(54) Titre : APPAREIL SERVANT A DOSER DES PIGMENTS DE PEINTURES
(54) Title: APPARATUS FOR METERING PIGMENTS FOR PAINTS

(57) Abrégé/Abstract:
An apparatus for metering pigments for paints and the like comprises a bearing framework thereon there is provided a rotary carousel supporting a plurality of pigment vessels each provided with a delivery or metering assembly. The main feature of the invention is that the delivery assembly comprises a valve element including a closure stem which can be located at a closing position, an opening position and a draining position in which the stem partially projects from the delivery nozzle.
APPARATUS FOR METERING PIGMENTS FOR PAINTS

ABSTRACT

An apparatus for metering pigments for paints and the like comprises a bearing framework thereon there is provided a rotary carousel supporting a plurality of pigment vessels each provided with a delivery or metering assembly. The main feature of the invention is that the delivery assembly comprises a valve element including a closure stem which can be located at a closing position, an opening position and a draining position in which the stem partially projects from the delivery nozzle.
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BACKGROUND OF THE INVENTION

The present invention relates to an apparatus for metering pigments for paints and the like.

There are already known apparatuses for metering pigments for paints and the like, which pigments are introduced into the paint materials, pre-set with base colours, so as to provide desired colour paints.

These prior apparatuses usually comprise a plurality of vessels permitting delivery of metered amounts of pigments, the vessels being provided, at the metering outlets thereof, with three-way rotary valves or with blade valves.

Such an approach is affected by several drawbacks since pigment deposits are frequently left at the delivery nozzle.

This drawback, in particular, is due to the fact that, as a pigment delivery is shut-off, the metering operation cannot be performed with the required accuracy; moreover, the formed deposits can prevent subsequent metering operations from being properly performed.

All the prior apparatuses, actually, are affected by the abovementioned drawbacks since they do not allow for precisely metering the pigment amount being introduced into the paint.

SUMMARY OF THE INVENTION

Accordingly, the aim of the present invention is to overcome the abovementioned drawbacks, by providing an apparatus for metering pigments for paints and the like, which comprises a new type of valve allowing to perfectly drain or clean the nozzle used for metering the pigment, while allowing a very accurate metering of the pigment without generating pigment deposit and the like.

Within the scope of the abovementioned aim, the invention seeks to provide such an apparatus which allows to perform a very accurate metering of the pigments, while preventing the pigments from dripping and which, moreover, is very
reliable and safe in operation.

Another aspect of the present invention is to provide such a pigment metering apparatus which can be easily made from easily available elements and materials and which, moreover, is very competitive from a mere economic standpoint.

According to one aspect of the present invention, there is provided an apparatus for metering pigments for paints comprising a bearing framework supporting a rotary carousel which support a plurality of pigment vessels, each vessel being provided with a pigment delivery assembly. Each pigment delivery assembly comprises a pigment delivery nozzle and a suction piston having a piston rod connected at a top portion thereof to a driving block slidably supported by an upright and connected to a first ball circulation assembly allowing the driving block and the piston rod to be precisely displaced near the suction piston. Valve means include a valve stem having a head connected to a second movable block also slidably supported on the upright and connected to a second ball circulation assembly driving the second movable block. The valve stem slides within a chamber and is provided with a middle or reduced neck portion whereby first duct means in the chamber provides for communication of second duct means of a pigment delivery vessel with third connecting duct means of the suction piston. In operation the valve stem can be moved from a first pigment delivery nozzle closed position in which the stem closes the pigment delivery nozzle and the neck portion of the stem is positioned such that the second duct means of the pigment delivery vessel communicates with the third connecting duct means of the suction piston, to a second pigment delivery nozzle open position whereby the suction piston can draw pigment from the pigment delivery vessel and then to a third residue pigment removing position in which the stem is caused to project from the pigment delivery nozzle.

BRIEF DESCRIPTION OF THE DRAWINGS

Further characteristics and advantages of the invention will become more apparent hereinafter from the following detailed disclosure of a preferred, though not exclusive, embodiment of an apparatus for metering pigments for paints
and the like, which is illustrated, by way of an indicative, but not limitative, example, in the figures of the accompanying drawings, where:

Figure 1 is a schematic view illustrating the delivery or metering assembly in a closure position thereof.

Figure 2 illustrates the delivery assembly in an opening position thereof.
Figure 3 illustrates the delivery assembly in a draining position thereof.
Figure 4 is a side elevation view of the subject apparatus.
Figure 5 is a partial cross-sectional view illustrating several delivery assemblies included in the subject apparatus.
Figure 6 is a top plan view of the subject apparatus.
Figure 7 is a bottom view of the apparatus, in which there is clearly illustrated the arrangement of the pigment vessels.

**DESCRIPTION OF THE PREFERRED EMBODIMENT**

With reference to the number references of the abovementioned figures, the apparatus, for metering pigments for paints and the like, according to the present invention, comprises a bearing framework, generally indicated at the reference number 1, in which there is provided a carousel 2 which can rotate step by step about a vertical axis, said carousel supporting a plurality of pigment vessels 3, each of which is provided with a delivery or metering assembly, generally indicated at the reference number 4, allowing a pigment to be properly delivered, in a set dose amount, at a pigment delivery station, generally indicated at the reference number 10.

Each pigment delivery assembly, as is clearly shown in Figures 1, 2 and 3, comprises a suction piston, indicated at 11, the piston rod 12 of which is connected at the top thereof to a driving block 13, which is slidably guided by an upright 14, (Figure 5) and is connected to a ball circulation assembly 15, allowing the block to be precisely displaced, together with the piston rod 12 of the piston 11.

Near the piston 11 there is provided a valve element, generally indicated at the reference number 20, which is provided with a stem 21 including a head 22 which is connected to a movable block 23, which can also slide on the upright 14,
(Figure 5) and is connected to a second ball circulation assembly 25, provided for driving said block 23.

The stem 21 is provided, at a middle portion thereof, with a cut-out 30 providing, inside the chamber 31 in which the stem 21 can slide, a duct adapted to communicate the vessel 3 connecting duct 32 with the piston 11 connecting duct 33.

More specifically, the stem 21 can be displaced to a closure or closing position, shown in Figure 1, in which the stem will close the outside communicating nozzle 35, whilst the neck portion 30 will cause the channels 32 and 35 to communicate with one another, so as to allow the piston 11 to withdraw the pigment.

In an opening position, the stem 21 is caused to rise, so that its free end portions will uncover the port 35 of the piston 11 communicating duct 33, so as to allow the piston to eject the pigment.

At the end of the pigment delivery step, the stem 21 is brought to a draining position, i.e. it is downwardly driven, so as to shut-off the communication with the outside and at least partially project from the port 35, to allow said stem to remove possible pigment residues thereby preventing deposits from forming and allowing a very accurate metered delivery of the pigment under all conditions.

From the above disclosure it should be apparent that the invention fully achieves the intended aim and objects.

In particular, the fact is to be pointed out that an apparatus has been provided in which the valve element 20, being provided with three positions, will permit a full draining of the delivery port or nozzle, thereby preventing possible deposits from forming.

Moreover, the disclosed ball circulation construction for operating both the piston and the valve element will provide a very accurate and precise operation.

The invention, as disclosed, is susceptible to several variations and modifications, all of which will come within the scope of the inventive idea.

Moreover, all of the details can be replaced by other technically equivalent elements.

In practicing the invention, the used materials, provided that they are
compatible to the intended use, as well as the contingent size and shapes, can be any, depending on requirements.
The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An apparatus for metering pigments for paints comprising a bearing framework supporting a rotary carousel which in turn supports a plurality of pigment vessels each provided with a pigment delivery assembly, wherein each said pigment delivery assembly comprises a pigment delivery nozzle and a suction piston having a piston rod connected at a top portion thereof to a driving block slidably supported by an upright and connected to a first ball circulation assembly allowing said driving block and said piston rod to be precisely displaced near said suction piston, valve means including a valve stem having a head connected to a second movable block also slidably supported on said upright which block is connected to a second ball circulation assembly for driving said movable block, said valve stem sliding within a chamber and having a reduced middle neck portion providing, in said chamber, first duct means adapted to provide flow communication between second duct means of a said pigment delivery assembly with third connecting duct means of said suction piston, said valve stem adapted to be driven from a first pigment delivery nozzle closing position in which said stem will close said pigment delivery nozzle and said neck portion of said stem will cause said second duct means of said pigment delivery vessel to be in communication with said third connecting duct means of said suction piston, to a second pigment delivery nozzle open position so as to allow said suction piston to draw a pigment from said pigment delivery vessel and then to a third residue pigment removing position in which said stem is caused to project from said pigment delivery nozzle.