

O. OHRVALL.
FOAM OR FROTH DISSIPATOR.
APPLICATION FILED AUG. 5, 1918.

1,389,101.

Patented Aug. 30, 1921.

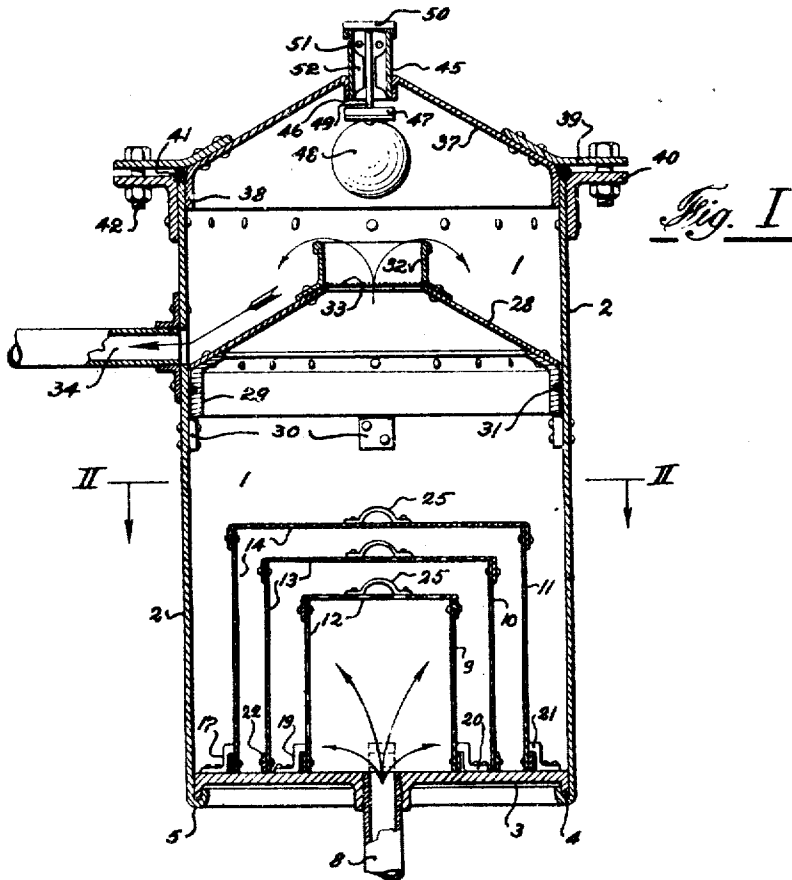


Fig. I

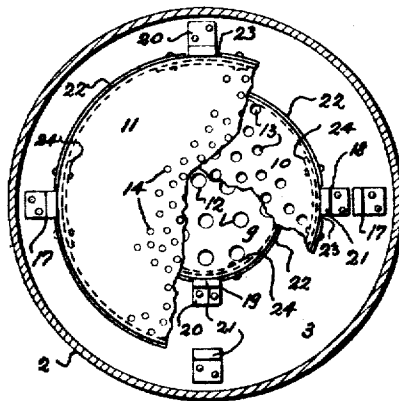


Fig. II

Inventor
Oscar Ohrvall
By his Attorney
H. Carlson

UNITED STATES PATENT OFFICE.

OSCAR OHRVALL, OF NEW YORK, N. Y.

FOAM OR FROTH DISSIPATOR.

1,389,101.

Specification of Letters Patent. Patented Aug. 30, 1921.

Application filed August 5, 1918. Serial No. 248,333.

To all whom it may concern:

Be it known that I, OSCAR OHRVALL, a citizen of the United States and a resident of the borough of Manhattan, in the county, city, and State of New York, have invented certain new and useful Improvements in Foam or Froth Dissipators, of which the following is a specification.

This invention relates to devices for breaking up the froth on liquids as well as for separating the gases from the same, and it is especially available to dissipate the foam found in milk and liberate the air contained therein.

The main object of the invention is to produce a device of the nature set forth which shall efficiently perform the function of breaking up the film that usually surrounds the bubbles in milk and separating the released gases or air therefrom.

Further objects are to provide a device of the character described that is of simple and durable construction, and the parts of which are readily removable for purposes of inspection or cleansing as well as quickly replaced.

Other objects and advantages of the invention will become apparent as the specification proceeds.

With the aforesaid objects in view, the invention consists of the novel combinations and arrangements of parts hereinafter described in their preferred embodiments, pointed out in the subjoined claims, and illustrated on the annexed drawing wherein like parts are designated by the same reference characters throughout the several views.

In the said drawing:—

Figure I is a sectional elevation of a device constituting one form of the present invention, some of the elements thereof being partly broken; and

Fig. II is a cross sectional plan view of the same form of the device, the section being taken on the line II—II looking in the direction pointed out by the arrows in the latter figure.

Generally described, the invention comprises a tank or vessel, the bottom whereof has an inlet admitting the liquid which is to have the foam or froth and the gases or air entrained in the same broken up and separated. Surrounding the inlet for the liquid is a primary bubble interceptor consisting of nested perforated elements

through which the fluid must flow and operating to break up most of the foam or froth bubbles. After the liquid has gone by the first interceptor it encounters a secondary bubble interceptor over which the fluid passes in a thin film. This serves to extract the most minute bubbles and release the last vestige of gases or air from the same. The degasified and frothless fluid is then drawn off. The invention also includes in its organization an air vent or escape for the liberated gases or air and a valve automatically closing the latter and thereby preventing overflow of the liquid in case it rises abnormally within the vessel.

The advantages of the invention as here outlined are best realized when all of its features and instrumentalities are combined in the one and same structure, but, useful devices may be produced embodying less than the whole.

It will be obvious to those skilled in the art to which the invention appertains, upon becoming conversant with the details thereof, that the same may be incorporated in several different constructions. The accompanying drawing, therefore, is submitted only as showing the preferred exemplification of the invention.

In the embodiment of the device under consideration, the numeral "1" denotes a container formed by a side wall 2, preferably cylindrical, and a bottom 3, having a flange 4 thereon to which the wall 2 is connected as by turning up the lower end of the latter around the said flange 4.

Substantially at the center of the container 1, is arranged an inlet pipe or conduit 8, through which the liquid to be freed from froth or foam is conducted in an upward direction.

Over the inlet 8 are placed a plurality of inverted basket-like or bell-shaped elements 9, 10 and 11 nested together. These elements are respectively provided with numerous sharp-edged perforations 12, 13 and 14 in their sides and tops. The perforations in the several elements are of varying size, the largest being in the innermost element 9, those next in dimension occurring in the element 10, and the smallest in the outermost element 11.

Although the said bell or basket-like elements are shown cylindrical and provided with perforations both in the sides and heads, as well as nesting with their lower

open ends directly on the bottom 3, it is understood that any other analogous form and arrangement thereof may be used.

The milk or other frothy fluid may be pumped or otherwise forced into the container 1, through the pipe 8. In order to rise therein, it must pass through the series of perforations in the nested elements 9, 10 and 11. The liquid films constituting the skin of the bubbles will be broken due to their passage through these perforations thereby allowing the occluded gas or air to escape and ascend, because of its greater lightness, and to eventually reach the surface of the liquid. At this point the gas or air may be entirely separated from the liquid. The mechanical agitation caused by the compression of the bubbles in the liquid while passing through the nested elements greatly assists the action of gravity in producing the separation. The edges of the perforations in the bell or basket-like elements being sharp, as heretofore stated, contribute to the cutting or breaking up of the film enveloping the bubbles or froth.

As the perforations 12, 13 and 14 are progressively diminishing in size, there is the assurance that all of the bubbles will be acted upon in the passage of the frothy liquid through the nested perforated elements. Bubbles not broken up by the edges of the perforations 12, will be caught by the edges of the perforations 13 or if they escape the last named perforations, they will be acted upon by the edges of the smaller perforations 14, where practically all the froth, will be found to have been disintegrated sufficiently to enable the escape of the occluded gas or air. The series of perforated bells or elements might be increased, if the breaking action on the froth or foam by the elements employed is found insufficient.

The basket-like elements or bells 9, 10 and 11 may be fastened to the bottom 3, or other support of the container 1, in any suitable manner. A convenient fastening means, permitting of the ready removal and replacement of the elements consists of plural series of Z-shaped keepers 17, 18 and 19 of substantially equal size and appearance. These keepers may be fixed to the bottom of the container as for instance by rivets passing through their foot-portions 20. The hooked or overhanging top parts 21 of the several series of keepers take over the upper edges of segmental straps 22 secured to the lower edges of the elements 10, 11 and 12. Intervals or gaps 23 slightly wider than the width of the said keepers 17, 18 and 19 are left between the ends of the straps 22. The fastening means here described has the character of a bayonet joint or lock. When occupying the position represented in Fig. II, the segmental straps 22, are free of the keep-

ers 17, 18 and 19, and the baskets or elements 9, 10 and 11 are disengaged and may be lifted out. A slight turn in either direction from the position last named will bring the straps 22 under the hooked parts 21 of the keepers and the elements will thereby be maintained in place.

The lower edges of the side walls of the bell elements 9, 10 and 11, in rear of the gaps 23 between the ends of the segmental straps 22, may be reinforced on the inside by similar, but shorter segments 24.

For convenience in handling the elements 9, 10 and 11 when inspecting or taking them out incidentally to cleaning, etc., grips or handles 25 are preferably attached to each of their head portions.

Above the outermost bell or element 11 in the container 1, there is located a plate or partition 28, which is preferably frusto-conical, as shown. At its outer edge said plate 28 is provided with a down-turned thickened flange 29. Lugs 30 are fastened to the inside of the cylindrical wall 2, and upon these the flange 29 of the plate 28 rests.

In order to afford a substantially leak-tight joint between the said wall 2 and the flange 29, a packing ring or gasket 31 is placed between the two, and the flange 29 is formed with a groove for receiving and supporting the gasket. The latter presses snugly against the sides of the flange and the container, thus closing the joint against the passage of liquid.

An open neck 32 is formed at the contracted middle portion of the plate 28, and this neck may conveniently be made as a separate part designed to clamp between it and the plate 28, a strainer 33 for catching impurities carried along by the fluid.

When the liquid still retains some trace of occluded gas or air released from the froth bubbles and flows out through the neck 32 it spreads out in a relatively thin film or stream down and over the conical upper surface of the plate 28. The occluded gas or air is thereby brought to the surface where its final separation and escape from the liquid are effected.

The substantially frothless and "flat" or degasified liquid which collects around the base of the plate 28, flows off through an outlet 34, disposed substantially level with the base of the said plate or inner head 28.

The upper end of the container is closed by a removable, and preferably conical, cover or outer head 37 which is formed with a circumferential lip 38 projecting downwardly into the container within the upper edge of the wall 2.

On the margin of the cover 37 there is attached an annular outwardly extending flange 39 which coacts with a similar flange 40 fastened adjacent to the upper outer edge of the said wall 2. A packing 41 is placed

between the two flanges 39 and 40 which are clamped into tight contact therewith by bolts 42, or other suitable means.

The cover 37 preferably at its highest point, is provided with a contracted neck or opening 45 which may be in the form of a small tube, the lower end 46 whereof, as shown, can be utilized as a seat for a valve 47, carried by a float 48 through the intermediary of a stem 49. The latter has at its outer or top end a cap or closure 50 which ordinarily overlies the opening or neck 45 with the exception of small apertures 51 formed in the upper part of this neck for allowing the escape of the volume of gas or air separated from the liquid in the normal or ordinary use of the apparatus. It is understood that the gas or air liberated from the froth and foam which separates from the liquid rises and collects in the upper part of the container beneath the cover 37.

The stem 49 carrying the valve 47 and cap 50 is preferably guided by wings or ribs 52 projecting inwardly from the neck 45, the gas and air of course, being free to pass between them.

In case there is an excessive supply of liquid to the container or the liquid for any other cause, rises to the top thereof, its escape through the neck 45 will be prevented by the valve 47, which is lifted against its seat when the float 48 is buoyed up by the liquid. Consequently there will be no loss of liquid.

The operation of the device will be perfectly obvious from the foregoing description.

While a certain preferred embodiment of this device has been shown and described, it will be understood that changes in the form, arrangements, proportions and details thereof may be made, without departing from the scope of the invention as defined by the appended claims.

Having described my invention what I desire to secure by Letters Patent and claim is:—

1. A device of the character described comprising a container having inlet and outlet openings, and an interceptor intermediate of said openings composed of a series of dome-shaped elements of different sizes, nesting one within the other in spaced relation to their respective sides and heads, said elements being provided with sharp-edged apertures through which a liquid may be passed to relieve it of foam or froth, the outlet from the container being higher than the dome-shaped elements and controlling the flow out of the same, the arrangement being such that the weight of the liquid above the elements opposes its flow through the series thereof whereby the bubbles are forced into contact with both the outer and inner edges of said apertures.

2. A device of the character described comprising a container, a plurality of dome-shaped elements therein resting with their lower ends upon a common closure, said elements being nested within one another and including walls and heads provided with apertures having sharp edges, an inlet conducting a liquid into the innermost element and directing the flow thereof toward each succeeding element so that the liquid will pass through their several apertures, the liquid rising from said closure above the plural elements and encountering the inner and outer edges of said apertures in its passage through said elements, and an outlet located above the dome-shaped elements for the liquid flowing through the latter.

3. A device of the character described comprising a container having an inlet at the bottom thereof, an interceptor for a liquid entering said inlet inverted over the latter, said interceptor being composed of dome-shaped elements arranged serially within one another and formed with apertures in their tops and sides, and keepers adapted to engage said sides below the apertures therein so as to retain said elements individually on the bottom of said container, said keepers having a detachable connection with the lower portions of the elements permitting them to be removed one after another in a vertical direction.

4. A device of the character described, comprising a container, an inlet for admitting liquid thereinto, a series of perforated elements of different sizes nesting one inside the other, through the perforations whereof the liquid from said inlet entering said container must pass, keepers on the bottom of the latter, and keeper-engaging means carried by said elements adapted to hold them individually in their assigned positions.

5. A device of the character described, comprising a container having an inlet for a frothy or foamy liquid, a primary interceptor serving to break up the largest bubbles in the liquid passing from said inlet into the body of said container, and a plate or partition above said interceptor provided with an opening guiding the liquid in a contracted stream and causing it to flow over the edge thereof in a thin film, whereby the elimination of the smaller bubbles is effected.

6. A device of the character described, comprising a container having an inlet for liquid, a primary froth and foam interceptor interposed between the body of said container and its inlet, and a secondary gas or air bubble interceptor above said first interceptor dividing said body into superposed compartments, said second interceptor having a raised surface provided with an open neck through which the liquid coming from

the first interceptor is adapted to pass and thence flow exteriorly down over said surface in the upper compartment in a thin film or stream, thereby supplementing the
5 action of the first interceptor.

7. A device of the character described, comprising a container, an inlet for admitting liquid into the bottom part thereof, a primary froth and foam interceptor receiving the liquid in its passage from said inlet to the body of said container, a second-

ary gas or air bubble interceptor through which the liquid rising from said first interceptor is adapted to flow, said secondary interceptor including a frusto-conical partition dividing off the upper part of the container into a separate compartment, and an outlet from said upper compartment located opposite the upper portion of said partition.
15

OSCAR OHRVALL.