



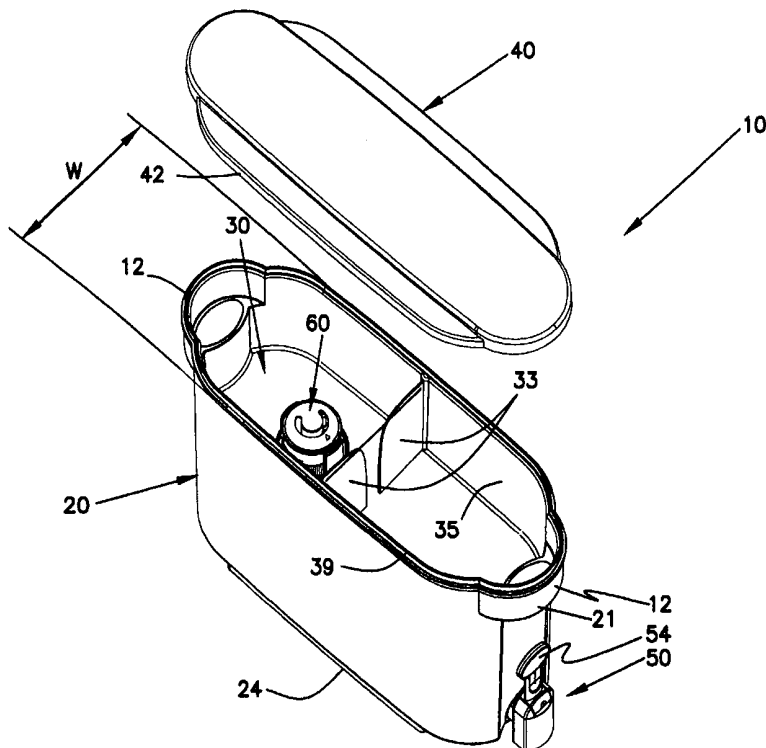
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/US99/00332 (22) International Filing Date: 7 January 1999 (07.01.99) (30) Priority Data: 09/005,292 9 January 1998 (09.01.98) US (71) Applicant: RECOVERY ENGINEERING, INC. [US/US]; 9300 North 75th Avenue, Minneapolis, MN 55428 (US). (72) Inventors: TANNER, John, D.; 16305 8th Avenue North, Plymouth, MN 55447 (US). EMMONS, David, J.; 670 Windemere Curve, Plymouth, MN 55441 (US). GASTON, Johannes, N.; 5139 Mayview Road, Minnetonka, MN 55345 (US). VAN ORNUM, Douglas, J.; 5455 Smetana Drive #1317, Minnetonka, MN 55345 (US). (74) Agent: BRUESS, Steven, C.; Merchant, Gould, Smith, Edell, Welter & Schmidt, P.A., 3100 Norwest Center, 90 South Seventh Street, Minneapolis, MN 55402-4131 (US).		(81) Designated States: AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published With international search report.

(54) Title: POUR-THROUGH WATER TREATMENT DISPENSER

(57) Abstract

A pour-through water treatment device. The device is a dispenser comprising a tank (20), pour tray (30) and cover (40). The length of the device is more than twice its width. Its height is between 9.0 and about 11.0 inches. The pour tray has a downwardly facing channel into which an upwardly facing edge of the tank is inserted. The pour tray also includes baffles (33) to prevent water from sloshing back and forth.



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POUR-THROUGH WATER TREATMENT DISPENSER

Field of the Invention

This invention relates to pour-through water treatment dispensers. In particular, this invention relates to a dispenser having optimum dimensions and shape, a tank/pour tray configuration for better separating treated water from untreated water, and baffles in the pour tray for reducing sloshing in the pour tray as it is being carried.

Background of the Invention

Domestic water treatment devices are known in the art. Among these devices are self-contained systems which process water in batches. Examples of batch devices are pitchers/carafes and larger dispensers from which treated water is poured through a spigot. These systems typically have upper and lower chambers separated by a filter cartridge. They are called "pour-through" devices because they rely on gravity to force water from the upper chamber, through the cartridge, and into the lower chamber, thereby producing treated water.

One of the shortcomings of pour-through dispensers is that they have not been optimally sized and configured. They tend to be wider than necessary, and less long and tall than they could be, which wastes valuable refrigerator space. Their dimensions and shape also have not been optimized to fit under the faucet in the typical kitchen sink when the pour tray is being filled.

As a result of recent improvements in filter media for pour-through devices, biological contaminants such as protozoan cysts (e.g., cryptosporidium) can now be removed. Successful removal of biological contaminants by the filter cartridge is of no benefit, however, if the treated water becomes contaminated with untreated water. Any contamination is unacceptable because even a small amount of biological contaminant would make all of the treated water unsuitable for drinking.

One way that treated water can become contaminated with untreated water in a pour-through dispenser is when filling the pour tray in the sink. Users often fill dispensers by first turning on the faucet and then moving it over the pour

tray. As the water stream passes over the top edges of the tank and pour tray, untreated water can leak between them and into the bottom of the tank.

Another problem with pour-through dispensers results from the large amount of water they contain. Users often carry the dispenser from the sink to the refrigerator (or somewhere else) immediately after filling the pour tray. The untreated water remaining in the pour tray can slosh back and forth, making the dispenser unstable and making water splash out of the pour tray.

What has been needed is a pour-through water treatment dispenser with optimized dimensions and shape, a tank/pour tray arrangement for better separating treated water from untreated water, and a pour-tray configuration which reduces sloshing in the pour tray.

Summary of the Invention

In one aspect of the invention, a water treatment dispenser comprises a tank for receiving treated water, a pour tray inserted into the tank, and a cover covering the pour tray. The length of the dispenser is more than twice its width.

In another aspect of the invention, a water treatment dispenser comprises a tank for receiving treated water and a pour tray inserted into the tank. The height of the dispenser is more than 9.0 but less than about 11.0 inches.

In another aspect of the invention, a water treatment dispenser comprises a tank for receiving treated water, a pour tray inserted into the tank, and a cover covering the pour tray. The pour tray has a generally downwardly facing channel around its periphery into which an upwardly facing edge of the tank is inserted.

In another aspect of the invention, a water treatment dispenser comprises a tank for receiving treated water, a pour tray inserted into the tank, and a cover covering the pour tray. The pour tray has a baffle extending inwardly into an interior of the pour tray.

These and other advantages and features of novelty which characterize the invention are pointed out with particularity in the claims annexed hereto. However, for a better understanding of the invention and its advantages, reference should be made to the drawings which form a further part hereof, and to

the accompanying descriptive matter in which there is illustrated and described a preferred embodiment of the invention.

Brief Description of the Drawings

A preferred embodiment of the present invention will be described
5 with reference to the accompanying drawings, wherein like reference numerals identify corresponding parts:

Figure 1 is a perspective view of a water treatment device according to the present invention, with the cover removed;

Figure 2 is a cross-sectional view of the device shown in Figure 1,
10 and;

Figure 2A is a cross-sectional view of a portion of the device shown in Figure 1, showing the intersection between the cover, pour tray and tank.

Detailed Description of the Preferred Embodiment

Water treatment device 10 includes tank 20, pour tray 30, lid 40 and
15 filter cartridge 60. Device 10 is used as other pour-through devices. Pour tray 30 is filled with tap water. By the force of gravity, water passes through filter cartridge 60 and into tank 20. In the case of the dispenser arrangement described herein, the user pours treated water out of tank 20 through spigot 50.

Device 10 is sized and configured to make optimum use of the space
20 available in most refrigerators. Because it is long and narrow (more than twice as long as it is wide), it takes up a minimum amount of the front shelf space available while not wasting shelf space behind it. It is also relatively tall, about the height of a milk carton, which further takes advantage of the space available. The specific dimensions of the preferred device are as follows: Height H1 (with cover 40 on) is
25 10.25 inches; width W is 5.50 inches; and length L is 15.38 inches. These dimensions could be varied within the principles of the invention to make a different sized, but relatively narrow, long and tall dispenser.

Device 10 is also sized and configured to fit in most kitchen sinks.
The length dimension L is short enough to fit in the sink diagonally or lengthwise.
30 The narrow width dimension W, and the rounded ends 12 of device 10, make it

easier for device 10 to fit diagonally in the sink. The height of device 10 without the cover (H2) must also be low enough so that device 10 will fit under the typical faucet while in the sink. The height H2 in the preferred embodiment is 9.51 inches, but it could be a little higher or lower within the principles of the invention.

5 Pour tray 30 and tank 20 are configured to prevent untreated water from leaking between pour tray 30 and upper edge 22 of tank 20 when pour tray 30 is being filled or when device 10 is being carried. Pour tray 30 includes lip 37 extending outwardly proximate the top of pour tray 30, and over upper edge 22 of tank 20. Overhanging wall 38 extends downwardly from an outer end of lip 37 and
10 along the outside of upper wall 21 of tank 20. In this way, a downwardly facing channel 36 is formed into which upper edge 22 of upper wall 21 of tank 20 is inserted. It will be understood that the shape and orientation of channel 36 and its location on pour tray 30 could be varied. Overhanging wall 38, while preferred because it helps retain pour tray 30 on tank 20 and helps block untreated water from
15 going into tank 20, is not absolutely necessary. Channel 36 and lip 37 need not be molded as part of pour tray 30, but could be a separate part attached to it. Upper edge 22 of tank 20 also need not be its uppermost edge, but could be positioned lower on tank 20.

 Cover 40 is placed on top of device 10 after it has been filled. Cover
20 40 is retained on pour tray 30 by peripheral wall 42 surrounding retaining wall 39, which extends upwardly from lip 37. The bottom of peripheral wall 42 rests on the upper side of lip 37.

 Pour tray 30 includes baffles 33. When device 10 is being carried by
finger holds 23 in tank 20 (pour tray 30 has correspondingly shaped ledges 34
25 resting on tank 20), water remaining in pour tray 30 can slosh back and forth, making the device unstable, and potentially causing water to splash out of pour tray 30. Baffles 33 are provided to prevent this. In the preferred embodiment, they are vertical walls extending perpendicularly from inner sidewalls 35 of pour tray into the interior of pour tray 30. They are positioned opposite one another in the middle of
30 pour tray 30. It will be understood that the number, shape and positioning of the baffles could be varied within the principles of the invention.

Referring to Figure 2, pour tray 30 tapers downwardly toward sleeve 32 so that all of the water in pour tray 30 is drained through filter cartridge 60. Similarly, as best seen in Figure 1, pour tray 30 also tapers downwardly toward its longitudinal center line so that all of the water on the side of baffles 33 opposite
5 filter cartridge 60 is drained to the filter cartridge 60.

Filter cartridge 60 is sealed to sleeve 32 by O-ring 62. It will be understood that a variety of filter cartridges, having a variety of media, could be employed within principles of the invention.

Treated water is poured from tank 20 through spigot 50. Spigot 50
10 includes valve 52 movable between open and closed positions by lever 54. Spigot 50 is sealed to spigot outlet 27 of tank 20 via O-ring 56. The bottom of spigot outlet 27 and the bottom of valve chamber 53 are placed very low in tank 20, below tank bottom 25, to allow tank 20 to fully drain. Base 24 raises tank 20 up so that the bottom of spigot 50 will not touch the refrigerator shelf or other surface on which
15 device 10 is standing.

It should be understood that the present invention is not limited to the preferred embodiment described above, which is illustrative only. Changes may be made in detail, especially in matters of shape, size, arrangement of parts, or material of components, within the principles of the invention to the full extent indicated by
20 the broad general meanings of the terms in which the appended claims are expressed.

WE CLAIM:

1. A water treatment device from which treated water is dispensed through a spigot, comprising a tank for receiving treated water, a pour tray inserted into said tank, and a cover covering said pour tray, with a length of the dispenser being more than twice a width of the dispenser.
2. A water treatment device according to claim 1, wherein said length is more than 14.5 inches.
3. A water treatment device according to claim 1, wherein said width is less than 7.0 inches.
4. A water treatment device according to claim 1, wherein a height of the dispenser is more than 9.0 inches.
5. A water treatment device from which treated water is dispensed through a spigot, comprising a tank for receiving treated water and a pour tray inserted into said tank, with a height of the dispenser being more than 9.0 inches but less than about 11.0 inches.
6. A water treatment device according to claim 5, wherein said height is about 9.5 inches.
7. A water treatment device according to claim 5, wherein a length of the dispenser is more than 14.5 inches but less than about 16.0 inches.
8. A water treatment device according to claim 7, wherein said length is about 15.5 inches.
9. A water treatment device according to claim 7, wherein opposite ends of said tank are rounded.

10. A water treatment device according to claim 5, wherein a width of the dispenser is less than 7.0 inches.
- 5 11. A water treatment device from which treated water is dispensed through a spigot, comprising:
- (a) a tank for receiving treated water, having an upwardly facing edge;
 - (b) a pour tray inserted into said tank, said pour tray having a generally downwardly facing channel around its periphery into which said upwardly facing
 - 10 edge of said tank is inserted; and
 - (c) a cover covering said pour tray.
12. A water treatment device according to claim 11, wherein said channel in said pour tray is formed by a generally horizontal lip extending outwardly from said pour
- 15 tray proximate an uppermost end, and an overhanging wall extending downwardly from an outer end of said lip.
13. A water treatment device according to claim 11, wherein said channel is molded as part of said pour tray.
- 20 14. A water treatment device according to claim 11, wherein said upwardly facing edge of said tank is also an uppermost edge of said tank.
15. A water treatment device according to claim 12, said pour tray further having
- 25 a cover retaining wall extending upwardly from said lip, a peripheral wall of said cover surrounding said retaining wall of said pour tray.
16. A water treatment device from which treated water is dispensed through a spigot, comprising:
- 30 (a) a tank for receiving treated water;
- (b) a pour tray inserted into said tank, said pour tray having a baffle extending inwardly into an interior of said pour tray; and

(c) a cover covering said pour tray.

17. A water treatment device according to claim 16, wherein said baffle is positioned proximate a middle of said pour tray.

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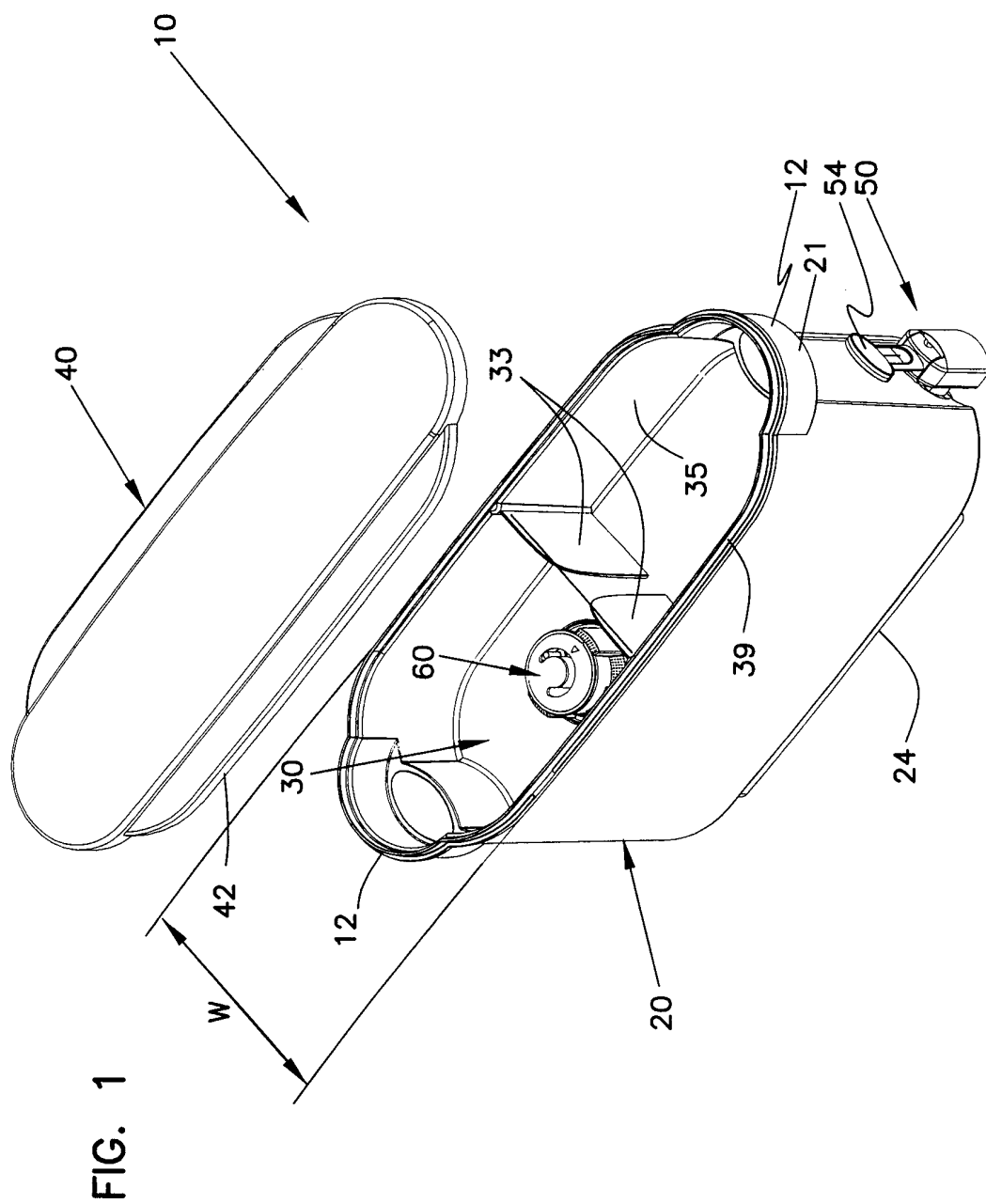
18. A water treatment device according to claim 16, comprising a plurality of baffles extending inwardly into an interior of said pour tray.

19. A water treatment device according to claim 18, wherein said baffles extend
10 toward one another from opposite sides of said pour tray, leaving a space between them through which water can move.

20. A water treatment device according to claim 16, wherein said baffle is molded as part of said pour tray.

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21. A water treatment device according to claim 16, wherein said baffle comprises a generally vertical wall extending generally perpendicularly from an inner wall of said pour tray.



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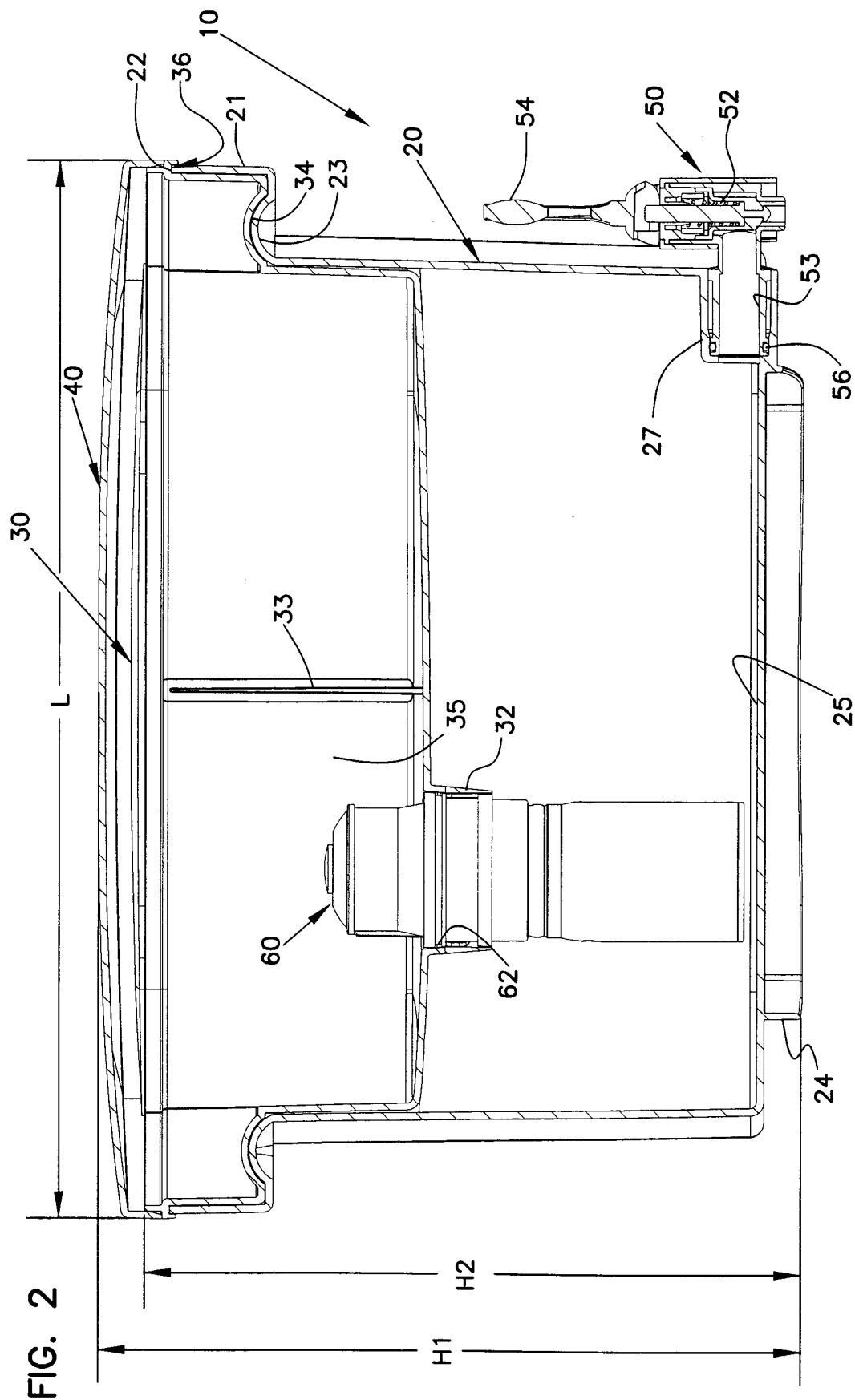
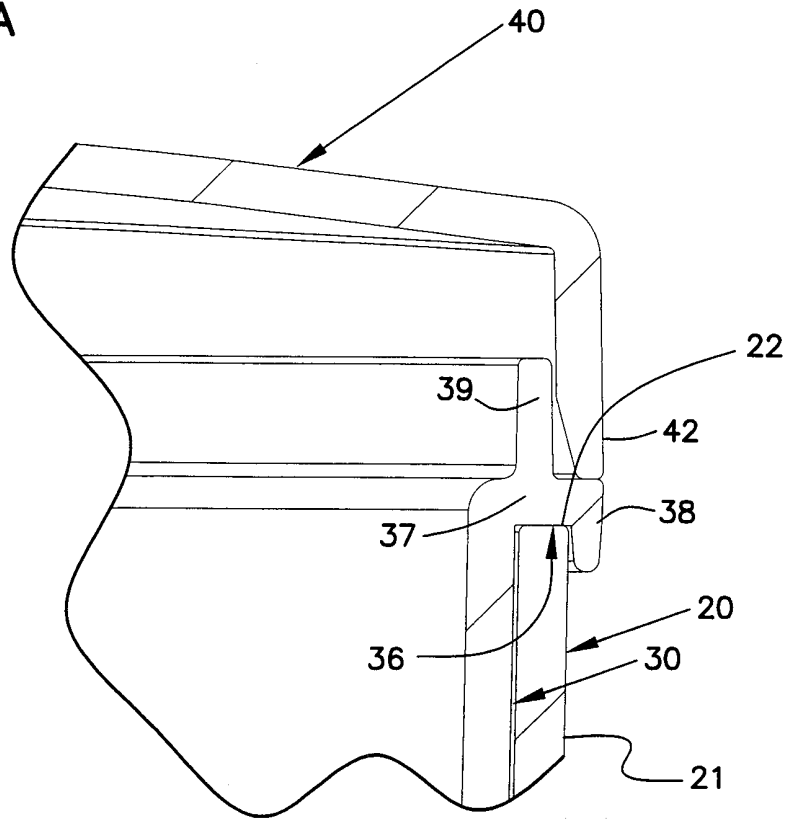


FIG. 2A



INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/00332

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 C02F1/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C02F B01D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 562 824 A (MAGNUSSON JAN H) 8 October 1996	11-15
Y	see column 4, line 57 - column 5, line 34; figure 2	1-10
Y	GB 2 288 529 A (KENWOOD MARKS LTD) 25 October 1995 see abstract; figure 1	1-10
A	US 1 674 203 A (HOLZ T C ET AL.) 19 June 1928 see the whole document	11-15
A	US 2 017 456 A (GUDMUNDSEN A) 15 October 1935 see the whole document	11-15
-/--		

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

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Date of the actual completion of the international search

14 April 1999

Date of mailing of the international search report

22.04.1999

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

International Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 637 214 A (KAHANA DOV) 10 June 1997 see figure 1	1-15
A	DE 41 02 701 A (FINKE ROBERT) 6 August 1992 see the whole document	1-15

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 99/ 00332

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/US 99/00332

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-10

Water treatment device with spigot for dispensing treated water, a tank for receiving treated water, a pour tray inserted into said tank, and a cover for pour tray characterised in that:
the apparatus has a specific form (e.g. the lenght being more than twice than the width) for enabling easyier handling when filling with water under a faucet in a kitchen sink or when putting it in the refrigerator.

2. Claims: 11-15

Water treatment device with spigot for dispensing treated water, a tank for receiving treated water, a pour tray inserted into said tank, and a cover for pour tray characterised in that:
the upper edge of the pour tray is formed in a specific way in order to prevent untreated water from leaking between pour tray and tank when pour tray is being filled or the whole apparatus is being carried.

3. Claims: 16-21

Water treatment device with spigot for dispensing treated water, a tank for receiving treated water, a pour tray inserted into said tank, and a cover for pour tray characterised in that:
the pour tray has baffles to prevent water remaining in pour tray from sloshing back and forth, rendering the apparatus unstable or splashing out of pour tray when the apparatus is being carried.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 99/00332

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5562824 A	08-10-1996	NONE	
GB 2288529 A	25-10-1995	AU 2263495 A DE 69504190 D EP 0756583 A EP 0861809 A WO 9529131 A	16-11-1995 24-09-1998 05-02-1997 02-09-1998 02-11-1995
US 1674203 A	19-06-1928	NONE	
US 2017456 A	15-10-1935	NONE	
US 5637214 A	10-06-1997	NONE	
DE 4102701 A	06-08-1992	NONE	