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FRUIT AND VEGETABLE WASHING DEVICE WITH VERTICAL CIRCULATIVE FLOW AND FAUCET ADAPTER

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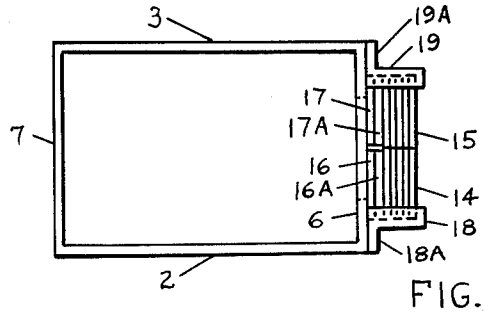


FIG. 2

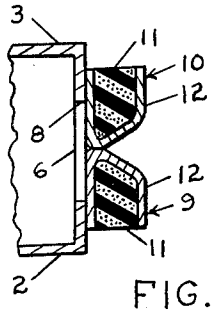


FIG. 4

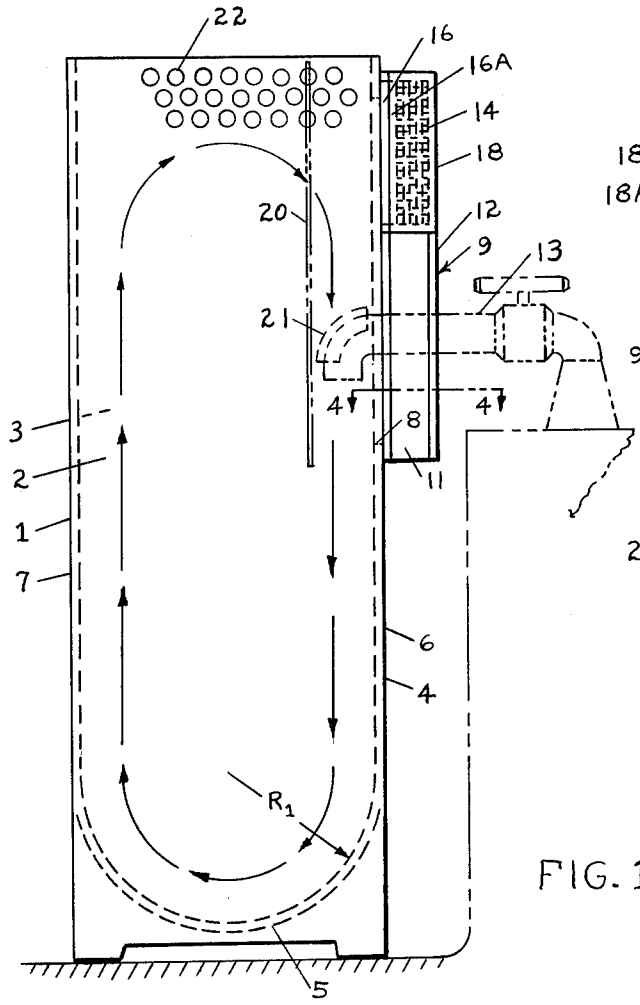


FIG. 1

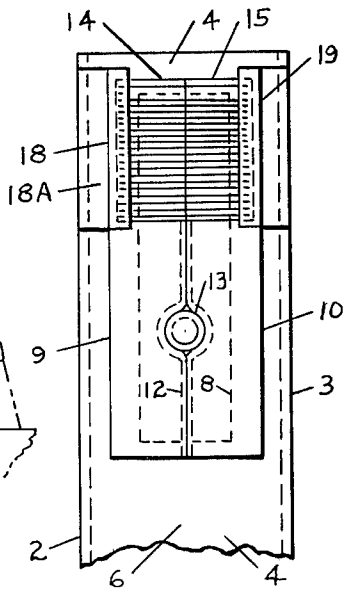


FIG. 3

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FRUIT AND VEGETABLE WASHING DEVICE WITH VERTICAL CIRCULATIVE FLOW AND FAUCET ADAPTER

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The present invention relates to a washing device for fruits, vegetables, and other solid food units. The device provides for imparting to contained liquid a two dimensional circulative flow in a vertical plane. Provision is included for the circulative liquid flow to receive sufficient pressure energy and kinetic energy from tangential inlet liquid flow to effect continuous vertical circulative motion of the fruits or vegetables.

Objects of the invention are to provide for the thorough cleaning of all surface areas of fruits and vegetables in minimum time and without bruises or damage.

Other ibjects are to provide a simple cleaning device having no moving mechanical parts, and which can be used conveniently in household kitchen sinks, and which can utilize kinetic energy and pressure energy available from conventional household faucet water.

Other objects are to provide reduced kinetic energy losses by introducing faucet water flow directly into circulative washing water thereby allowing easier starting of circulative flow of a static food pile, larger load washing at low faucet water pressure, and larger load washing for a given size of washing device.

Another object is to eliminate the difficulty of providing an extension conduit requiring universal leak resistant end adapters for the faucet and washing device.

An object is to eliminate the inconvenience of installing and disconnecting an extension conduit at each use of the device.

Another object is to provide for preventing the intake of air at openings in faucet aerators during food unit washing and preventing a corresponding loss of inlet liquid momentum and kinetic energy.

An object is to prevent the wedging of circulating food units between the submerged faucet nozzle and the side walls of the device without reducing the augmentation of the inlet liquid jet by contained circulating liquid.

Another object is to provide for adaptation of the washing device to various heights of sink floor to faucet outlet combinations.

A number of other objects and advantages will become apparent as the description proceeds.

One form of the present invention is illustrated in the accompanying drawings wherein similar numerals refer to similar parts throughout the views.

FIGURE 1 is a side view of the fruit and vegetable washing device properly positioned with respect to an open water faucet. The arrows indicate the flow path of the circulative liquid flow. The hatched base line represents the floor of a conventional household kitchen sink having a fixed distance relationship with overhead faucet **13**.

FIGURE 2 is a plan view of FIGURE 1.

FIGURE 3 is a fragmentary end view of FIGURE 1 showing details of an elastic seal which is opened at one point due to the insertion of faucet **13**.

FIGURE 4 shows the cross-section of FIGURE 1 through line **4**—**4**.

The prior art has provided various washing devices, including a narrow, two-dimensional flow washing device of the present type. That device is described in copending application of Serial No. 465,822, effective filing date Dec. 3, 1962. That device sits on the floor of the sink, and an elastic liquid conduit is provided to extend from

the faucet nozzle to the tangential inlet unit of the device. The present device provides comparable performance but without the problems, inconvenience, and cost of the extension conduit and associated connectors which must have universal adaptability.

Referring to the figures, washing device **1** includes side walls **2** and **3** extending longitudinally and vertically and spaced apart in relative proximity. A lateral wall **4** extends between side walls **2** and **3** to provide a bottom wall **5** and two opposite end walls **6** and **7**. The bottom wall **5** and end wall **6** are faired together by radius R_1 to provide a curved inner surface as shown. The internal surface of lateral wall **4** provides a smooth, curved perimeter flow path for contained liquid.

End wall **6** includes a vertically elongated slot or opening **8**. Slot **8** is sufficiently wide to accommodate conventional kitchen sink faucets up to the largest faucet sizes. Slot **8** is of a length suitable for a wide range of household faucet elevations with respect to the sink floors. Hence, slot **8** is of a width and length and elevation to accommodate almost any conventional faucet and sink combination, wherein the washing device is sitting on the floor of the sink. Slot **8** is located in the center of end wall **6** midway between side walls **2** and **3** to allow for the insertion of faucet **13** directly above the center of the curved inner surface at radius R_1. Slot **8** at lower areas having relatively large static pressure heads, is covered by a symmetrical pair of closure portions or elements **9** and **10**. Closure elements **9** and **10** have elastically resilient core portions **11** which can be made from porous foam rubber or the like. Core portions **11** are covered with lubricated surface finishes or with skin portions **12** made of silicone impregnated rubber sheet, Teflon treated fabric or the like. Thin skin portions **12** are bonded to core portions **11**, and these assemblies in turn are bonded to end wall **6**. Closure elements **9** and **10** are adequately strong to resist liquid pressure, elastically resilient to snugly encompass a faucet nozzle at any elevation along the lengths of the elements, and of low frictional resistance to easily admit any faucet nozzle under a small amount of horizontally applied force.

At higher elevations within the container the static pressure head of the liquid is less than at lower elevations, and hence less sealing strength is required locally. Hence, the upper areas of slot **8** are sealed with a weaker seal, but one having the advantage of lower cost and greater durability. This seal is in the form of many short, stiff but flexible, horizontally disposed filaments or bristles **14** and **15**. The bristles are fronted on the liquid side by thin rubber sheets **16** and **17** for improved sealing. These sheets are reinforced by thin rubber sheets **16***a* and **17***a*. Bristles **14** and **15**, and sheets **16** and **17** are held in clamped relation by sockets **18** and **19**. Sockets **18** and **19** are bonded to end wall **6** by suitable adhesive along tabs **18***a* and **19***a*. Bristles **14** and **15** surround any inserted nozzle in a snug manner to prevent the escape overboard of small food units even though there may be a small amount of liquid seepage between the bristles during normal operation.

There are several preferred ways of protecting delicate skinned fruit from damage by impingement against faucet **13**. A screen curtain **20**, shown referenced in FIGURE 1, may be mounted vertically adjacent to nozzle **13**. Alternately, a local deflector not shown, but made of screen-like material and mounted slidably above nozzle **13** is more suitable in some instances depending upon the size and nature of the food units.

The most preferred method of the present invention for protecting delicate skinned fruits from damage by impingement on faucet **13** is to provide a soft, flexible bumper **21** contoured to overlie the upper surface of faucet **13**. Bumper **21** is formed of foam rubber or the

like and has the under surface treated with pressure sensitive adhesive for convenient installation. The upper surface of bumper 21 is of glossy, smooth texture and simulates chromium in appearance to blend with the faucet fixture.

In operation, the liquid flow is introduced by faucet 13 which is positioned over end wall 6. This provides inlet flow which is tangential to radius R_1. Thus, circulative liquid flow is established. The discharge end of faucet 13 is submerged below the surface of the contained liquid since the liquid overflow is through exhaust apertures 22. Submerged liquid inlet provides an efficient transfer of pressure energy and kinetic energy to the contained mass of revolving liquid and food units being cleaned.

During operation of the device, soil particles and other impurities are progressively removed from the contained food units by a continuously diluting liquid flow.

While one embodiment of the present invention has been illustrated it is to be understood that what is defined by Letters Patent is specified by the appended claims.

What is claimed is:

1. A washing device including two side walls extending longitudinally and vertically and spaced apart, a lateral wall extending between said side walls to provide a bottom wall and two opposite end walls and connecting with said side walls in unitary relation, and the inner surface of said bottom wall and the inner surface of at least one of said end walls substantially faired to provide a substantially curved inner surface at the region of juncture, and an opening upwardly in at least one of said walls, and said opening covered by at least one elastically resilient closure portion having at least one free vertical edge to provide for insertion into said device of a faucet nozzle in a substantially leak resistant manner, and said closure portion comprising many horizontally disposed bristle-like elements, and means for supporting said closure portion with respect to said device.

2. A washing device as in claim 1, and said opening located in that end wall substantially faired with said bottom wall.

3. A washing device as in claim 1, and said closure portion fronted on the liquid side by thin sheet material.

4. A washing device as in claim 1, and said closure portion including thin overlying resilient sheets.

5. A washing device including two side walls extending longitudinally and vertically and spaced apart, a lateral wall extending between said side walls to provide a bottom wall and two opposite end walls and connecting with said side walls in unitary relation, and the inner surface of said bottom wall and the inner surface of at least one of said end walls substantially faired to provide a substantially curved inner surface at the region of juncture, and an opening upwardly in at least one of said walls, and said opening covered by at least two elastically resilient closure portions each having free vertical adjacent edges to provide for insertion into said device of a faucet nozzle in a substantially leak resistant manner, and said closure portions comprising many horizontally disposed bristle-like elements, and means for supporting said closure portions with respect to said device.

6. A washing device including two side walls extending longitudinally and vertically and spaced apart, a lateral wall extending between said side walls to provide a bottom wall and two opposite end walls and connecting with said side walls in unitary relation, and the inner surface of said bottom wall and the inner surface of at least one of said end walls substantially faired to provide a substantially curved inner surface at the region of juncture, and a vertically elongated opening located upwardly in said substantially faired end wall, and said opening covered by at least two elastically resilient closure portions each having free vertical adjacent adges to provide for insertion into said device of a faucet nozzle in a substantially leak resistant manner, and said closure portions comprising many horizontally disposed bristle-like elements, and means for supporting said closure portions with respect to said device.

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