Oct. 21, 1969 P. A. MONGERSON 3,473,558

TUB SPOUT DIVERTER

Filed Feb. 20, 1967 2 Sheets-Sheet 1

fig. 1.

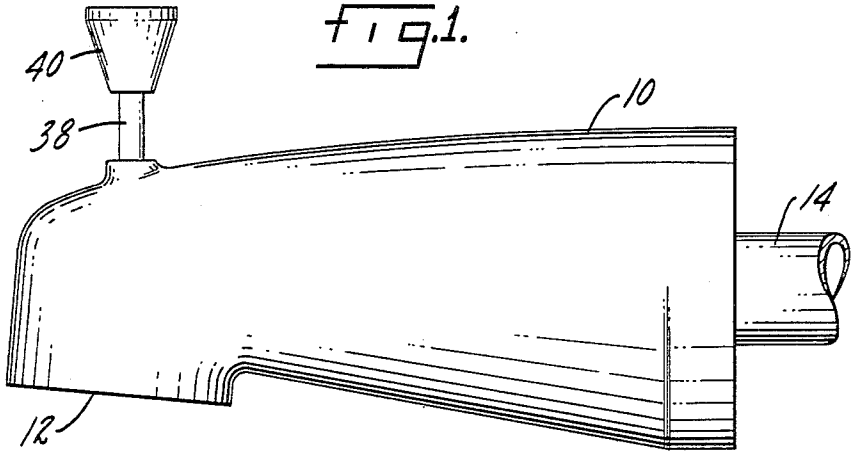
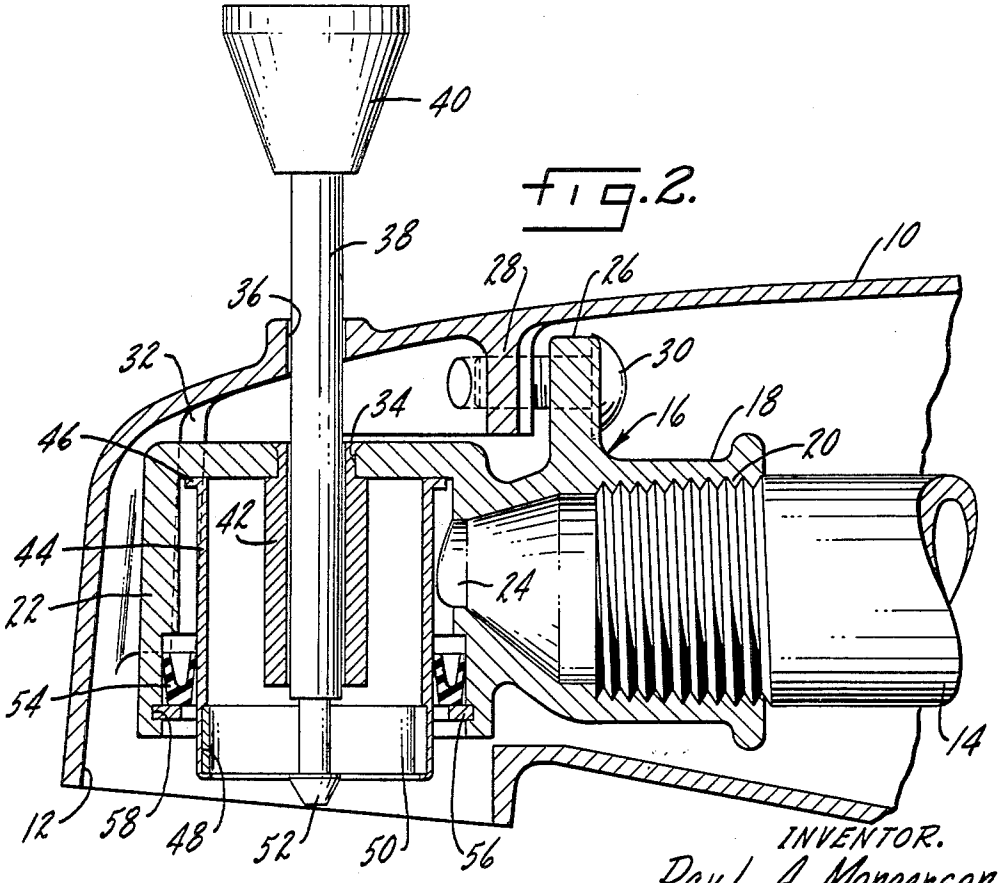


fig. 2.



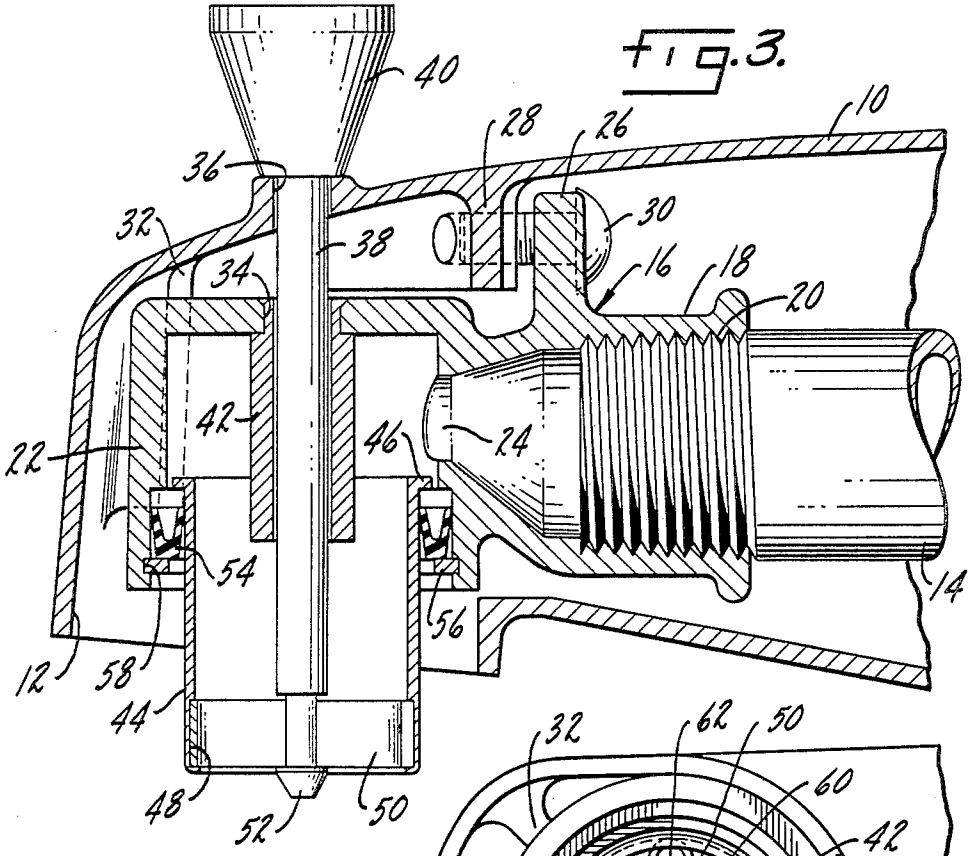
INVENTOR.
Paul A. Mongerson,
BY Parker & Carter
Attorneys.

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fig. 3.



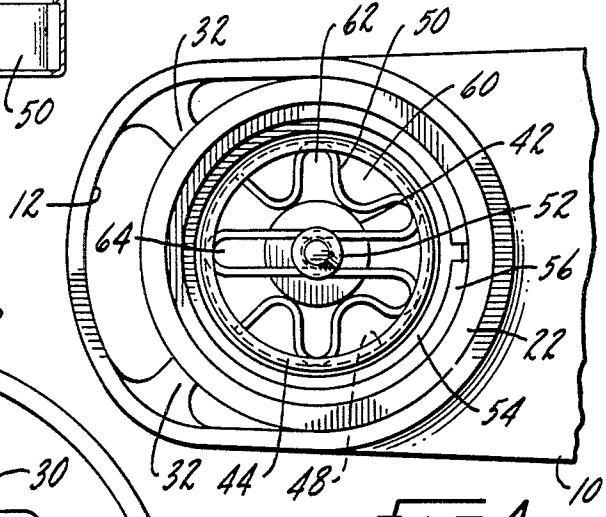
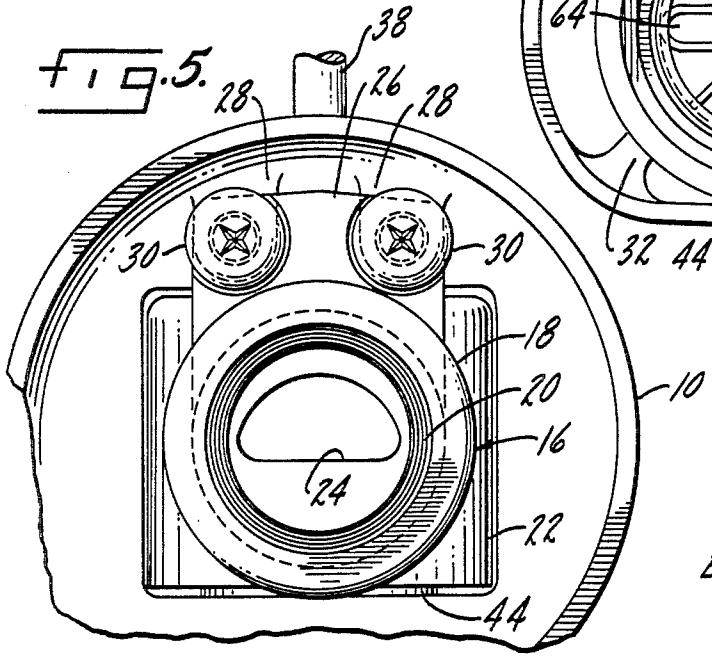


fig. 4.

fig. 5.



INVENTOR.
Paul A. Mongerson,
BY Parker & Carter
Attorneys.

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TUB SPOUT DIVERTER

Paul A. Mongerson, Elyria, Ohio, assignor to Standard Screw Company, Bellwood, Ill., a corporation of New Jersey

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Int. Cl. F16k 31/44, 51/00
U.S. Cl. 137—467 10 Claims

ABSTRACT OF THE DISCLOSURE

This invention relates to a tub spout diverter of the type which will stay in the closed or shower position once it has been moved to that position, but which will drop down to the tub position when the water is turned off. Basically, the invention includes a spout housing, a diverter mounting means which is removably attached to the housing, and a reciprocal diverter which is held in place by the diverter mounting means. The reciprocal diverter may also include a stream forming member. The diverter member includes an annular pressure surface which is effective to hold the diverter in the shower position by virtue of water pressure upon it.

This invention relates to a tub spout diverter and particularly to such a diverter which can remain in the shower position as long as the water pressure is on, but which will automatically drop to the tub position when the water is turned off.

A primary purpose of the invention is a tub spout diverter of the type described which includes a removable diverter mounting means within the spout housing or shell.

Another purpose is a tub spout diverter of the type described including a stream forming member within the diverter.

Another purpose is a tub spout diverter of the type described including a reciprocal diverter member having an annular pressure surface for use in holding the diverter in a closed or shower position.

Another purpose is a simply constructed, reliably operable, tub spout diverter.

Other purposes will appear in the ensuing specification, drawings and claims.

The invention is illustrated diagrammatically in the following drawings wherein:

FIGURE 1 is a side elevation of a spout housing, with the operating handle of the diverter member extending outside of the housing,

FIGURE 2 is an enlarged vertical section through the structure of FIGURE 1, illustrating the diverter in the closed position,

FIGURE 3 is an enlarged vertical section of the structure of FIGURE 1, illustrating the diverter in the open position,

FIGURE 4 is a bottom view of the diverter and housing, and

FIGURE 5 is an end view illustrating the diverter mounting means and its connection to the spout housing.

The spout may have a somewhat conventionally shaped housing **10** having a discharge opening **12** with a water conduit or water pipe **14** extending into the housing as is customary for mounting plumbing fixtures of this type. The housing **10** may be formed of a variety of materials, for example brass, zinc, or plated plastic.

Within the housing **10** is a diverter mounting means indicated generally at **16** which may be a casting, for example brass. The mounting means **16** includes a water passage section **18**, internally threaded as at **20**, for mounting the water pipe or water conduit **14**. There is

a cylindrical diverter mounting section **22**, which is a part of the diverter mounting means **16** and which is connected to the passage section **20** by means of an opening **24**. The opening **24** may be semicircular in cross section, as shown in FIGURE 5. The opening **24** will place the interior of the diverter mounting section **22** in communication with the water pipe **14**. The mounting member **16** may have an outwardly extending flange **26** which can be positioned adjacent a pair of downwardly extending projections **28** on the interior of the housing so that mounting screws or the like **30** may be used to fasten the diverter mounting member to the housing **10**. The projections **28** may extend inwardly from the top, sides or bottom of the housing **10**. The housing **10** may have internal inwardly extending guide members **32** which extend toward and are in contact with the outer cylindrical surface of the mounting section **22** for properly positioning the diverter mounting means within the housing.

As mentioned above, the diverter mounting section **22** is generally cylindrical in form and may have an upper opening **34**, which is in alignment with an opening **36** in the housing **10**. A stem **38** passes through the aligned openings **34** and **36** and may have a knob or the like **40** at its outside end. The stem passes downwardly through a sleeve **42**, which may be formed of brass or the like, and which is fixed in the opening **34**. In effect, the sleeve **42** provides a guide for the stem **38**.

Within the cylindrical section **22** is a cylindrical diverter member **44**, which has a flange or flare **46** functioning as an annular pressure surface at its open upper end. The lower end of the diverter member **44** may have an annular groove **48** which mounts a stream forming member **50**. The lower end of the stem **38** may be attached to the stream forming member **50**, by means of an enlarged nose or the like **52**. Surrounding the diverter member **44** is an annular seal **54** which is held in position by a snap ring or the like **56**, positioned in a groove **58**. The seal **54** is effective to seal the outer annular surface of the diverter member **44**.

As illustrated particularly in FIGURE 4, the stream forming member may be somewhat sinuous in cross section providing a plurality of curved sections or curved openings **60** for directing water to the tub below the spout. Water also flows through the intermediate areas **62** and **64** which are formed by the sinuous stream forming member **50**.

In operation, assuming the diverter has been moved to the shower position of FIGURE 2, water flowing through the conduit **14** and the water passage **24** will enter the annular chamber formed by the outer surface of diverter member **44** and the inside surface of the diverter mounting section **22**. Water pressure within this chamber will provide an upwardly directed force on the flange **46**. Inasmuch as there is no corresponding surface below the water passage **24**, or stated another way, inasmuch as the surface with the greater diameter is above the passage **24**, the diverter member **44** will be held in the up position by means of the upwardly directed water pressure upon the flange **46**. The diverter member will stay in this closed or shower position as long as the water pressure remains on. The lower side of the diverter member is sealed by the annular seal **54** so that there is no leakage at this point.

As soon as water pressure is turned off, there is nothing to hold the diverter in the shower position of FIGURE 2 and it will automatically drop to the tub position of FIGURE 1. Note that in the tub position the lower surface of the knob **40** abuts or seats against the upper surface of the housing **10**, thus limiting downward travel of the diverter. The flange **46** does not rest upon the seal **54**, but is spaced above it because of the abutting sur-

faces of the knob and the housing **10**. The outside annular surface of the diverter is sealed so that there will be no water leakage at this point and all water will flow downwardly through the diverter member.

The stream forming member is important and it has been found to provide an excellent flow pattern, with minimum splash into the tub. The sinuous pattern or cross sectional area of the stream forming member provides sufficient dispersion of the water to minimize splash, yet there is a sufficient stream such that the water coming out of the tube spout does not appear to be in the form of a spray.

Of importance is the means of attaching the diverter mounting means. When the spout housing is to be used without a diverter, a different bracket for attachment to pipe **14** may be provided. The snap ring **56** provides for quick disassembly of the diverter for replacement of any worn parts. Note particularly that there is only a single seal, with the remaining internal members all being formed of brass or some other suitable material resistant to water. The housing may be metal or a plastic clad metal. It may be cast, molded or stamped. Note also that the housing does not have water in contact with it, thus permitting the housing to be entirely of plastic, if so desired.

The spout in its cast form may be used with or without a diverter. The diverter itself may be removed by first taking snap ring **56** out of its groove. In the alternative, a different housing may be used to attach pipe **14**. When used without a diverter, the opening **36** in the housing may provide a degree of aeration of the water stream.

The invention should not be limited to the stem **38** and knob **40** as the operating means for the diverter. For example, movement of the diverter may be controlled by a lever which extends through a forward slot in the housing and is attached to the diverter. The lever may be hinged at its rear end so that upward movement of the lever will bring the diverter to a shower position. In like manner, the diverter may be raised by pushing it up from the bottom.

Whereas the preferred form of the invention has been shown and described herein, it should be realized that there are many modifications, substitutions and alterations thereto within the scope of the following claims.

I claim:

1. In a tub spout diverter, a spout housing, diverter mounting means within said housing, a water passage in said mounting means for connection to a water conduit, a generally cylindrical hollow reciprocal diverter in said diverter mounting means, an annular space between said generally cylindrical diverter and said diverter mounting means, an annular seal held by said mounting means and sealing the annular space between said mounting means and said diverter, said annular seal closing said annular space and being in sealing contact with said diverter at all positions of said diverter, an operating member attached to said reciprocal diverter and extending outside of said housing, said reciprocal diverter having an outside annular pressure surface in communication with said water passage, with water pressure against said surface holding said diverter in a closed position, removal of water pressure permitting said diverter to drop to the open position.

2. The structure of claim **1** further characterized in that said diverter mounting means is removably attached to said housing.

3. The structure of claim **1** further characterized in that said diverter mounting means includes a cylindrical section for mounting said reciprocal diverter, and a water passage section, with said water passage section opening into said cylindrical section.

4. The structure of claim **3** further characterized in that said pressure surface is formed by a flange at one end of said cylindrical diverter.

5. The structure of claim **4** further characterized in that said annular seal is positioned at the lower open end of said cylindrical diverter mounting means, and a snap ring for holding said annular seal in position within said diverter mounting means.

6. The structure of claim **1** further characterized in that said operating member is in the form of a stem fastened to one end of said reciprocal diverter member, with said stem extending through said housing, and an operating handle on the end of said stem outside of said housing.

7. The structure of claim **1** further characterized in that said housing has a plurality of guide members, extending inwardly toward and in contact with said diverter mounting means.

8. The structure of claim **1** further characterized by and including a stream forming member positioned within said reciprocal diverter member.

9. The structure of claim **8** further characterized in that said stream forming member has a sinuous cross section providing a plurality of curved sections through which water flows downwardly through said reciprocal diverter member.

10. The structure of claim **8** further characterized in that said operating member is attached to said stream forming member.

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WILLIAM F. O'DEA, Primary Examiner

HOWARD M. COHN, Assistant Examiner

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137—119; 251—320, 350, 353