Aug. 14, 1945. R. W. WILSON 2,382,688

JET NOZZLE

Filed Sept. 11, 1944

Fig. 1.

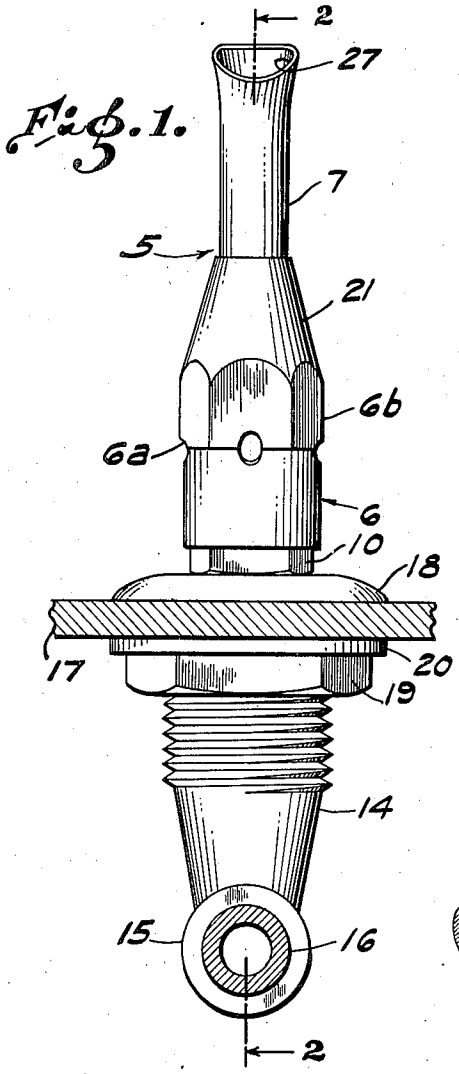


Fig. 2.

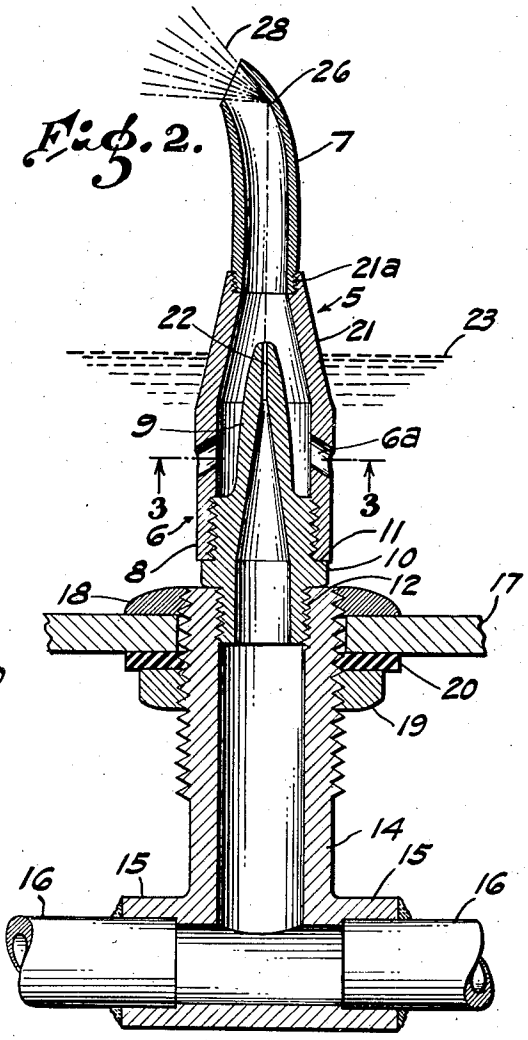
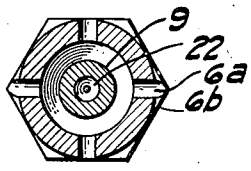


Fig. 3.



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JET NOZZLE

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Application September 11, 1944, Serial No. 553,577

2 Claims. (Cl. 299—154)

This invention relates to improvements in jet nozzles.

At the present time, in low water pressure systems the nozzles fail to prime due to their mouth portions not being so shaped as to produce the amount of suction required to entrain a sufficient liquid for priming purposes. It is an object of this invention to overcome this defect.

It is one of the important objects of the invention to provide a jet nozzle for use in dishwashing machines for more efficiently increasing the volume of water for washing the dishes when pumping under a given pressure, especially when such pressure in the supply line is low, and also for causing a more efficient rotation of the dish container basket when filled with dishes and against which the force of the discharged spray is directed.

A further important object of the invention is to provide a nozzle which is less likely to clog up by incrustations building up in its discharge end portion because of a weaker scouring action when the water pressure is low and not empowered with sufficient velocity to keep the detergent from clinging to the interior of the restricted passage through which the liquid that is to cleanse passes.

Also, it is an object to conserve material by constructing the device in two parts, each of said parts serving for a different diameter for the length of the nozzle.

The present application relates to an improvement upon the nozzle shown in applicant's Patent 2,315,572, issued April 6, 1943. The nature of said device is clearly set forth in said patent.

Referring to the accompanying drawing, which illustrates what is at present deemed to be a preferred embodiment of the invention,

Fig. 1 is an elevational view of the device showing it connected to a conduit of a water supply system and mounted in an operative relation to the tub or basin of a dishwashing machine only a fragment of the bottom of said basin being shown.

Fig. 2 is a vertical midsection on line 2—2 of Fig. 1.

Fig. 3 is a transverse section on line 3—3 of Fig. 2.

Referring in detail to the drawing, the device comprises a nozzle member 5 consisting of a cylindrical intake body portion 6 and a discharge portion 7. Said nozzle body has an internally screwthreaded skirt portion 8, said skirt having through it above its screwthreaded part a plurality of upwardly inclined intake passages 6a arranged in a circumferentially spaced apart series, through which water from the basin is entrained in a manner hereinafter described.

A conventional power jet 9 is screwed onto a tubular union 14, said jet being provided with a circumferential, hexagonal flange 10, thereby providing a shoulder 11 against which the lower end portion of said skirt abuts. Below said flange 10 said jet has an externally screwthreaded end portion 12 which screws into the mouth of the union 14, the latter being of an inverted T-shape, thereby providing at its lower end branches 15 adapted to receive conduit sections 16 to supply a current of liquid to said jet. The upper end portion of said union passes through the basin bottom 17, a water tight fit being secured by screwing into place the upper nut-like member 18 and the lower nut 19, a gasket 20 being interposed between the bottom of the basin and said nut 19.

Between the cylindrical bottom portion 6 of the nozzle and its discharge portion 7 said nozzle has a frusto-conical portion or reducer 21 the midlength portion of which surrounds the discharge end of the outlet 22 of the jet 9, said outlet being spaced slightly above the liquid level 23 in the basin. The mouth portion of said frusto-conical part 21 is internally screwthreaded at 21a to have screwed into it the lower, externally screwthreaded end of the discharge portion 7 of the nozzle, the internal screwthreads of the skirt portion of the nozzle being coarser than the threads 21a of the connection of the discharge portion 7 of the nozzle with the body portion thereof.

Said discharge portion 7 has its upper part laterally deflected in an arcuate manner so as to bring the internal surface of its wall into alinement with the upwardly produced axis of the jet 9, so that said produced axis meets said wall at a point designated 26 on Fig. 2.

The nozzle has around its mouth a semi-elliptical lip portion 27, the lower convex portion of said lip being somewhat widened or flared, said mouth lying in a plane slightly inclined from the vertical, so that the conically expanded deflected stream 28 of spray which issues from the nozzle has its axis substanaially coinciding with the center of said nozzle mouth. Or the mouth of the discharge end of the nozzle may be described as having the shape of an ellipse the upper side of which is flattened parallel to its long axis.

In the operation of the device, it is to be understood that a stream of liquid is supplied from

an outside source under pressure from the conduit 16 through the fitting 14 into the jet 9, the water level 23 being slightly spaced below the mouth of the jet 9 as shown in Fig. 2. As the water under pressure is expelled through the mouth of the jet it strikes the inner surface of the discharge nozzle at the indicated point 26, causing a generally conical deflection or expansion of the stream into a spray out through the mouth of the discharge portion of the nozzle and thereby creates a current of air out through said mouth, which produces a suction within the nozzle, in turn entraining the liquid from the basin through the passages 6a. Owing to the great velocity of the stream of water from the greatly tapered jet 9, sufficient force is imparted to the spray delivered as stated to accomplish the desired result, in respect to rotating the dish basket and including an efficient washing of the dishes against which the spray is directed.

The screwthreaded connection 21a is made sufficiently tight so that the nozzle 7 may be selectively positioned circumferentially and will remain in a somewhat selectively adjusted position in a friction tight manner due to the clearance between cooperating threads. As viewed in Fig. 1 it will be seen that the nozzle has an externally hexagonal portion 6b to receive a wrench whereby the nozzle body may be screwed onto the jet piece in so secure a manner that its rotational position will not be disturbed when the nozzle discharge portion 7 is rotationally adjusted.

By virtue of the fact that the discharge portion 7 of the nozzle may be constructed of one size of tubular material, and the remainder of the nozzle made from tubular material of a different diameter, a considerable saving of material is effected.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the subject matter claimed.

What is claimed is:

1. In a device of the kind described, a nozzle body for screwing onto the externally screwthreaded portion of a jet piece so as to produce an annular passage between said nozzle body and said jet piece, there being liquid intake passages leading through said nozzle body into said annular passage, a tubular nozzle discharge part, said nozzle body being cylindrical and having a frusto-conical upper end portion to the upper end of which said tubular discharge part is secured, said frusto-conical part acting as a reducer between the body portion of the nozzle and its said tubular discharge part, said nozzle discharge part having a deflected discharge portion provided with a mouth shaped as an ellipse one side of which is flattened parallel to its long axis, said flattened side being uppermost, said mouth being so positioned in relation to the axis of said nozzle discharge part that a conically expanded body of spray directed through said mouth by the deflected nozzle discharge part will act to produce a differential in pressure which will prime the nozzle, by entraining liquid through the aforesaid liquid intake passages.

2. In a nozzle structure, a nozzle proper having a tubular skirt portion provided with a diametrically contracted tubular axial extension which is joined to said extension by a frusto-conical reducer, said nozzle proper having its discharge end portion deflected toward one side thereby causing its inside surface to intersect its axis, and a jet piece within said nozzle proper positioned to direct a small, high velocity stream of liquid against said inside surface to be thereby deflected out of the mouth of the nozzle as a generally conically shaped body of spray, the nozzle having around its mouth an approximately semi-elliptical lip portion the lower convex portion of said lip being somewhat widened or flared, said mouth lying in a plane slightly inclined from the vertical whereby the conically expanded deflected stream of spray which issues from the nozzle has its axis substantially coinciding with the center of said nozzle mouth, there being liquid inlet means positioned to admit liquid to said skirt portion of said nozzle thence to be entrained through the nozzle by said body of discharged spray.

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