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[54] **DEVICE FOR ATOMIZING LIQUID**
8 Claims, 1 Drawing Fig.

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[50] **Field of Search** 239/419.5, 428.5, 399, 404

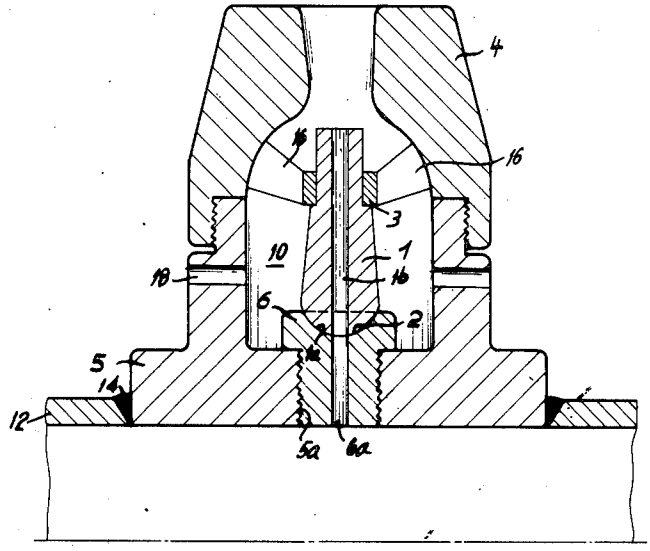
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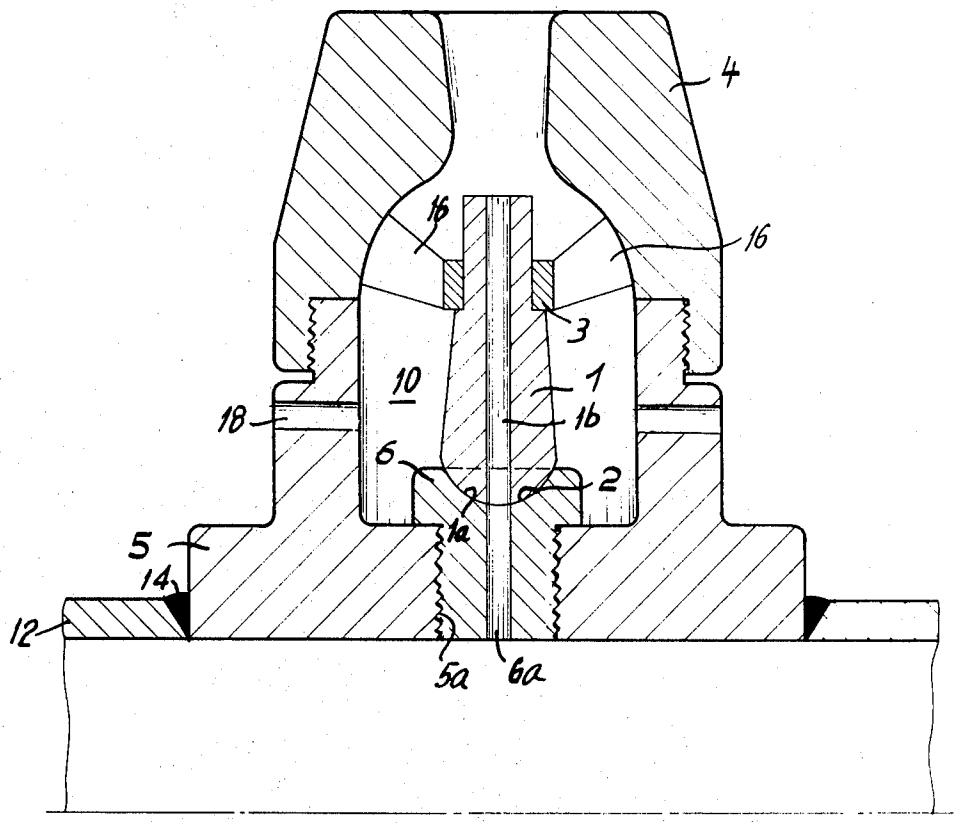
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ABSTRACT: A device for atomizing liquid, particularly sulfite liquor which is adapted to be burnt after it is atomized, includes a housing formed of upper and lower parts, the lower part being connectable to a feed pipe for the liquid to be atomized and having a threaded bore which carries an insert with a liquid flow passage therethrough. The upper part of the housing carries a support which extends into a vapor chamber defined by the interior of the upper and lower parts and which supports a liquid nozzle on a recess of the insert in a manner such that the flow passage of the nozzle is aligned with the flow passage of the insert. The insert is preferably provided with a hemispherical recess to permit the pivotal arrangement of the nozzle thereon and the alignment of the passages. The supports defined by the upper part include radial support fingers which hold a central annular collar which is adapted to engage around the upper portion of the nozzle and hold it in position over the insert.





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DEVICE FOR ATOMIZING LIQUID

SUMMARY OF THE INVENTION

This invention relates in general to the construction of nozzles and in particular to a new and useful nozzle construction for atomizing a liquid which includes means for centering a separate nozzle member over an insert of the housing having a passage which is alignable with a passage in the nozzle for the direction of the liquid therethrough.

In the atomization of a liquid such as sulfite liquor vapor is used to enhance the mixing effect. A nozzle housing for carrying out the atomization usually includes an annular vapor chamber around a central nozzle member defining the passage for the liquid. It is necessary that the annular passage around the liquid nozzle has a uniform cross section around the circumference as far as is possible. The known devices, particularly for the atomization of sulfite liquor, however, provide a construction in which the liquor nozzle is a uniform body rigidly connected with a lower part of the nozzle assembly, for example, by threading. In addition, an upper part of the mixing nozzle is also threaded to the lower part of the mixing nozzle. With such a threaded securing the centering the liquid nozzle is not insured in view of the orientation of the surrounding upper part in respect to the central nozzle member defining the liquid passage. Consequently, the annular space around the liquid nozzle does not have the uniform dimensions necessary for optimal atomization, particularly at the outlet of the liquid nozzle. Attempts have been made to compensate for such inaccuracies by the use of centering washers but this is a makeshift solution which does not yield the desired effect in most cases, as has been shown by practice.

In accordance with the present invention, there is provided an atomizer for liquids which is particularly useful for atomizing sulfite liquors and which does not have the disadvantages of the known devices of this type. This is achieved by providing an upper part of the nozzle housing which is threaded to the lower part and which carries, on radial arm supports, a central annular holding flange for the upper end of the central liquid nozzle. The liquid nozzle in turn is provided with a ball-shaped lower end which rests in a hemispherical recess or socket of an insert member which is threaded into the lower part directly below the annular support. The liquid nozzle member may therefore be pivoted on the recess of the insert and its upper end held in a stationary position by the support s o that the passage therein for liquid aligns with the passage defined in the insert. A particularly favorable arrangement is to provide a support in the form of a ring having radially extending supporting straps, preferably three equally spaced straps which extend upwardly in the flow direction into the wall of the upper part of the nozzle housing. The straps advantageously extend either parallel or are inclined in the flow direction so as to have very little retarding effect on the vapor flow in the area defined around the nozzle member within the upper and lower housing parts. The straps supporting the ring member for the liquid nozzle may also be formed, for example, in the form of a spiral in order to provide a whirling flow of the vapor toward the end of the liquid nozzle for enhancing the mixing effect therewith. The straps may be preferably made of such a slight thickness that the fluid flow thereby is provided with a twist so that it hugs the wall of the vapor chamber, defined by the nozzle, like a film. This construction not only provides a favorable mixing effect but also has a favorable effect on the subsequent combustion of the atomized liquid.

Accordingly, it is an object of the invention to provide a nozzle construction, particularly for atomizing a liquid such as sulfite waste liquor, which includes a nozzle housing defining a vapor chamber and which includes a central insert forming a support seat for centering a separate nozzle member which is held at its outer end by a collar carried by the housing, the nozzle member and the insert defining a flow passage for the liquid.

A further object of the invention is to provide a multipart nozzle construction which includes means for centering the nozzle member within the vapor chamber of the housing and which provides a pivotal support for the inner end of the nozzle member.

A further object of the invention is to provide a nozzle, particularly for the atomization of a liquid such as sulfite liquor, which is simple in design, rugged in construction and economical to manufacture.

BRIEF DESCRIPTION OF THE DRAWING

The only FIGURE of the drawing is transverse sectional view of a nozzle constructed in accordance with the invention.

GENERAL DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing in particular, the invention embodied therein comprises a mixing nozzle assembly which includes a separate liquid nozzle member or nozzle piece **1** having an upper or outer end which is centered by a collar support **3**. The collar support **3** is centered within a vapor chamber **10** defined within an interconnected upper part **4** and a lower part **5**. The lower part **5** is secured, for example, to a feed pipe or other housing part **12** such as by welding **14**.

In accordance with the invention the lower part is provided with a threaded bore **5***a* which receives an insert **6** having a central passage **6***a* which is aligned centrally within the vapor chamber **10** and which carries a hemispherical recess or socket for receiving the lower end of a ball head portion **1***a* of the nozzle member **1**. The nozzle member **1** is positioned on the recess **2** so that a bore thereof **1** becomes aligned with the bore **6***a* of the insert **6**.

In accordance with a feature of the invention the ring support **3** is held in position by radially extending arms **16** which for example may be equally spaced around the periphery of the outer end of the nozzle **1** and may advantageously be curved so as to impart a slight twisting movement to the fluid moving thereby. In addition, the interior of the nozzle **1** may be provided with grooves or projections for imparting a whirling flow to the liquid.

Vapor or air may advantageously be admitted into the chamber **10**, for example, through one or more openings **18** defined around the circumference of the lower part **5**. Preferably the upper and lower parts are interconnected by a threaded connection in the same manner as the insert **6** is connected into the lower part **5**.

What is claimed is:

1. A liquid atomizer nozzle construction including a housing defining a vapor chamber with an atomizer discharge opening, an insert member aligned with the discharge opening in said housing having a liquid passage therethrough for conducting liquid to be atomized, said insert member having an end adjacent the discharge opening of said housing with a centering recess therein, a liquid nozzle member having a passage therethrough for liquid and a first end with a bottom which engages in the recess of said insert for centering said nozzle member to align and communicate the passage thereof with the passage of said insert and having a second opposite end, and a support defined within said housing adjacent the discharge opening for centering the opposite end of said liquid nozzle member over said insert and within said vapor chamber in alignment with the discharge opening.

2. A nozzle construction according to claim **1**, wherein said support comprises a collar centered within the vapor chamber and a plurality of arms extending outwardly from said collar and connected to said housing and supporting said collar centrally within said housing in alignment with the discharge opening.

3. A nozzle construction according to claim **2**, wherein said arms extend substantially parallel to the flow direction through said vapor chamber to said discharge.

4. A nozzle construction according to claim 1, wherein said nozzle member includes a bore imparting a twist to the liquid passing therethrough, said support including supporting arms arranged in the vapor chamber and shaped to impart a twisting movement to the vapor passing thereby.

5. A nozzle construction according to claim 1, wherein said housing includes an upper and a lower part threadedly connected together and defining said vapor chamber, said insert comprising a separate member threaded into said lower part and having an outer end defining a hemispherical recess for supporting said liquid member.

6. A device according to claim 5, including means defined in said lower part for the inflow of a gas into said vapor chamber around said nozzle member.

7. A liquid atomizer, comprising a nozzle housing having an interior vapor chamber and a narrow neck venturi nozzle throat passage terminating in an atomizer discharge opening, an insert member defined in said housing opposite to said opening and having a passage therethrough for the flow of liquid and terminating in a recess aligned with said opening, a

liquid nozzle member having a passage therethrough for liquid to be atomized with a first end defining a bottom which is engageable in the recess of said insert for centering said nozzle member to align the passage therein with the passage of said insert, said nozzle member passage terminating at the opposite end in a discharge opening aligned with the discharge opening of said nozzle housing, and support means engageable with said liquid nozzle member and holding said member to align the passage therein with the passage of said insert member and the discharge of the passage with the discharge of said nozzle housing.

8. A liquid atomizer nozzle, according to claim 7, wherein said liquid nozzle member bottom is of hemispherical form said recess in said insert member being a correspondingly formed hemispherical recess, said liquid nozzle member being pivotal in said recess, said support means comprising a collar engaging around said liquid nozzle member and holding said liquid nozzle member so that it does not rotate in respect to the recess of said insert member.

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