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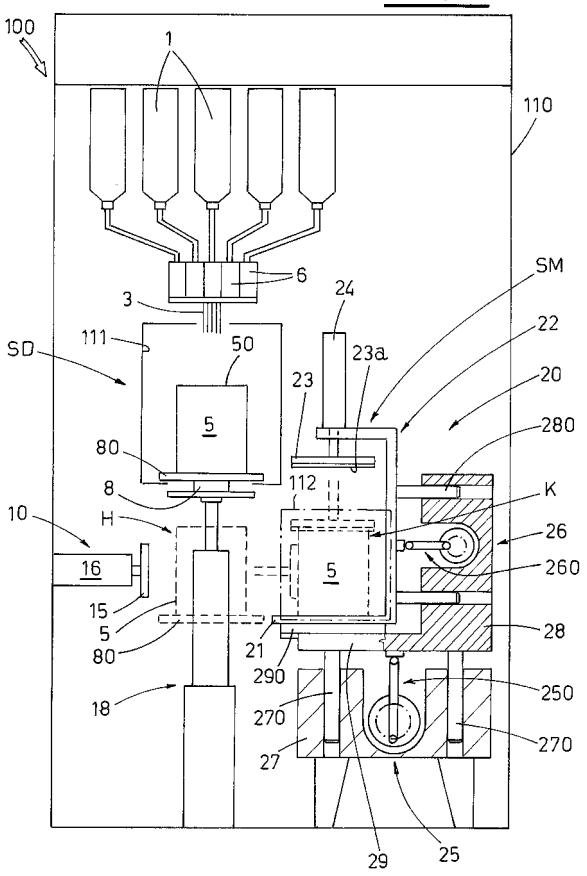
(54) Apparatus for batching coloured pigments of a paint or neutral glaze in a container, and for fabricating a mixture

(57) The apparatus (100, 200) is for batching coloured pigments in a container (5) of paint or neutral glaze, and for blending the mix obtained. The apparatus (100, 200) comprises: a batching station (SD) into which the container (5) of paint or neutral glaze is introduced; dispensing organs (3), located in the batching station (SD), for introducing into the container (5) predetermined quantities of the coloured pigments; transport means (10) for transferring the container (5), following the introduction of coloured pigments, towards a mixing station (SM), comprised in the apparatus (100, 200); means (20) for gripping and shaking the container (5), located in the mixing station (SM) in order to homogeneously blend the mix of paint or neutral glaze and coloured pigments obtained. The apparatus (100, 200), closed in containing cabinets, include a first window (111, 211) and a second window (112, 212), respectively for introduction of the container (5) into the batching station (SD), and for extraction thereof from the mixing station (SM).

FIG.1B



EP 2 025 393 A1

Description

[0001] The invention relates to the technical sector of paints or glazes of predefined colour.

[0002] In particular, the invention relates to an apparatus for obtaining a predetermined quantity of paint, glaze or similar products having a colour established by a precise formulation, starting from a base component of a neutral colour and added-to by appropriate quantities of coloured pigments.

[0003] The prior art includes apparatus which can precisely batch a composition of a mixture of colours, known as colour meters.

[0004] Colour meters can be installed in the workshops professional operators for example upholsterers, or can be placed at the service of users at specialised sales points, such as painting and decorating shops, where an assistant prepares a quantity of colour requested by an actual customer.

[0005] Recently, there has been considerable amount of installation of colour meters in large retail centres, either wholesale or retail, even where the centres are not specialised in particular in painting products; often the organisation is of the self-service type.

[0006] In order to meet this tendency, and to make the process easier for non-specialised users, on 16/01/2003 the present Applicant filed an Italian patent application for Industrial Invention, no. BO2003A 000018, which describes an "Apparatus for batching coloured pigments in a paint or neutral glaze and a container usable with the apparatus."

[0007] The apparatus consists in a colour meter of a self-service type, for a batched introduction of coloured pigments in a neutral product present in a container.

[0008] The colour meter comprises a plurality of tanks of the coloured pigments and a same number of dispensing needles arranged in a colouring chamber.

[0009] The container is provided with a lid exhibiting a window closed by a membrane of elastomer material.

[0010] The container, complete with the lid, is rested on a plate of a scales equipped internally of the colouring chamber; after the user has set the necessary data and pre-paid for the operation, by means of special devices in the colour meter, raising means lift the scales and the container, such that the dispensing needles perforate the membrane and are thus introduced into the container itself, for the dispensing of coloured pigments.

[0011] At the end, the container is lowered, the holes in the membrane spontaneously close up and the user can remove the container with the coloured product as requested.

[0012] The above-described apparatus exhibits various advantageous aspects, both in relation to the commercial structure that makes it available to the public, and for the public which, by simply introducing a code or positioning a sample in a spectrophotometer, can obtain the desired colour in a completely automous way, without needing any training or competence in order to do so.

[0013] Colour meters, both traditional and the one described above and in the cited patent, are limited to dispensing predetermined quantities of pigments into the neutral base colour; the mixture, before being used, has to be carefully stirred, in order for the colour to become homogeneous.

[0014] This last operation is usually done by the user just before applying the paint, but often is done approximatively and incompletely, either due to hurry or poor understanding of the medium, with obvious drawbacks for the final result.

[0015] With the aim of better serving the "do-it-yourself" clientèle, some sales points, already having traditional colour meters, have installed a second apparatus which mixes the meter-batched mix of paint before the client takes delivery of it.

[0016] In order to perform the mixing operation, the container has to be collected as it exits the colour meter, closed if necessary with a lid, positioned in the mixing apparatus, taking care to correctly perform the operations for correct blocking of the container, and the machine has to be started up; finally the container has to be removed.

[0017] It can be understood how this procedure, being laborious and not without risks caused by clumsy manoeuvring, cannot be directly left to the client to do in a self-service sales point; so the mixing apparatus can be installed exclusively where there are sales assistants available to the public.

[0018] The main aim of the present invention is to provide an apparatus dedicated in particular to self-service sales points which, apart from precisely batching the components in order to obtain paints and glazes of a predetermined colour, can adequately mix the paints before delivering the product to the client, without the client's having to do anything at all.

[0019] A further aim of the invention consists in providing an apparatus in which all the operative stages are done in chambers isolated from the outside, such as to obtain a total protection of the operators against any risk to their health.

[0020] A further aim of the invention is to realise a highly-reliable apparatus, of simple concept and intuitive use.

[0021] The above aims are obtained by an apparatus for batching coloured pigments in a paint or neutral glaze container and for mixing the obtained mixture, characterised in that it comprises: a batching station, in which the paint or neutral glaze is introduced; dispensing organs, located in the batching station, for introducing into the container predetermined quantities of the coloured pigments; means for moving, for transferring the container, following the introduction of the coloured pigments therein, towards a mixing station, included in the same apparatus; means located in the mixing station for gripping and shaking the container in order to render the mix of paint or neutral glaze and the coloured pigments homogeneous.

[0022] The characteristics of the invention, for obtain-

ing the above aims, will be made evident in the following description of preferred embodiments thereof, according to what is cited in the claims and with the aid of the accompanying figures of the drawings, in which:

figure 1A illustrates, in a schematic front view, a first embodiment of the apparatus;

figure 1B illustrates, in enlarged scale, the apparatus of figure 1A with the internal organs illustrated;

figure 2A illustrates, in a schematic front view, a second embodiment of the apparatus;

figure 2B illustrates, in enlarged scale, the apparatus of figure 2A with the internal organs illustrated;

figure 3 illustrates, in a partially sectioned view according to a vertical plane, a variant of a constructional detail of the apparatus.

[0023] With reference to the figures 1A, 1B, 100 denotes the first embodiment of the apparatus, in its entirety; the second embodiment, illustrated in figures 2A, 2B, has been denoted by 200.

[0024] The apparatus 100, 200 receives a container 5 of base product of a neutral colour, constituted for example by paints of many types: washable, transpiring, textured, glazes, rust-proof and the like, and dispenses, internally of the base product, batched quantities of coloured pigments in order to obtain a mix responding to a precise formulation.

[0025] To this end, the apparatus 100, 200 comprises a batching station SD in which dispensing organs 3 operate, which introduce prefixed quantities of the coloured pigments into the container 5.

[0026] In a preferred constructional solution, the dispensing organs 3 and the container 5 are of a type such as the one described in the previouslycited Italian patent application BO2003A 000018, i.e. constituted, respectively, by hollow needles arranged vertically with the point facing downwards, destined to penetrate a membrane made of an elastomer material (not illustrated in detail) included in the lid 50 of the container 5.

[0027] The dispensing needles 3 are supplied by relative tanks 1 of coloured pigments, by means of flow regulators 6 managed by a processing unit (not illustrated) provided with means for interfacing with the user and connected to devices for automatic collection of the payment (also not illustrated).

[0028] As in the cited patent application BO2003A 000018, the container 5 is arranged by the user on a plate 80 supported by a load-cell scales 8 which provides the values read off to the processing unit.

[0029] The plate 80 and the scales 8 are borne by raising means 18 which make them vertically mobile in order to raise the container 5, such as to induce the dispensing needles 3 to perforate the membrane of the lid 50 and penetrate internally of the container, in order to enable admission of the coloured pigments into the neutral-coloured base component.

[0030] The apparatus 100, 200 further comprises transport means 10, for transferring the container 5, once the coloured pigments have been received, towards a mixing station SM in which means are provided 20 which grip the container 5 and shake it, in order to amalgamate the mixture obtained and make it homogeneous in the selected tone of colour.

[0031] The means 20, for example, are constituted by a mixer device comprising: a rest base 21, destined to receive the container 5, made integral to a frame 22; a presser organ 23, superiorly associated to the frame 22, activated in a downwards direction by an actuator 24 for intercepting the lid 50 of the container 5, locking the container 5 against the underlying base 21, blocking it; first shaking organs 25, associated to the frame 22, for impressing on the frame 22 and the container 5 blocked thereto an alternating vertical motion; second shaking organs 26, associated to the frame 22 and destined to impress thereon and on the container 5 blocked thereto an alternating horizontal motion.

[0032] In order to guarantee an effective blocking of the container 5 between the presser organ 23 and the base 21, a layer 23a of "giving" elastic material, for example rubber or other material having similar properties, is advantageously provided fixed to a lower surface of the presser organ 23. Additionally, or alternatively, a further layer of this material, not illustrated, can also be fixed to the base 21.

[0033] A variant of the invention includes realising, in the base 21 and/or in the lower surface of the presser organ 23, concentric seatings 215 having different depth and diameters corresponding to those of the containers 5 of standard size which are mostly used.

[0034] In figure 3, by way of example, the base 21 is realised with three seatings 215A, 215B and 215C having corresponding and progressively increasing diameters D1, D2, D3, for a same number of containers 5. The containers 5 are partially illustrated using broken lines.

[0035] The first and second shaking organs 25, 26 are preferably provided with independent motors (not illustrated) which can be activated simultaneously or separately.

[0036] A possible but not exclusive embodiment of the first and second shaking organs 25, 26 has the relative alternating movements, vertical and horizontal, impressed by respective first and second kinematic conrod-and-crank assemblies 250, 260.

[0037] The first kinematic assembly 250, for vertical motion, is associated to the base 27 of the mixer device 20 and commands the rising and falling of a cage 28 guided by stems 270 bearing the frame 22 associated thereto.

[0038] The second kinematic assembly 260, for horizontal motion, is associated to the cage 28 and commands the left and right translation of the frame 22, guid-

ed by relative stems 280 and by a slide 290, interposed between the frame 22 and an underlying horizontal plate 29, being part of the cage 28.

[0039] The apparatus 100, in the first embodiment (figures 1A, 1B) is realised internally of a single containment unit 110, for example parallelepiped in shape, which houses the organs of the batching station SD and the organs of the mixing station SM, for which are respectively included a first and a second window 111, 112, which afford access from the outside.

[0040] Through the first window 111, the user places the container 5 on the plate 80 for receiving the coloured pigments, while the user removes the same container 5 from the second window 112 at the end of a colouring and mixing cycle.

[0041] The windows 111, 112 are preferably provided with relatively safety hatches (not illustrated) bearing associated consent organs (for example micro-switches) for inhibiting the functioning of the apparatus if hatches are not perfectly closed.

[0042] In this first embodiment of the apparatus, the transport means 10 comprise the above-mentioned raising means 18 of the batching station SD, specially conformed so that the plate 80, after the raising run for the introduction of the pigments into the container 5, can perform a descending run which brings the container 5 below the first window 111 (first position H (broken-line) in figure 1 B), such that the plate 80 is coplanar with the rest base 21 of the device 20, positioned immediately beside it.

[0043] A pusher 15 is also included in the transport means 10, horizontally activated by a respective actuator 16, for laterally intercepting the container 5, located in the same position H, in order to transfer it from the plate 80 to the rest base 21 (second position K (broken-line) in figure 1 B), in phase relation with the inoperative raised position of the presser organ 23.

[0044] The apparatus 200 in the second embodiment (figures 2A, 2B) is realised in two coupled modules M1, M2, each provided with a relative containing cabinet 210, 220.

[0045] The organs of the batching station SD and at least part of the transport organs 10 are housed in the, for example, parallelepiped cabinet 210 of the first module M1.

[0046] The cabinet 220 of the second module M2 houses the means 20 of the mixing station SM constituted, in the example of figure 2B, by the mixer device described above.

[0047] A first window 211 is afforded in the cabinet 210 of the first module M1, which first window 211 is alike to the first window 211 of the first embodiment, for introducing the container 5 into the batching station SD; the cabinet 220 of the second module M2 affords the second window 212 which enables the container 5 to be extracted at the end of the cycle.

[0048] In this case too the windows 2111, 212 are provided with safety hatches having functions which are similar to those already mentioned.

[0049] Openings 213, 223 are provided in facing walls of the cabinets 210, 220, and are of such a size as to allow passage of the transport organs 10 of the container 5.

[0050] In the second embodiment, the transport organs 10 comprise, similarly to the above first embodiment, the raising means 18 of the batching station SD, conformed to enable the plate 80 and the container 5 to lower into the position H (broken lines in figure 2B) below the first window 211.

[0051] In this position H, the plate 80 is coplanar with a roller plane 17 extending by the side of the plate 80 up to in proximity of the rest base 21 of the device 20.

[0052] Similarly to the above, a pusher 15 is included in the transport means 10, activated horizontally by an actuator 16, for laterally intercepting the container 5 located in the position H, for transferring it from the plate 80 to the rest base 21 (second position K (broken-line) in figure 2B), in phase relation with the inoperative raised position of the presser organ 23.

[0053] In this case the actuator 16 must be able to perform an increased run in accordance with the length of the roller plane 17.

[0054] In a variant, not illustrated, the transfer of the container 5 from the plate 80 to the rest base 21 is performed by means of several organs acting in succession, for example: a pusher 15, activated by an actuator 16 similar to that of the first embodiment of the apparatus, for displacing the plate 80 to the roller plane 17; the roller plane 17 is motorised for displacement of the container 5 along the development of the roller plane 17; a further pusher, activated by a relative actuator, is for completing the positioning of the container 5 on the base 21.

[0055] In both described embodiments, the transport organs 10 and the mixer device 20 are activated in phase relation with the organs of the batching station SD, in an appropriate automatic program memorised in the processing unit.

[0056] Once the container 5 has been introduced into the batching station SD through the first window 111, 211 and the necessary operations performed for starting up the apparatus 100, 200, the user need perform no further action up until when, at the end of the automatic introduction cycle of the pigments and the mixing of the mixture, the container 5 is ready to be collected from the second window 112, 212.

[0057] It is very evident, therefore, that the apparatus possesses the requisites for satisfying the set aims, especially in view of a use thereof in self-service sales points, with users having no specific competence.

[0058] The apparatus is able to precisely batch the components for obtaining paints or glazes of prefixed colours, and mixing the components adequately in order to blend them and make them homogeneous, all without the client's having to perform any actions.

[0059] All of the operations are performed in chambers isolated from the outside, guaranteeing maximum security for the people who are close to the apparatus, in ac-

cordance with the existing norms and regulations for machines.

[0060] A further but no less important characteristic of the apparatus is its intrinsic constructional simplicity, which is translated into a high level of reliability for the intended use thereof as well as for the satisfaction of the clientèle and, consequently, in order to guarantee the required profitability.

Claims

1. An apparatus for batching coloured pigments in a paint or neutral glaze container and for blending a mixture thereby obtained, **characterised in that** it comprises: a batching station (SD) into which the container (5) of paint or neutral glaze is introduced; dispensing organs (3), located in the batching station (SD), for introducing into the container (5) predetermined quantities of the coloured pigments; transport means (10) for transferring the container (5), following the introduction of coloured pigments, towards a mixing station (SM), comprised in the apparatus (100, 200); means (20) for gripping and shaking the container (5), located in the mixing station (SM) in order to homogeneously blend the mix of paint or neutral glaze and coloured pigments obtained.

2. The apparatus of claim 1, **characterised in that** the means (20) provided in the mixing station (SM) are constituted by a mixer device comprising: a rest base (21), destined to receive the container (5), made integral to a frame (22); a presser organ (23), superiorly associated to the frame (22) and activated in a downwards direction by an actuator (24) for intercepting a lid (50) of the container (5), pushing the container (5) against the underlying base (21), blocking the container (5); first shaking organs (25), associated to the frame (22) for impressing thereon, and on the container (5) blocked thereto, an alternating vertical motion; second shaking organs (26), associated to the frame (22), for impressing thereon, and on the container (5) blocked thereto, an alternating horizontal motion.

3. The apparatus of claim 2, **characterised in that** the rest base (21) and/or the presser organ (23) is fixed to a layer (23a) of a soft elastic material, for example made of rubber or other materials having similar characteristics, destined to facilitate the blocking of the container (5).

4. The apparatus of claim 2, **characterised in that** the rest base (21) bears substantially concentric seatings (215), having various depths and diameters corresponding to diameters of standardised measurements of the container (5).

5. The apparatus of claim 2, **characterised in that** the first shaking organs (25) comprise a con-rod and crank kinematic assembly (250), associated to the base (27) of the mixer device (20), for commanding the raising and descending of a cage (28), guided by relative stems (270), bearing the frame (22) associated thereto.

6. The apparatus of claim 2, **characterised in that** the second shaking organs (26) comprise a con-rod and crank kinematic assembly (260) associated to a cage (28) of the mixer device (20) subjected to the alternating vertical motion impressed by the first shaking organs (25), the kinematic assembly (260) commanding a right and left translation of the frame (22), guided by stems (280) and a slide (290) interposed between the frame (22) and an underlying horizontal plate (29) exhibited by the cage (28).

7. The apparatus of claim 2 or 5 or 6, **characterised in that** the first and second shaking organs (25, 26) are activated by relative independent motor means.

8. The apparatus of claim 1, **characterised in that** it comprises a containing cabinet (110) which houses the organs of the batching station (SD) and mixing station (SM) as well as the transport means (10), with the containing cabinet (110) provided with a first window and a second window (111, 112), respectively at the batching station (SD), for introduction of the container (5), and at the mixing station (SM), for extraction thereof.

9. The apparatus of claim 1, **characterised in that** it is constituted by a first and a second module (M1, M2), each provided with a containing cabinet (210, 220), with the first cabinet (210) for housing the organs of the batching station (SD) and at least a part of the transport means (10), as well as being provided with a first window (211) for introducing the container (5) into the batching station (SD); and with the second cabinet (220) for housing the organs of the mixing station (SM) and a remaining part of the transport organs (10), as well as being provided with a second window (212) for extraction of the container (5) from the mixing station (SM).

10. The apparatus of claim 8 or 9, **characterised in that** the first window and the second window (111, 211, 112, 212) are provided with safety hatches, bearing associated consent organs for inhibiting a functioning of the apparatus when the hatches are open.

11. The apparatus of claim 9, **characterised in that** opposite walls of the containing cabinets (210, 220) afford respective openings (213, 223) having dimensions such as to enable transit from the first module (M1) to the second module (M2) of the transport or-

gans (10) and the container (5).

12. The apparatus of claim 1 or 8, **characterised in that** the transport means (10) comprise: raising means (18) arranged in the batching station (SD) for moving a plate (80) downwards, the plate (80) supporting the container (5), for bringing the container (5), after the stage of introduction of the coloured pigments, into a predetermined position (H) underlying the first window (111) and such that the plate (80) is coplanar to a flanking rest base (21) comprised in the means (20) of the mixer station (SM); pusher organs (15), activated horizontally by an actuator (16), for laterally intercepting the container (5) in the position (H), for transferring the container (5) from the plate (80) to the rest base (21), into a second predetermined position (K).

13. The apparatus of claim 1 or 9, **characterised in that** the transport means (10) comprise: raising means (18), arranged in the batching station (SD), for downwardly moving a plate (80) for supporting the container (5), for bringing the container (5) after the stage of introducing the coloured pigments, into a prefixed position (H), underlying the first window (111) and such that the plate (80) is coplanar to a flanking roller plane (17), which roller plane (17) extends towards a rest base (21) included in the means (20) of the mixing station (SM); pusher organs (15), horizontally activated by a relative actuator (16), for laterally intercepting the container (5), in the position (H), for transferring the container (5) from the plate (80) to the roller plane (17) and thereafter to the rest base (21), into a second prefixed position (K).

14. The apparatus of claim 1 or 9, **characterised in that** the transport means (10) comprise: raising means (18), arranged in the batching station (SD), for downwardly moving a plate (80) for supporting the container (5), for bringing the container (5) after the stage of introducing the coloured pigments, into a prefixed position (H), underlying the first window (111) and such that the plate (80) is coplanar to a flanking roller plane (17), which roller plane (17) extends towards a rest base (21) included in the means (20) of the mixing station (SM); pusher organs (15), horizontally activated by a relative actuator (16), for laterally intercepting the container (5), in the position (H), for transferring the container (5) from the plate (80) to the roller plane (17); motor means, associated to the roller plane (17), for enabling a translation of the container (5) along a whole development of the roller plane (17); further pusher organs, for completing transfer of the container (5) from the roller plane (17) to the rest base (21), into a second prefixed position (K).

15. The apparatus of claim 1, **characterised in that** it includes means for programming and processing, for activating the organs of the batching station (SD) and the mixing station (SM), as well as the transport means (10), in reciprocal phase relation, for automatically performing the operative cycles of the apparatus (100, 200).

FIG.1A

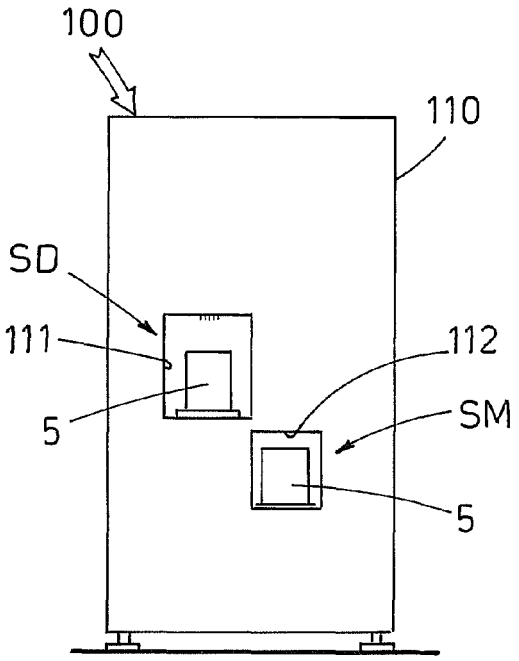
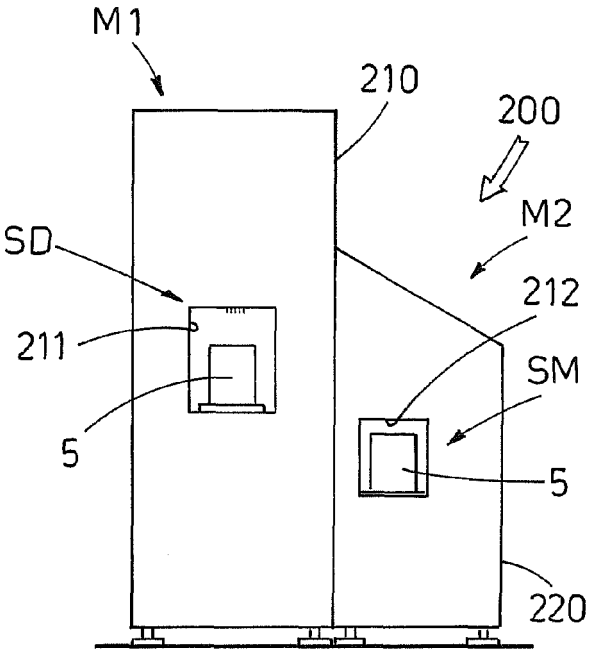


FIG.2A



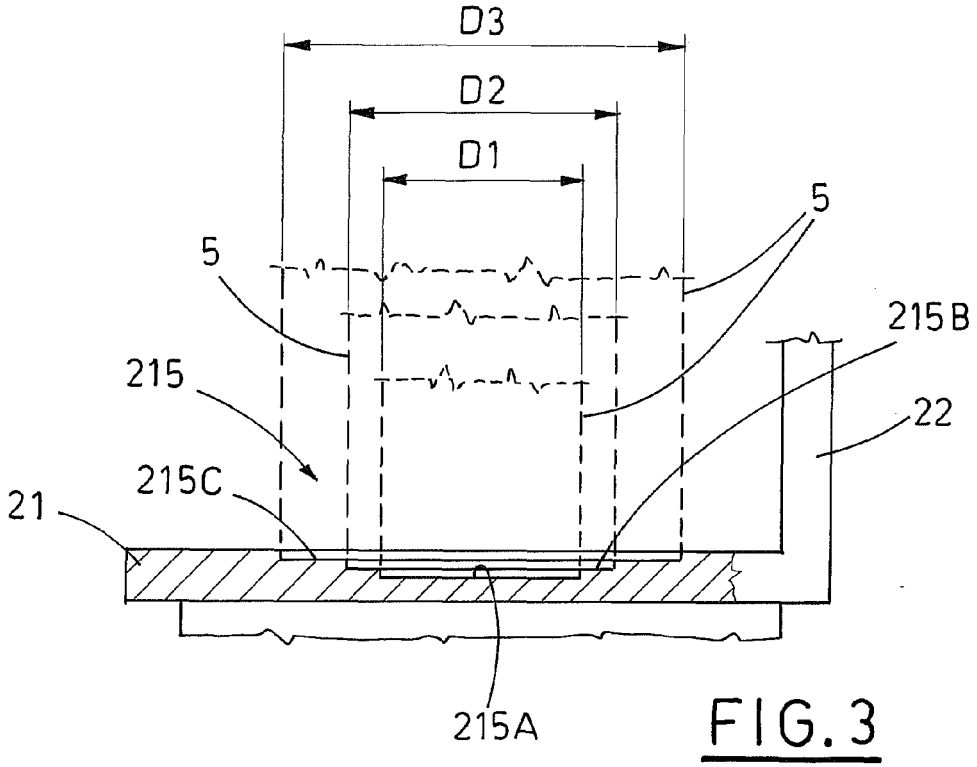
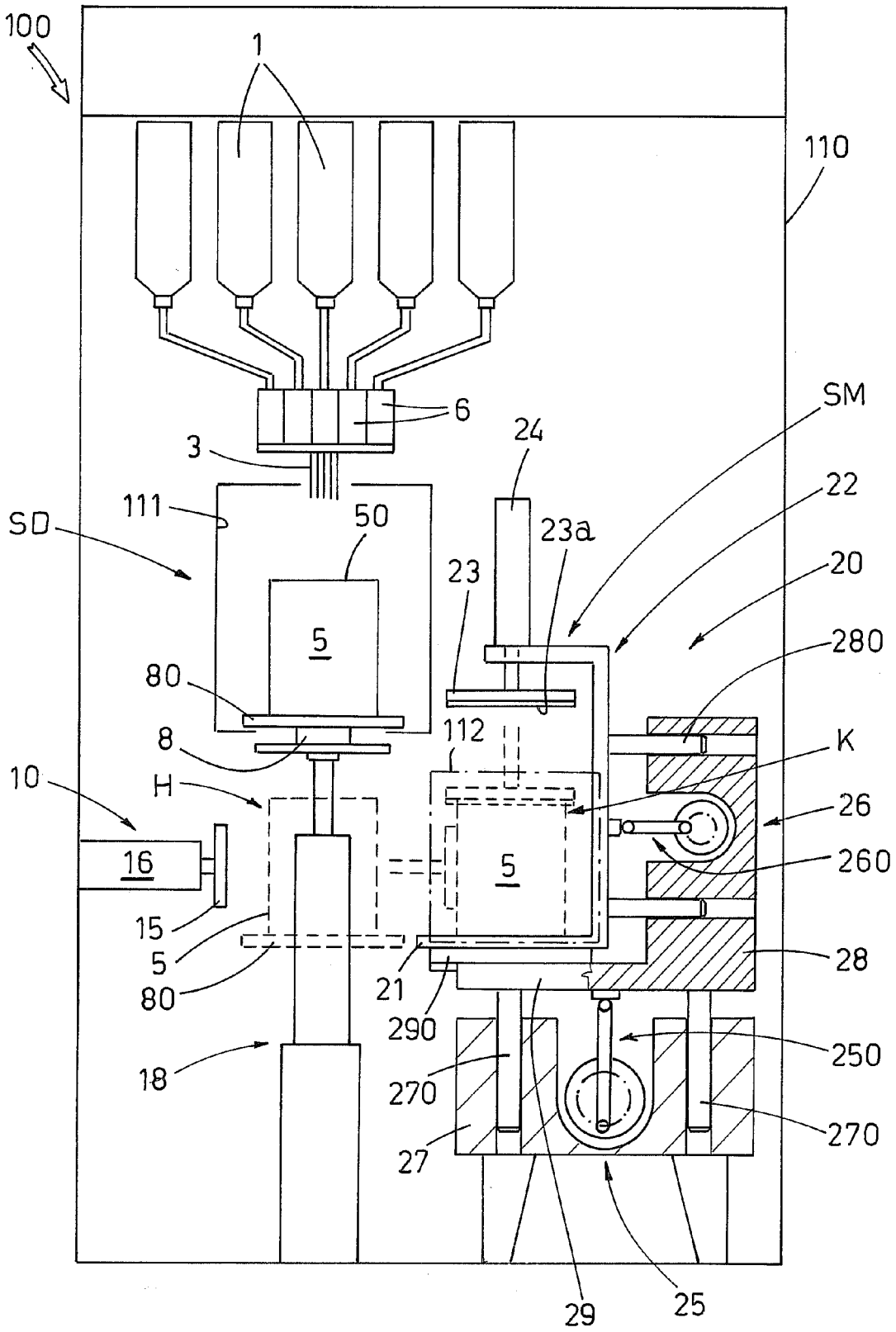


FIG.3

FIG.1B


100
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110
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SM
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23a
SD
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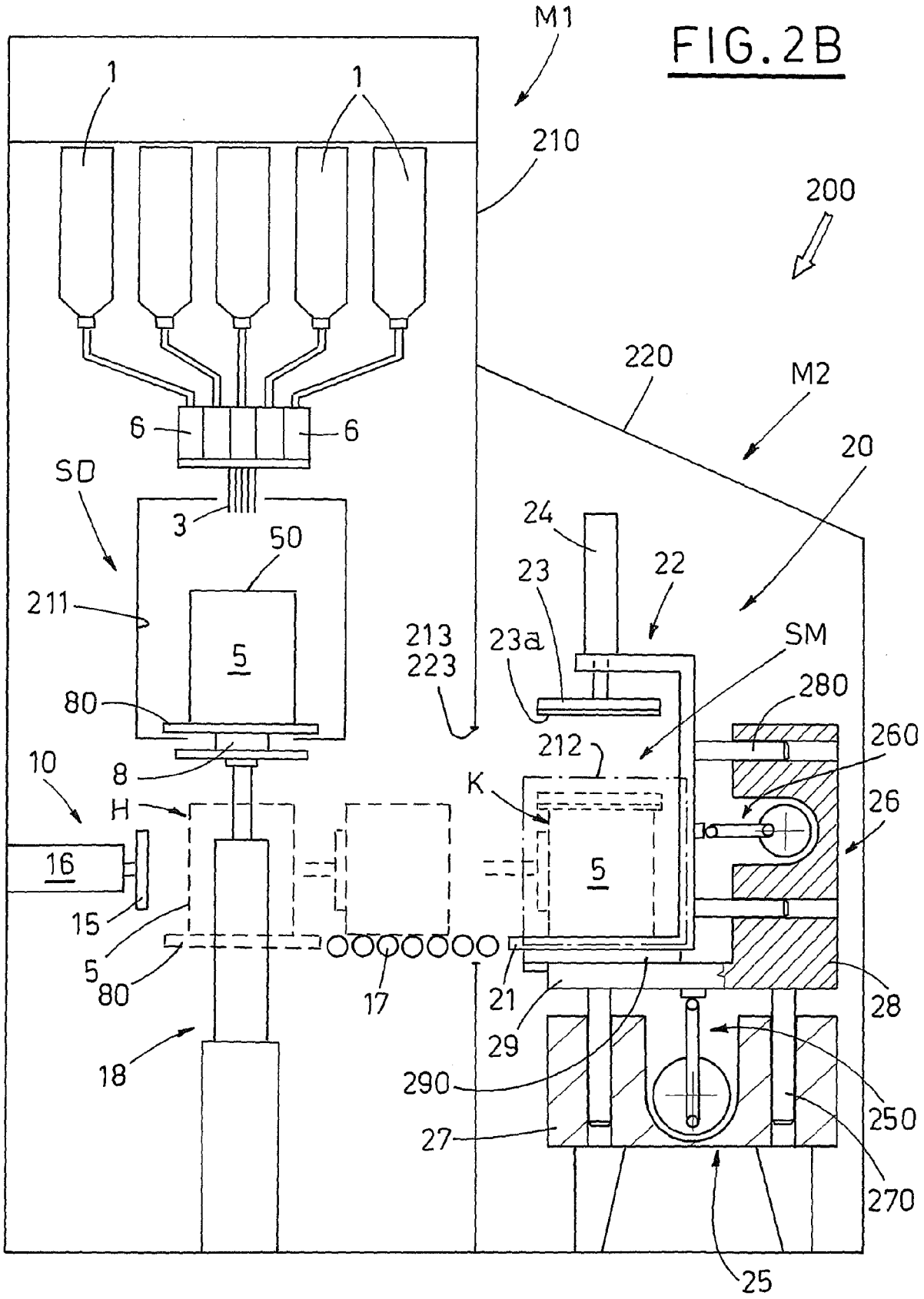
FIG.2B


M1
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220
M2
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EUROPEAN SEARCH REPORT

Application Number
EP 08 16 1641

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2006/036096 A (TEXO APPLIC AB [SE]; LINDBLOM BO [SE]) 6 April 2006 (2006-04-06) * page 1, lines 3-15 * * page 5, line 19 - page 6, line 11 * * page 6, line 29 - page 8, line 10 * * page 14, line 7 - page 15, line 9 * * abstract; figures 1-4 *	1-15	INV. B01F13/10 B01F11/00 B01F15/04 B01F1/00 ADD. B01F15/00
X A	JP 02 060800 A (NIPPON PAINT CO LTD) 1 March 1990 (1990-03-01) * abstract; figures 1-6 *	1 2-15	
A	EP 1 428 569 A (VALPAINT S R L [IT]) 16 June 2004 (2004-06-16) * abstract; figures 1,2 *	1-15	
A	EP 1 439 000 A (VALPAINT S R L [IT]) 21 July 2004 (2004-07-21) * abstract; figures 1-4 *	1-15	
A	US 2004/013031 A1 (SALAS MARTIN MIGUEL [US] ET AL) 22 January 2004 (2004-01-22) * paragraphs [0001] - [0003], [0005], [0016] * * abstract; figures 1-5 *	1-15	TECHNICAL FIELDS SEARCHED (IPC) B01F
A	DE 299 11 370 U1 (SUEVERKRUEP RICHARD [DE]; DEICKE ANNE [DE]) 7 October 1999 (1999-10-07) * page 6, line 17 - page 7, line 37 * * claims 1,5 * * abstract; figures 2,4 *	1-15	

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	4 December 2008	Brunold, Axel

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 203 07 593 U1 (COLLOMIX RUEHR MISCHGERAETE [DE]) 24 July 2003 (2003-07-24) * page 1, lines 11-13 * * page 1, line 22 - page 4, line 30 * * abstract; figures 1,2 * -----	1-15	
A	NL 76 718 C (B A KRUIP) 15 July 1954 (1954-07-15) * figures 1,2 * -----	1-15	
A	US 2005/169102 A1 (MANKE SCOTT G [US]) 4 August 2005 (2005-08-04) * paragraphs [0001] - [0003] * * abstract; figures 1-5 * -----	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	4 December 2008	Brunold, Axel

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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L : document cited for other reasons

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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04-12-2008

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2006036096 A	06-04-2006	SE 528575 C2	19-12-2006
		SE 0402318 A	28-03-2006
		US 2008051936 A1	28-02-2008
JP 2060800 A	01-03-1990	JP 1984918 C	25-10-1995
		JP 6098879 B	07-12-1994
EP 1428569 A	16-06-2004	NONE	
EP 1439000 A	21-07-2004	NONE	
US 2004013031 A1	22-01-2004	NONE	
DE 29911370 U1	07-10-1999	NONE	
DE 20307593 U1	24-07-2003	NONE	
NL 76718 C		NONE	
US 2005169102 A1	04-08-2005	US 2008089172 A1	17-04-2008

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- IT BO20030018 A **[0006] [0026]**