

As an alternative to the above, the process may comprise mixing into water from about 180 to about 240 parts per million of disodium phosphate, directing the water into containers, heating the containers and water to at least 215° F., for a period sufficient to sterilize the water and the containers, and sealing the containers under vacuum.

A variation of this process is to fill the containers with water and seal them under vacuum. The sealed containers are then placed in a retort, and after the latter is closed, the containers are heated to at least 212° F. and not over 300° F. for the required period.

In all cases, the water must be stored in unlacquered cans. As is well known, many cans for liquids are lacquered on the inside. However, it is believed that this lacquer in itself could contaminate the water. The disodium phosphate protects the water against any of the metal of the containers dissolving therein. It may also be possible to use plastic containers. However, the plastic would have to be such that it in itself would not contaminate or lead to contamination of the water.

By packing the water under vacuum, air is excluded from the containers, thereby reducing the possibility of contamination.

Water treated and packed in accordance with this invention can be kept for a very long time, and it will always be fresh when the containers are opened. The importance of this will be realized that the containers may be opened in time of emergency, or in places where water is not available or is unfit for human consumption. Thus, the water must always be in first class condition, and the present process fulfills this requirement.

What I claim as my invention is:

1. Method of protecting water against contamination during long storage periods, which comprises mixing into water from about 180 to about 240 parts per million of disodium phosphate, heating said water at 212° F., directing the hot water into a sterilized metal container, and sealing said container under vacuum.

2. Method of protecting water against contamination during long storage periods, which comprises mixing into water from about 180 to about 240 parts per million of disodium phosphate, heating said water to at least 212° F. and not over 300° F. for a period sufficient to sterilize it, directing the sterile water into a sterilized metal container, and sealing said container under vacuum.

3. Method of protecting water against contamination during long storage periods, which comprises mixing into water from about 180 to about 240 parts per million of disodium phosphate, directing the water into a metal container, heating the container and water to at least 212° F. and not over 300° F. for a period sufficient to sterilize said water and container, and sealing said container under vacuum.

4. Method of protecting water against contamination during long storage periods, which comprises mixing into water from about 180 to about 240 parts per million of disodium phosphate, directing the water into a metal container, sealing the container under vacuum, placing the sealed container in a retort, heating the container and water in the closed retort to at least 212° F. and not over

300° F. for a period sufficient to sterilize said water and container, and removing filled container from retort.

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