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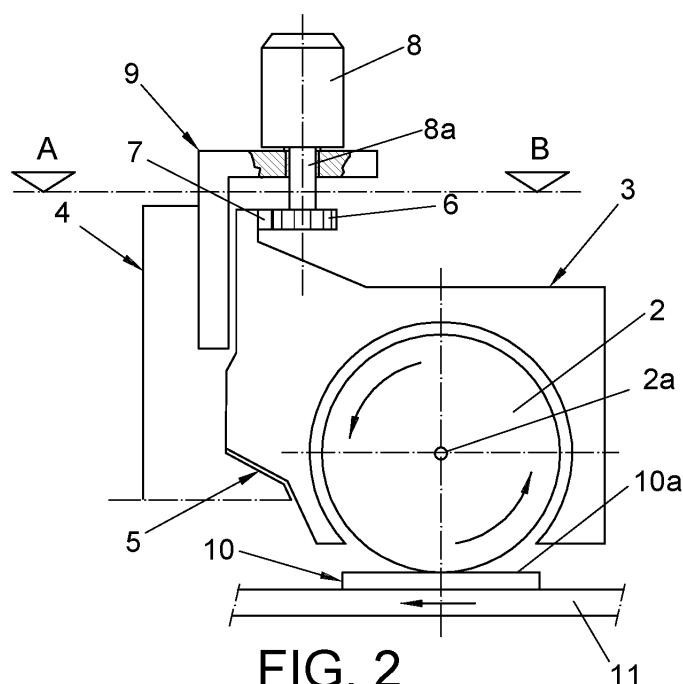
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(54) **GLAZING-BRUSHING MACHINE**

(57) The invention relates to a glazing-brushing machine comprising a conveyor belt (11), at least one brushing cylinder (2) arranged to rotate, and a head (3) coupled to a bridge (4). The brushing cylinder (2) is coupled to the head (3) and is arranged to come into contact with the surface (10a) of a part (10) supported by the conveyor belt (11). The machine also comprises a device for moving the head (3), designed to move the head (3) alternately in two directions along an axis parallel to the bridge (4), the head (3) being coupled to the bridge (4) by means of a guide (5). The controlled movement of the brushing cylinder (2) prevents irregular and premature wear of the cylinder, such that the abrasive surface of said cylinder wears uniformly.

ing the head (3), designed to move the head (3) alternately in two directions along an axis parallel to the bridge (4), the head (3) being coupled to the bridge (4) by means of a guide (5). The controlled movement of the brushing cylinder (2) prevents irregular and premature wear of the cylinder, such that the abrasive surface of said cylinder wears uniformly.



**FIG. 2**

## Description

### Object of the invention

[0001] The present invention relates to a glazing-brushing machine; wherein a brushing cylinder is specially designed for treating the visible surface of ceramic parts and similar once the manufacturing process thereof is completed, normally when exiting the kiln; the objective thereof being to give said visible surface a finish that is more glazed, even and pleasant to the touch and therefore, more appropriate and appealing commercially. Based on this premise, the objective of the invention are moving means which enable the brushing cylinder to move in the two directions along a transversal axis along a bridge, such that the controlled movement of the brushing cylinder prevents irregular and premature wear of said brushing cylinder, such that the abrasive surface of the brushing cylinder wears uniformly.

### Technical problem to be resolved and background of the invention

[0002] Current glazing-brushing machines incorporate brushing cylinders, each of which is mounted on a head, such that the assembly of said head with the cylinder is kept in a static position during tangential contact of the brushing cylinder with the surface of the ceramic part to be brushed and/or glazed which is pulled by a conveyor belt located below the brushing cylinder.

[0003] These conventional machines have the drawback that the outer surface of the brushing cylinders which is in contact with the ceramic part wears prematurely and irregularly, such that it is necessary to change the brushing cylinders also prematurely, which entails an added cost.

### Description of the invention

[0004] In order to achieve the objectives and avoid the drawbacks mentioned in the previous sections, the invention proposes a glazing-brushing machine comprising a conveyor belt, at least one brushing cylinder arranged to rotate, and a head coupled to a bridge.

[0005] The brushing cylinder is coupled to the head and is arranged to come into contact with the surface of a ceramic part supported by the conveyor belt.

[0006] The machine of the invention comprises a device for moving the head, designed to move the head alternately in two directions along an axis parallel to the bridge, the head being coupled to the bridge by means of a guide.

[0007] In a first case, the brushing cylinder can be oriented on an axis perpendicular to the axis of the conveyor belt; and in a second case, the brushing cylinder can be oriented on an axis with a certain obliqueness with respect to the axis of the conveyor belt, since this arrangement improves the attack of the brushing cylinder on the

part to be treated; wherein in this second case, the orientation of the brushing cylinder is not perpendicular to the axis of the conveyor belt.

[0008] The moving device comprises a rack and pinion mechanism; wherein the guide is parallel to the rack of the rack and pinion mechanism.

[0009] The pinion is fixed to a shaft of a rotating motor element which is fixed to a support integral to the bridge, while the rack is located in parallel to the bridge.

[0010] In an embodiment of the invention, the rack is an independent part fixed to the head, while in another embodiment of the invention the rack is part of the head itself.

[0011] Furthermore, in another embodiment of the invention, the support is integral to the head, while the rack is located in an independent part which is fixed to the bridge, or said rack is part of the head itself. Obviously, in this embodiment, the motor is fixed to the support and the pinion is fixed to the shaft of the motor.

[0012] The moving device can further comprise a mechanism made up of a linear actuator, or any other equivalent mechanism that enables the head to be moved in parallel to the bridge.

[0013] Mobility along a transversal axis of the assembly of the head and brushing cylinder is automatically activated to move said assembly according to a previously established anti-wear pattern, whereby the brushing cylinder will move from one side to another simultaneously with longitudinal advancement of the conveyor belt supporting the ceramic parts.

[0014] With this described arrangement, the abrasive surface of the brushing cylinder wears evenly and uniformly, preventing the formation of sunken or staggered areas which destroy the abrasive material of the brushing cylinder, wearing it out prematurely; thus, with the economic and production effects this entails, forcing the brushing assembly to stop for exchange thereof.

[0015] It should be noted that the current market tends to increasingly use these glazing systems of the ceramic part or plate, placing them permanently in the ceramic part manufacturing or enamelling line itself. Therefore, it becomes necessary to have versatile devices which make the most of the abrasive materials, which are one of the most important consumable elements in the high-volume production of current ceramic companies.

[0016] Next, to help better understand this specification and as an integral part thereof, a series of figures is attached in which the object of the invention is depicted in an illustrative and non-limiting manner.

### Brief description of the figures

[0017]

[0017] **Figure 1** shows a perspective view of a glazing-brushing machine, object of the invention.

**Figure 2** shows a profile view of the machine of the invention.

**Figure 3** shows a section plan view according to the section A-B of Figure 2.

**Figure 4** shows a view of a conventional brushing cylinder irregularly worn.

### Description of an exemplary embodiment of the invention

**[0018]** Considering the numeration adopted in the figures, the glazing-brushing machines 1 comprises a head 3 coupled to a bridge 4 by means of a guide 5 which connects the head 3 with said bridge 4, wherein the guide 5 is parallel to a longitudinal axis 2a of a brushing cylinder 2 which is coupled to the head 3.

**[0019]** The machine of the invention further comprises a device for moving the head 3 made up of a rack 7 and pinion 6 mechanism; wherein the rack 7 is located in parallel to the guide 5, such that when the pinion 6 rotates, it pulls the assembly of the head 3 together with the brushing cylinder 2.

**[0020]** In the embodiment shown in the figures, the pinion 6 is fixed on a shaft 8a of a rotating motor element 8 which is fixed to a support 9 integral to the bridge 4, while the rack 7 is fixed to the head 3, although there is also the possibility that the rack 7 is part of the head 3 itself.

**[0021]** With the described arrangement, in a first direction of rotation of the pinion 6, the assembly of the head 3 and brushing cylinder 2 moves linearly in a direction of advancement in parallel to the guide 5, while when the pinion 6 rotates in a second direction of rotation opposite to the first direction of rotation previously described, the assembly of the head 3 and brushing cylinder 2 moves linearly in the other direction of advancement in parallel to the guide 5.

**[0022]** Thus, during the operation of the machine 1 of the invention, the brushing cylinder 2 is in contact with a surface 10a of a part 10 supported by a conveyor belt 11 located below the brushing cylinder 2, wherein the brushing cylinder 2 has a cylindrical shape and is arranged to rotate and contact tangentially with the surface 10a of the part 10 which moves pulled by the conveyor belt 11 on a longitudinal axis which is perpendicular or oblique with respect to the transversal movement of the head 3, such that the brushing cylinder 2 has an abrasive outer surface 2a for glazing and brushing said part 10 which moves pulled by the conveyor belt 11.

**[0023]** The brushing cylinder 2 is arranged on a transversal axis over the conveyor belt 11, such that as the part 10 moves pulled by the conveyor belt 11 on a longitudinal axis and the outer surface of the brushing cylinder 2 being in tangential contact with the surface 10a of the part 10, the glazing and brushing operation of said surface 10a of the part 10 is performed.

**[0024]** Figure 4 shows a conventional brushing cylinder irregularly worn in a central portion of said brushing cylinder, such that said irregular wear corresponds to the width of the part pulled by the conveyor belt.

### Claims

1. **A glazing-brushing machine**, comprising a conveyor belt (11), at least one brushing cylinder (2) arranged to rotate, and a head (3) coupled to a bridge (4); wherein the brushing cylinder (2) is coupled to the head (3); and wherein the brushing cylinder (2) is arranged to come into contact with the surface (10a) of a part (10) supported by the conveyor belt (11); **characterised in that** it comprises a device for moving the head (3), designed to move said head (3) alternately in two directions along an axis parallel to the bridge (4); the head (3) being coupled to the bridge (4) by means of a guide (5).
2. The **glazing-brushing machine**, according to claim 1, **characterised in that** the moving device comprises a rack (7) and pinion (6) mechanism; wherein the guide (5) is parallel to the rack (7) of the rack (7) and pinion (6) mechanism.
3. The **glazing-brushing machine**, according to claim 2, **characterised in that** the pinion (6) is fixed to a shaft (8a) of a rotating motor element (8) which is fixed to a support (9) integral to the bridge (4), while the rack (7) is located in parallel to the bridge (4).
4. The **glazing-brushing machine**, according to any one of the preceding claims 2 or 3, **characterised in that** the rack (7) is an independent part fixed to the head (3).
5. The **glazing-brushing machine**, according to any one of the preceding claims 2 or 3, **characterised in that** the rack (7) is part of the head (3) itself.

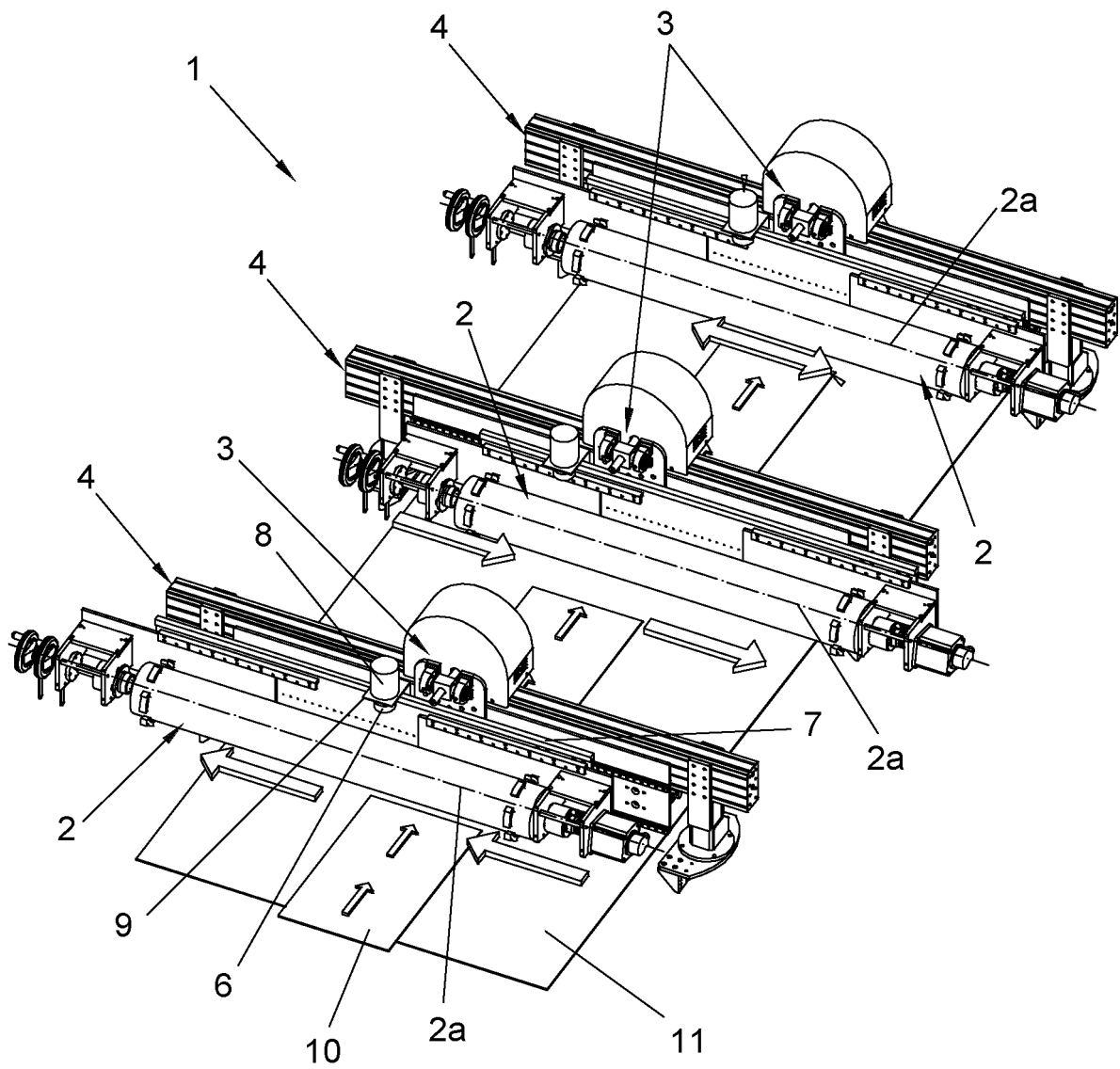
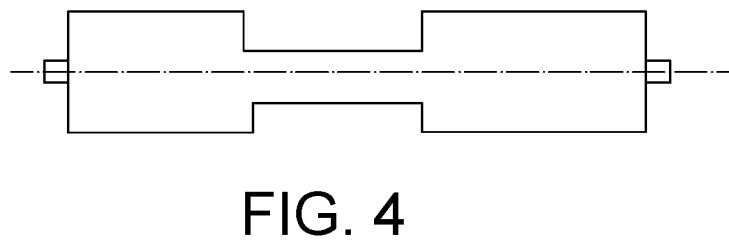
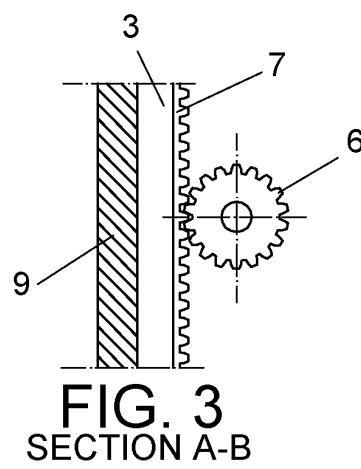
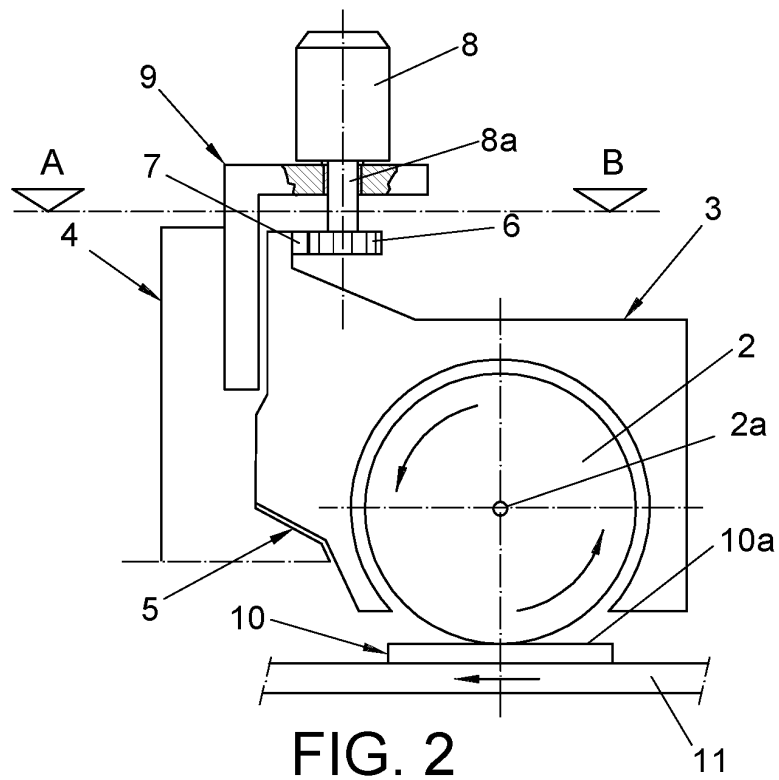


FIG. 1



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2018/070777

<p>A. CLASSIFICATION OF SUBJECT MATTER</p> <p><b>B28B11/08</b> (2006.01)  <b>B24B33/055</b> (2006.01)  According to International Patent Classification (IPC) or to both national classification and IPC</p>											
<p>B. FIELDS SEARCHED</p>											
<p>Minimum documentation searched (classification system followed by classification symbols)  <b>B28B, B24B</b></p>											
<p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched</p>											
<p>Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)</p> <p><b>EPODOC, INVENES</b></p>											
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p>											
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td data-bbox="272 826 384 960">A</td> <td data-bbox="384 826 1106 960">CN 206241806U U (WEIFANG LIANHAI DOWN-HOLE DRILLING MACHINERY CO LTD) 13/06/2017, Figures &amp; abstract from DataBase EPODOC. Retrieved in EPOQUE; AN-CN-201621154087-U</td> <td data-bbox="1106 826 1361 960">1</td> </tr> <tr> <td data-bbox="272 960 384 1140">A</td> <td data-bbox="384 960 1106 1140">CN 105193006 A (HUZHOU YOUCHUANG TECHNOLOGY CO LTD) 30/12/2015, Figures &amp; abstract of the DataBase EPODOC. Retrieved in EPOQUE; AN-CN-201510664206-A</td> <td data-bbox="1106 960 1361 1140">1-2</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	A	CN 206241806U U (WEIFANG LIANHAI DOWN-HOLE DRILLING MACHINERY CO LTD) 13/06/2017, Figures & abstract from DataBase EPODOC. Retrieved in EPOQUE; AN-CN-201621154087-U	1	A	CN 105193006 A (HUZHOU YOUCHUANG TECHNOLOGY CO LTD) 30/12/2015, Figures & abstract of the DataBase EPODOC. Retrieved in EPOQUE; AN-CN-201510664206-A	1-2		
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<p><input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.      <input checked="" type="checkbox"/> See patent family annex.</p>											
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<p>Date of the actual completion of the international search  <b>12/04/2019</b></p>	<p>Date of mailing of the international search report  <b>(17/04/2019)</b></p>										
<p>Name and mailing address of the ISA/  <b>OFICINA ESPAÑOLA DE PATENTES Y MARCAS</b>  Paseo de la Castellana, 75 - 28071 Madrid (España)  Facsimile No.: 91 349 53 04</p>	<p>Authorized officer  <b>J. Hernández Cerdán</b></p> <p>Telephone No. 91 3495339</p>										

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International application No.  
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