Dec. 28, 1937. C. E. LEHMAN 2,103,424

FAUCET ATTACHMENT SPRAY PLATE AND PROCESS FOR MAKING THE SAME

Filed Dec. 18, 1936

Fig. 1.

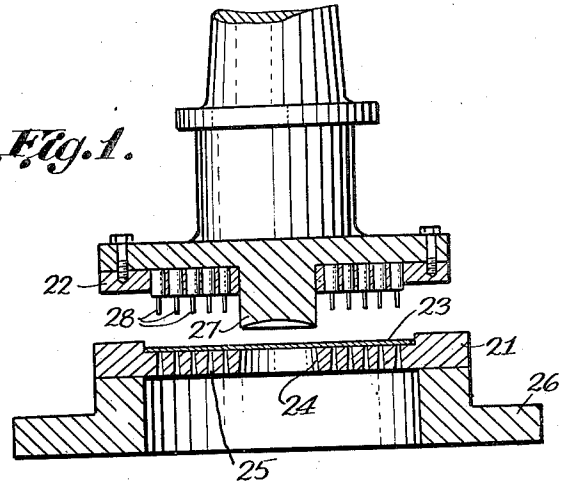


Fig. 2.

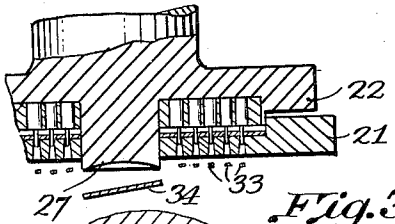


Fig. 3.

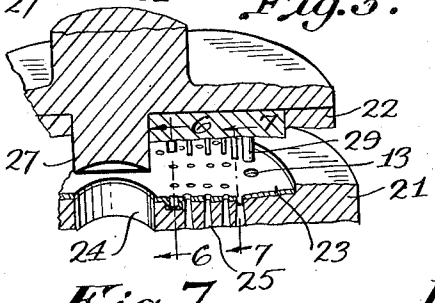


Fig. 4.

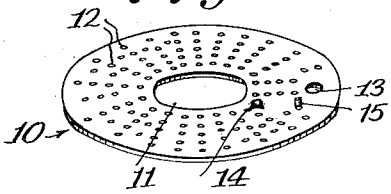


Fig. 5.

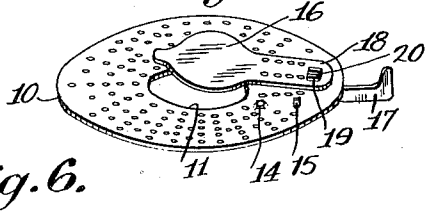


Fig. 7.

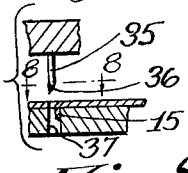


Fig. 6.

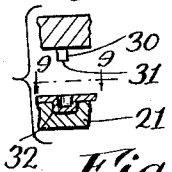


Fig. 8.

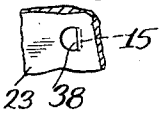


Fig. 9.



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FAUCET ATTACHMENT SPRAY PLATE AND PROCESS FOR MAKING THE SAME

Carl E. Lehman, Chicago, Ill.

Application December 18, 1936, Serial No. 116,630

2 Claims. (Cl. 29—157)

This invention relates to a faucet attachment spray plate and to a process for making the same and has for an object to provide an improved process for making a spray plate especially useful in a faucet attachment of the nature shown in application, Serial Number 32,599, filed July 22, 1935, and allowed September 19, 1936, and in an application filed concurrently herewith on Dec. 18, 1936, Ser. No. 116,631, which is a continuation of said aforementioned application.

A further object of this invention is to provide a spray plate and a process for making the same, which is comparatively inexpensive, yet rapid, so that the spray plate may be made so inexpensively that the faucet attachment of the aforementioned application may be made and sold to the ultimate consumer at an extremely low cost.

In the spray plate referred to in the aforementioned applications, it is necessary to provide a movable valve member or door; it is also necessary to provide means for moving the valve door and additionally a means for limiting the movement of the valve door in one direction so that the valve door may be made in closed position.

The means for limiting the movement of the valve door in one direction is provided by this invention simultaneously with the process of making the spray plate itself, thereby avoiding the necessity of an additional step in manufacturing with the consequential additional cost.

A further object of this invention is to provide a spray plate having a central stream aperture, a plurality of spray apertures, and valve stop means, all of which features may be provided in a singe die-stamping operation.

A further object of this invention is to provide a valve door stop means for the spray plate in either a sheared form or a drawn form or a combination of a sheared and drawn form which stop members are made at the same time that stream and spray apertures are provided.

With the foregoing and other objects in view, as will hereinafter become apparent, this invention comprises the constructions, combinations and arrangements of parts hereinafter set forth, disclosed and shown on the accompanying drawing. In this drawing:

Fig. 1 is a sectional view showing the spray plate in position on the die.

Fig. 2 is a view showing the die in completed operation.

Fig. 3 is a view of a similar form wherein the die has just completed the process of making the spray plate.

Fig. 4 is a perspective view of the spray plate members.

Fig. 5 is a view similar to Fig. 4 with the door valve in assembled position.

Fig. 6 is a fragmentary sectional view showing the die having sheared through a stop member on line 6—6 of Fig. 3.

Fig. 7 is a similar view in connection with a drawn stop member on line 7—7 of Fig. 3.

Fig. 8 is an elevational view of a sheared stop member on line 8—8 of Fig. 7.

Fig. 9 is an elevational view of a drawn stop member on line 9—9 of Fig. 6.

There is shown at 10 a spray plate forming the article of this invention and made according to the process of this invention. This spray plate 10 is provided with a central stream opening 11, a plurality of spray openings 12, a handle pivoting opening 13, a drawn valve stop member 14, and a sheared valve stop member 15. A valve door member 16 is secured on the spray plate 10 by a handle member 17 extending beyond the edge thereof and having a reduced neck extended through the pivoting opening 13, and through an opening in the stem or lever 18 of the valve member 16, to which it is secured by having its top edge 19 peaned over along a central line 20, to cause the same to be riveted thereto.

By moving the handle 17, it is obvious that the door valve member 16 may be moved to a closing position over the stream opening 11, the side of the lever 18 abutting against the stop members 14 and 15. The spray plate 10 is made by the process of placing a blank 23 on a female die 21, beneath a male die 22. The female die as shown is provided with a central opening 24 and a plurality of smaller openings 25, the die 21 being supported on a suitable base 26. Each of the openings 24 and 25, it will be observed, flare outwardly.

The male die 22 may include a central punch 27 for cooperating with the central opening 24 and a plurality of smaller individual male punches 28 for providing the spray openings 12. A slightly larger male punch 29, and a cooperating female opening in the female die provides the handle pivoting opening 13. Two special male punches and cooperating female openings are provided for simultaneously making the stop members 14 and 15. Although both forms of stop members are shown on the same plate, it will be apparent it is within the scope of this invention to likewise make both stop members either in the drawn form or in the sheared form, as well as in both forms as herein shown.

The drawn stop member 14 is made by providing a male punch 30 circular in cross-section and having a flat end 31, and a female recess 32 in the female die 21 of a corresponding shape and depth equal to the depth of the male punch 30, but having a radius greater than the radius of the punch 30 by an amount equal to the thickness of the spray plate 10. As will be apparent from inspection of Figs. 6 and 9, such a male punch 30 will draw the metal of the spray plate into the female recess 32 without cutting it or tearing it from the plate.

The male punches 28 which shear through the spray openings 12 are of a diameter equal to the minimum diameter of the openings 25 in the female die 21, the diameter of these being equal, the spray openings 18 are sheared completely through and the metal cut thereby falls through the bottom of the die 21 as at 33 and 34 in Fig. 2.

In order to provide a sheared stop member 15, a male punch member 35 is provided which has substantially the same radius as that of the male punches 28 but is of substantially half the thickness of the male punches 28. Furthermore, its end, instead of being flat as in the male punches 28, is sharpened and angular as at 36. The diameter of the female opening 37, through which this male punch 35 extends, is identical with that of the other female openings 25. Hence, as this punch 35 passes through the blank 23, it cuts around the sharpened angular end 36 but leaves the other side of the blank uncut as at 38, the sharpened angular edge 36 bending the cut portion back about the uncut portion 38 to thereby provide the sheared stop member 15.

This invention thus provides a spray plate having a central large stream opening and a plurality of small spray openings and simultaneously stop members which are either or both sheared or drawn all at a single stamping operation. The spray plate thus provided is then assembled by having the valve door member 16 operably secured thereto by riveting over a reduced neck 19 of the operating handle 17, to thus assemble the complete spray plate with its valve and operating handle.

The novel features and the operations of this device will be apparent from the foregoing description. While the device has been shown and the structure described in detail, it is obvious that this is not to be considered limited to the exact form disclosed and that changes may be made therein within the scope of what is claimed without departing from the spirit of the invention.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

1. A spray plate having a central stream opening and a plurality of spray apertures extending therethrough, and a valve stop member integrally extending from one side of said spray plate, said spray plate having a handle pivoting aperture therethrough, a door valve member, an operating handle and a neck extending from said handle through said handle pivoting aperture and riveted to said valve door member to secure said valve door member in operative position on the opposite side of said plate from said handle, said stop member limiting the movement of said valve member in one direction.

2. The process of making a spray plate comprising the step of stamping a blank simultaneously with a central stream opening, a plurality of spray openings, a stop member integrally extending to one side thereof, a handle pivoting aperture, and the further step of inserting a handle member through said handle pivoting aperture and peaning over the end of the handle through an opening in a door valve member to secure the door valve member in movable relation to the spray plate to abut against the stop member in one direction of movement.

CARL E. LEHMAN.