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(72) MICHAEL, Hans Peter, CH
(72) HAAS, Gerald, CH
(71) ITW GEMA AG, CH

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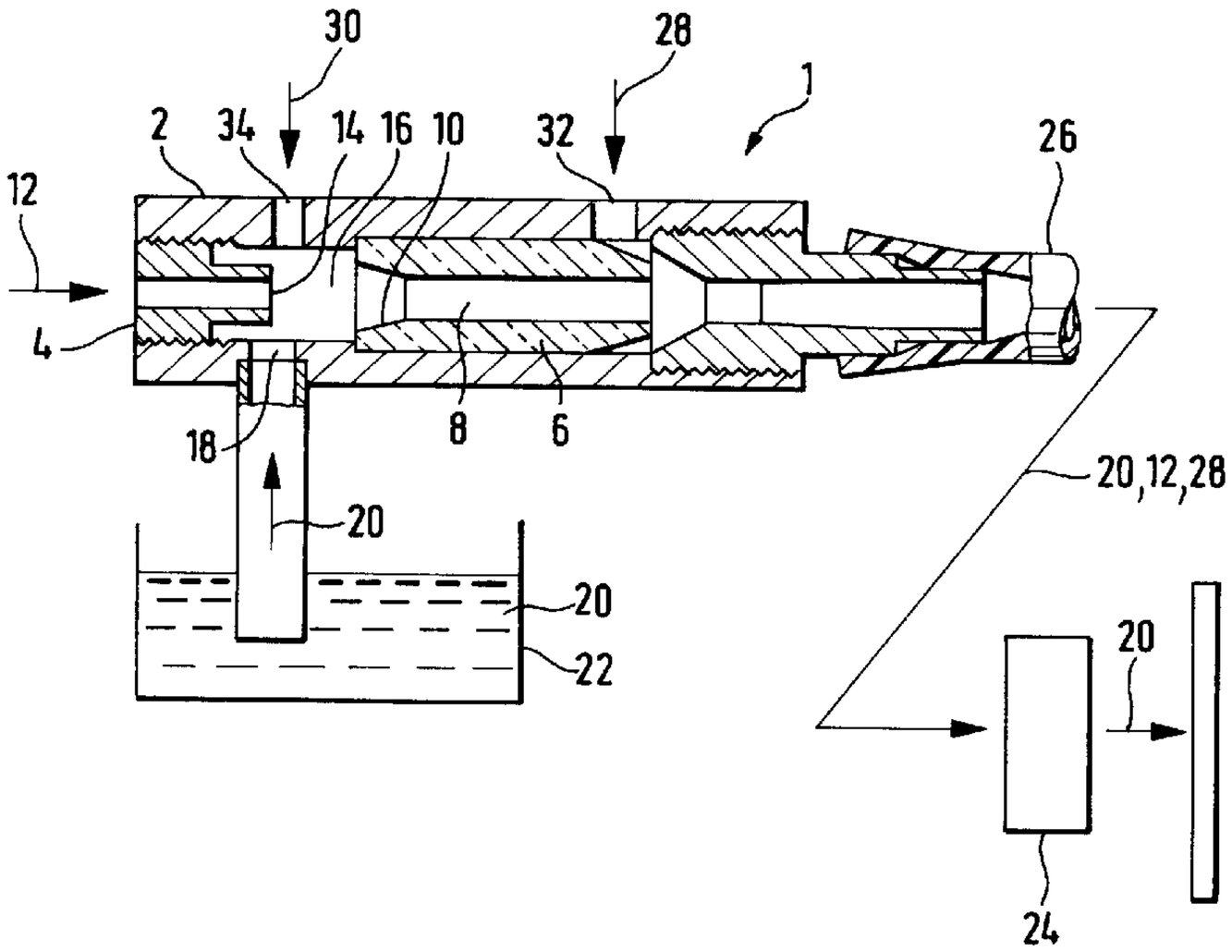
(54) **INJECTEUR TRANSPORTEUR**
(54) **CONVEYING INJECTOR**



(57) A powder-conveying injector to move coating powder and wherein the jet guiding duct (8) of the axial guiding nozzle (6) is made of glass.

CONVEYING INJECTOR

ABSTRACT

A powder-conveying injector to move coating powder and wherein the jet guiding duct (8) of the axial guiding nozzle (6) is made of glass.

Fig. 1.

CONVEYING INJECTOR

The invention relates to a powder-conveying injector to convey coating powders as defined in the preamble of claim 1.

Injectors of this kind comprise a conveying jet nozzle, a body defining a jet guiding duct opposite and axially spaced from said nozzle, and a powder-aspirating aperture affixed to the conveying jet nozzle or between it and the jet guiding duct. Furthermore one or more apertures for additional air may be present at the conveying-jet nozzle or between it and the jet guiding duct or downstream of the latter. Injectors of this kind are known in various embodiments from the German patent documents 1,266,685; 1,922,889 and C2 42 01 665. The jet guiding duct is frequently also called "guiding nozzle".

The known injectors incur the drawback that the airflow and the powder particles wear down the jet guiding duct. As a result, not only must the jet guiding duct be exchanged frequently, but also, depending on the rate of wear, the volumetric powder flow (quantity of is powder conveyed per unit time) will change, entailing non-uniform coating thicknesses of a workplace being coated. The known jet guiding ducts are made of metal or plastic. A metal is disadvantageous in that the powder particles tend to adhere to and sinter onto the wall of the jet guiding duct. As a result the cross-section of the guiding duct varies and hence the volumetric powder flow. Plastics offer better slippage than metal, and typically those plastics are selected for which the powder particles show minimal adhesive friction. But in this design as well powder particle accretion and incipient sintering cannot always be reliably avoided. Moreover plastics are "softer" than metal and accordingly suffer more from wear.

The invention's objective is to achieve a lesser rate of wear of the jet guiding duct and reducing, or even completely avoiding accretions and incipient sintering of powder particles.

The invention solves this problem in that the jet guiding duct is made of glass with a smooth duct surface at least in those zones of the jet guiding duct where a jet of powder conveying air impinges on it.

The invention offers the advantages that practically no sintering onto and practically no wear occur in the jet guiding duct. As a result uniform powder conveyance is assured also over long time spans of operation.

Further features of the invention are stated in the dependent claims.

Powder conveying injectors of the invention may be designed in arbitrary manner; this is also the case for the state of the art. Illustratively one or more intakes of additional air may be present in the partial-vacuum zone of the injector and/or downstream from it in the powder duct transmitting the air-powder mixture.

The invention is described below in relation to the drawing.

Fig. 1 is an axial section of a powder conveying injector of the invention used to convey coating powders.

The injector of Fig. 1 comprises a conveying jet nozzle 4 in a housing 2 and, at an axial distance from the nozzle 4, an axial guiding nozzle body 6 with a jet guiding duct 8 which is frustoconically tapering at its upstream end zone 10. Beyond the nozzle aperture 14 of the conveying jet nozzle 4, a conveying airflow 12 generates a partial vacuum in a partial-vacuum zone 16 of the housing 2 to aspirate coating powder 20 from a powder container 22 through a powder aspiration aperture 18. The aspirated coating powder 20 is moved by the conveying airflow 12 into the jet guiding duct 8 where it partly impinges on the wall of duct 8.

The jet guiding duct 8 is composed of glass with a very smooth duct surface at least in the zone 10 where powder particles impinge on the duct wall. Preferably the entire guide

nozzle 6 is made of this glass. The glass should be as hard as possible, for instance being sapphire glass. Its duct surface should be as smooth as possible. An especially smooth surface can be achieved by glass blowing when manufacturing the glass.

The pneumatically moved powder 20 can be moved from the injector 1 to a further container or to a spray device 24, illustratively a manual or automatic spray gun with which the powder is sprayed on the objects to be coated.

The magnitude of volumetric flow of powder (the quantity of powder moved per unit time) depends foremost on the magnitude of the partial vacuum in the partial-vacuum zone 16 and thereby primarily on the magnitude of the flow 12 of conveying air. For small quantities of powder per unit time, the conveying air flow 12 may be so slight that some powder will deposit in the powder line 26 connecting the injector 1 to the powder recipient 24. Accordingly additional air 28 is conventionally introduced into the flow of powder-conveying air beyond the partial-vacuum zone 16 in order to regulate the total quantity of air required to convey powder in the powder line 26 without forming powder deposits in latter.

One or more intakes 32 for additional air 28 can be situated downstream of the guiding nozzle body 6 as shown in the drawing, or upstream of it. The feasibility of introducing additional air 30 upstream of the guiding nozzle 6 is indicated by an arrow and a further intake 34.

Preferably the guiding nozzle body 6 is mounted exchangeable in the housing 2, for instance being plugged or screwed into it.

WHAT IS CLAIMED IS:

1. A powder conveying injector to convey coating powder, comprising a conveying jet nozzle (4), a jet guiding duct (8) axially spaced from and opposite said nozzle (4), and a powder aspirating aperture (18) in the conveying jet nozzle (4) or between it and the jet guiding duct (8), characterized in that the jet guiding duct (8) consists of glass with a smooth duct surface at least in a zone (10) where it is impinged by a jet of powder-conveying air.

2. Powder conveying injector as claimed in claim 1, characterized in that the glass of the jet guiding duct (8) is sapphire glass.

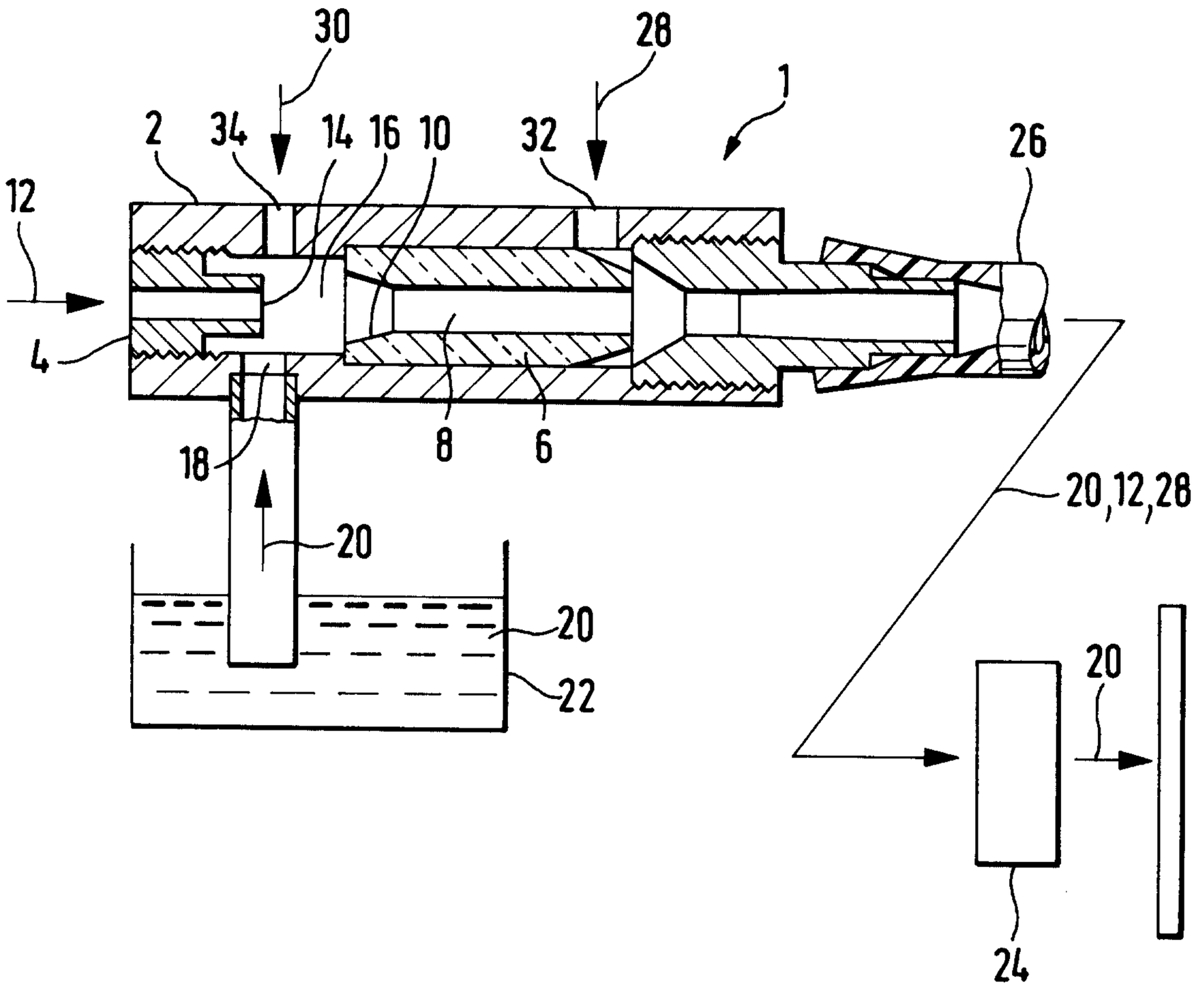
3. Powder conveying injector as claimed in either of claims 1 and 2, characterized in that a body (6) forming the jet guiding duct (8) is exchangeably inserted into a housing (2).

4. Powder conveying injector as claimed in one of claims 1 through 3, characterized in that the jet guiding duct (8) is of frustoconical in cross-section and tapers inwardly in the direction of flow, at least in the zone (10).

5. Powder-conveying injector as claimed in one of the above claims, characterized in that the at least one-intake (32, 34) of additional air is situated downstream of the jet guiding nozzle (4).

6. Powder-conveying injector as claimed in claim 5, characterized in that the at least one intake (32) of additional air is situated downstream of the zone of the jet guiding duct (8).

FIG.1



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