

[54] **NOZZLE FOR SPRAYING FOAMING MATERIALS**

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[51] Int. Cl. B05b 7/06

[58] Field of Search.....239/404, 424, 405, 406

[56]

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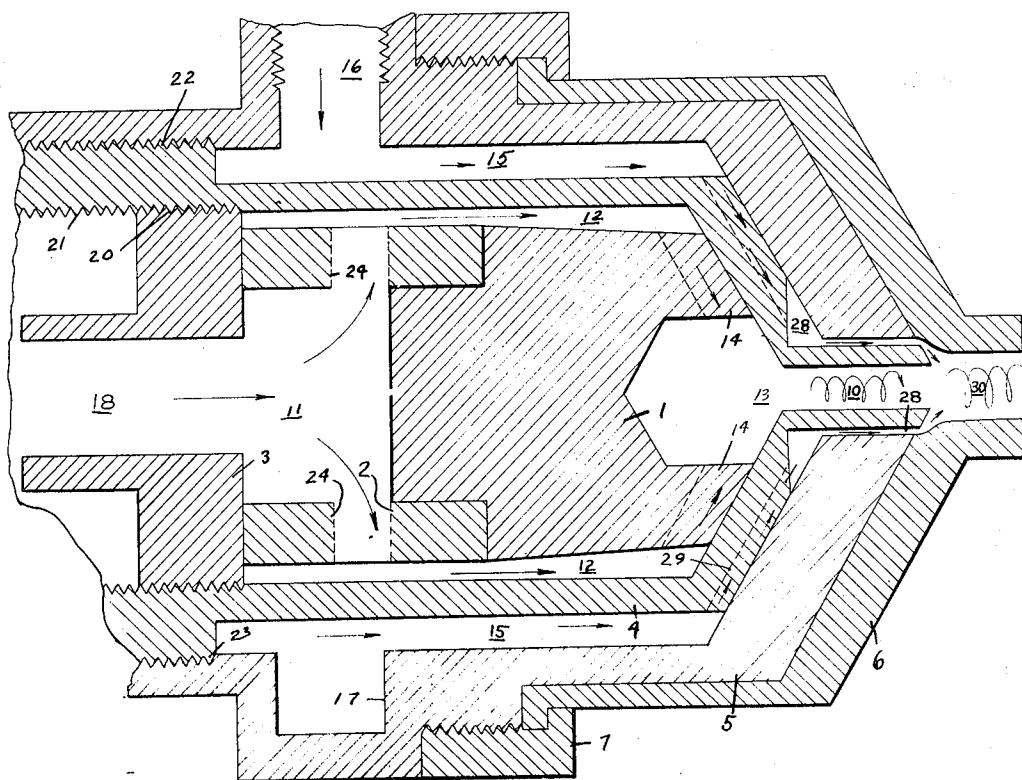
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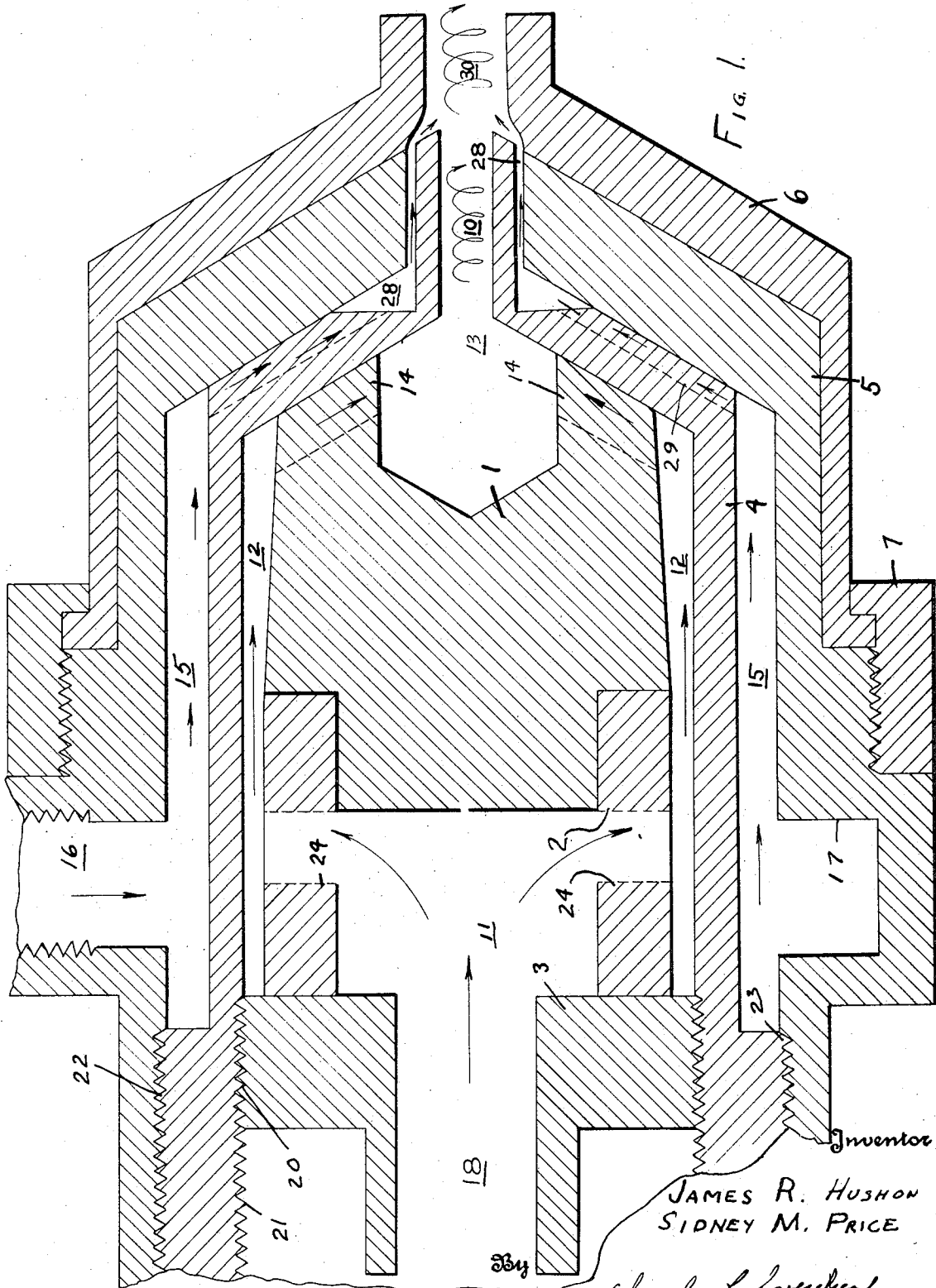
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ABSTRACT

The specification discloses a spray nozzle assembly for simultaneously spraying two materials, such as the material and catalyst of urethane foam. The nozzle assembly is made up of two concentric spray nozzle members defining a central path and a cylindrical path concentric to the central path. The nozzles are so arranged that the material is given a turbulent motion as it emerges from the nozzle thereby causing a mixing of the two materials. The assembly can be used without a pump connected to a source of pressure.

3 Claims, 5 Drawing Figures





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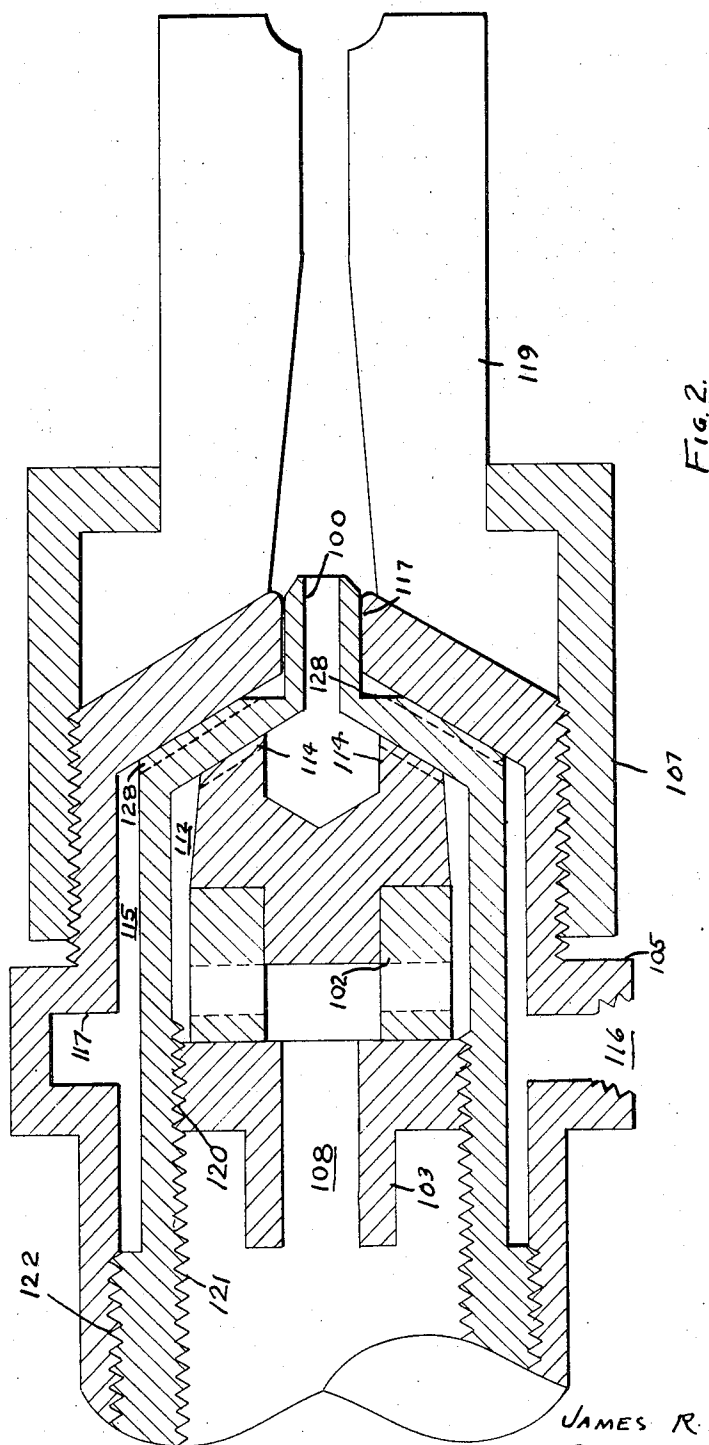


Fig. 2.

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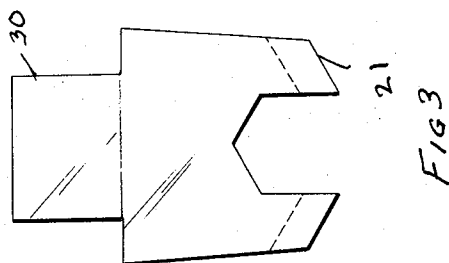
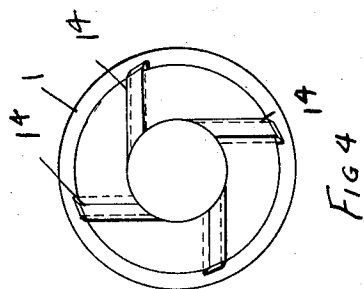
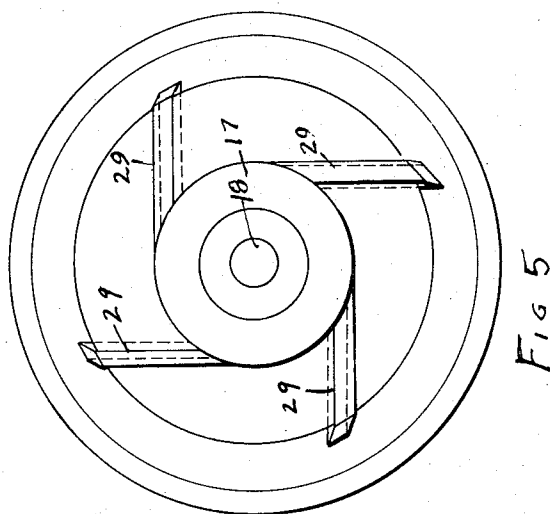
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NOZZLE FOR SPRAYING FOAMING MATERIALS

OBJECTS OF THE INVENTION

It is an object of the invention to provide an improved nozzle arrangement.

Another object of the invention is to provide a mixing nozzle for urethane foam.

Another object of the invention is to provide an improved machine for applying urethane foam.

With the above and other objects in view, the present invention consists of the combination and arrangement of parts hereinafter more fully described, illustrated in the accompanying drawings and more particularly pointed out in the appended claims, it being understood that changes may be made in the form, size, proportions, and minor details of construction without departing from the spirit or sacrificing any of the advantages of the invention.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a longitudinal cross sectional view of the nozzle according to the invention.

FIG. 2 is a longitudinal cross sectional view of another embodiment of the invention.

FIG. 3 is a side view of the primary stabilizer 1.

FIG. 4 is a front view of the primary stabilizer 1.

FIG. 5 is a front view of the secondary stabilizer housing 4.

DETAILED DESCRIPTION OF THE DRAWINGS

Now with more particular reference to the drawings, the nozzle is made up of a primary stabilizing member which may be connected to a source of supply of a first material 18. The member 3 is externally threaded 20 and received on the internal threads 21 of the secondary stabilizing housing 4. The secondary stabilizing housing 4 has an external thread 22 which is received in the internal thread 23 on the secondary control housing 5. The secondary control housing 5 has an annular chamber 17 that connects to a source of supply at 16. The primary stabilizer support 2 is supported on a reduced size portion of the primary stabilizer 3 as shown. The primary stabilizer support 2 is a hollow cylindrical member having radially disposed openings 24 through which the material from the chamber 11 can travel into the chamber 12. The primary stabilizer 1 has tangentially disposed openings 14 that communicate from the annular space of chamber 12 to the central annular space 13 from whence the material can flow out the end 10 of the secondary stabilizer housing 4. The secondary control housing 5 is hollow and its front internal surface engages the front end of the secondary stabilizer housing 4. The material may flow from the annular space 17 through the annular chamber 15 and through the radially disposed openings 29 to space 28 and out through the end 30. Since the openings 14 and 29 are tangentially disposed relative to the central opening 13, the material passing from the chamber 12 to the chamber 13 is given a swirling action which it maintains as it passes from the exit end of chamber 13.

The second material passing from the supply source at 16 is passed through the chamber 15 and through the openings 29 to the space 28. This material, in passing

through the openings 29 which is tangential to the space 28, is given a swirling action which it maintains as it passes from the exit end of space 28 and end 30.

The pattern control orifice member 6 is held onto the secondary control housing 5 by means of a ring 7, thus the nozzle may be dismantled by removing the ring 7 thereby allowing the pattern control orifice member 6 to be removed and by removing the member 5 from the member 4 at external threads 22. Then member 4 can be removed from member 3 at external threads 20. This will allow the member 1 to be released as well as the primary stabilizer support 2.

The embodiment of the invention shown in FIG. 2 is similar to that shown in FIG. 1; that is, the members are shown having 100 added to the part numbers. The ring 107 in FIG. 2, however, holds the extension of 119 in place for extruding the material.

The foregoing specifications sets forth the invention in its preferred practical forms but the structure shown is capable of modification within a range of equivalents without departing from the invention which is to be understood is broadly novel as is commensurate with the appended claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A nozzle structure for spraying urethane foam comprising a central cylindrical passage in said nozzle structure,
 - said passage extending from the central rear of said nozzle structure toward the front thereof,
 - means for connecting said central passage to a source of first material,
 - a central cylindrical inner member,
 - an intermediate hollow cylindrical member and an outer hollow cylindrical member,
 - said central cylindrical member and said intermediate cylindrical member and said outer hollow member being disposed concentric to each other,
 - said central cylindrical member and said intermediate cylindrical member defining a first annular passage,
 - said outer hollow member and said intermediate cylindrical member defining a second annular passage,
 - said intermediate hollow cylindrical member terminating in an end having an inside surface defining a frustum of a cone and an outside surface defining a frustum of a cone,
 - a tubular member fixed to the outside of said intermediate hollow cylindrical member end,
 - said outer cylindrical member having an end with an inside surface defining the frustum of a cone,
 - a round opening in the center of said end of said outer hollow cylindrical member,
 - said tubular member extending through said opening in said end of said outer cylindrical member defining an annular outlet space between said outer cylindrical member end and the outside of said tubular member,
 - the outside of the end of said intermediate cylindrical member engaging the inside surface of said outside cylindrical member end,
 - said central passage communicating with said second annular cylindrical passage,

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said first annular cylindrical passage communicating with a central cylindrical discharge passage by way of spaced first passages formed in the end of said central cylindrical member,
said spaced passages being disposed tangentially to said central cylindrical passage whereby fluid in said spaced passages is given a swirling motion, and said second annular passage having means for connecting it to a source of fluid material,
said second annular passage being adapted to be connected to a second source of material to be mixed with said first material,
a cylindrical outlet passage,
said cylindrical outlet being aligned with the inside of said tubular member and the said annular outlet, spaced second passages communicating between said second annular passage and said annular outlets,
said spaced second passages being tangential to said

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outlet passage whereby said second material is given a turbulent flow relative to said first material.

2. The nozzle structure recited in claim 1 wherein when said means for giving said first material and said second material swirling motions comprises a central path and an inner member,

slots in said outer member disposed tangentially to said central path diverting said second material from said outer annular path toward said central path.

3. The nozzle structure recited in claim 1 wherein means is provided in said outer member to give said second material a spiral motion in a circular path concentric to said inner path and an annular end opening into which said materials are directed whereby said materials mix together and are discharged.

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