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STEAM AND CLAY MIXING NOZZLE

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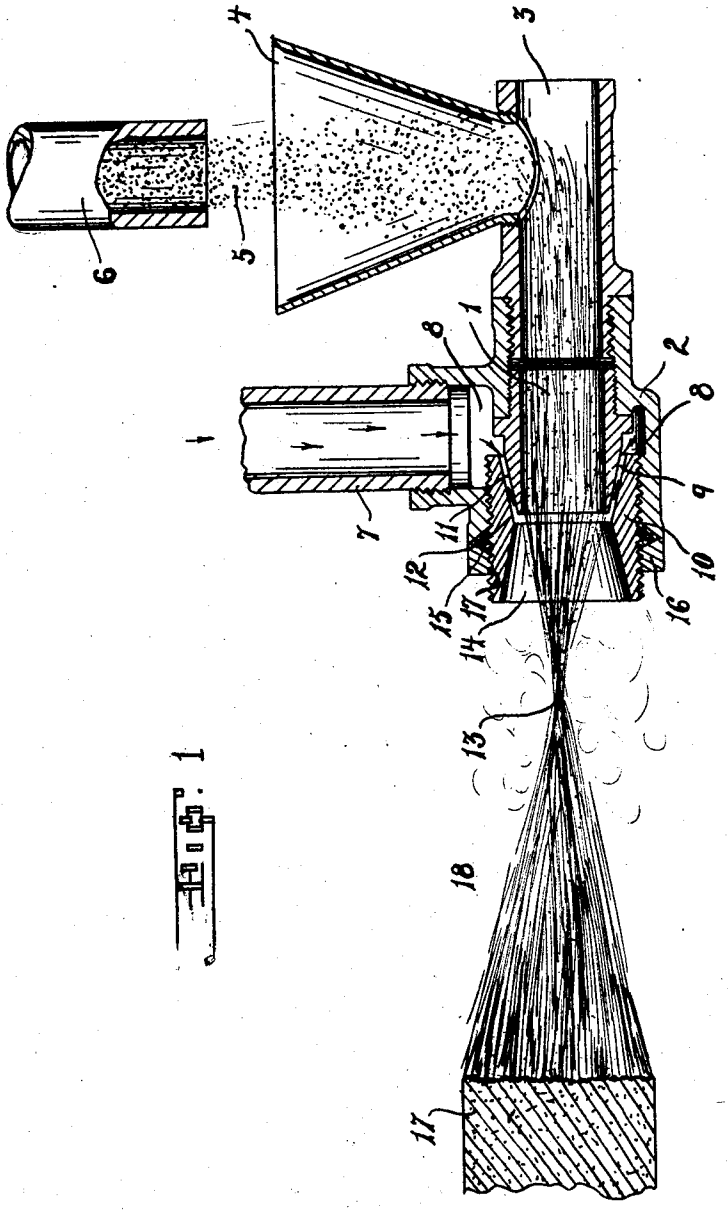



Fig. 1

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# UNITED STATES PATENT OFFICE

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## STEAM AND CLAY MIXING NOZZLE

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My invention relates to a class of nozzles adapted to be attached to pipes connected with a source of supply of granular veneer materials such as fine clay and the like and a source of fluid supply in a manner that will permit the fluid to be admitted to the nozzle and released therefrom under variable pressures for the purpose of carrying with it the granular veneer materials and forcefully projecting them onto and into surfaces that are adapted to be veneered thereby.

A particular object of my invention is to provide preferably a steam and clay mixing nozzle with which an operator may direct the mixture of steam and clay to the plastic surfaces of a ribbon of clay as it comes out of the forming die and to cause such mixture of the two after each has left the nozzle and thus heating and projecting the veneer materials by steam and thus avoid any accumulation of wet clay and the like on the inner surfaces of the nozzle.

A further object of my invention is to provide in a nozzle of this kind an arrangement whereby the clay or other fine veneering materials may be sucked into and through a central tubular member of the nozzle by the force of and bathed in the hot steam under variable pressures escaping from the steam outlet of the nozzle which in this case is an annular discharge opening surrounding the discharge end of the central clay conducting tube and arranged in a manner that permits the steam to escape from around the outlet of the central tube at such an angle of projection of the foreful escape of steam that it will suck the supply of veneer materials into the steam line bringing the dry materials first into contact with the steam at a point beyond the end of the discharge mouth of the nozzle, where the veneer materials are heated and projected by the steam.

I attain the objects of my invention in the device described in the annexed specifications, recited in the claims and illustrated in the accompanying drawings in which like reference numerals indicate like parts in the several figures.

Referring to the figures:

Figure 1 is a longitudinal half section of the nozzle of my invention showing its construction as assembled and its relative position to the source of steam and clay supply as well as a clay column on which it is adapted to project the veneer materials.

Referring in detail to the drawings for the description of my device I shall now show the construction and manner of operating the steam and clay mixing nozzle of my invention.

I provide a central tubular sleeve —1— adapted to accommodate the passage of clay and the like in fine granular, preferably dry, form through the steam and clay mixing nozzle. This central sleeve is preferably held adjustably into normal operating position by screw threads that hold the sleeve substantially within casing —2— of the nozzle.

At the rearward opening of the nozzle is attached, by threads, an extension tube —3— and a funneled receiving hopper —4— adapted to receive within the nozzle the granular particles of clay and the like —5— carried to hopper —4— through distributing tubes —6—.

When steam or other fluids under relatively high pressure is admitted to the nozzle through fluid pipes —7— it enters an annular recess —8— within casing —2— from which it normally escapes from the discharge end of the nozzle through an annular opening —9— made variable in size by screw adjustment either of outer sleeve —10— or central tube —1—.

Central tube —1— has an outer annular taper —11— with which the inner annular taper —12— of sleeve —10— adjustably fits in registry for the escape of steam from annular recess —8— of the nozzle in a manner that will bring the fluid and clay into contact with each other at a point beyond the end of the nozzle indicated in its approximate position by numeral —13—.

The outer flare —14— of the discharge mouth-piece —10— of the nozzle is provided in the relative form indicated to provide a free and clear movement of the veneer particles as they are projected from the nozzle by the forceful escape of steam under pressure which for heating and projecting purposes is preferably used in order that the same may

suitably moisten and heat the veneer materials while projecting them from the nozzle to the body on which the veneer materials are being projected.

When using steam with this nozzle it is advisable to use a suitable form of packing —15— around sleeve —10— and held in place by a threaded ring —16— thus to prevent the escape of steam through thread —17— on the outside of sleeve —10— between this sleeve and casing —2—.

In the preferred use of this nozzle, granular particles of clay and the like are forcefully sucked through central tube —1— and forcefully projected into a plastic ribbon of clay —17— after being moistened while in the steam line —18—. While the veneer materials are thus being projected from the nozzle they do not meet the heating and moistening steam until they have passed beyond contact with the discharge mouthpiece of the nozzle. With the veneer materials therefore conducted dry through the central tube of the nozzle and not meeting with the steam until they have passed beyond contact with the nozzle there will be no accumulation of moistened clay and the like on the surfaces of the discharge mouth-piece of the nozzle.

The preferred use of this nozzle is in connection with the veneering of a plastic ribbon of clay and the like while the same moves out of a die where a plurality of nozzles are placed in registry with the exposed faces of the clay column; where the column is substantially veneered with granular particles of clay and the like or other veneering materials by being projected into the exposed plastic faces of the column by the escape of steam under relatively high pressure; whereby the granular veneer materials are moistened while being projected.

Having thus described the nature of my invention, what I claim is:

1. A steam and clay mixing nozzle comprising in co-operative combination a central discharge tube provided with an outer annular converging tapering surface at the discharge end, a fluid pressure jacket encompassing and supportably engaging the tube, co-operating with the central discharge tube to define an annular tapering duct encircling the discharge mouth of the central discharge tube; said annular duct being of a cone frustrum formation whose apex is beyond the essential limits of the discharge end of the annular sleeve.

2. A steam and clay mixing nozzle comprising in co-operative combination a central discharge tube provided with an outer annular converging tapering surface at the discharge end, a steam jacket encompassing and detachably supporting the discharge tube, an adjustable sleeve within the jacket and adjustably co-operating with the outer tapering surface of the central discharge tube to define an annular tapering duct encircling the discharge mouth of the central discharge tube; said annular duct being of a cone frustrum formation whose apex is beyond the essential limits of the discharge end of the annular adjustable sleeve; means co-operating with said adjustable sleeve and jacket for preventing unnecessary escape of steam from the nozzle and means detachably connected with said jacket for feeding granular clay and the like into said central discharge tube.

3. A steam and clay mixing nozzle comprising in combination a central discharge tube having a uniform opening throughout its length, outer screw threads at the inner end and an outer annular converging tapering surface at its discharge end, a T coupling forming a steam jacket encompassing and detachably supporting the central discharge tube within the jacket and threaded at its openings; said central tube provided with an annular integral collar defining the limits of its threaded end and providing stop means to prevent undesired escape of steam, a threaded sleeve adjustably secured within a threaded opening of the jacket; said sleeve having an inner converging tapering surface co-operating with the outer tapering surface of the discharge end of the central tube to define an annular tapering duct encircling the discharge mouth of the central discharge tube; said tapering duct being of cone frustrum formation whose apex is beyond the essential limits of the discharge end of the adjustable sleeve; said sleeve having an inner diverging tapering surface at its discharge end; a threaded collar co-operating with said sleeve and jacket for preventing unnecessary escape of steam, means detachably connected with said jacket for feeding granular clay and the like thereto and means connected with said coupling for feeding steam under pressure into the steam jacket thereof.

In witness whereof, I hereunto set my hand this 30th day of September, 1927.

EMMETT V. POSTON.